SELF-EFFICACY AND ACHIEVEMENT GOALS AMONG MALAYSIAN PHYSICAL EDUCATION PRESERVICE TEACHERS

A Dissertation

by

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ABSTRACT

Physical Education Teacher Education (PETE) programs have responsibility to prepare preservice teachers to become effective PE teachers, who in turn will impact the quality of school physical education in the future. Therefore, it is important for researchers and practitioners to understand and explain what motivates preservice teachers to learn and achieve during their training in PETE programs. Guided by self-efficacy theory and achievement goal theory, the present study examined teacher self-efficacy and teachers' achievement goals and their relations to important educational outcomes (intention to become a physical education teacher in the future, GPA, and teaching behavior) among PE preservice teachers in Malaysia. Utilizing multiple sources of data (questionnaires, interviews and videotaped lessons), the present study attempted to answer four research questions: (1) What is the reliability and validity of adapted Teachers' Sense of Self-Efficacy (TSES) and Achievement Goal Questionnaire for Teaching (AGQ-T)? (2) What are the relationships between teacher self-efficacy, achievement goals and important educational outcomes? (3) To what extent is teacher self-efficacy related to observed teaching behaviors among PE preservice teachers? and (4) What experiences did preservice teachers perceive contributing to their self-efficacy in their PETE program?

Participants included 176 preservice teachers (age M = 24.19, SD = 1.11; 97 males and 79 females; 94 juniors and 82 seniors) enrolled in the PETE program at a major research university in Malaysia. Results of both Item Response Theory (IRT) analyses and Confirmatory Factor Analyses (CFAs) revealed that TSES was a reliable and valid measure to assess teacher self-efficacy for classroom management, instructional strategies and student engagement among this group of preservice teachers. AGQ-T, after the deletion of five items and several

modifications, demonstrated acceptable reliability and validity as a measure to assess six teachers' achievement goals in the present study.

Structural equation modeling (SEM) analysis revealed teacher self-efficacy for classroom management, instructional strategies and student engagement all positively predicted preservice teachers' intention to become a PE teacher in the future. Among the six teachers' achievement goals, only self-approach goals were found to positively predict this intention outcome.

The Poisson regression analyses revealed teacher self-efficacy for classroom management and teacher self-efficacy for student engagement predicted the occurrence of teaching behaviors that focused on classroom management and student engagement in PE classes that were observed in the present study. This finding provides the first empirical evidence that teacher self-efficacy predicted some actual teaching behaviors and thus extends the research literature that links teacher self-efficacy to teaching behaviors assessed by self-reports.

Lastly, the interview data revealed that preservice teachers reported enhanced self-efficacy for teaching physical education from the beginning to the end of their 14 weeks student teaching at schools. This finding adds support to the importance of student teaching in the development of self-efficacy for preservice teachers. Additionally, preservice teachers in the present study identified professors in the PETE program, school mentor teachers, and student teaching as the most important contributors to the development of their self-efficacy for teaching physical education during their study in the program. With such insightful information, faculty members in PETEs may be in a better position to prepare preservice teachers to become effective PE teachers.

DEDICATION

I would like to dedicate this dissertation to

my parents, wife, children, mentors and teachers

for their relentless supports, encouragements and sacrifications.

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CHAPTER I

INTRODUCTION

Broadly considered, an individual with a prolonged condition of being overweight or obese will lead to a chronic effect of metabolic disorders (e.g., diabetes mellitus and hypertension). Numerous studies have linked overweight or obesity to cardiovascular diseases, type II diabetes mellitus and hypertension, which result in higher mortality rates (Brown, Fujioka, Wilson, & Wooodworth, 2009; Zhang, Bansback, Amarsi, Birmingham, & Anis, 2009). As a developing country, Malaysia is not excluded from this vexing condition of obesity/overweight. In recent empirical research, data have shown that 1 in every 2 Malaysians was obese/overweight (Chan et al., 2017). Further, 52% of this population was reportedly living in sedentary behaviors such as sitting longer than 8 hours due to a job commitment, physical inactivity and overeating habit (Malaysia National Health and Morbidity [NHMS], 2015). Accordingly, the World Health Organization (WHO) has also ranked Malaysia as the most obese country compared to other South-East Asian countries (WHO, 2016). One of the major contributors that leads an individual for being overweight or obese is physically inactivity (Laframboise & deGraauw, 2011)

As such, regular participation in physical activity (PA) becomes an important means to fight against overweight or obesity. WHO guidelines (2011) recommended that to obtain the full benefits of health from regular participation in PA; a person aged between 18 to 64 years old is advised to perform at least 150 min/week of moderate-intensity aerobic PA, or 75 min/week of vigorous-intensity aerobic, or combinations of moderate and vigorous intensity PA, which is equivalent to a total PA level of at least 600 metabolic equivalent (MET)-minutes per week or 10 MET-hours/week. In addition, to assisting individuals to stay in within their normal weight,

regular PA participation can prevent metabolic disorders (e.g., hypertension and diabetes mellitus), promote psychological well-being and improve functional quality of life (Warburton & Charlesworth, 2010)

However, promotion of PA is not well versed and embedded in Malaysian`s culture (De Vries, 1990; Salleh, 1997). Therefore, to promote regular participation in PA among Malaysians, quality school physical education (PE) is needed so life-long learning about PA or exercise among children could become possible (Galloa et al, 2016).

Malaysia Physical Education

In Malaysia, Physical Education (PE) is a compulsory and core subject for all school students ages 7 - 17 (MNSC; Malaysia National School Curriculum, 1989). They are required to take PE for a minimum per class period of 35 minutes twice a week. However, to date, school PE largely is taught by teachers who chose PE as their minor when they studied in teacher education preparation programs. In other words, school PE in Malaysia is not taught by physical education specialists.

Unlike other core academic subjects (e.g., Mathematics, English, History and Science), PE is not evaluated in Malaysia National School Board Exam (MNSBE). As a national school exam, MNSBE aims to evaluate student academic competency or achievement on academic core subjects and consists of three check points. The first check-point occurs when students are 12 years old, just before they progress from elementary school to middle school. The second check-point is conducted at middle school level (i.e., students at the age of 15 years old), before students start high school. Lastly, the third check-point is performed when students are 17 years old, before entering to college.

As the country is progressing to become a developed country by 2030, the development of Malaysia PE curriculum has resulted in a new curriculum structure. In 2009, a new Malaysia PE curriculum was established and named as "1 Student 1 Sport" (Ministry of Education, 2009). It represents the hope of Malaysia government to give boost towards a better reputation and recognition of PE at any school level (Ministry of Education [MOE], 2009). Further, this newly structured curriculum was designed to implement an effective PE program at schools and to create awareness about being physically active among school students throughout their life. Accordingly, all school students between 7 and 17 years old are required to be evaluated twice a year for their physical fitness components, using the "Malaysia PE School Based Evaluation" system. This system includes physical fitness tests assessing cardiovascular fitness, muscular endurance and strength, flexibility, agility and speed (MOE, 2009).

A recent study has been conducted to comprehensively evaluate the effectiveness of the new PE curriculum "1 Student 1 Sport" implemented in schools (DeVries, 2016). Findings from this study have shown that PE is considered a non-examination subject and has been treated as the least important subject at schools' administrative level (e.g., scheduling PE classes, allocation of financial resources and assigning PE teachers). In addition, it was found that most principals did not understand and value the role of PE as the core subject in shaping school students' awareness about the importance of healthy lifestyle.

Motivation and Physical Education Teacher Education (PETE) as "Catalyst"

Motivation is defined as traits or attributes that initiate, drive and direct human beings to behave on a particular task (Gredler, Broussard & Garrison, 2004). Tracking back to early 19th century, research has shown that motivation is an important determinant that causes human beings to behave and demonstrate their competency such as learning or mastering a task, striving

an achievement, fulfilling responsibility on an objective and resilience to any challenges (Gottfried, 1990; Turner, 1995, Nicholls 1984, Bandura, 1997). Several theories have been proposed to understand and explain the complexity of human motivation, including achievement goal theory (Ames; 1992; Dweck, 1986; Elliot, 1997; Elliot, Murayama, & Pekrun, 2011; Nicholls, 1989), expectancy-value theory (Eccles et al., 1983; Wigfield & Eccles, 2000), self-efficacy theory (Bandura, 1976; 1997) and self-determination theory (Deci & Ryan, 1985). Guided by these theories, a great deal of work has been conducted to examine the influence of motivation on human beings in a variety of settings, including classroom and physical education.

In the early decades of research on motivation, educational researchers have mainly examined the influence of teachers' motivation on student achievement (Armor et al., 1976; Dembo & Gibson, 1985; Caprara, Barbaranelli, Steca, & Malone, 2006). However, there has been some research work on preservice teachers' motivation (Tschanen-Moran & Hoy, 1990; Anderson, 1995; Galliani, Felisatti, 2005; Mantovani, Vannini, 2007; Balduzzi, Vannini, 2009). This work revealed that preservice teachers' motivation was related positively to their confidence in teaching, effective teaching behaviors, better academic achievement and higher job satisfaction throughout their teaching career span (Chacon, 2005; Klassen & Chiu, 201; Shapka & Perry, 2012; Wyatt, 2014). Considering these findings, Tschannen-Moran and Hoy (2001) recommended the emphasis of early intervention on motivation for preservice teachers as they enter in the program.

Teacher education preparation programs have responsibility to prepare preservice teachers to become effective teachers. There are a wide variety of definitions and characteristics of effective teacher. For example, Bransford, Hammond, and LePage (2005) defined effective teachers as:

> "…good teachers understand students and this narrative can be confirmed by students everywhere. Teaching is not just talking, and learning is not just listening. Effective teachers are able to figure out not only what they want to teach, but also how to deliver the knowledge, so the students can understand and use this new information and skills". (p.88)

In a PE setting, an effective teacher is a teacher who can deliver and act as a mediator of instructions to improve student learning such as awareness of benefits for being physically active, learning new skills and building students' characters through sports (Rink, 2013). Despite differences in the definition of effective teacher, research has consistently documented that effective teachers are generally the ones who were motivated to learn in their programs when they were preservice teachers (Hoy & Woolfolk, 2000; Hoy & Burke-Spero, 2005; Buns & Thomas, 2015; Gencay, 2015).

Like teacher education preparation programs in other content areas such as math, language, and science, physical education teacher education (PETE) programs aim to train students, also known as preservice teachers, to become effective in-service teachers in physical education upon graduation. Because preservice teachers are like a "new born" baby when they enter into PETEs, always represent future generations of in-service teachers, and how well they are trained in PETEs will have a lasting impact on the quality of school physical education, it is imperative for researchers and practitioners to understand and explain what motivates them to learn and achieve in PETEs. Such inquiry might improve practices in PETEs and assist faculty to become more effective in their training of preservice teachers, which in turn will lead to higher quality of school physical education programs.

To provide a thorough literature review surrounding the concepts under investigation within this study, the extended literature review that follows is organized to focus on: a) self-efficacy theory, b) research on teacher self-efficacy, c) measurement of teacher self-efficacy, d) achievement goal theory, e) research on teachers' achievement goals, f) measurement of teachers' achievement goals, and g) item response theory versus classical test theory.

This extended literature review focuses on research in physical education (PE). However, if there is limited research conducted in PE, studies from classroom research settings are included to provide more complete information of the proposed study presented in this paper.

Self-Efficacy Theory

Self-efficacy plays the central role in self-efficacy theory (SET; Bandura, 1977; 1997). Bandura (1997) defined it as "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (p. 3). To differentiate SET from other motivational theories such as achievement goal theory (Ames; 1992; Dweck, 1986; Elliot, 1997; Elliot, Murayama, & Pekrun, 2011; Nicholls, 1989), expectancy-value theory (Eccles et al., 1983; Wigfield & Eccles, 2000) and self-determination theory (Deci & Ryan, 1985), Bandura (1997) proposed several key points or basics of self-efficacy as described below.

First, self-efficacy refers to individuals' concerns related to their perceived abilities on a given specific task. Second, self-efficacy is a future-oriented perception about an individual to execute a task. Third, self-efficacy relies on the type of tasks and situations, which can be used to explain an individual's behavior to engage and invest his or her effort especially in facing challenges. Consequently, self-efficacy may vary in terms of magnitude, generality and strength. The magnitude refers to how difficult the task is to be performed for an individual, the generality refers to the transferability of being efficacious for successfully accomplishing a task to another

domain of tasks, and the strength refers to the certainty of this individual's ability to perform a necessary action as required in a given task. Because of these characteristics, self-efficacy is multi-faceted construct. Therefore, an individual may motivate, behave and perceive differently from one task to another task. Fourth, self-efficacy will influence how one thinks, feels, behaves, and motivate him or her in learning activities or tasks (Bandura, 1995; Schunk, 1991). In other words, self-efficacy involves a forethought process mechanism that will determine the approach that an individual takes to accomplish a given task. For an individual's self-efficacy to develop in accomplishing a task, he or she needs to acquire knowledge and judgement of ability and skills to use this knowledge and judgement as a whole unit. In other words, this individual needs to contemplate, project the probable behavior, and intricate these facets with his or her beliefs and skills (Bandura, 1997; Schunk & Pajares, 2005).

It is important to note that self-efficacy alone is not sufficient to produce competent behaviors. This is because behaviors occur as a result of wide arrays of cognitive, affective, and circumstantial influences (Schunk, 1991). For example, there is an individual who would feel confident to perform an accurate shooting skill in soccer and produce a favorable outcome. Self-efficacy theory would posit that this individual would perceive his or her degree of confidence in this skill to be high, and therefore he or she may perform the shooting skill because he or she feels confident of using his or her skill. Conversely, if he or she does not feel competent to perform the shooting skill and has a low degree of confidence in this skill, this individual may choose not to perform it, because he or she does not believe his or her action would attain a favorable outcome. In other words, a low self-efficacy tends to produce avoidance behaviors whereas high self-efficacy tends to motivate individuals to engage in tasks and activities in

which they feel confident and that their behaviors will lead them to a successful attempt (Schunk, 1991).

Bandura (1997) also theorized that the sources of self-efficacy can be derived from: a) mastery experience, b) vicarious experience, c) verbal persuasion, and d) psychological and emotional states. First, mastery experiences refer to an interpretive effect from an individual's prior experiences when engaged in certain tasks (Bandura, 1995; Schunk & Pajares, 2005). In general, individuals will use this information from prior experiences to develop their judgement of ability and self-efficacy based on the tasks that lead to success or failure attempt. Success tends to increase perceptions of self-efficacy and failure tends to decrease them (Bandura, 1995; Schunk, 1991). Second, vicarious experiences refer to an individual's learning ability through observing other people to perform a similar task (Bandura, 1997). Modeling can be especially influential when a person observes someone else performing a task, associates him or her with a similar attribute, and uses the other person's performance as a guide in evaluating his or her own functioning capability (Schunk & Pajares, 2005). Third, social persuasions and verbal communications obtained from others also exert influence over the development of self-efficacy. The feedback received from significant others regarding an individual's capabilities may contribute to increasing confidence and promote resilience when difficulties arise (Bandura, 1997). Fourth, the emotional and physical state of an individual's experiences while performing an activity would also contribute to self-efficacy (Schunk & Pajares, 2005). As individuals experience strong emotional reactions, they begin to experience fear, stress, and depression which may further perpetuate anxiety and self-doubt and decrease their ability to perform in ways that would demonstrate their true ability level (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996). However, such strong emotional and physiological reactions can often be

mediated if individuals previously experienced positive outcomes in a similar situation or closely associated task (Bandura, 1997; Schunk & Pajares, 2005). Therefore, it is critical to provide individuals opportunity to master leaning tasks and observe successful performances.

In the educational research settings, numerous studies have linked students' self-efficacy to their educational outcomes and academic performance (e.g., Anderson, Greene, & Loewen, 1988; Ashton & Webb, 1986; Gibson & Dembo, 1985; Ross, 1992; Tschannen-Moran, Hoy, & Hoy, 1998; Muijs & Reynolds, 2000; Caprara, Barbranelli, Steaca, & Malone, 2006; Usher & Pajares, 2008). Findings have revealed that students who hold high self-efficacy are known to be more willing to take academic risks, perform better on recall tasks, more likely to have a mastery goal, and demonstrate academic success in the classroom. Conversely, students who hold low self-efficacy do not believe that they can be academically successful. Further, these students are less likely to engage in class participation and exhibit higher order thinking skills in the classroom (Pajares, 1996; Zimmerman, 1995; Carr & Steele, 2009). Nevertheless, compared to students' self-efficacy, teachers' self-efficacy has been much less researched.

Research on Teacher Self-Efficacy

Historically, research on teacher self-efficacy was initiated through the groundbreaking work conducted by Rand researchers (Armor, et al., 1976). This work has been identified crucial for the historical development of teacher self-efficacy research (Schunk, Pajares, Wigfield, Eccles, Guskey, 1997, 1998; Smylie, 1988; Ashton & Webb, 1986). However, since early 1980s, research on teacher self-efficacy has been predominantly guided by Bandura's self-efficacy theory (1977, 1986, 1997). In this work, teacher self-efficacy was defined as "the extent to which the teacher believes he or she has the capacity to affect student performance" (Bandura, 1997; Berman, McLaughlin, Bass, Pauly, & Zellman, 1977). Tschannen-Moran and Hoy (2001) has

been recognized for making the greatest effort to contribute and solidify research on teacher self-efficacy in classroom settings. They defined teacher self-efficacy (TSE) as teacher's "judgment of his or her capabilities to bring about desired outcomes of student engagement and learning, even among those students who may be difficult or unmotivated" (Tschannen-Moran & Hoy, 2001, p. 783).

Considerable work on teacher self-efficacy has been conducted (Avanzi et al., 2013; Berg & Smith, 2014; Cheung, 2008; Coladarci, 1992; Goddard & Goddard, 2001; Pintrich & Schunk, 2002; Skaalvi & Skaalvik, 2007). As can be seen from this work, teacher self-efficacy has been found to be a major predictor of teachers' cognitive, affective and behavioral aspects of teaching-related practices, which in turn significantly impact students' learning and achievement (Bandura, 1997; Skaalvik & Skaalvik, 2007; Tschannen-Moran & Woolfolk Hoy, 2001). For example, teacher self-efficacy has been found associated with their general attitude toward teaching and classroom instruction. Teachers who feel efficacious tend to show higher levels of enthusiasm for teaching, expend more efforts, and challenge themselves by adopting a variety of innovative teaching strategies (Allinder, 1994; Guskey, 1988; Stein & Wang, 1988). In a meta-analysis of research on teacher self-efficacy, Jerald (2007) highlighted some teachers' behaviors that were found to be related to teacher self-efficacy by stating that a teacher with high self-efficacy:

> "… will exhibit greater levels of planning and organization; are more open to new ideas and are more willing to experiment with new methods to better meet the needs of their students; are more persistent and resilient when things do not go smoothly; are less critical of students when they make errors and are less inclined to refer a difficult student to school principal or administrator for any disciplinary punishment (p. 33)".

In other words, a teacher who exhibits these behaviors would be likely to have high teacher self-efficacy and significantly impact their students' learning through behaviors such as effective lesson planning, classroom management, and instructional methodologies.

Inspired by the research on teacher self-efficacy and realizing that preservice teachers represent future generations of teachers and developing their self-efficacy is essential in preparing them to teach effectively, some researchers have turned their attention to preservice teachers' self-efficacy in their research endeavors. Woolfolk and Hoy (1990) reported that preservice teachers who held lower degrees of teacher self-efficacy felt that they had no control over the organization of the school environment and parental influence. In this study, researchers operationally defined teacher self-efficacy as their personal ability belief to complete and successfully execute a teaching task regardless of teaching environments. Preservice teachers with lower teacher self-efficacy believed that external factors such as home backgrounds were fixed, which made them feel powerless to overcome students' socioeconomic status. As a result, they perceived that their chances to change student academic achievement were limited. Conversely, pre-service teachers with higher self-efficacy had a more humanistic view and dealt more personally with students. They also tended to have higher expectations for their at-risk students not just in their classroom but for the whole school and wider professional learning community.

In a longitudinal study, Woolfolk and Hoy (2000) examined pre-service teachers' self-efficacy from the beginning of their teacher education preparation program until they entered the first year of teaching as in-service teachers. They reported that pre-service teachers' self-efficacy was significantly increased throughout their years in the program, but significantly declined after they completed the first year of teaching as in-service teachers. Considering these results, the

researchers argued that increased self-efficacy observed during the teacher education preparation program was due to the support that preservice teachers received from the program. When this support was not provided during their first year of teaching, their self-efficacy decreased.

Tschannen-Moran and Hoy (2005) compared sources of teacher self-efficacy between pre-service and experienced teachers. They hypothesized that pre-service teachers do not have sufficient experience factors such as mastery and vicarious experiences and therefore they might play stronger roles in the development of self-efficacy for pre-service teachers than experienced teachers. Findings of this study revealed that vicarious experiences accounted for 49% of the variance in preservice teacher's self-efficacy. Conversely, for experienced teachers, these factors only accounted for 19% of the variance in this construct. Therefore, vicarious experience such as observing effective teachers during teacher education preparation program might facilitate the development of preservice teachers' self-efficacy.

Lin and Gorrell (2001) examined differences in teacher self-efficacy between sophomore and senior preservice teachers enrolled in four-year teacher education institutions. In this study, the senior cohort had two more years of teaching experiences than the sophomore cohort. They reported that the sophomore cohort had higher self-efficacy when teaching difficult students and adjusting to students' ability levels than the senior cohort. Preservice teachers in the sophomore cohort also felt more confident in their ability to provide culturally relevant and appropriate learning experiences. However, they had lower efficacy in their ability to make a difference in students' actual learning and held a strong belief that student learning is limited due to family background. On the other hand, the senior cohort had higher self-efficacy in their ability to affect student learning. This cohort also felt more confident that students can learn regardless of family

background or other socioeconomic factors (e.g., family income, parents' education level and quality of neighborhoods).

Student teaching is an integral part of teacher education preparation programs and has potential to develop teacher self-efficacy for preservice teachers. Knoblauch and Hoy (2008) examined this potential with a group of 102 preservice teachers enrolled in a university located in the Midwest of the United States (US). The purposes of the study were to examine whether student teachers' teacher self-efficacy would vary as a function of student teachers' school placement locations (e.g., rural, suburban and urban areas) and changes of student teachers' teacher self-efficacy during the 16-week student teaching. All participants responded to the Teachers' Sense of Efficacy Scale (TSES, Moran & Hoy, 2001) on a 9-point Likert scale, with 1 indicating as "Nothing" and 9 as "A great deal". Data were collected before and at the end of student teaching. Comparisons between pre- and post-test data revealed that changes in student teachers' teacher self-efficacy differed by school placement locations. Student teachers who taught in urban schools had the most mean increase in teacher self-efficacy (*M* pre = 6.53 vs *M* post = 7.25), followed by those who taught in suburban (*M* pre = 7.02 vs *M* post = 7.51), and rural (*M* pre = 6.69 vs *M* post = 7.19) schools, respectively. When analyzed as a whole, this group of preservice teachers scored significantly higher in teacher self-efficacy at the end of student teaching than they did prior to student teaching (*M* pre = 6.79 vs *M* post = 7.35).

In a similar vein, Colson, Sparks, Berridge, Frimming and Willis (2017) examined the effect of student teaching on teacher self-efficacy among 144 preservice teachers from a university located in the Midwest of US. In this study, one group of preservice teachers was placed in a year-long student teaching placement, while the other group of preservice teachers was placed in a 16-week student teaching placement. All participating preservice teachers

completed TSES. Findings revealed that pre-service teachers who student taught for a period of one year reported significantly higher levels of efficacy in student engagement and classroom management compared to their counterparts who student taught for 16 weeks. Nevertheless, there was no significant difference in the levels of efficacy in instructional strategies between the two groups of preservice teachers. Considered together, both studies provided empirical evidence to support the impact of student teaching on the development of teacher self-efficacy for preservice teachers.

As the interest of teacher self-efficacy research has grown and gained the recognition among researchers in classroom settings, researchers in physical education (PE) have started to pay attention to this line of inquiry. Martin, Kulinna, Eklund and Reed (2001) situated their study in self-efficacy, planned behavior, and reasoned action theories and hypothesized that teacher self-efficacy, subjective norm (e.g., peers influence), attitude (e.g., perception of enjoyment in teaching a PE class) and perceived behavioral control (e.g., intention to regulate behavior to implement an active class) would act as significant determinants to PE teachers' intention to teach physically active classes. A total of 187 PE teachers from a Midwestern state were asked to respond to questionnaires assessing teacher self-efficacy, subjective norm, attitude, perceived behavioral control and an intention to teach a physically active class. Utilizing hierarchical regression analyses, Martin et al (2001) found that attitude and subjective norm emerged as determinants and accounted for 65% of the variance in PE teachers' intention to teach physically active classes. However, teacher self-efficacy and perceived behavioral control failed to emerge as significant determinants.

This unexpected finding prompted Martin and colleagues to continue their effort in the examination of teacher self-efficacy among PE teachers. In 2003, Martin and Kulinna developed

an instrument to assess teacher self-efficacy in PE setting and labeled it Physical Education Teacher's Physical Activity Self-Efficacy (PETPAS). A total of 309 PE teachers from Midwest states were recruited to provide data. Exploratory factorial analysis (EFA) revealed four factors underlying teacher self-efficacy assessed by PETPAS, which explained 83.5% of the variance. The four factors were labeled Student (e.g., My students do not highly value PE), Space (e.g., My activity space is used for other purposes), Time (e.g., My class sessions are too short in duration) and Institution (e.g., My principal or athletic director does not provide adequate support for PE).

In 2008, Martin, McCaughtry, Kulinna, and Cothran (2008) examined whether a professional development course would impact teacher self-efficacy. In this quasi-experimental study, participants were 50 and assigned into three groups: Group 1 (n = 15) one day of professional development course, Group 2 (n = 15) two days of professional development course with additional two times of teaching observation from the researchers, and Group 3 (n = 20) as a control group. The professional development course was designed following the Exemplary Physical Education Curriculum (EPEC) and guided by Bandura's (1997) self-efficacy theory. EPEC is a school PE curriculum that emphasized four key teaching facets: (a) physical fitness; (b) motor skills; (c) physical activity and fitness knowledge; and (d) personal and social development. While taking the professional development course, participants were trained and guided by the researchers with the basic tenets of Bandura's sources of self-efficacy, such as mastery teaching experiences, persuasive feedback and observing experienced role models to improve their self-efficacy. Findings revealed increased self-efficacy in teaching physical fitness, motor skills, physical activity and fitness knowledge, and personal and social development for both intervention groups in comparison to the control group. This study provided empirical

evidence that teacher self-efficacy could be developed through professional development course during their teaching career in physical education

Stephanou and Tsapakidou (2007) examined the impact of teacher self-efficacy on the use of Mosston's teaching styles among 160 Greek PE teachers recruited from several elementary and high schools. Mosston (2002) viewed the Command, Practice, Reciprocal, Self-check and Inclusion teaching styles as primarily teacher centered and the Guided discovery, Convergent discovery, Divergent production, Learner's individual designed program, Learner initiated, and Self teaching as student centered. In this study, teacher self-efficacy was assessed by PETPAS (Martin & Kulinna, 2003), which was validated by exploratory factorial analysis. Findings of the study revealed a link between teacher self-efficacy and use of the teaching styles among this group of Greek PE teachers. They also revealed that high efficacious teachers were likely to utilize student centered teaching styles (e.g., guided discovery and convergent discovery), while low efficacious teachers tended to adopt teacher centered teaching styles (e.g., command and practice). These findings are consistent with classroom research that high efficacious teachers would be likely to adopt student centered teaching styles, implement creative learning instruction, and promote student autonomy in their teaching (e.g., Caprara, Barbaranelli, Borgogni, Petitta et al., 2003; Jesus & Lens, 2005; Loughran, 2005; Tschannen-Moran &Woolfolk, 2001).

Targeting preservice teachers, Gurvey and Metzle (2009) examined whether early teaching exposure would impact their teacher self-efficacy in a PETE program. A total of 59 preservice teachers were divided into two groups: laboratory-based (LB) and field-based (FB). The LB group (n = 31) underwent a traditional PETE program structure that emphasized teaching in a controlled laboratory setting and had students do field-based teaching in their 6th

semester or the third year in the program (i.e., Junior). For this group, the teaching experience occurred in a less complex teaching environment where participants received close supervision support from the program's professors, and conducted microteaching in front of their peers and had all equipment for their teaching aids provided by the program. In contrast, the FB group (n = 29) was required to teach at a school for field-based teaching experience as early as in their 2nd semester or the first year in the program (i.e., Freshman). The teaching experience, therefore, occurred in more complex teaching environments because participants had limited equipment for teaching aid, received less supervision from the program's professors and had to deal with school children in a classroom setting. All participants were required to complete the Teachers' Sense of Efficacy Scale (TSES; Tschannen-Moran & Hoy, 2001): (1) at the entry of the program; (2) at the start of their teaching methods course; (3) at the end of the methods course, just prior to student teaching; and (4) upon completion of their program. A repeated measure of analysis of variance (RM-ANOVA) revealed no significant differences on teacher self-efficacy between the two groups of preservice teachers. However, it would be premature to conclude that early exposure to field-based teaching didn't increase preservice teachers' teacher self-efficacy.

Nevertheless, Gao, Xiang, Chen and McBride (2013) observed that student teaching experience had a significant impact on teacher self-efficacy among PE preservice teachers. A total of 107 preservice teachers were recruited from a PETE program in a large university located in Southern part of the United States. They student taught in their final semester of the program for 12 weeks, which consisted of 6 weeks at elementary schools and 6 weeks at high schools. During their student teaching, participants were supervised at least six times by supervisors from the university. Similar to Gurvey and Metzle (2009), Gao et al. used the Teachers' Sense of Efficacy Scale (TSES; Tschannen-Moran & Hoy, 2001) to assess teacher

self-efficacy in the study. The participants completed TSES twice: at the third week and at the end of student teaching. A repeated measure of multivariate analysis of variance (RM-MANOVA) revealed that teacher self-efficacy improved significantly as a result of the 12-week student teaching at schools. The inconsistent findings revealed in Gurvey and Metzle (2009) and Gao et al. (2013) warrant further research in this area of inquiry.

Measurement of Teacher Self-Efficacy

A review of the literature in teacher self-efficacy has revealed several measures assessing this construct. They include the Responsibility for Student Achievement (RSA; Guskey, 1981), the Teacher Locus Control (TLC; Rose & Medway, 1982), the Webb's Efficacy Scale (WES; Ashton, Olejnik, Crocker, & McAuliffe, 1984), the Teachers' Sense of Efficacy Scale (TSES; Tschannen-Moran & Hoy, 2001) and the Teacher's Physical Activity Self-Efficacy (PETPAS) (Martin & Kulinna, 2003).

Among these measures, TSES is considered completely aligned with Bandura's self-efficacy theory (1977, 1997) and has been widely used in research on teacher self-efficacy in classroom settings (Skaalvik & Skaalvik, 2007; Tschannen-Moran & Woolfolk Hoy, 2001; Wolters & Daugherty, 2007). This instrument asks teachers to indicate the extent to which they are able to respond to a variety of classroom situations on a 9-point Likert scale ranging from 1 (*Nothing*) to 9 (*A great deal*).

During the development and validation phases of TSES, Tschannen-Moran and Hoy (2001) conducted three studies, which resulted in the current long version of TSES that consisted of 24 items. Initially, a group of two researchers and eight graduate students was involved to identify selected items from the Bandura Teacher Efficacy Scale (Bandura, undated), which the researchers considered essential for teachers in any teaching settings. In addition, each researcher

also attempted to generate 8 to 10 new items that were not included on Bandura's measure. From this pool of items, 52 items were identified to be included after several revisions and reviews among researchers in the group. In this first study, a total of 224 teachers responded to a 9-point Likert scale, with 1 indicating the complete lack of self-perceived ability to influence the outcome and 9 indicating a great deal of self-perceived capacity to affect the outcome. Based on principal-axis factoring with criterion loadings higher than .60, 31 items were identified to be tested for further validation phase. An additional item involving motivation with a loading of .59 was also included because the researchers contended that it was a critical teaching task. Results of the first study informed further validation of 32 items of the TSES.

In the second study, researchers progressed to examine the factor structure of the initial revised 32-item TSES. A total of 217 teachers completed it. Results of principal-axis factoring revealed that eight factors were emerged with eigenvalues greater than one. These factors accounted for 63% of the variance in teacher self-efficacy. However, the scree plot suggested that two or three factors could be extracted. Nevertheless, the researchers decided to accept a three-factor model and deleted items with lowest loadings within each of the three factors. Consequently, 18 items were retained. The three factors that accounted for 51% of the variance were labeled: Efficacy for Student Engagement (8 items; reliability .82), Efficacy for Instructional Strategies (7 items; reliability .81), and Efficacy for Classroom Management (3 items; reliability .72). The relatively low reliability of the classroom management factor prompted the researchers to add questions and change the wording of several items, which led to a new pool of 36 items to be tested in the third study.

A total of 183 teachers provided data in the third study. Results of principal-axis factoring with varimax rotation of 36 items yielded four factors with eigenvalues greater than

one and accounted for 58% of the variance. A scree plot suggested three factors, which were labeled: Efficacy for Instructional Strategies (15 items; reliability .91), Efficacy for Classroom Management (9 items; reliability .90), and Efficacy for Student Engagement (12 items; reliability .90). The number of items was further reduced as only the best eight items (i.e., highest loading) representing each of the three factors were allowed to be included in TSES, resulting in 24 items. As such, another round of the principal- axis factoring on the 24 items yielded the same three factors with loadings ranging from .50 to .78. The subsequent Cronbach's Alphas analysis revealed coefficients of .86, .86 and .81 for the three factors, respectively. As a result, the finalized version of TSES consisted of 24 items, assessing three factors of teacher self-efficacy: efficacy for student engagement, which refers to the extent that teachers can promote students to engage in an activity during their teaching; efficacy for instructional strategies, which concerns the extent that teachers can control and use a variety of teaching practices, such as differentiating assessment or answering difficult questions; and efficacy for classroom management, which deals with the extent of control that teachers feel they have over student behaviors in their classroom.

Additionally, TSES has a 12-item short version. To explore whether the 24 items of TSES could be reduced to achieve greater parsimony, Tschannen-Moran and Hoy (2001) selected the four highest loading items from each of the three factors (student engagement, instructional strategies and classroom management) and then ran principal-axis Factoring with varimax Rotation on the items. Results of the analysis revealed the same three factors as observed with the 24 items and they accounted for 69.10% of the variance in teacher self-efficacy. Cronbach's alphas ranged from .86 to .81. Considered together, the 12-item version of TSES has demonstrated acceptable validity and reliability.

Both long and short versions of the TSES have been widely utilized to assess teacher self-efficacy in classroom and physical education settings (Tschannen-Moran & Hoy, 2001; Martin & Kulinna, 2003). Some studies have examined the psychometric properties of TSES with different populations (e.g., Ho & Hau, 2004; Knobloch & Whittington, 2002; Klassen et al, 2009; Poulou, 2007; Preus, 2007; Wolters & Daugherty, 2007; Yeom & Ginsburg, 2007). For example, in Ruan et. al (2015) study, 489 Japanese, Korean and Chinese in-service teachers responded to the two versions of TSES, long (24 items) and short (12 items). CFAs revealed no consistent results across the two versions of TSES. The three-factor model was not observed in the long version of TSES (24 items). In contrast, results with the short version of TSES (12 items) revealed an acceptable fit between the three-factor model and data: China ($\chi 2$ (249) = 595.79, p = .11, CFI= .81, RMSEA= .10); Korea ($\chi 2$ (249) = 644.75, p =.15, CFI= .86, RMSEA= .90); Japan ($\chi 2$ (249) = 499.77, p = .69, CFI= .90, RMSEA= .08). To further improve the model fit, the item, "How much can you do to calm a student who is disruptive or noisy?" was removed. Subsequent CFAs yielded a better fit between the three-factor model and data: China ($\chi 2$ (41) = 62.46, p = .02, CFI= .96, RMSEA= .06); Korea ($\chi 2$ (41) = 55.10, p = .07, CFI= .99, RMSEA= .04); Japan ($\chi 2$ (41) = 41.13, p = .47, CFI= 1.00, RMSEA= .01) respectively. Multiple-group CFA analyses revealed that only the short version of TSES demonstrated measurement invariances across the three countries. Results of this study seemed to provide empirical evidence that the TSES short version could be utilized to assess teacher self-efficacy among teachers in East Asia.

In a PE setting, Goa and associates (2013) utilized the long version (24 items) of TSES in the examination of the effect of 12-week student teaching on teacher self-efficacy among 107 PE preservice teachers in USA. Results of a CFA revealed an acceptable fit between the three-factor

model and data, supporting the construct validity of the long version of TSES among PE preservice teachers. This result was different from that of Ruan et. al (2015). Apparently, more research is needed to further determine the psychometric properties of TSES with a diverse of populations.

As reviewed above, both versions have been proven to be a reliable and valid measure assessing teacher self-efficacy in educational settings. Nevertheless, in this study, the researcher will intend to adapt and utilize the long version of TSES to examine teacher self-efficacy among Malaysia PE preservice teachers.

Achievement Goal Theory

Since the inception of achievement goal theory in the late 1970s and early 1980s, achievement goals have been conceptualized as: the aim or purpose that students have for learning new knowledge or skill in an activity (Ames, 1984; Maehr, 1989); the concept of ability that is construed by an individual to demonstrate his or her competence for successfully executing a task (Nicholls, 1989); and the cognitive-dynamic process of individuals to portray their competency in achievement settings (Elliot, 1997). Regardless of how achievement goals are defined, their essence is about how individuals evaluate their competence and define success while engaging in an achievement activity (Nicholls, 1984). As a theoretical perspective, achievement goal theory has provided fruitful insights on understanding individuals' cognitive, affective and behavioral responses in a variety of achievement settings, including sport, physical education (PE) and physical activity (PA).

Historically, several models of achievement goal theory have been proposed and developed. They are dichotomous, trichotomous, 2 x 2, and 3 x 2 models. In the dichotomous model, two achievement goals were labeled as mastery and performance (Ames, 1992b; Ames &

Archer, 1988), learning and performance (Dweck, 1986; Dweck & Leggett, 1988), or task-involvement and ego-involvement (Nicholls, 1989). For the purpose of this review, the terminology of mastery goal and performance goal is used. Mastery goal denotes a purpose of an individual to strive for improving skill and competency, while performance goal signifies of an individual to strive for competing with or outperforming others (Nicholls, 1989). In PE/PA settings, research findings showed that mastery goals were linked to adaptive outcomes such as students' persistent to invest their effort in learning new skills, resilience after facing a failure and seeking continuous improvement to develop their skills. On the contrary, performance goals were linked to maladaptive outcomes such as students' giving up trying and impaired performance when given failure feedback (Nichollas, 1984; Solmon & Boone, 1993; Xiang & Lee, 1998, 2002). For example, Cury, Biddle, Sarrazin and Famose (1997) investigated the predictive value of achievement goals on the investment in learning dribbling skills in basketball with a sample of 152 school children aged between 13-15 years old. Results showed that students high in performance goal and low in perceived ability had lower success expectations and showed less persistence of effort to learn the skills than students who were high in performance goal and perceived ability, who endorsed mastery goal with high perceived ability, and who endorsed mastery goal with low perceived ability. Results also revealed participants high in performance goal with low perceived ability tended to attribute their failure to ability and wanted to drop out of the basketball dribbling skill practice.

The dichotomous model focuses exclusively on demonstrating or developing competence with no consideration that some individuals may aim to avoid incompetence in achievement settings. Perhaps because of this, some work guided by the dichotomous model revealed inconsistent findings about the performance goal (e.g., Ames, 1992; Butler, 1992; Elliott &

Dweck, 1988). To rectify and advance the dichotomous model, Elliot and colleagues (Elliot, 1999; 2005; Elliot & Harackiewicz, 1996; Elliot & McGregor, 2001) proposed the trichotomous model. In this model, competence is placed at the heart of the achievement goal construct. As such, achievement goals can be distinguished in terms of both the definition and valence of competence. The definition of competence concerns the standards that determine if competence is being demonstrated, such as self- referenced (mastery) or other-referenced (performance), while the valence of competence refers to the direction of focus, such as desiring competence (approach) or avoiding incompetence (avoidance). These conceptualizations resulted in dividing the performance goal into performance-approach and performance-avoidance goals and retaining the mastery goal intact from the dichotomous model.

Consequently, the trichotomous model consists of three independent achievement goals: mastery goal (MA), performance-approach goal (PAp) and performance-avoidance goal (PAv). MA focuses on the mastery of tasks and competence development and is characterized as an approach goal. PAp focuses on demonstrating normative competence, and due to its focus on a potential positive outcome, is also characterized as an approach goal. PAv focuses on avoiding demonstrating normative incompetence and is conceptualized as an avoidance goal. This facet also is conceptualized to directing or influencing an individual's cognitive, affective and behavior patterns towards a potential negative outcome. Research conducted in academic and PA/PE settings has provided empirical support of the trichotomous model (e.g., Agbuga & Xiang, 2008; Cury, Biddle, Sarrazin, & Famose, 1997; Cury, Fonséca, Rufo, Peres, & Sarrazin, 2003). For example, in a study conducted among French high school children, Cury and colleagues (2002) found MA goals were positively associated with incremental beliefs, perceptions of competence and perceptions of a mastery motivational climate, but negatively

associated with perceptions of a performance motivational climate. PAp goals were positively associated with perceptions of competence, entity beliefs and perceptions of a performance motivational climate, but negatively associated with incremental beliefs. Finally, PAv goals were positively associated with entity beliefs and perceptions of a performance motivational climate, but negatively associated with perceptions of competence and incremental beliefs.

Following the reasoning of the trichotomous model that achievement goals can be defined by both the definition and valence of competence, Elliot and McGregor (2001) proposed the 2 x 2 model where MA was bisected into mastery-approach (MAp) and mastery-avoidance (MAv) goals. MAp is construed the same as in the trichomous model, while MAv focuses on avoidance due to intrapersonal incompetence. MAv is also characterized as an avoidance goal because of its focus on avoiding a negative outcome possibility. The MAp, MAv, PAp, and PAv goals in the 2 x 2 model give a complete representation of the different ways that competence can be construed (Elliot, 1999). This model has been most used and well-known in educational settings (e.g., Elliot & McGregor, 2001; Elliot & Thrash, 2001; Elliot & Harackiewicz, 1996; Maehr & Zusho, 2009), and several studies have utilized it to understand student achievement goals and related motivational and educational outcomes in physical education (PE)/physical activity (PA) settings (e.g., Guan, McBride, Xiang, 2007; Su, McBride, & Xiang, 2015). With a sample of college students, Gao and associates (2003) reported that MAp was positively related to perceived competence, motivation and persistence/ effort in physical activity classes; MAv and PAv were negatively related to lack of motivation and persistence/effort; and the predictive values of PAp were inconclusive. In a study conducted in Taiwan among 364 college students, Chen and Stotlar (2012) reported that PAp was negatively associated with motivation regulations, especially indicators of lack of effort and motivation. However, a study conducted in

Greece among high school students aged between 13 to 15 years old, showed that PAp was positively related to students' effort/persistence and intrinsic motivation to engage in an activity (Ntoumanis, Thøgersen-Ntoumani, & Smith, 2009)

In the latest 3 x 2 model, the definition of competence has been expanded to include a task-referenced standard, resulting in three standards to evaluate competence, which are labeled: task, self, and other (Elliot, Murayama, & Pekrun, 2011). A task-approach goal addresses obtaining task-based competence such as individuals focusing on doing a task correctly. Self-approach goals focus on self-based competence such as improving one's self than before, while other-approach goals have the similar conceptualized meaning to PAp goals. Individuals with task-avoidance goals, self-avoidance goals, and other-avoidance goals seek to avoid looking incompetent in learning outcomes.

Numerous empirical studies have examined students' achievement goals in classroom, PE and PA settings for decades (Ames, 1992; Ames & Archer, 1988; Church, Elliot, & Gable, 2001; Elliot, 1999; Elliot & Dweck, 1988; Elliot & Harackiewicz, 1996; Guan, McBride, & Xiang, 2007; Linnenbrink, 2005; Liu, Xiang, Lee, & Li, 2017; Moreno, González-Cutre, Sicilia, & Spray, 2010; Shih, 2008; Su, McBride, & Xiang, 2015; Turner, Meyer, Midgley, & Patrick; Urdan & Mestas, 2006). This work has consistently documented that mastery goals are motivationally beneficial to students. Compared to research on students' achievement goals, much less research has examined teachers' achievement goals, including preservice teachers' achievement goals. To advocate this line of research, the following section provides a review on research on teachers' achievement goals.

Research on Teachers' Achievement Goals

As reviewed in the previous section, a great deal of work has revealed that achievement goals are one of the determinants influencing students' cognitive, affective and behavioral patterns in classroom settings (e.g., Elliot & Harackiewicz, 1996; Elliot & McGregor, 2001; Pekrun, Elliot, & Maier, 2006; Van Yperen, 2006). Nevertheless, due to dynamic demands in teaching practices (e.g., school motivational climate, administration support, changes of curriculum structure), some achievement goal researchers have moved their research interest to examine the roles of teachers' achievement goals in their teaching practices (e.g., Fasching, Dresel, Dickhäuser, & Nitsche, 2010; Nitsche, Dickhäuser, Fasching, & Dresel, 2011, 2013; Papaioannou & Christodoulidis, 2007; Retelsdorf & Günther, 2011). Among them, Butler (2007) has been identified as one of the most influential scholars and her work in this line of inquiry has gained attention from educational researchers to venture their efforts on teachers' achievement goals. For example, Butler (2007) asserted:

> "…achievement goals are clearly applicable to teachers as well as students because school is an achievement arena for teachers in which they engage in various forms of competence-relevant pursuits. Therefore, achievement goals are the central or core construct to understand teachers' achievement goals as they are to an understanding of students' achievement goals." (p. 242).

While this line of research is still emerging, several researchers have already made their initial attempts to examine the link between teachers' achievement goals and several important educational outcomes such as the impact of teacher's instructional types (Butler, 2012; Retelsdorf et. al, 2010; Retelsdorf & Gunther, 2011; Shim et al., 2013), student perceptions (Butler, 2012; Butler & Shibaz, 2008) and professional development (Nitsche et. al, 2012). Most

of these studies, however, were primarily conducted in Middle East (e.g., Israel) and European countries (e.g., France). The need for more studies on this emergent line of inquiry is reflected by "…the call for an extension of such work to teachers, and the present research is designed to answer this call using the most fully developed model in the achievement goals literature" (Mascret, Elliot, & Cury, 2017, p.357).

Most research on teachers' achievement goals has been primarily informed by the conceptual framework initiated and established by Butler (2007). She conceptualized that while teaching, teachers strive to gain more competence and knowledge, to demonstrate competence to others, to avoid demonstration of incompetence, or to avoid extra work. Accordingly, she distinguished the four types of goals as follows: (a) mastery goals (e.g., aiming to learn and develop professional understanding and expertise), (b) performance- approach goals (e.g., demonstrating superior teaching skills), (c) performance-avoidance goals (e.g., avoiding demonstrating inferior teaching skills), and (d) work-avoidance goals (e.g., making it through the work day with as little effort as possible). Considering the conceptual difficulties associated with mastery avoidance goals described in the 2 x 2 achievement goal model, Butler did not incorporate this goal in her conceptual framework. With a sample of 320 in-service teachers in Israel, Butler developed an instrument, Goal Orientations for Teaching (GOT), to assess teachers' achievement goals in teaching practices. The GOT was built on Nicholls' (1989) work on Motivational Orientations Measure and consisted of 16 items on a 5-point Likert scale ranging from 1 (do not agree at all) and 5 (agree completely), with the stem "Teachers differ in what makes them feel they had a successful day in school; when would you feel that you had a successful day?" The 16 items made up four subscales (four items for each subscale): mastery goal (e.g., "I learned something new about teaching or about myself as a teacher."),

performance-approach goal (e.g., “My classes did better than those of other teachers on an exam.”), performance-avoidance goal (e.g., “My class did not do worse than those of other teachers on an exam.”), and work-avoidance goal (e.g., “The material was easy and I did not have to prepare lessons.”). Confirmatory Factorial Analysis (CFA) revealed that GOT demonstrated a good fit between the 4-factor model and data ($\chi 2/df$ (98) = 1.78, p = .13, CFI= .89, RMSEA= .07), explaining 53.59% of the variance. Further, the Cronbach’s alphas analysis indicated the four subscales were reliable with alphas coefficients ranging from .76 to .82. To provide a predictive validity of the GOT, results of multiple regression analyses showed that mastery goal predicted positive perceptions of help seeking, preferences for receiving autonomous help, and frequency of help seeking; performance-avoidance goal predicted negative perceptions and help seeking; and work avoidance predicted expedient help seeking.

Utilizing the GOT, Butler and Shibaz (2008) examined the effects of teachers’ achievement goals on students’ perceptions of whether their teachers could give them sufficient support to ask questions and help-seeking during the class lesson. This study involved 53 in-service teachers and their 1287 students aged between 13 to 14 years old in Israel. Results of the study revealed that teachers’ mastery goals predicted students’ perceptions that teachers supported their help-seeking and asking questions. Contrarily, teachers who endorsed performance avoidance goal did not give enough support to promote students to ask questions. Teachers' performance-approach and work-avoidance goals were found not significantly to predict students’ perceptions.

To expand her conceptual framework on teachers’ achievement goals (Butler, 2007), Butler (2012) added another achievement goal, labeled relational goal, in her study. She conceptualized relational goal as a goal that teachers hold for the nature of their social

relationships with students in the classroom. For example, a teacher could promote and create a meaningful relationship with her/his students. She hypothesized that teachers' relational and mastery goals would predict mastery type-instruction (e.g., taking initiative to monitor students' progress about their learning). She also hypothesized that performance approach and performance avoidance goals would predict performance type-instruction such as praising and only giving special privileges to students who obtained good grades. To test the conceptualization of relational goal and the hypotheses, 530 in-service teachers from various school levels in Israel were recruited and asked to complete the new version of GOT, which added 4 items to assess relational goals, in addition to the original 16 items assessing mastery, performance-approach, performance-avoidance, and work-avoidance goals. The participating teachers also completed a 5-point Likert-scale questionnaire adapted from the Patterns of Adaptive Learning Scales (PALS; Midgley et al., 2000) assessing mastery type- (e.g., "I tell my classes that the individual development of my students is most important to me") and performance type-instructions (e.g., "It's enough for me if students study just enough to pass the year"). Exploratory Factorial Analysis (EFA) yielded 5 underlying factors, which accounted for 53% of the variance in teachers' achievement goals. Particularly, the relational goal contributed 22% to the explained variance. Further, multiple regression analyses revealed that mastery and relational goals were significant predictors of teachers who embraced mastery-type instruction, while performance-approach and performance-avoidance goals were significant predictors of teachers who embraced performance type-instruction in their teaching. These results provided empirical support to the inclusion of relational goal in Butler's conceptual framework on teachers' achievement goals in the classroom.

Building on Butler's work (2012), Schiefele (2017) examined the link between teachers' achievement goals and students' reports on their educational interest and mastery goals among 110 in-service teachers and their 1731 students in the fifth and sixth grades in Northern Germany. Teachers' mastery, performance-approach, performance-avoidance, work-avoidance and relational goals were assessed by the GOT (Butler 2012). Students' mastery goals (e.g., "I learn as much as possible") and educational interest (e.g., "Being involved with this subject puts me in a good mood") were assessed by 4-point Likert scale questionnaires (1 - *Not at all true* and 4 - *Very true*). Multiple regression analyses revealed that teachers' mastery and relational goals emerged as significant predictors of students' educational interest and mastery goals but their performance-approach, performance-avoidance and work-avoidance goals failed to do so. These results suggested that teachers who endorsed relational and mastery goals in their teaching fostered students' interest in learning and supported them to adopt mastery goals for learning.

In a PE setting, there have been attempts from researchers to expand the work of Butler (2007, 2012) on teachers' achievement goals. For example, Wang and colleagues (2018) examined achievement goals among 322 in-service teachers in China. The GOT with 16 items (Butler, 2007) was adapted to assess teachers' mastery, performance-approach, performance-avoidance, and work-avoidance goals. Results of EFA supported the construct validity of the GOT that the four achievement goals emerged as distinct factors and accounted for 79.91% of the variance in achievement goals. Results of multiple regression analysis provided some evidence to support the predictive validity of the GOT as they revealed that mastery and performance-approach goals significantly predicted teachers' job satisfaction, while performance-avoidance and work- avoidance goals didn't predict this outcome ($\beta = .04$, $t = .76$, $p = .45$; $\beta = .00$, $t = .08$, $p = .94$). These results are generally aligned with Butler's conceptual

framework on teachers' achievement goals in the classroom. More important, the study provided empirical evidence that achievement goals could play an important role in PE teachers' satisfaction for their teaching career.

While Butler's (2007) conceptual framework has dominated the classroom research on teachers' achievement goals and there has been an increased interest in this framework in the PE setting, some researchers have situated their work in achievement goal models that were initially conceptualized to examine students' achievement goals in classroom settings, while attempting to understand physical education teachers' motivation for teaching. As reviewed earlier, these models are the dichotomous model (Ames, 1992; Dweck and Leggett, 1988), trichotomous model (Elliot, 1997; Elliot and Church, 1997; Elliot and Harackiewicz, 1996), 2 x 2 model (Elliot, 1999; Elliot and McGregor, 2001), and 3 x 2 model (Elliot, Murayama, & Pekrun, 2011).

Utilizing the dichotomous model of achievement goals (Ames, 1992; Dweck & Leggett, 1988). Xiang, McBride and Solmon (2003) examined motivational climates in 10 teachers' second and fourth grade elementary physical education classes. Videotaping of teachers (4 consecutive lessons per teacher) and teacher and student questionnaires and interviews were used to collect data. Results of the study revealed the motivational climate created by these teachers was neither mastery nor performance focused but a mix of both, supporting the notion that both mastery- and performance-focused instructional and motivational strategies are implemented in the classrooms (Wigfield, Eccles, & Rodriguez, 1998).

Gorozidis and Papaioannou (2011) utilized the trichotomous model (Elliot, 1997) to assess mastery, performance-approach and performance-avoidance goals and their impact on teachers' intention to implement a new PE curriculum with a sample of 290 Greek PE in-service teachers. Teachers' social approval goals were also assessed in the study. Questionnaires were

used to collect data. Results of the study revealed mastery goals were positively and performance-approach and performance-avoidance goals were negatively associated with teachers' intention to implement the new PE curriculum. Nevertheless, no relationship was observed between social approval goals and teachers' intention to implement the new curriculum.

In a recent study conducted in the USA, Liu and colleagues (2019) examined the 2 x 2 model of achievement goals (Elliot, 1999; Elliot & McGregor, 2001) among 419 PE preservice teachers recruited from several colleges offering PETE programs. The researchers also attempted to understand relationships between four achievement goals and self-regulated learning strategies such as general cognitive strategies, elaboration and critical thinking (Pintrich, 2004). All participating pre-service teachers completed questionnaires assessing mastery-approach goals, mastery-avoidance goals, performance-approach goals, performance-avoidance goals and self-regulated learning strategies. Structure equation modelling (SEM) was used to analyze the data where four achievement goals served as predictors while self-regulated learning strategies served as outcome measures in this model. Findings revealed that mastery-approach goals (MAp) predicted PE pre-service teachers' general cognitive strategies (GCS), which explained 31.1% of the variance. MAp was also found linked to self-regulated learning of elaboration, explaining 17.8% of the variance. On the other hand, performance-approach goals (PAp) were found to account for 4.1% of total variance in critical thinking of regulated learning strategies and 1.7% of the explained variance in GCS, while performance-avoidance (PAv) goals were found to account for 3.5% of the explained variance in GCS. This study has established links between the 2 x 2 achievement goal model and self-regulated learning strategies among preservice teachers in PE setting.

As reviewed earlier, the 3 x 2 model of achievement goals (Elliot, Murayama, & Pekrun, 2011) represents the latest development of achievement goal models and consists of six achievement goals: task-approach focusing on attaining success accomplishment as required by the task itself, task-avoidance focusing on avoiding a task due to incompetence, self-approach focusing on individual self-improvement, self-avoidance concerning an individual's avoidance due to self-based incompetence, and other-approach and other-avoidance focusing on intrapersonal competence/incompetence or normative perception by comparing to their peers.

As explained in the review above, there is a paucity of research on teachers' achievement goals. This is particularly noticeable with the 3 x 2 teachers' achievement goal model newly developed by Mascret et al. (2017). In their groundbreaking work, Mascret and colleagues (2017) attempted to incorporate this new model to examine teachers' achievement goals and labelled it as the 3 x 2 model of teachers' achievement goals. Parallel with the 3 x 2 achievement goal model as established in student population, the six domains of achievement goals also emerged in this teacher population. In this adapted model, all six achievement goals were considered to specifically tap into teaching practices and operationally labeled as: task-approach goal (e.g., focused on attaining teaching task-based competence), task-avoidance goal (e.g., focused on avoiding teaching task-based incompetence), self-approach goal (e.g., focused on teaching self-based competence), self-avoidance goal (e.g., focused on teaching self-based incompetence), other-approach goal (e.g., focused on attaining teaching other-based competence) and other-avoidance goal (e.g., focused on avoiding teaching other-based incompetence).

Therefore, the present study will adapt the 3 x 2 teachers' achievement goal model to examine teachers' achievement goals among Malaysian PE preservice teachers. By utilizing this teachers' achievement goal model in the PE setting, we hope that the model could provide a new

and viable approach to understand teachers' achievement goals and related teaching practices in preservice PE teachers' population.

Measurement of Teachers' Achievement Goals

Compared to measures that assess students' achievement goals, very few measures on teachers' achievement goals exist in this line of inquiry. Perhaps, the Achievement Goals Questionnaire for Teaching (AGQ-T; Mascret, Elliot, & Cury, 2017) is the only available measure that can suit the purpose of the present study. As such, a review of this measure is provided below.

The AGQ-T (Mascret, Elliot, & Cury, 2017) is a recently established instrument that assesses teachers' achievement goals in the context of classroom teaching. This instrument corresponds to the 3 x 2 achievement goal model developed in student population (Elliot, Murayama, & Pekrun, 2011). With the data provided by 304 female inservice teachers recruited from several schools in France, Mascret and colleagues (2017) conducted CFA to examine the psychometric properties of AGQ-T. The CFA results revealed that the fit indices met the criteria of a good fitting model: χ^2 (120, N= 304) = 150.73, $p < .05$, CFI = .99, RMSEA = .029, and the standardized factor loadings ranged from .76 to .95. The Cronbach alphas for the six achievement goals ranged from 0.83 to 0.93. Based on the fit indices and Cronbach alpha coefficients, this study showed that AGQ-T is a valid and reliable measure to assess achievement goals among inservice teachers. Nevertheless, this study has two major shortcomings that need to be pointed out. First, only French female inservice teachers (i.e., homogenous sample) were involved in the study. This could lead to a sampling bias and a potential of measurement error (i.e., invariant measure) in this study. Second, no attempt was made to demonstrate other

validities of the AGQ-T, such as predictive validity and discriminative validity. Apparently, more rigorous testing of the AGQ-T is needed.

Item Response Theory versus Classical Test Theory

As mentioned earlier, teachers` self-efficacy and achievement goals will serve as two major theoretical constructs in this proposed study. As such, Teacher Sense of Efficacy Scale (TSES; Tschannen-Moran & Woolfolk Hoy, 2001) and Achievement Goals Questionnaire for Teaching (AGQ-T; Mascret, Elliot, & Cury, 2017) will be utilized to assess them, respectively. Though TSES and AGQ-T have been found reliable and valid with populations of inservice teachers in Greece, France, China, Japan, South Korea and USA in classroom settings (e.g., Knobloch & Whittington, 2002; Klassen & Chiu, 2010; Mascret, Elliot, & Cury, 2017; Poulou, 2007; Tschannen-Moran & Hoy, 2001, 2007), they have not been utilized to assess PE pre-service teachers in Malaysia, the target population in the proposed study. Consequently, there is a need to ensure that TSE and AGQ-T will be reliable and valid instruments for this population.

Researchers in educational settings have long recognized the importance of measurement as a part of the process in obtaining an instrument's validity and reliability. An instrument that demonstrates an acceptable validity and reliability characteristics will contribute to a good psychometric property of an instrument (Linden, 1997). To determine a valid and reliable instrument, researchers typically employ Exploratory Factor Analysis (EFA) or Confirmatory Factorial Analysis (CFA). For years, the utilization of EFA and CFA has dominated the field. Nevertheless, Embretson and Reise (2000) asserted that violations, such as underestimating of factor loadings (i.e., pattern/structure coefficients) and overestimating of the number of latent dimensions, could lead to misinterpretation of results from factorial structure analysis. In addition, these techniques are purely derived from the pure science setting that is called the

Classical Test Theory (CTT). CTT is based on mathematical measurement model to examine the construct validation of latent or measured variable with the primary purpose to identify measurement error. (Crocker & Algina, 1986; Traub, 1994). The CTT basic mathematical model can be shown as:

$$\boldsymbol{X = T + E}$$

In this equation, *X* represents an observed score, *T* represents the true score and *E* represents the measurement error. Nevertheless, CTT has several limitations, including: (a) constructed as a linear model and sample-depended; (b) failing to identify the discrimination and difficulty of items; (c) model measurement error, which is due to the practice that educational researchers tend to treat the survey/questionnaire scales as continuous interval scales (Bond & Fox, 2001). Further, Bond and Fox (2001) criticized educational researchers for normally treating a Likert's scale as an interval scale of measurement on a survey/questionnaire instrument. The distorted use of Likert's scale among educational researchers prompted Bond and Fox (2001) to address this issue in their report,

> "…whenever scores are added in this manner, the ratio, or at least the interval nature for the data is being presumed. That is, the relative value of each response category across all items is treated as being the same, and the unit increases across the rating scale are given equal value. On the one hand, the subjectivity of attitude data is acknowledged each time the data is collected. Yet on the other hand, the data are subsequently analyzed in a rigidly prescriptive and inappropriate statistical way" (p.67).

As a result, any survey instrument that is approached using this measurement paradigm (i.e., CTT) could be a probable cause to misconstrue interpretation, non-invariant measurement and probability of Type-2 error (Fan, 1998).

Unlike CTT, Item Response Theory (IRT) is based on a latent trait mathematical model, which examines the probability function of a test taker or person on item parameters. The basic notion of IRT mathematical model can be reflected in three facets: (a) item discrimination; (b) item difficulty; and (c) pseudo-guessing (Ayala, 2009; Wainer & Bradlow, 2007). The IRT mathematical model can be described as:

$$P(\theta, a, b, c) = c + \frac{(1-c)\, exp\,[a(\theta - b)]}{1 + exp\,[a(\theta - b)]}$$

In this equation, θ represents a test taker or respondent's ability, a equates how a test taker or respondent discriminate on an item (item discrimination), b equates how difficult an item for a test taker or respondent to answer it (item difficulty), and c represents the guessing parameters for a test taker or respondent on an item. As an alternative to address the shortcomings of CTT measurement model, IRT offers an option for researches to obtain a robust measurement model on construct validity at item-level. According to Yau, Wong, Lam, and McGrath (2015), the strengths of IRT are such as: (a) all items are presumed to be equally weighted; (b) sample independent; (c) one constant (k) reliability estimation; and (d) the measured items are treated at least as a categorical or an ordinal measurement scale that could represent the "arbitrary condition" of latent trait from respondents' perceptions as compared to interval continuous scale that purely derived from pure science setting. Similar to CTT's function on measuring measurement invariance, IRT also offers researchers to determine measurement invariance of survey instrument on an item (Meade & Lautenschlager, 2004; Reise, Widaman, & Pugh, 1993), an analysis known as differential item functioning (DIF) analysis. The presence of DIF on an item indicates the item estimation parameter is biased, either on its function of discrimination or difficulty (Kim & Cohen, 1995). In other words, DIF analysis can serve as the

means to detect any measurement invariance across groups regardless of their characteristics, such as gender, ethnicity, culture, and nationality. As such, it can provide valuable information for researchers interested in psychometric properties of a survey instrument at item-level construct validity. In addition, De Ayala (2009) asserted the importance of considering measurement invariance on an instrument in educational research settings, "…we would like our measurement instrument to be independent of what it is we are measuring. If this is true, then the instrument possesses the property of invariance" (p. 3). In other words, measurement invariance means that a test or assessment equates the same latent trait(s) "in the same way, when administered to two or more qualitatively distinct groups (e.g., male and female)" (Reise, Widaman, & Pugh, 1993, p. 552).

As reviewed in the previous sections, TSES (Tschannen-Moran & Hoy, 2001) and AGQ-T (Mascret, Elliot, & Cury, 2017) are proven to be valid and reliable instruments to examine teachers' self-efficacy and achievement goals in classroom settings, respectively. However, both instruments have been validated through EFA and CFA techniques only, which are part of the CTT's measurement paradigm. As a result, their psychometric properties at item-level are unknown. Apparently, there is a need to have them validated through IRT as well. Doing so affords researchers an opportunity to examine the quality of items in TSES and AGQ-T, thus providing evidence of item-level construct validity and complimenting the work demonstrating the factorial validity of TSES and AGQ-T. Therefore, the present study will utilize IRT, along with CFA, to provide stronger evidence to support the validity of TSES and AGQ-T in PE setting.

Important Educational Outcomes

The important educational outcomes reviewed in this section include intention, Grade Point Average (GPA) and teaching behavior. They have been extensively examined in the literature on preservice teachers and teachers in both classroom and physical education settings (e.g., Egel, 2009; Gao, Xiang, Chen, & McBride, 2013; Gorozidis & Papaioannou, 2011; Martin et al, 2001; Moulding, Stewart, & Dunmeyer, 2014). This is because these educational outcomes are important constructs to predict preservice teachers and teachers' motivation on their performance and achievement.

Intention is considered an activator or a motivational determinant that will predict teachers' behavior in their teaching in a classroom setting (Ajzen & Madden, 1986; Ajzen, 1991; Gorozidis & Papaioannou, 2011). Considerable research work has been done to examine this construct from different motivational perspectives, including self-efficacy theory and achievement goal theory. In a PE setting, Gorozidis and Papaioannou (2011) examined the influences of teacher self-efficacy and achievement goals (e.g., mastery goals, performance approach goals, performance avoidance goals, and social goals) on teachers' intention to implement a new PE curriculum in Greek. Results of their study revealed that teacher self-efficacy and mastery goals significantly predicted teachers' intention to implement the new PE curriculum. Likewise, Martin et al. (2001) found that PE teachers who possessed high scores in teacher self-efficacy demonstrated a strong intention to promote vigorous physical activity in PE class. Informed by this review, intention to become a PE teacher in the future (Int.PE) was selected as a dependent variable in the present study.

GPA is defined as grade point average to measure students' academic achievement in their ability to master content-knowledge of the course work in their programs (Moulding,

Stewart, & Dunmeyer, 2014) and are often used as a proxy of academic achievement in both self-efficacy and achievement goal research (e.g., Evans, Kelly, Baldwin, & Arnold, 2016; Goh, Wong, & Osman, 2012; Svanum & Aigner, 2011). Research focusing on the relationship between teacher self-efficacy and GPA yielded some mixed results. Rockoff, Jacobs, Kane, and Staiger (2011) reported that teacher self-efficacy did not predict preservice teachers' GPA during their training in the teacher education program. However, Egel (2009) observed that efficacious preservice teachers had a higher GPA than their counterparts who reported a lower GPA and lacked efficacy.

While limited work has been found to examine the relationship between preservice teachers' achievement goals and GPA, several studies have been conducted examining GPA in relation to achievement goals among undergraduate students (e.g., Daniels, Perry, Stupnisky, Stewart, Bewall, & Clifton, 2014; Durik, Lovejoy, & Johson, 2009; Goraya & Hasan, 2012; Svanum & Aigner, 2011). One such study came from Durik, Lovejoy and Johson (2009). They reported that performance-approach goals positively and performance-avoidance goals negatively predicted undergraduates' GPA, and mastery goals did not emerge as a significant predictor. This finding revealed differential roles of achievement goals in predicting undergraduate students' GPA. Considering that GPA can represent academic achievement of college students and that the present study aims to understand motivation, teaching performance, and achievement of preservice teachers in Malaysia, logically, GPA became another dependent variable in the present study.

Teaching behavior is defined as what the teacher does (e.g., a PE teacher modelling soccer shooting kick skill to students) and says (e.g., a PE teacher giving instructions and explaining about the importance of exercise and eating healthy food) while teaching. Helping

preservice teachers develop teaching behaviors conductive to student learning is a very important goal for all PETEs. A great deal of classroom research has linked teacher self-efficacy to teaching behaviors such as persistence to give an amount of effort to educate failing students and willingness to implement a new instructional strategy (Dembo, 1984; Donohoo, 2018). However, teacher behaviors in this work were primarily assessed by self-reports (e.g., Brouwers & Tomic, 2000; Dembo, 1984; Gao, Xiang, Chen, & McBride, 2013; George, Richardson, & Watt, 2018; Guskey, 1998; Moseley, Rienke, & Bookout, 2002; Rose & Medway, 1981; Saklofske, Michaluk, & Randhawa, 1988). As a result, little is known whether teacher self-efficacy would be related to actual teaching behaviors in both classroom and physical education settings, a gap that needs to be addressed in the educational research. Therefore, the third dependent variable to be examined in the present study would be actual (or observed) teaching behaviors of preservice teachers.

CHAPTER II

THE PRESENT STUDY

Obesity is an epidemic disease in our current modern society. Empirical research has demonstrated that a person who is in the state of being obese or overweight could have a high possibility of developing metabolic disorders over the years, such as diabetes mellitus and hypertension (Brown, Fujioka, Wilson, & Wooodworth, 2009). As a developing country, Malaysia is not excluded from this worrisome condition. A recent study has shown that 1 in every 2 Malaysians was obese/overweight (Chan et al., 2017). Further, the World Health Organization (WHO) has also ranked Malaysia as the most obese country compared to other countries in the South-East Asian region (WHO, 2016). To combat such vexing condition, research has consistently documented that physical activity (PA) can help individuals maintain their normal healthy weight, and thus combating diseases such as diabetes mellitus and hypertension (Birmingham, & Anis, 2009; Brown, Fujioka, Wilson, & Wooodworth, 2009; Laframboise & deGraauw, 2011)

Accordingly, school physical education (PE) has been considered an important avenue for promoting awareness and educating school-age children about physical activity (PA). To achieve this, school physical education programs must be of quality. Critical to quality PE programs is effective PE teachers. According to Rink (2013), an effective PE teacher is a teacher who can deliver and act as a mediator of instructions to improve student learning such as awareness of benefits for being physically active, learning new skills and building students' characters through sports.

Physical education teacher education (PETE) programs have pinnacle roles to produce effective teachers. How well preservice teachers in PETE programs are trained during their years

in the programs will reflect their effectiveness as in-service teachers upon graduation. Motivation has been identified as a one key element that influences preservice teachers' growth and development as future in-service teachers (Buns & Thomas, 2015; Gencay, 2015; Liu, Xiang, McBride, & Chen, 2019).

Motivation is defined as latent traits that initiate, drive and direct an individual to execute on a particular task (Gredler, Broussard & Garrison, 2004). Tracking back in the early years of educational research in motivation, researchers have primarily focused on the effect of teachers' motivation on student achievement (e.g., Armor et al., 1976; Dembo & Gibson, 1985; Caprara, Barbaranelli, Steca, & Malone, 2000) and only a few studies have paid attention to preservice teachers' motivation. In this line of inquiry, studies have revealed that preservice teachers' motivation was positively related to their confidence in teaching, effective teaching behaviors, better academic achievement and higher job satisfaction throughout their teaching career span (Chacon, 2005; Klassen & Chiu, 201; Shapka & Perry, 2012; Wyatt, 2014). Further, it has been found that effective teachers were generally the ones who were motivated to learn in their teacher education preparation programs when they were preservice teachers (e.g., Buns & Thomas, 2015; Gencay, 2015; Hoy & Burke-Spero, 2005; Hoy & Woolfolk, 2000). Considering the importance of motivation on preservice teachers, Tschannen-Moran and Hoy (2001) postulated the emphasis of an early intervention on motivation of preservice teachers as soon as they enroll in the program. Hence, it is important for the PETE programs to mold preservice teachers' motivation as soon as they enroll into the programs.

Self-efficacy theory (Bandura, 1976; 1997) and achievement goal theory (Ames; 1992; Dweck, 1986; Elliot, 1997; Elliot, Murayama, & Pekrun, 2011; Nicholls, 1989) are two motivational theories that have been utilized by researchers in educational settings. Nevertheless,

not much research has been done to integrate both theories in PE and even less has been conducted with PE preservice teachers as a target population. This paucity warrants researchers to integrate both theories to provide better understanding in explaining PE preservice teachers' motivation during their years in the programs. Therefore, the present study utilized both self-efficacy theory and achievement goal theory to examine the motivation of Malaysian PE preservice teachers and related educational outcomes in PETE programs.

Self-Efficacy Theory and Teacher Self-Efficacy

In self-efficacy theory, Bandura (1997) defined self-efficacy as "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (p. 3). This construct is key to our understanding of the complexities of human motivation on "why and how" a human being thinks, behaves and reacts on a specific task. Further, self-efficacy influences how individuals will put their efforts on a task, resilience to overcome a setback and persistence to venture continuous effort on developing their competence regardless in any environments (Bandura, 1993).

Self-efficacy theory has been widely applied in research on teaching in classrooms (e.g., Anderson, Greene, & Loewen, 1988; Ashton & Webb, 1986; Caprara, Barbranelli, Steaca, & Malone, 2006; Dembo & Gibson, 1985; Muijs & Reynolds, 2000; Ross, 1992; Tschannen-Moran, Hoy, & Hoy, 1998; Usher & Pajares, 2008). In this line of inquiry, teacher self-efficacy is generally defined as a teacher's "judgment of his or her capabilities to bring about desired outcomes of student engagement and learning, even among those students who may be difficult or unmotivated" (Tschannen-Moran & Hoy, 2001, p. 783). Findings have revealed that teacher self-efficacy has been found linked to teachers' general attitude toward teaching and classroom instruction (Cheung, 2008; Coladarci, 1992; Goddard & Goddard, 2001). In addition, findings

also revealed that teachers who feel efficacious tend to show higher levels of enthusiasm for teaching, expend more efforts, and challenge themselves by adopting a variety of innovative teaching strategies (Allinder, 1994; Guskey, 1988; Stein & Wang, 1988).

Realizing that preservice teachers represent future generations of teachers and developing their self-efficacy is essential in preparing them to teach effectively, some researchers have turned their focus and interest to preservice teachers. Tschannen-Moran and Hoy (1998) asserted, "…teacher preparation programs and across the first several years in the field could begin to map the development of efficacy beliefs and could assess the efficacy impact of different teacher preparation programs and practices" (p.242). Further, Clark and Newberry (2019) addressed the importance of teacher self-efficacy on preservice teachers' development by stating, "…it is imperative that preservice teachers leave their programs confident, capable, highly efficacious, and ready for the demands of teaching… teacher self-efficacy can assist teacher education programs in providing preservice teachers with rich and meaningful experiences that are designed to build strong teacher self-efficacy at such a pivotal time" (p.43).

Similar to the findings observed among in-service teacher populations, preservice teachers who held high teacher self-efficacy had better performance when they student-taught at schools. They also demonstrated a better skill in giving instruction to their students, felt confident to manage students in a classroom and obtained a better academic achievement upon graduating from the programs (e.g., Goh, Wong, & Rosma, 2012; Hand, 2014; Moulding, Stewart, & Dunmayer, 2014; Ozer & Dimerel, 2017).Compared to teacher self-efficacy research in classrooms, less research has been conducted on teacher self-efficacy in physical education, especially with preservice teachers. However, only two studies were found particularly relevant to the present study. Gurvitch and Metzler (2009) examined the effect of early teaching exposure

on teacher self-efficacy among 60 PE preservice teachers in the United States. The preservice teachers were assigned into two groups: laboratory-based (LB) and field-based (FB). The LB group participants (n = 31) underwent a traditional PETE program structure that emphasized teaching in a controlled laboratory setting and did field-based teaching in such setting in their 6th semester or the third year in the program (i.e., Junior). On the other hand, the FB group participants (n = 29) taught at a school for field-based teaching experience as early as in their 2nd semester or the first year in the program (i.e., Freshman). Therefore, compared to the LB group participants, the FB group participants had teaching experience in more complex teaching environments due to limited equipment for teaching aid, less supervision from the program's professors and complexity to manage with school children in a classroom setting. Results demonstrated no significant differences on teacher self-efficacy between both groups of preservice teachers. Nevertheless, Gao and colleagues (2013) found that teacher self-efficacy among PE preservice teachers was significantly improved after they had a 12-week student teaching at schools. The inconsistencies between the two studies warrant further research on the impact of teaching experiences in teacher self-efficacy among PE preservice teachers, including those in Malaysia.

In the research on teacher self-efficacy in both classroom and physical education settings, compared to other measures, including the Responsibility for Student Achievement (RSA; Guskey, 1981), the Teacher Locus Control (TLC; Rose & Medway, 1982), the Webb's Efficacy Scale (WES; Ashton, Olejnik, Crocker, & McAuliffe, 1984), and the Teacher's Physical Activity Self-Efficacy (PETPAS) (Martin & Kulinna, 2003), the Teachers' Sense of Efficacy Scale (TSES; Tschannen-Moran & Hoy, 2001) has been most often used to assess teachers' self-efficacy. TSES has two versions: the long version with 24 items and the short

version comprised of 12 items. Both consist of 3 subscales to measure teacher self-efficacy in: classroom management, student engagement and instructional strategies. Considering that TSES has never been used with PE preservice teachers in Malaysia, the present study adapted the long version of TSES to assess teacher self-efficacy for this population. Inherent in such adaptation is a need to examine the psychometric properties of TSES to ensure that adapted TSES would provide reliable and valid data on teacher self-efficacy of PE preservice teachers in Malaysia.

Achievement Goal Theory and Teachers' Achievement Goals

Since the late 1970s and early 1980s, achievement goal theory has been widely utilized to understand students' motivation and related cognitive, affective and behavioral responses in a variety of achievement settings, including sport, PE and PA. (e.g., Agbuga & Xiang, 2008; Cury, Biddle, Sarrazin, & Famose, 1997; Elliot & Harackiewicz, 1996; Elliot & McGregor, 2001; Pekrun, Elliot, & Maier, 2006; Van Yperen, 2006; Xiang & Lee, 1998, 2002). As a construct central to achievement goal theory, achievement goals have been defined as: a) the aim or purpose that students have for learning new knowledge or skill in an activity (Ames, 1984; Maehr, 1989); b) the concept of ability that is construed by an individual to demonstrate his or her competence for successfully executing a task (Nicholls, 1989); and c) the cognitive-dynamic process of individuals to portray their competency in achievement settings (Elliot, 1997). Though defined and conceptualized differently, the gist of achievement goals is related to how individuals evaluate their competence and define success while engaging in an achievement activity (Nicholls, 1984).

For the past several decades, several models of achievement goal theory have been proposed and developed, starting from a dichotomous model (mastery vs. performance goals;

e.g., Ames, 1992; Dweck & Leggett, 1988), to a trichotomous model (mastery vs performance approach vs performance avoidance goals; Elliot & Church, 1997; Elliot & Harackiewicz, 1996), to a 2x2 model (mastery approach vs mastery avoidance vs performance approach vs performance avoidance goals; Elliot, 1999; Elliot & McGregor, 2001), and to a 3 x 2 model (task approach vs task avoidance vs self-approach vs self-avoidance vs other-approach vs other-avoidance goals; Elliot, Murayama, & Pekrun, 2011). While a great deal of research has examined students' achievement goals and revealed that achievement goals are one of the factors influencing students' cognitive, affective and behavioral patterns (e.g., Agbuga & Xiang, 2008; Guan, Xiang, McBride, & Bruene, 2006; Henderson & Dweck, 1990; Linnenbrink, 2005; Pintrich, 2002; Urdan & Mestas, 2006; Xiang, Bruene, & McBride, 2004), some researchers have paid attention to teachers' achievement goals and their roles in their teaching practices (e.g., Fasching, Dresel, Dickhäuser, & Nitsche, 2010; Nitsche, Dickhäuser, Fasching, & Dresel, 2011, 2013). Their work revealed the impact of teachers' achievement goals on teacher's instructional types (e.g., Butler, 2012; Retelsdorf et. al, 2010; Retelsdorf & Gunther, 2011; Shim et al., 2013), student perceptions (e.g., Butler, 2012; Butler & Shibaz, 2008) and professional development (Nitsche et. al, 2012).

Prompted by the recent established 3 x 2 model of achievement goals in student population (Elliot, Murayama, & Pekrun, 2011), Mascret, Elliot and Cury (2017) developed a parallel model with a group of female inservice teachers in French, and named it as the 3 x 2 model of teachers' achievement goals. During the model development, the researchers constructed the Achievement Goals Questionnaire for Teaching (AGQ-T) to assess six achievement goals that teachers tend to embrace during their teaching practices. The six achievement goals were operationally labeled as: task-approach goal (e.g., focused on attaining

teaching task-based competence), task-avoidance goal (e.g., focused on avoiding teaching task-based incompetence), self-approach goal (e.g., focused on teaching self-based competence), self-avoidance goal (e.g., focused on teaching self-based incompetence), other-approach goal (e.g., focused on attaining teaching other-based competence) and other-avoidance goal (e.g., focused on avoiding teaching other-based incompetence). Confirmatory factor analyses yielded a good fit between the six-achievement goal model and data and Cronbach alpha coefficients ranged from 0.83 to 0.93 for the six achievement goals. Considered together, these results showed that AGQ-T is a valid and reliable measure to assess achievement goals among in-service teachers. Results of this study also revealed that only two task-based goals and self-approach goals were positively associated with teachers' interest.

Additionally, there has been some research work on teachers' achievement goals in the PE settings (e.g., Nitsche, Dickhäuser, Fasching, & Dresel, 2011, 2013; Papaioannou & Christodoulidis, 2007; Retelsdorf & Günther, 2011). Gorozidis and Papaioannou (2011) utilized the trichotomous model (Elliot, 1997) to assess mastery, performance-approach and performance-avoidance goals and their impact on teachers' intention to implement a new PE curriculum with a sample of 290 Greek PE in-service teachers. Results of the study revealed that mastery goals were positively and performance-approach and performance-avoidance goals were negatively associated with teachers' intention to implement the new PE curriculum. Guided by the 2 x 2 model of achievement goals, Liu, Xiang, McBride and Chen (2019) examined mastery-approach goals, mastery-avoidance goals, performance-approach goals, and performance-avoidance goals in relation to self-regulated learning strategies such as general cognitive strategies, elaboration and critical thinking among 419 PE preservice teachers in USA. Structure equation modelling results revealed that mastery-approach goals predicted PE pre-service

teachers' general cognitive strategies, which explained 31.1% of the variance. They were also found linked to elaboration, explaining 17.8% of the variance. On the other hand, performance-approach goals were found to account for 4.1% of total variance in critical thinking and 1.7% of the explained variance in general cognitive strategies, while performance-avoidance goals were found to account for 3.5% of the explained variance in general cognitive strategies. This study has established links between the 2 x 2 achievement goal model and self-regulated learning strategies among preservice teachers in PE setting.

To date, no study has been conducted to utilize the newly developed 3 x 2 model of teachers' achievement goals in a PE setting. Evidently, there is a need for researchers to apply this model to understand teachers' achievement goals and related important educational outcomes in physical education. To address this need, the 3 x 2 model of teachers' achievement goals was utilized in the present study. Prior to this line of inquiry, research work related to psychometric properties of the AGQ-T assessing the six teachers' achievement goals depicted in the 3 x 2 models of teachers' achievement goals must be conducted to ensure that this instrument is reliable and valid in Malaysia PE settings.

Item Response Theory

Item Response Theory (IRT) is widely utilized in modern psychometric evaluations of scales. It is based on a latent trait mathematical model, which examines the probability function of a test taker or person on item parameters. The essence of IRT measurement model is measured on two facets: (a) item discrimination *a*i parameter and (b) item difficulty *b*i parameter. The item discrimination *ai* parameter refers to participants' ability to discriminate or distinguish an item based on their latent trait θ (theta) level, whereas item difficulty *b*i parameter refers to how difficult it is for a participant to achieve a 0.5 probability of a correct response for an item given

the participant's level of latent trait θ (theta). As a result, IRT provides evidence of item-level construct validity, which complements and adds to Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) as both techniques deal with the factorial level construct validity and are considered part of the Classical Test Theory (CTT).

The research literature has revealed that the Teacher Sense of Efficacy Scale (TSES; Tschannen-Moran & Woolfolk Hoy, 2001) and Achievement Goals Questionnaire for Teaching (AGQ-T; Mascret, Elliot, & Cury, 2017), which were adapted in the present study, have proved to be valid and reliable instruments to examine teachers' self-efficacy and achievement goals in classroom settings, respectively. However, both instruments have been validated through EFA and CFA techniques only. As a result, their psychometric properties at item-level are unknown.

Apparently, there is a need to have them validated through IRT as well. Doing so, it allows researchers to examine the quality of items in adapted TSES and AGQ-T, thus providing evidence of item-level construct validity and complimenting the work demonstrating the factorial validity of TSES and AGQ-T. Therefore, the present study utilized IRT, along with CFA, to provide stronger evidence to support the validity of adapted TSES and AGQ-T in a PE setting.

To sum up, research on teacher self-efficacy and teachers' achievement goals in PE settings is limited. This is especially true for PE preservice teachers, including Malaysia PE preservice teachers. Therefore, the present study applied self-efficacy theory and achievement goal theory to understand motivation and related important educational outcomes among PE preservice teachers in Malaysia. The purposes of the study are two folds: a) to examine physical education (PE) pre-service teachers` self-efficacy and achievement goals and how these constructs are related to important educational outcomes (i.e., intention to become a PE teacher in the future, GPA and teaching behaviors) in Malaysia, and b) to explore preservice teachers'

experiences that were perceived to contribute to their teacher self-efficacy in the PETE program. Specifically, the present study attempted to answer the following research questions:

(1) What is the reliability and validity of adapted TSES and AGQ-T? As mentioned earlier, TSES and AGQ-T were adapted to assess teacher self-efficacy and teachers' achievement goals, respectively, in the present study. As such, there was a need to examine their psychometric properties. Once the adapted TSES and AGQ-T were proven reliable and valid, teacher self-efficacy and teachers' achievement goals were then examined in relation to important educational outcomes (intention to become a PE teacher in the future, GPA, and observed teaching behaviors).

(2) What are the relationships between teacher self-efficacy, achievement goals and the educational outcomes (intention to become a PE teacher in the future and GPA)?

(3) To what extent is teacher self-efficacy related to observed teaching behaviors among preservice PE teachers?

(4) What experiences did pre-service teachers perceive contributing to their self-efficacy in their PETE program? This question was proposed to provide in-depth information about contributors that pre-service teachers perceived to their self-efficacy in the PETE program. Such information may help PETE faculty gain better understanding of how to effectively develop self-efficacy among preservice teachers in their program.

Methods

Research Setting and Participants

This study was conducted at the Universiti Putra Malaysia (UPM) in Malaysia during the academic year of Spring 2019. The university is currently offering Physical Education Teacher Education (PETE) program for pre-service teachers (undergraduate students) majoring in educational studies, which has been accredited by the Malaysia Qualification Agency (MQA). Further, this program is the oldest PETE program offering PE as major since early 80s in the country.

Like other PETE programs across Malaysia, the PETE program at UPM is structured as follows: the 1st year (i.e., freshman) and 2nd year (i.e., sophomore) students are required to take coursework such as fundamental knowledge in kinesiology and PE, general educational studies, curriculum and instruction, educational psychology, and philosophy of education. During the 3rd year (i.e., junior), students are required to take high school teaching methods coursework. This coursework is a capstone coursework in their PETE degree plan designed to expose them to various teaching styles in PE. As a requirement to complete this coursework, students must complete seven weeks of field-based teaching at a designated school. During the 4th year (i.e., senior), students are required to undergo an internship for 14 weeks (i.e., student-teaching) at high schools. This internship is mandatory for teaching certification and their bachelor's degree diploma.

A total of 176 PE preservice students (age $M = 24.19$, $SD = 1.11$) were recruited for participation in the present study. Participants were 97 males and 79 females; 94 juniors (i.e., 3rd year cohort) and 82 seniors (i.e., 4th year cohort) They had all completed at least 80 credit hours of their coursework in their PETE program. This inclusion criterion was set to

ensure that participants have been adequately exposed to their PETE program and able to provide reliable and valid responses in the study. The ethnicities of participants were: Malay (82.39%), Chinese (3.41%), Indian (0.57%), Native Sabah and Sarawak (12.50%), and others (1.14%), respectively.

Variables and Measures

Demographics. A personal information sheet was used to gather participants' demographic information such as date of birth, age, gender, cohort year classification, university and GPA and ethnicity (see Appendix A).

Teacher self-efficacy. Teachers' Sense of Efficacy Scale (TSES; Tschannen-Moran & Hoy, 2001; see Appendix B) was adapted to assess preservice teachers` self-efficacy in this study. Several modifications were made. First, the words of "school work" in each item from the original TSES were deleted. Second, the word of "you" was replaced by the word of "I." Third, a stem of "When I am teaching PE…" was added to accord with the purpose of the study. The adapted TSES consisted of 24 items, assessing teacher self-efficacy for classroom management (e.g., "How much can I do to control disruptive behavior in physical education class"), student engagement (e.g., "How much can I do to motivate students who show little interest in physical education") and instructional strategies (e.g., "How well can I implement alternative strategies in my physical education class"). Teacher self-efficacy in each of these three areas was assessed by 8 items. All participants responded to the items on a 7-point Likert scale ranged from 1 (Nothing) to 7 (Absolutely).

Teachers' achievement goals. The 18-item Achievement Goals Questionnaire for Teaching (AGQ-T; Mascret, Elliot & Cury, 2017; see Appendix C) was adapted to assess preservice teachers` six achievement goals for teaching PE in the present study. One major

modification that was made in the present study was a change in the stem from "With my classes this year, I try…" to "When I'm teaching physical education, I try to…." The six achievement goals were: task-approach (e.g., "Promote the success of my students"), task-avoidance (e.g., "Avoid that my students fail"), self-approach (e.g., "Teach more effectively than before"), self- avoidance (e.g., "Avoid teaching less effectively than I did before"), other-approach (e.g., "Teach better than other teachers"), and other-avoidance (e.g., "Avoid being a worse teacher than others"). Each of the six goals was measured by three items. All participants were asked to indicate how much they agreed or disagreed with the items on a 7-point Likert scale that ranges from 1 *"Strongly disagree"* to 7 *"Strongly agree"*.

Intention to become a physical education teacher in the future. Based on the body of literature, individuals' disposition to choose the teaching profession as their future career is important for them to become resilient and effective teachers throughout their career span (Pajares, 1992; Xiang, Lowy & McBride, 2002; see Appendix D). Therefore, this variable was included as an important educational outcome in the study. Adapted from the Preparation to Teach Physical Education in Primary School Survey (Freak, 2011), three items (e.g., "I`m looking forward to teaching physical education after graduating from this physical education teacher education program") were used to assess this variable on a 7-point Likert scale that ranged from 1 *"Strongly disagree"* to 7 *"Strongly agree"*.

GPA. Considerable research has been conducted and revealed that GPA is a good indicator of undergraduate students' academic achievement at college (Kuncel, Crede, & Thomas, 2005; Robbins et al., 2004). Therefore, a self-reported overall cumulative GPA was obtained from each of the participating preservice teachers in the present study: 4.0 = A, 3.0 = B, 2.0 = C, 1.0 = D, and < 1.0 = F.

Teaching behavior. Teaching behavior is broadly defined as what the teacher does (e.g., a PE teacher modelling soccer shooting kick skill to students) and says (e.g., a PE teacher giving instructions and explaining about the importance of exercise and eating healthy food) while teaching. Classroom research has shown that teacher self-efficacy is linked to teaching behaviors such as persistence to give an amount of effort to educate failing students and willingness to implement a new instructional strategy (Dembo, 1984; Donohoo, 2018). Therefore, teaching behavior was examined in relation to teacher self-efficacy in the present study. Additionally, research on teacher self-efficacy has rarely assessed the extent to which teachers' self-efficacy is related to their observed teaching behaviors, a gap that needs to be addressed in this line of inquiry.

One way to address this gap is to collect observational data on teaching behaviors and those behaviors should parallel to what is assessed in the Teachers' Sense of Efficacy (TSE, Tschannen-Moran & Woolfolk Hoy, 2001). That is, teaching behaviors in classroom management, instructional strategies, and student engagement. To record and code them, the Observation Form of Preservice Physical Education Teacher's Self-Efficacy-Related Behaviors (OBPE-TSE, see Apendix E) was constructed. In the OBPE-TSE, teaching behaviors were operationally defined and described as follows:

a) Classroom management: teaching behaviors with goals to run the gymnasium, playground or classroom smoothly. They include establishing routines, making expectations clear to students and dealing with disruptive behavior of students.
b) Instructional strategies: a variety of teaching approaches that the teacher takes to increase student learning. Examples of instructional strategies include allowing students choices of learning and making learning meaningful to

students.

c) Student engagement: teaching behaviors that aim to motivate and promote student engagement. They include providing a variety of learning activities to accommodate with different skill levels of students and checking students' understanding through questions.

Interviews. Interview is one of the methods in qualitative research design aimed to gain in-depth understanding on a specific phenomenon. This method ensures that researchers gain deep holistic information about participants' perceptions, thoughts and feelings (Berg, 2007). To further understand preservice teachers' self-efficacy in teaching PE, interviews with semi- structured format were conducted among juniors as well as seniors (i.e., 3rd and 4th year cohorts) who student taught at their respective schools. The interviews were conducted in two phases. The first phase was comprised of both junior and senior cohorts (before they started student teaching). Interviews at this phase aimed to: a) explore participants' reasons why they chose PE as their major, b) understand their current level of confidence (i.e., self-efficacy) to teach PE, and c) explore whether and how the PETE program was perceived to have an impact on participants' self-efficacy to teach PE. The second phase of interviews involved only senior participants who student taught at schools.

Interviews conducted in this phase explored whether and how participants perceived that student teaching had an impact on their self-efficacy and confidence level to teach PE. The interview questions at both phases were as follows:

Phase one questions included:

1) Why did you choose physical education as your major?

2) If you were to teach a PE class (for 4th or 8th graders) now, how confident do you feel about teaching it? Why?

3) Do you think your teacher education program has prepared you to teach physical education? How so/not?

Phase two questions were:

You have almost completed your student teaching. I would like to know whether your confidence level of teaching PE has changed as a result of this student teaching experience. Here is a scale of confidence from 1 to 5, with 1 meaning that you do not feel confident in teaching PE at all, and 5 meaning that you do feel very confident

Please tell me where you were on this scale the first week when you taught. Also, please tell me where you are on this scale at this moment.

4) Do you feel any changes in your confidence level to teach PE between the beginning and end of your student teaching?

If so, what changes occurred? What are some factors that contributed to these changes?

5) Do you feel this student teaching experience has contributed to your confidence to teach PE? How so/n

Procedures

Upon approval from Texas A & M University's Institute Review Board (IRB), the researcher obtained the research data collection approval from UPM in Malaysia. Participants' informed consent was obtained prior to the data collection, which started in the Spring 2019 semester. All data were collected by the researcher with assistance from faculty members at UPM, who were trained with the data collection procedures.

To collect questionnaire data, participants' academic advisors were contacted for data collection permission and then participants, by their cohort, completed questionnaires in the classrooms at UPM. It took them approximately 20-25 minutes to answer the questionnaires.

To conduct the first phase of interviews, which occurred approximately two weeks after the questionnaire data collection, 25 participants (11 juniors and 14 seniors), who responded to the questionnaires and also gave their consent to be interviewed, were individually interviewed by the researcher through online medium, Skype, for 20-30 minutes.

To collect data on teaching behaviors during student teaching, only 14 senior participants, who provided their consents in both questionnaire data and phase one interviews session, agreed to be videotaped. As such, each of them was videotaped for three lessons (with each lesson lasting for approximately 40 minutes), resulting in a total of 42 lessons. All these lessons were videotaped at week 3, 7 and 10 while they student taught at schools. During the videotaping session, the researcher positioned one digital video camera on wide pan-angle view and a cordless microphone system was utilized to record verbal and nonverbal behaviors of these senior participants

during teaching. While videotaping, the researcher took field notes in order to provide another data source of what was actually going on in those videotaped lessons.

Lastly, at the second phase of interviews, the above-mentioned 14 seniors were individually interviewed for the second time by the researcher at the end of their student teaching (approximately 2 weeks before they completed their 14 weeks student teaching at schools), with each interview lasting for approximately 30 minutes. During this phase, these seniors were asked to answer questions regarding whether their student teaching experiences significantly contributed to their confidence changes to teach PE at schools.

Data Analyses

Data from questionnaires and videotaped lessons were used to answer the first three research questions, while data from interviews were used to answer the last research question, which attempted to explore preservice teachers' experiences in the PETE program, including student teaching, that contributed to their self-efficacy to teach PE. Stata Version 15.0 (StataCorp, 2017) and IRTPRO Version 3 (Scientific Software International, 2015) software were used for data analysis in the present study. Specifically, the researcher utilized the Stata software to conduct preliminary analyses consisting of data screening, Cronbach alpha coefficients to provide reliability evidence for the instruments, confirmatory factorial analyses (CFAs) to examine factor-level validity of TSES AND AGQ-T, structural equation modeling to test relationships between teacher self-efficacy, teachers' achievement goals and educational outcomes (intention to become a PE teacher in the future and GPA), and Poisson regression analyses to examine the relationships between teacher self-efficacy and observed teacher behaviors in this study. Additionally, the

researcher used IRTPRO software to examine the item-level validity of TSES and AGQ-T.

Questionnaire data. The preliminary data analysis was conducted through data screening check to examine any missing data, outliers, and normality of the distribution (absolute value of Skewness and Kurtosis that exceeded the value of 3 indicated the violation of assumption in normally distributed data; Kline, 2005). This process was required to ensure the appropriateness of the subsequent statistical data analyses.

To answer the first research question, psychometric properties of TSES and AGQ-T, which assessed teacher self-efficacy and teachers' achievement goals, respectively, three steps were taken. First, IRT measurement model was used to examine items validity of TSES and AGQ-T (i.e., item level validation). Three IRT indices were used to evaluate the items validity: (a) Standardized Chi-Square (S-χ^2), (b) items' discriminant value (a_i), and (c) items' difficulty (b_i). Any significant value at $p < .05$ on an item indicates the item is a "poor item," or misfit in a subscale or factor of an instrument (Orlando & Thissen, 2000). Further, to evaluate whether an item is discriminating by the participants or respondents, any (a_i) value above the cutoff value of 4.0 indicates that the item is a non-discriminant item (Nguyen, Han, Kim, & Chan, 2014). Moreover, to evaluate an item difficulty (b_i), any value outside the range from -3 to +3 suggests that particular item is a difficult item for participants/respondents to respond (Stucki, Daltroy, Katz, Johannesson, & Liang, 1996).

Second, confirmatory factor analyses (CFA) were conducted to test the construct validity of TSES and AGQ-T at the structural level of factors (i.e., factor-level validation). TSES assessed the 3-factor model of teacher self-efficacy and AGQ-T assessed the 6-factor model of teachers' achievement goals. To assess the model fit, four CFA fit indices were used: (a) Chi-Square Test of Model Fit (χ^2), (b) Root Mean Square Error of Approximation

(RMSEA), (c) Comparative Fit Index (CFI), and (d) Standardized Root Mean Square Residual (SRMR). The χ^2 is a measure of the discrepancy between a proposed model and data, and the *p* value is an indicator of whether the model fits the data (Hox, Maas, & Brinkhuis, 2010). Nevertheless, χ^2 is relatively sensitive to small sample size due to a low statistical power (McDonald & Mok, 1995). The RMSEA is a measure to provide information about the "badness of fit" on a model, with an RMSEA value less than ≤ .06 indicates a good model (Hu & Bentler, 1999; Kline, 2010; Taasoobhisrazi & Wang, 2016). However, Kenny, Kaniskan and McCoach (2014) argued that the RMSEA cutoff value could be high as .10 to be considered as a marginal fit model if the sample size is small than 200 participants. Additionally, the CFI is a comparative index to provide information about the covariance structure of a model and it is used to examine the improvement fit of a baseline model compared to a more restricted model; a CFI value ≥ .95 indicates a better fit model (Bentler, 1995, 1990; Hu & Bentler; 1999). Finally, the SRMR is an index of standardized average correlation residual in a proposed model and the SRMR value of ≤ .08 indicates a good model fit (Bentler, 1995; Hu & Bentler; Jöreskog & Sörbom, 1981). Third, once the TSES and AGQ-T demonstrated satisfactory item-level and factor-level validities, Cronbach's alpha coefficients were calculated to provide reliability evidence for them. After these analyses on psychometric properties of TSES and AGQ-T, descriptive statistics and Pearson's correlations were provided to describe univariate characteristics of the study sample and relationships between variables.

To answer the second research question, a structural equation modeling analysis (SEM) was performed to examine whether teacher self-efficacy and teachers' achievement goals emerged as significant predictors of the important educational outcomes (intention to become

a PE teacher in the future and GPA) among this group of pre-service teachers. A two-step SEM which consisted of measurement model and full structural model was conducted to examine relationships between the latent variables and outcome measures in the present study.

Observation data on teaching behaviors. The Observation Form of Preservice Physical Education Teacher's Self-Efficacy (OBPE-TSE, see Appendix E), developed by the researcher with supervision of his doctoral committee advisor, was used to code the targeted teaching behaviors of senior participants , which were videotaped during their student teaching at schools. Data on observed teaching behaviors addressed the third research question in the present study, the extent to which teacher self-efficacy was related to observed teaching behaviors among those preservice teachers. As mentioned earlier, the targeted teaching behaviors in the present study were the same as those assessed by the TSES (Tscahannen-Moran & Hoy, 2001) in: a) classroom management, b) instructional strategies, and c) student engagement. Those behaviors were coded using the OBPE-TSE. Two coders were trained to use this form. Each coder went for a 4-hour vigorous training. This training allowed the coders to have sufficient practice and understand how to code the targeted teaching behaviors. Further, the training also permitted the coders to familiarize with the operational definitions of those targeted teaching behaviors through viewing the videotaped sample lessons, and simultaneous coded the behaviors, and it followed by several discussions on any undecided or overlapping situation (e.g., disagreements on coding process of targeted teaching behavior). To ensure the inter-rater reliability between coders, the agreement was calculated and ranged between 91% to 96% (O'Donoghue & Parker, 2001).

Following the Academic Learning Time in Physical Education (ALT-PE) coding

protocol, each of the two coders viewed all videotaped lessons and coded the observed teaching behaviors for every 2-minute interval until the length of the videotaped lesson was ended (Siedentop, Birdwell, & Metzler, 1979). During the coding process, in each 2-minute interval, which was signaled by a recorded audiotape, each time the coder identified one of the observed teaching behaviors, a tally was made. Thus, the number of tallies for each of those observed teaching behaviors (i.e., classroom management, instructional strategies and student engagement) were determined by frequency. For instance, if a preservice teacher asked a student to stay quiet within a 2-minute interval, a tally was made. However, no tally was marked when none of the targeted teaching behaviors occurred within the 2-minute interval. To answer the third research question, a series of multiple Poisson's regression analyses were conducted and a significant *p* value from each of these Poisson's regression analyses would determine the extent to which teacher self-efficacy was related to observed teaching behaviors among this group of preservice PE teachers in Malaysia. There are several assumptions required for Poisson regression analysis. They include: a) observed data must be in a count measure, b) observations must be independent from other observed variables, c) the mean must be equaled to its variance, and d) the log of mean rate must be a linear function of Poisson distribution (Frome & Checkoway, 1985; Land, McCall, & Nagin, 1996).

Interview data. All interviews data were transcribed verbatim and then analyzed using constant comparative analysis (Lincoln & Guba, 1985). This process involved in several phases such as breaking a large content of information into the smaller units (unitizing), grouping similar units into categories (categorizing), and merging relevant categories into themes. As a part of the processes, two trained faculty members from UPM were involved to read the interview transcriptions and sort out significant meaningful units

in relation to the last research question in this study. Later, the meaningful units were categorized into main themes. Finally, the researchers involved in this study reviewed the categories and made necessary adjustments until agreement between them were reached. To establish trustworthiness of interview data, peer debriefing and member-check techniques were employed.

Results

Results from this study are reported separately in two main sections: a) quantitative results, and b) qualitative findings. These sections are in accordance with the methods and analyses reported earlier in this study. In the first section, results, which were derived from questionnaires and videotaped lessons, are presented in relation to the first three research questions. While in the second section, findings from interviews with select preservice teachers are presented to describe experiences in the PETE program that those preservice teachers perceived contributing to their teacher self-efficacy to teach PE

Preliminary Analyses for Questionnaire Data

Initial data screening resulted in the removal of seven participants (i.e., cases) from the dataset due to their incomplete questionnaire responses. Further, there were 11 missing values on six variables and these values were Missing Completely At Random (MCAR). Because the missing values were at random and less than 10% as well, the item-mean substitution (IMS) method was used to impute the missing values (Bono, Ried, Kimberlin, & Vogel, 2007). Multivariate outlier analyses were employed to identify any significant outliers in the dataset. In these analyses, if a significant value (p) of Mahalanobis Distance (MD) is $< .001$, then the case was removed from the dataset. Later, the normality was checked to determine whether the dataset violated the assumptions of normal distribution. Both univariate Skewness and Kurtosis

indicators were within an acceptable range, Skewness = .01 to .14, Kurtosis = .01 to .94, suggesting that the dataset in the present study did not violate the assumptions of distribution normality. Finally, a total of 176 participants (i.e., cases) were retained in the dataset for subsequent analyses. Their demographic data were: 97 males (55.11%) and 79 females (44.89%); ages ranged between 22 – 26 years old (M = 24.19, SD = 1.10); 94 juniors (53.42%; i.e., 3rd year cohort), and 82 seniors (46.59%; i.e., 4th year cohort); 145 (82.39%) Malay, 6 (3.41%) Chinese, 1 (0.57%) Indian, 22 (12.50%) Native Sabah and Sarawak, 2 (1.14%) others.

Item Response Theory Analyses

To determine the psychometric properties of the TSES and AGQ-T at item-level, several item response theory (IRT) analyses were conducted. The IRT analyses' results of the TSES were reported first, then followed by the results of the AGQ-T. Their results are reported below.

Teacher self-efficacy for classroom management. The IRT fit indices for each item are presented in Table 1. Results revealed that item #21 was the most discriminant item (a = 6.09), followed by item #15 (a = 5.55), item #20 (a = 5.38), item #18 (a = 5.33), item #9 (a = 5.24), item#12 (a = 5.23), item #3 (a = 4.97) and item #6 (a = 4.76) in measuring the construct of teacher self-efficacy for classroom management. The difficulty indices of the items ($b_1 – b_6$) ranged from -3.42 to .13. Results of the standardized chi-square indices ($S\text{-}x^2$) revealed that all items were considered good items measuring teacher self-efficacy for classroom management.

Teacher self-efficacy for instructional strategies. The IRT fit indices for each item are presented in Table 2. Results revealed that the most discriminant item was item #8 (a = 5.58), followed by item #11 (a = 5.52), item #5 (a = 5.06), item #14 (a = 4.92), item #2 (a = 4.86), item #24 (a = 4.43), item #19 (a = 4.20) and the least discriminant item was item #17(a = 4.18) in measuring the construct of teacher self-efficacy for instructional strategies. The difficulty indices

of the items ($b_1 – b_6$) ranged from -1.60 to .93. Results of the standardized chi-square test ($S\text{-}x^2$) showed that all items were good items in measuring teacher self-efficacy for instructional strategies in the present study.

Teacher self-efficacy for student engagement. The IRT fit indices for each item are presented in Table 3. Results revealed that item #22 (a = 5.86) was the most discriminant item, followed by item #13 (a = 5.44), item#23 (a = 4.70), item#1 (a = 4.57), item#16 (a = 4.56), item#10 (a = 4.40), item #7 (a = 4.18) and item #17 (a = 2.20) was considered the least discriminant item in measuring the construct of teacher self-efficacy for student engagement. The difficulty indices of the items ($b_1 – b_6$) ranged from -3.94 to .11. Results of the standardized chi-square test ($S\text{-}x^2$) revealed that only item #4 was a poor item in measuring teacher self-efficacy for student engagement in the present study**.**

Task-approach goals. The IRT fit indices for each item are presented in Table 4. Results revealed that item #1 was the most discriminant item (a = 4.80), followed by item #7 (a = 4.73), and item #15 was the least discriminant item (a = 4.20) in measuring the task-approach goal construct. The difficulty indices of the three items ($b_1–b_6$) were between -3.30 to .10. Results of the standardized chi-square test ($S\text{-}x^2$) indicated that none of the assessed items was significant at $p < .05$, which suggested the items were all good items to measure the task-approach goal among participants.

Task-avoidance goals. The IRT fit indices for each item are presented in Table 5. Results revealed that item #18 was the most discriminant item (a = 6.22), followed by item #4 (a = 4.03), and the least discriminant item was item #10 (a = 3.37), respectively. The difficulty indices of the three items ($b_1–b_6$) ranged from -2.09 to .28. Results of the standardized chi-square test ($S\text{-}x^2$) revealed that item #10 was significant at $p < .05$, indicating this item was a misfit or a

poor item to measure the task-avoidance goal construct. Nevertheless, items #18 and #4 were regarded as good measures of this goal construct among participants in the present study.

Self-approach goals. The IRT fit indices for each item are presented in Table 6. Results revealed that item #3 was the most discriminant item (a = 4.83), followed by item #16 (a = 4.66), and item #13 was the least discriminant item (a = 4.06) in measuring the self-approach goal construct. The difficulty indices of the items (b_1–b_6) ranged from -2.06 to .20. Results of the standardized chi-square test (S-x^2) revealed items #3 and #13 were good items to measure the self-approach goal construct but item #16 was not despite it showed a good discriminant index to measure the self-approach goal among the participants.

Self-avoidance goals. The IRT fit indices for each item are presented in Table 7. Results revealed that item #8 was the most discriminant item (a = 4.45), followed by item #11 (a = 4.09), and item #2 was the least discriminant item (a = 3.12) in measuring the self-avoidance goal construct. The difficulty indices of the items (b_1–b_6) ranged from -1.97 to .41. Results of the standardized chi-square test (S-x^2) revealed that item #2 was significant at $p < .05$, indicating that the item was misfit or a poor item. Nevertheless, items #8 and #11 were considered good items measuring self-avoidance goals among the participants.

Other-approach goals. The IRT fit indices for each item are presented in Table 8. Results revealed that item #5 was the most discriminant item (a = 13.08), followed by item #9 (a = 4.10), and item #17 was the least discriminant item (a = 3.12) in measuring the other-approach goal construct. The difficulty indices of the items (b_1–b_6) ranged from -2.67 to .09. Results of the standardized chi-square test (S-x^2) showed that item #17 was significant at $p < .05$, indicating that the item was a poor item measuring the other-approach goal construct. However, items #8 and #11 were good items measuring this goal construct. .

Other-avoidance goals. The IRT fit indices for each item are presented in Table 9. Results revealed item #6 was the most discriminant item (a = 7.20), followed by item #12 (a = 5.55), and item #14 was the least discriminant item (a = 3.02) in measuring the other-avoidance goal construct. The difficulty indices of the items (b_1–b_6) ranged from -1.81 to .59. Results of the standardized chi-square test (S-x^2) showed that item #14 was significant at $p < .05$, indicating that the item was a poor item. However, items #6 and #12 were considered good items to measure the other-avoidance goal among participants in the present study.

Table 1. TSES: teacher self-efficacy for classroom management

Item #	Item description	*a*	$b_1 - b_6$	*S*-x^2	*p*
3	How much can I do to control disruptive behavior in the physical education class?	4.97	-1.38 – 1.22	34.59	.26
6	To what extent can I make my expectations clear about student behavior?	4.76	-1.35 – 1.27	42.32	.12
9	How well can I establish routines to keep activities running smoothly?	5.33	-1.58 - 1.24	19.35	.73
12	How much can I do to calm a student who is disruptive or noisy?	5.23	-1.64 - .90	26.10	.57
15	How much can I do to get children to follow physical education class rules?	5.44	-1.51 - .61	25.19	.51
18	How well can I keep a few problem students from ruining an entire lesson?	5.24	-3.42 - .13	31.60	.29
20	How well can I establish a physical education class management system with each group of students?	5.38	-1.60 – 1.23	30.93	.19
21	How well can I respond to disruptive students?	6.09	-1.43 – 1.11	35.44	.23

Notes. *a* = item discrimination; $b_1 - b_6 =$ item difficulty; *S*-x^2 = standardized chi square *$p <$. 05

Table 2. TSES: teacher self-efficacy for instructional strategies

Item #	Item description	*a*	$b_1 - b_6$	*S*-x^2	*p*
2	How well can I respond to difficult questions from my students?	4.86	-1.41 – 1.49	22.81	.82
5	How much can I gauge student comprehension of what I have taught?	5.06	-1.26 – 1.34	25.56	.59
8	To what extent can I craft good questions for my students?	5.58	-1.36 – 1.02	32.70	.17
11	How much can I do to adjust my lessons to the proper level for individual students?	5.52	-1.54 – 1.07	14.00	.94
14	How much can I use a variety of assessment strategies?	4.92	-1.59 – 1.57	34.71	.17
17	To what extent can I provide an alternative explanation or example when students are confused?	4.18	-1.60 - .93	39.11	.06
19	How well can I implement alternative strategies in my physical education class?	4.20	-1.51 – 1.33	25.49	.54
24	How well can I provide appropriate challenges for very capable students	4.43	-1.58 - .94	33.51	.18

Notes. *a* = item discrimination; $b_1 - b_6$ = item difficulty; *S*-x^2 = standardized chi square
**p* <. 05

Table 3. TSES: teacher self-efficacy for student engagement

Item #	Item description	*a*	$b_1 - b_6$	*S*-x^2	*p*
1	How much can I do to get through to the most difficult students?	4.57	-1.17 - .13	27.54	.65
4	How much can I do to help my students think critically?	2.20	-1.5 - .24	38.37	.02*
7	How much can I do to motivate students who show low interest in physical education class?	4.18	-1.76 - .37	22.35	.27
10	How much can I do to help my students value learning?	4.40	-1.67 - .48	16.12	.67
13	How much can I do to foster student creativity?	5.44	-1.66 - .11	18.72	.73
16	How much can I do to get students to believe they can do well in physical education class?	4.56	-.82 - 1.28	17.88	.71
22	How much can I do to improve the skills of a student who is failing?	5.86	-1.71 - .51	16.21	.69
23	How much can I assist families in helping their children do well in school?	4.70	-3.94 – 1.07	17.37	.68

Notes. *a* = item discrimination; $b_1 - b_6 =$ item difficulty; *S*-x^2 = standardized chi square; *$p <$. 05

Table 4. AGQ-T: task-approach goals

Item #	Item description	*a*	$b_1 - b_6$	*S*-x^2	*p*
1	Promote the success of my students.	4.80	-3.30 - .30	14.99	.24
7	Enable my students to succeed.	4.73	-1.84 - .20	11.95	.37
15	Ensure that my students succeed.	4.20	-1.75 - .10	9.15	.52

Notes. *a* = item discrimination; $b_1 - b_6$ = item difficulty; *S*-x^2 = standardized chi square
*p <. 05

Table 5. AGQ-T: task-avoidance goals

Item #	Item description	*a*	$b_1 - b_6$	*S*-x^2	*p*
4	Avoid that my students fail.	4.03	-1.34 - .34	26.69	.13
10	Avoid student failure.	6.22	-1.03 - .28	29.05	.39
18	Avoid having failing students.	3.37	-.2.09 - .49	34.32	.03*

Notes. *a* = item discrimination; $b_1 - b_6$ = item difficulty; *S*-x^2 = standardized chi square
*p <. 0

Table 6. AGQ-T: self-approach goals

Item #	Item description	*a*	$b_1 - b_6$	*S*-x^2	*p*
3	Teach more effectively than before.	4.83	-2.06 - .20	18.30	.11
13	Teach better than I did before.	4.06	-1.94 - .20	17.19	.46
16	Be better than before in my teaching.	4.66	-1.06 - .21	38.09	.01*

Notes. *a* = item discrimination; $b_1 - b_6$ = item difficulty; *S*-x^2 = standardized chi square
*p <. 05

Table 7. AGQ-T: self-avoidance goals

Item #	Item description	*a*	$b_1 - b_6$	*S*-x^2	*p*
2	Avoid being worse than before in my teaching.	3.12	-1.49 - .57	20.75	.04*
8	Avoid teaching less efficiently than before.	4.45	-1.16 - .41	17.32	.14
11	Avoid teaching less effectively than I did before	4.09	-1.97 - .43	17.79	.27

Notes. *a* = item discrimination; $b_1 - b_6 =$ item difficulty; *S*-x^2 = standardized chi square
*p <. 05

Table 8. AGQ-T: other-approach goals

Item #	Item description	*a*	$b_1 - b_6$	*S*-x^2	*p*
5	Each better than other teachers.	13.08	-2.67 - .11	26.25	.08
9	Be a better teacher than others.	4.10	-1.45 - .15	27.12	.07
17	Be more effective than other teachers.	3.45	-1.48 - .09	37.16	.02*

Notes. *a* = item discrimination; $b_1 - b_6 =$ item difficulty; *S*-x^2 = standardized chi square
*p <. 05

Table 9. AGQ-T: other-avoidance goals

Item #	Item description	*a*	$b_1 - b_6$	*S*-x^2	*p*
6	Avoid being a worse teacher than others.	7.20	-.83 - .71	13.84	.24
12	Avoid being less effective than other teachers.	5.55	-1.81 - .64	15.10	.25
14	Avoid teaching less effectively than other teachers.	3.02	-1.28 - 59	27.39	.02*

Notes. *a* = item discrimination; $b_1 - b_6 =$ item difficulty; *S*-x^2 = standardized chi square; *p <. 05

Confirmatory Factorial Analyses

To examining the psychometric properties of the TSES and AGQ-T at factor-level, CFAs were conducted to determine the factorial structural validity for both instruments. The CFA indices for both instruments are provided in Table 10.

Teacher self-efficacy. The initial CFA results revealed an acceptable fit between the 3-factor model of teacher self-efficacy and data ($\chi 2$ (276), $p < .001$, CFI = .92, TLI = .91, RMSEA = .071, SRMR = .046). The standardized factor loadings of teacher self-efficacy ranged from .64 to .79. Further, the standardized factor correlations among the three latent factors of teacher self-efficacy ranged from .34 to .51. Though results of this CFA revealed that the measurement model demonstrated an acceptable fit, there was a need to consider item-level validation results provided by the IRT analyses that were conducted earlier. Consequently, a second CFA test was conducted in which item #4 (How much can I do to help my students think critically?) was removed as this item had a value of $a < 4.0$, indicating that it was a non-discriminant item in measuring the construct of teacher self-efficacy for student engagement. At the same time, this item was assessed as a misfit or poor item ($p <. 05$). Results of the second CFA revealed that the model fit was improved (χ^2 (253), $p < .001$, CFI = .96, TLI = .95, RMSEA = .064, SRMR = .037). The standardized factor loadings of teacher self-efficacy ranged from .67 to .81, while the standardized factor correlations among the three teacher self-efficacy as latent variables ranged from .36 to .87. As shown in Figure 1, indeed, these fit indices pointed out that the 3-factor model of teacher self-efficacy, after the removal of item #4, demonstrated a good fit model to examine teacher self-efficacy for classroom management, instructional strategies, and student engagement among the participants in the present study.

Teachers' achievement goals. Initially, the CFA test results in the present study revealed a marginal fit between the 6-factor model of teachers' achievement goals and data ($\chi 2$ (153), $p <$ .001, CFI = .91, TLI = .89, RMSEA = .115, SRMR = .056). The standardized factor loadings of teachers' achievement goals ranged from .70 to .95. Further, the standardized factor correlations among the six teachers' achievement goals as latent variables ranged from .26 to .95, with the highest correlation observed between task-approach goals and self-approach goals (r = .952). Given these results, a second CFA was conducted with the consideration of item-level validation results provided by the IRT analyses, which were conducted earlier. Specifically, items #2 ("Avoid being worse than before in my teaching"), #14 ("Avoid teaching less effectively than other teachers") , item #16 (Be better than before in my teaching"), #17 ("Be more effective than other teachers"), and #18 ("Avoid having failing students") were removed from the second CFA as they were considered misfit or poor items. Results of the second CFA revealed a better model fit (χ^2 (62), $p <$ .001, CFI = .95, TLI = .93, RMSEA = .101, SRMR = .05). The standardized factor loadings of teachers' achievement goals ranged from .79 to .82. Further, the standardized factor correlations among the six teachers' achievement goals as latent variables ranged from .25 to .93. To further improve the 6-factor model of the AGQ-T, a third CFA analysis was conducted to improve the 6-factor of teachers' achievement goals through the suggested modification indices that obtained from the second CFA analysis. The modifications were performed through covarying the paths of residual error variance between item #1 (TAp subscale) and Item#3 (SAp subscale), and also item #1 (TAp subscale) and item #13 (SAp subscale). After the modifications, the third CFA analysis revealed that the measurement model (i.e., finalized model) was an acceptable model and had a better fit than the model with all 18 items: χ^2 (64), $p <$ .001, CFI = .96, TLI = .94, RMSEA = .092, SRMR = .049. The standardized

factor loadings of teachers' achievement goals ranged from .71 to .81. Moreover, the standardized factor correlations among the six teachers' achievement goals as latent variables ranged from .25 and .85. As shown in Figure 2, considered together, the 6-factor model of teachers' achievement goals with 13 items was an acceptable fit model to examine the six teachers' achievement goals among the participants in the present study.

Table 10. Results of CFAs for TSES and AGQ-T

Measures	***df***	χ^2	**CFI**	**TLI**	**SRMR**	**RMSEA**
TSES						
First CFA	276	3005.20	.92	.91	.046	.071
Second CFA (deletion of item #4)	253	2808.13	.96	.95	.037	.064
AGQ-T						
First CFA	153	282.85	.91	.89	.056	.115
Second CFA (deletion of item #2, #14, #16, #17 and #18)	62	2194.73	.95	.93	.055	.101
Third CFA	64	2187.67	.96	.94	.049	.092

Notes. *df* = degree of freedom ; χ^2 = chi-square ; CFI = comparative fit index ; TLI = Tucker-Lewis index ; SRMR = standardized root-mean-square residual; RMSEA = root-mean-square-error of approximation

Cronbach Alphas

Given that both AGQ-T and SESE demonstrated acceptable validity at both the item- and factor-level, Cronbach alpha coefficients were calculated for the scores of six teachers' achievement goals and of teacher self-efficacy for classroom management, instructional strategies, and student engagement, respectively. These coefficients are reported in Table 11. A Cronbach alpha coefficient was also calculated and reported in Table 11, for the score of intention to become PE teacher in the future, which served as an outcome measure in this study. As shown in Table 11, Cronbach alpha coefficients ranged from .72 to .94, indicating that all scores reported in the present study were reliable.

Descriptive Statistics

The descriptive statistics are presented in Table 11. The mean scores of task-approach goals (M = 6.20, SD = .75), task-avoidance goals (M = 5.573, SD = 1.29), self-approach goals (M = 6.18, SD = .71), self-avoidance goals (M = 5.70, SD = 1.21), other-approach goals (M = 5.34, SD = 1.47), and other-avoidance goals (M = 5.51, SD = 1.27) were all higher than the midpoint of the scales (i.e., 4 or with a descriptor of "neither agree nor disagree"), suggesting that the participants in this present study endorsed these six teachers' achievement goals for teaching PE.

Similarly, the mean scores of teacher self-efficacy for classroom management (M = 5.66, SD = .72), instructional strategies (M = 5.61, SD = .69) and student engagement (M = 5.76, SD = .69) were all higher than the midpoint of the scales (i.e., 4 or with a descriptor of "Quite a bit."), suggesting that preservice teachers in the present study perceived that their self-efficacy in managing the classroom, employing instructional strategies and getting students engaged during PE class was higher than the average level of self-efficacy as

measured by the TSES.

Furthermore, as the educational outcomes in the present study, the mean scores of intention to become a PE teacher in the future (M = 6.31, SD = 1.11) and GPA (M = 3.37, SD = .22) were higher than the midpoint of the scale (i.e., 4) or the average GPA score (i.e., 2), respectively. These mean scores indicated that preservice teachers in the present study, as a whole, were willing to become PE teachers in the future and obtained higher than average GPA in the PETE program.

Correlations

The correlations among teacher self-efficacy, teachers' achievement goals and important educational outcomes are presented in Table 12. Task-approach (TAp) and self-approach (SAp) goals were significantly positively correlated with all of teacher self-efficacy for classroom management, instructional strategies and student engagement. Other-approach (OAp) goals were positively correlated with teacher self-efficacy for instructional strategies (SEIS), but negatively correlated with teacher self-efficacy for classroom management (SECM) and teacher self-efficacy for student engagement (SESE). Interestingly, other-avoidance (OAv) goals were found positively correlated with SECM, SEIS and SESE. Nevertheless, no significant correlations were observed between task-avoidance goals (TAv), self-avoidance goals (SAv) goals and SECM, SEIS and SESE.

TAp, SAp and OAp goals were positively correlated with the variable of intention to become a PE teacher in the future (Int.PE). SAv goals were negatively corelated with Int.PE, and no significant correlations were observed between TAv and OAv goals and Int.PE. All of teacher self-efficacy (SECM SEIS and SESE) were positively correlated with Int. PE. Interestingly, none of the teachers' achievement goals (i.e., task-approach goals (TAv), task-

avoidance goals (TAv), self-approach goals (SAp), self-avoidance goal (SAv), other-approach goals (OAp) and other-avoidance goals (OAv) and teacher self-efficacy for classroom management (SESM), instructional strategies (SEIS) and student engagement (SESE) were significantly correlated with grade point average (GPA), either positively or negatively. Consequently, GPA was dropped from the subsequent SEM.

Table 11. Descriptive statistics and reliability scores

	N	Observed Range	Mean	SD	Skewness	Kurtosis	Cronbach α
Teacher self-efficacy							
SECM	176	4-7	5.66	.72	.05	.07	.72
SEIS	176	4-7	5.61	.69	.14	.29	.90
SESE	176	4-7	5.76	.69	.11	.07	.89
Achievement goals							
TAp	176	4-7	6.20	.75	.03	.93	.74
TAv	176	3-7	5.73	1.29	.02	.96	.92
SAp	176	4-7	6.18	.71	.01	.00	.73
SAv	176	3-7	5.70	1.21	.01	.32	.89
OAp	176	1-7	5.34	1.47	.04	.52	.94
OAv	176	2-7	5.51	1.27	.03	.59	.92
Educational outcomes							
Int. PE	176	1-7	6.31	1.11	.01	.01	.93
GPA	176	2.49 -3.78	3.37	.22	.06	.12	-

Notes. SECM = self-efficacy for classroom management, SEIS = self-efficacy in instructional strategies, SESE = self-efficacy for student engagement; TAp = task-approach goals, TAv = task-avoidance goals, SAp = self-approach goals, SAv = self-avoidance goals, OAp = other-approach goals, OAv = other-avoidance goals; Int. PE = intention to become PE teacher in the future, GPA = grade point average.

Table 12. Correlations among teacher self-efficacy, teachers' achievement goals and educational outcomes

	SECM	**SEIS**	**SESE**	**TAp**	**TAv**	**SAp**	**SAv**	**OAp**	**OAv**	**Int.PE**	**GPA**
SECM	-										
SEIS	.87**	-									
SESE	.89**	.87**	-								
TAp	.43**	.50**	.44**	-							
TAv	.07	.10	.10	.24*	-						
SAp	.43**	.45**	.42**	.82**	-.20*	-					
SAv	.13	.13	.11	-.26**	.84**	.28**	-				
OAp	-.04*	.01*	-.03*	-.09**	-.81**	-.09*	.81**	-			
OAv	.08*	.11*	.06*	-.16**	-.78**	-.14*	74**	.88**	-		
Int. PE	.29**	.24**	.25**	.25**	.07	.35**	-.16*	.07*	.05	-	
GPA	.07	.11	.02	.05	.02	.08	-.01	.05	.02	.12	-

Notes. SECM = teacher self-efficacy for classroom management, SEIS = teacher self-efficacy for instructional strategies, SESE = teacher self-efficacy for student engagement; TAp = task-approach goals, TAv = task-avoidance goals, SAp = self-approach goals, SAv = self-avoidance goals, OAp = other-approach goals, OAv = other-avoidance goals; Int. PE = intention to become PE teacher, GPA = grade point average. *$p < .05$, ** $p < .001$.

Structural Equation Modeling

A two-step structural equation modeling (SEM) was conducted to examine the relationships between the latent variables (i.e., teacher self-efficacy and teachers' achievement goals) and educational outcomes (i.e., GPA and intention to become a PE teacher in the future) in this study. At the first step in this SEM, a measurement model was constructed, and results revealed a good fit model, χ^2 (442), $p < .001$, CFI = .94, TLI = .93, RMSEA = .051, SRMR = .055. For all the variables, the standardized factor loadings ranged from .67 to .96, and factor correlations ranged from -.15 to .93. Because the measurement model was a good fit model, the second step of SEM was taken to examine whether teacher self-efficacy and teachers' achievement goals emerged as predictors of GPA and Inte.PE.

Results of this test revealed the model fit indices as follows: χ^2 (512), $p < .001$, CFI = .95, TLI = .94, RMSEA = .055, SRMR = .063, suggesting an acceptable fit between the model and data. All of teacher self-efficacy, SECM, SEIS, and SESE, emerged as significant predictors (p <.01*)* of Inte.PE in the model. They explained 1.21%, 5.29%, and less than 1% of the variance in Inte.PE, respectively. On the other hand, all the other teachers' achievement goals, TAp, TAv, SAv, OAp and OAv, failed to emerge as significant predictors in this model. Interestingly, only SAp emerged as a significant predictor (p <.01) and accounted for 19.36% of the variance in Inte.PE. Unexpectedly, neither teacher self-efficacy (i.e., SECM, SEIS, and SESE) nor teachers' achievement goals (i.e., TAp, TAv, SAp, SAv, OAp and OAv) emerged as significant predictors of GPA in this model. As shown in Figure 3, the path parameters were statistically significant ($p < .05$), and non-significant path parameter were not illustrated . All solid arrow indicated as a significant path.

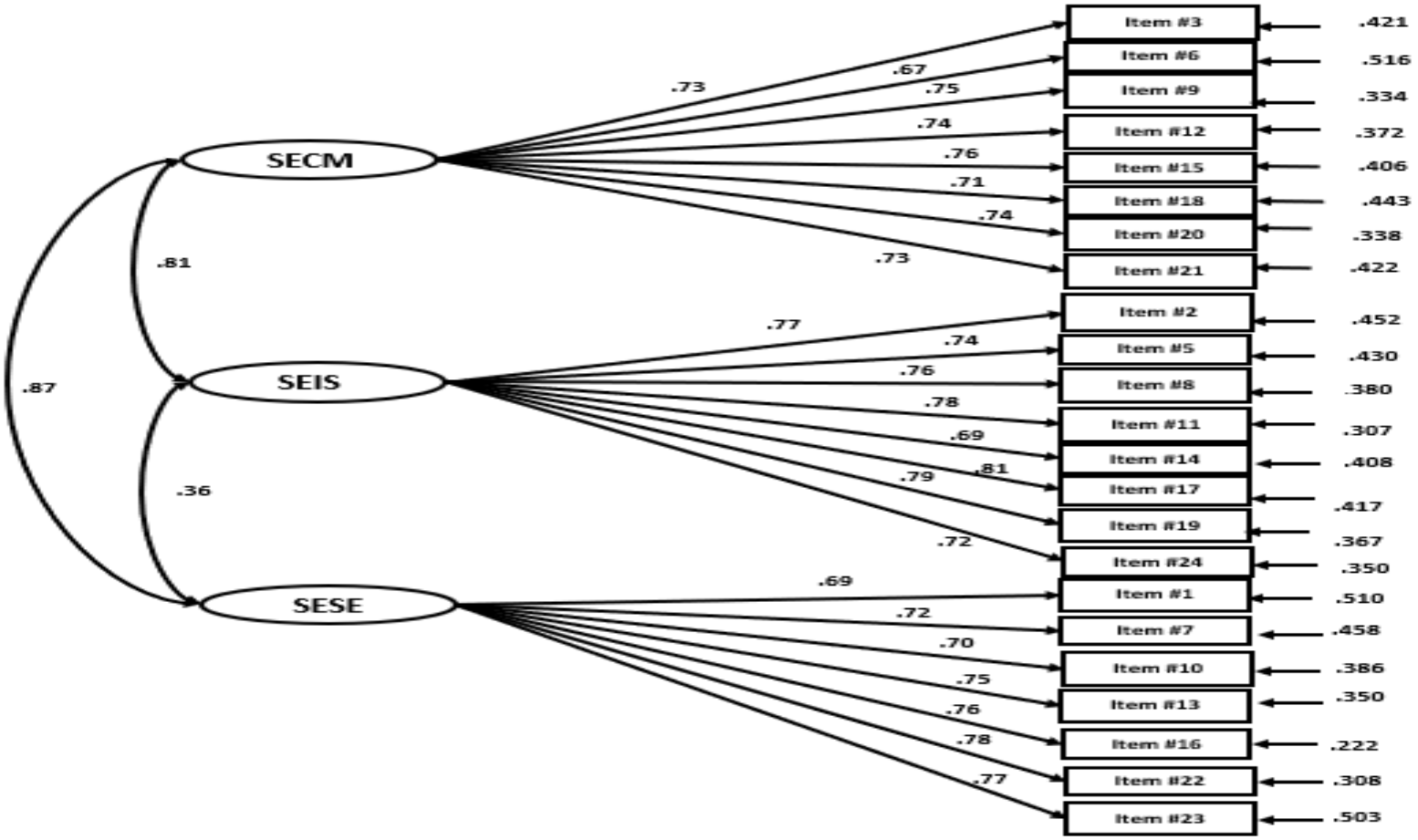

Figure 1. The finalized 3-factor measurement model for the TSES. *Note.* SECM = teacher self-efficacy of classroom management, SEIS = teacher self-efficacy of instructional strategies, SESE = teacher self-efficacy of student engagement. (refer to ppt tables)

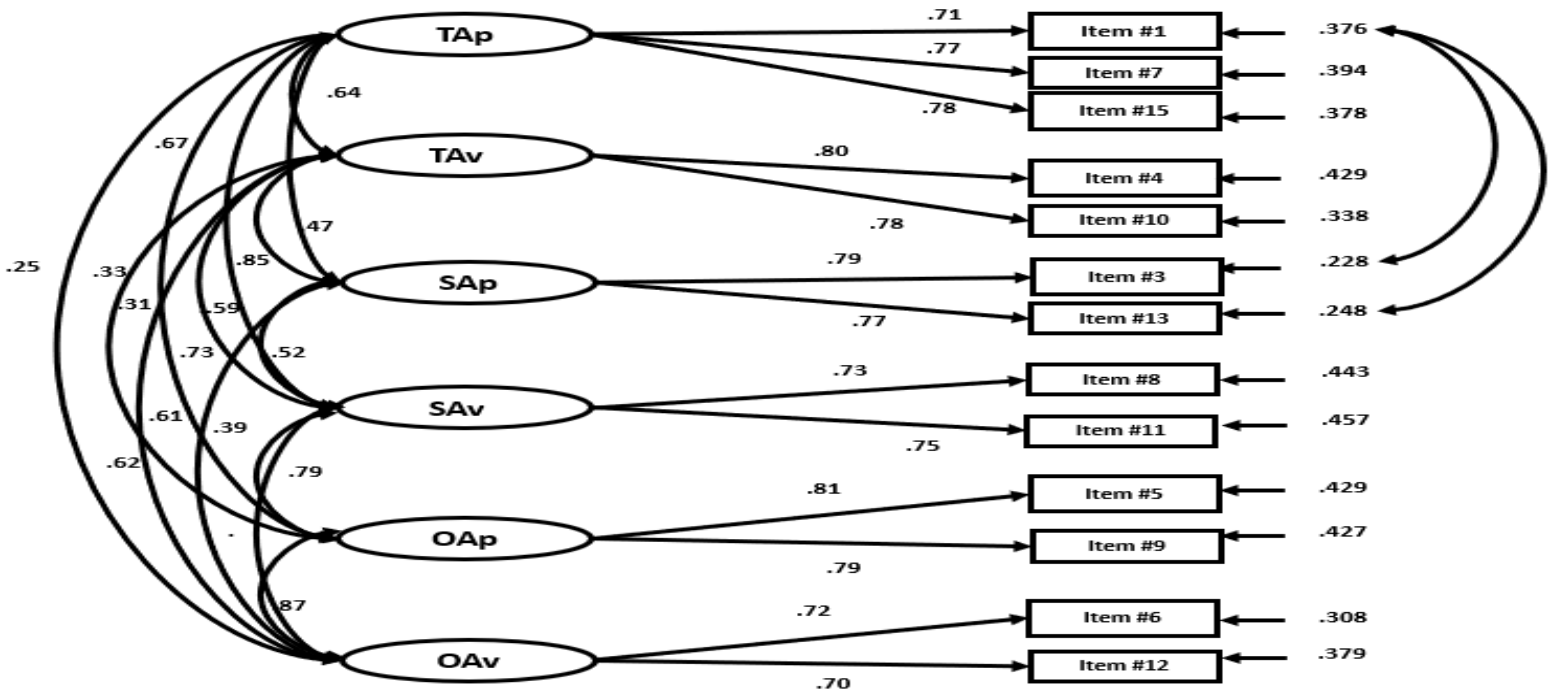

Figure 2. The finalized 6-factor measurement model for the AGQ-T. *Note.* TAp = task-approach goals, TAv = task-avoidance goals, SAp = self-approach goals, SAv = self-avoidance goals, OAp = other-approach goals, OAv = other-avoidance goals. (refer to ppt tables)

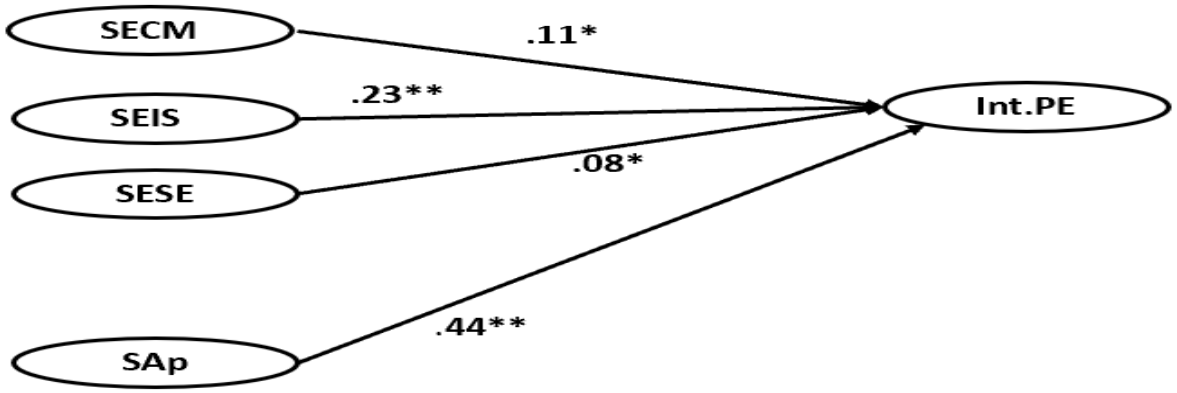

Figure 3. Results of full structural model of SEM on important educational outcome. *Note.* SECM = teacher self-efficacy for classroom management, SEIS = teacher self-efficacy for instructional strategies, SESE = teacher self-efficacy for student engagement; SAP = self-approach goals. *$p < .05$, ** $p < .001$.

Observation Results on Teaching Behaviors

All participating seniors had to complete their student teaching for 14 weeks at schools, as a part of requirements to graduate and be certified as a PE teacher upon graduation. They taught co-ed classes with 35 to 45 students for two times per week (approximately 35 – 40 minutes per lesson). Further, they were required to implement Teaching Games for Understanding (TGfU; Bunker & Thorpe, 1982; Werner, Thorpe, & Bunker, 1996) as a teaching style in their teaching, which parallels with the Malaysia PE National Curriculum "1 Student 1 Sport" teaching style requirement (Malaysia Ministry of Education, 2009).

A total of 1256 teaching behaviors were observed across 42 lessons among these 14 participating seniors (i.e. 4th year cohort) when they student taught at schools. Specifically, there were 560 (44.586%) teaching behaviors of student engagement (TBSE), 442 (35.191%) teaching behaviors of classroom management (TBCM) and 254 (20.223%) teaching behaviors of instructional strategies (TBIS). Frequencies and percentages of those observed teaching behaviors are presented in Table 13. TSCM included those behaviors such as having students to listen to the teacher's instruction (e.g., Guys! Please listen…I need you to perform a proper dynamic warm up before we start our hockey passing drill today), having students to follow and adhere class rules (e.g., Ahmed, stop hassling and disturbing your friend!), and establishing routines (e.g., I need you guys to wear a proper workout attire for the next class… because there are some of you guys did not wear it today!).

TBIS included those teaching behaviors such as modifying lessons (e.g., Ok guys, in the first half of this soccer match, you have played in a small-sided game. So, in the second half…I need you guys to play a full side game but please utilize the space when you are attacking the opponent team), checking students' understanding (e.g., Hey Pranesh, why do you think that

when you want to catch a rugby ball…you need to show both of your palms towards to your teammates?), and using a variety of assessment/strategies/evaluations (e.g., Guys, we just had our first test on your hockey dribbling skill, next week I will test you guys about the hockey rules. So, please be prepared to read about the rules and I will give a small quiz on it!). Lastly, TBSE included teaching behaviors such as promoting students to engage an activity (e.g., Sharifah, you can do it girl! Focus on your body positioning in the court), asking questions to foster students' critical thinking (e.g., Guys, why do you think we use the tennis ball to play soccer instead of using the real soccer ball?), and maintaining students' interest or motivation (e.g., Guys! as you have watched from the video, how obesity effects on your health condition. Do you think you want to be like the obsess lady in the video? Please think a minute?).

Relationships between teacher self-efficacy and observed teaching behaviors. To answer the third research question, the extent to which teacher self-efficacy was related to observed teaching behaviors among this group of senior participants (n = 14; male = 5 and female = 9), a series of Poisson regression analyses were conducted where teacher self-efficacy for classroom management (SECM), teacher self-efficacy for instructional strategies (TSIS), and teacher self-efficacy for student engagement (SESE) served as predictors and observed teaching behaviors (TBSE, TBCM, TBIS) as outcome variables. The descriptive data on teacher self-efficacy for these 14 participants were: SECM (M = 5.83, SD = 1.33), SEIS (M = 5.75, SD = 1.31), and SESE (M = 5.76, SD = 1.40). Results of the Poisson regression analyses are presented in Table 14. SECM emerged as a significant predictor of TBCM and accounted for 17.64% of the variance in TBCM. Additionally, when controlling other predictors in the model, one unit increase in SECM would result in 2.71 occurrences of TBCM. SEIS, however, failed to emerge as a significant predictor of TBIS. Finally, SESE

emerged as a significant predictor of TBSE and accounted for 1.7% variance in TBSE. Additionally, when controlling other predictors in the model, for one unit increase in SESE, 2.13 occurrences of TBSE would be observed.

Table 13. Frequencies and percentages of observed teaching behaviors

Teaching Behaviors	Frequency	Percentages
Classroom Management Teaching Behaviors		35.191%
having students to listen to the teacher's instruction	257	
having students to follow and adhere class rules	97	
establishing routines	88	
Instructional Strategies Teaching Behaviors		20.223%
modifying lessons	81	
checking students' understanding	97	
using variety of assessment/strategies/evaluations	76	
Student Engagement Teaching Behaviors		44.586%
promoting students to engage an activity	297	
asking questions to foster students' critical thinking	56	
maintaining students' interest or motivation	207	
Total Observed Teaching Behaviors	**1256**	

Table 14. Results of Poisson regression analyses

	Observed teaching behaviors								
	TBCM			TBIS			TBSE		
Predictors	***B***	***SE B***	***IRR***	***B***	***SE B***	***IRR***	***B***	***SE B***	***IRR***
Classroom Management	.42	.15	2.71*	.10	.23	.43	.08	.15	.59
Instructional Strategies	.02	.14	.03	.33	.22	.77	.04	.14	.30
Student Engagement	.01	.51	.21	.03	.07	.67	.13	.06	2.13*

Note. TBCM = teaching behaviors of classroom management, TBIS = teaching behaviors of instructional strategies, TBSE = teaching behaviors of student engagement, *$p < .05$, *IRR* = Incident Rate Ratio

Qualitative Findings for Interview Data

A total of 25 participant, 11 juniors (male = 6, female = 5) and 14 seniors (male = 5, female = 9), were individually interviewed in the present study. As mentioned earlier in the Method section, two phases of interviews were conducted, with phase one consisting of three interview questions (questions 1, 2, and 3) and phase two consisting of two interview questions (questions 4 and 5). In this section, themes emerged from responses to question 1 were first reported. Responses to questions 2 and 3 revealed a lot of overlaps and thus were reported together. The same was observed for responses to questions 4 and 5 and those responses were reported last in this section. Interviewees' demographics and means of teacher self-efficacy for classroom management, instructional strategies, and student engagement are presented in Table 15.

The first interview question (i.e., Question 1) was designated to tap into participants' reasons why they chose PE as their major. A total of 58 unit cards were generated from 25 participants' responses to this question. Two main themes emerged: a) sport backgrounds, and b) coach and parents' influences. These themes and their corresponding frequencies and percentages are summarized in Table 16 and are presented below.

Sport backgrounds. The first theme generated 53.45% of 25 participants' responses to the question**.** This theme was a reflection on the participants' reasons or purposes why they chose PE as their main major when applied for the admission at Universiti Putra Malaysia (UPM). For instance, Munirah (F, senior) mentioned, "….one of the reasons I enrolled in this program because I love to play sports since when I was 7 years old. In my high school years, I represented my state for athletics event and netball. When I applied for UPM, I was looking for a major that allowed me to stay active in sports. So, I saw PE major as my best bet that will allow me to continue my passion". Similarly, Faiz (M, junior) stated, "…I played rugby and soccer for the state of Johor during my years at high school…While applying for UPM, I was looking either PE

or Sport Science as my major due to my interest in sport. Since UPM is only offering PE… then I made my mind to choose this major to continue my study … this major allows me at the same time to pursue my interest in sports…".

Coach and parents' influences. The second theme, which comprised of 46.55% of participants' responses, focused on coach and parents' influences that led them to choose PE as their major at UPM. Ezzyana (F, senior) stated, "…both of my parents are teachers at school. Watching both of them going to work on daily basis and at the same time, my mother was my class teacher in high school. This has inspired me to become a teacher". Dollah (M, junior) mentioned, "…I have a pretty much close relationship with my athletic coach…since the coach was also a former PE student at UPM. He advised me to pursue this major considering my passion in athletics. One of his [mentor teacher] words that I still remember…Since UPM is the main training base camp where all the national elite athletes in athletic events are gathered….PE major at UPM will accommodate your interest…which it will allow you to train with these national athletes in the afternoon after your lecture hours".

Table 15. Characteristics of preservice teacher interviewees (*n* = 25)

Characteristics	N	Percentages (%)	Mean	SD
Age	25	-	24.19	1.11
Gender				
Male	11	44%	-	-
Female	14	56%	-	-
Classifications				
Juniors	11	44%	-	-
Seniors	14	56%	-	-
Teacher self-efficacy scores				
Juniors				
SECM	11	-	5.71	.73
SEIS	11	-	5.64	.72
SESE	11	-	5.81	.70
Seniors				
SECM	14	-	5.84	.78
SEIS	14	-	5.46	.74
SESE	14	-	5.58	.75

Table 16. Frequencies and percentages of themes from question 1

Themes	Number of responses (n = 58)	Percentages
Sport backgrounds	31	53.448%
Coach and parents' influences	27	46.551%
Total responses	58	

Note. SECM = self-efficacy for classroom management, SEIS = self-efficacy for instructional strategies, SESE = self-efficacy for student engagement

For questions number 2 and 3, these two questions were aimed to gather information about participants' confidence level of teaching physical education classes (i.e., self-efficacy in teaching PE classes) and what and how they perceived their PETE program prepared them to teach PE. As part of question 2, 25 participants were asked, "If you were to teach a PE class for the fourth- or eighth-graders, how confident do you feel about teaching it?" Their responses to it were provided in Table 17. Only two juniors (18.18%) chose one (not at all confident) indicating they had exceptionally low teacher self-efficacy level; 7 juniors (63.63%) and none of the seniors chose two (little confident) indicating they had a bit of self- efficacy level; 2 juniors (18.18%) and 2 seniors (14.28%) chose three (some confident), indicating they had medium self-efficacy level. Further, none of juniors and 12 seniors (25.71%) chose four (confident) indicating they had a relatively high teacher self-efficacy level. Interestingly, neither junior nor senior cohorts chose five (very confident), an exceptionally high teacher self-efficacy level.

There were a total of 155 unit cards generated from 25 participants' responses to the two questions. Three themes emerged: a) professors' supports, b) extracurricular activities, and c) offered content-knowledge courses. The themes and their corresponding frequencies and percentages are summarized in Table 18 and are presented below.

Table 17. Teaching confidence level among preservice teacher interviewees for question 2

Teaching Confidence Level	Frequencies	Percentages (%)
Juniors (*n = 11)*		
Not all confident (1)	2	18.18%
Little confident (2)	7	63.64%
Some confident (3)	2	18.18%
Confident (4)	0	0%
Very confident (5)	0	0%
Seniors (*n = 14)*		
Not all confident (1)	0	0%
Little confident (2)	0	0%
Some confident (3)	2	14.29%
Confident (4)	12	85.74%
Very confident (5)	0	0%

Professors' supports. This theme reflected participants' perceptions of how professors in their PETE program prepared them so far to develop their teacher self-efficacy to teach PE. A total of 36.77% of responses referred to this theme.

For example, Stephanie (F, senior) said that, "…Dr. Tengku is my favorite professor in the department. She treats me like her own daughter. A lovely professor who has always inspired us with her inspirational words during or outside from the lecture hours…Besides that…she has also advised us on what courses we should take every semester".

Faiz (M, junior) also reflected on the support from professors and stated, "…Dr. Saidon is my professor and he has involved a lot in my rugby activities. Despite, some of these guys feel scared to him…I personally believe that he is like my mentor and father in this department. Occasionally, he will invite us at his home to have some chats concerning rugby, life and academic stuff." Munir (S, junior) mentioned, "…I love the way Dr. Soh treats her students because I feel she is so motherly treating them…Her smiling and warm-welcomed when I meet her…really makes my day!".

Extra-curricular activities. The second emergent theme generated 33.55% of responses provided by these 25 participants. This theme showed that participants contributed the development of their self-efficacy to extra-curricular activities provided by their PETE program and department as well. Those extra-curricular activities included having opportunities to serve as a volunteered coach for a sport team and becoming actively involved in any leadership program offered in the department. For example, Aminah (F, senior) stated that, "…before the semester break, the department will normally post volunteer job positions that are related to several sport associations either at state or national level. Because I was a former national youth netball player, I would grab such a position to gain some experience. Last semester, I did a volunteered coaching job for a netball team in Kuala Lumpur…during that time, I assisted the team head coach to train and manage the team for a tournament…from there, I was also exposed to lead the players in several small skill drills that developed my teaching confidence" In addition, Rizal (M, senior) explained:

> " The department is always creating some opportunities for me to develop my teaching confidence …in one of the occasions…last year, I was involved with a small rugby coaching committee to organize a rugby clinic that attracted 316 elementary school kids from all over Malaysia. From this event, I had opportunities to teach those kids with basic rugby skills…".

Offered content-knowledge courses. The third emergent theme consisted of 29.68% of responses provided by 25 participants. In this theme, participants reflected that their PETE program offered a variety of courses to develop their teaching confidence. For example, Syed (M, senior) stated, "….when I took PE Teaching Methodology course in my third year (i.e., junior year)…I found that this course was a profound content-knowledge course to develop my teaching skills…from there, I learned some of the teaching techniques that I could use in the

future. Besides that, my cohort was exposed to field-based experiences at three school for 4 weeks to observe experienced PE teachers… teaching their PE classes." Hidayah (F, junior) echoed that, "…at first, I think these courses such as biomechanics and exercise physiology were difficult to learn and digest…but, in one occasion…when I tried to explain the principles of biomechanics and exercise physiology to my field hockey teammates who were not in the PE major…indirectly, I am practicing what I have learned and understood …thus, it gains my confidence to explain to other people in the future if required…especially to my future's students".

Table 18. Frequencies and percentages of themes for questions 2 and 3

Themes	**Number of responses (n = 155)**	**Percentages**
Professors' supports	57	36.774%
Extra-curricular activities	52	33.548%
Offered content-knowledge courses	46	29.677%
Total responses	155	

For questions 4 and 5, only 14 senior participants were involved in this second phase of interviews. These questions were focused on whether student teaching experiences were perceived to result in any change in teacher self-efficacy in teaching physical education classes at schools among this group of participants. Each of these 14 senior participants was individually interviewed at the end of their 14-week student teaching experiences.

To respond to question 4, participants first needed to indicate where they were on the scale of confidence from 1 (not at all confident) to 5 (very confident) the first week when they student taught and the moment when they were interviewed, which occurred two weeks before the 14-week student teaching ended. As shown in Table 19, during the first week of student teaching at schools, the results showed that 2 seniors (14.29%) chose three (some confident) indicating they had medium self-efficacy level, while 12 other seniors (85.71%) chose four (confident), indicating they had a relatively high teacher self-efficacy level. Near the end of student teaching, results showed that 1 senior (7.14%) chose four (confident) indicating s/he had a relatively high teacher self-efficacy level, while 13 other seniors (92.86%) chose five (very confident) showing that they had exceptionally high teacher self-efficacy level based on their responses after having gone through a 14-week student teaching at schools.

Participants were then asked to indicate whether they felt a change in their confidence level to teach PE between the beginning and end of student teaching and to describe what might contribute to such a change. Of the 14 participants interviewed, all of them agreed that their confidence level to teach PE changed (for better) significantly as a result of their 14-week student teaching at schools.

Their responses to questions 4 and 5 also revealed three themes as described below. Their corresponding frequency and percentage were provided in Table 20.

Table 19. Frequencies of teaching confidence level among the participating seniors (n = 14)

Teaching Confidence Level	**Before Student Teaching**	**After Student Teaching**
Not all confident (1)	0	0
Little confident (2)	0	0
Some confident (3)	2	0
Confident (4)	12	1
Very confident (5)	0	13

Mentor teachers. This theme generated 40.15% of 14 participants' responses to the questions. It captured critical roles that mentor teachers played to guide and lead these participating seniors successfully through student teaching at schools. Participants recognized that their mentor teachers demonstrated how to become a "role model teacher" or served as their advisor for becoming an effective PE teacher in managing students' behaviors and creating an evaluation or assessment tool that can be used to assess student learning in PE. For example, Munirah (F, senior) explained, "… I feel so lucky because my mentor teacher has played a significant role to show me what are needed all this while…in the first week of my student teaching, she [mentor teacher] requested me to observe her teaching. From what I observed her [teacher-mentor], I made some notations for my reference and right after the class, we discussed any related inquiries about her teaching content. In addition, she [mentor-teacher] requested me in advance related to the content and lesson plan that I will teach in the next class".

Shakirin (M, senior) added, "…in the first week, I felt anxious on what I should do at the school. However, my mentor teacher helped me understand the processes that I needed to get prepared for, such as teaching preparation, school's expectations and some clerical stuff related to school administration".

Varied experiences. This emergent theme was of the 36.36% of responses provided by the 14 participants. This theme primarily referred to a variety of non-teaching activities or events that participants were engaged in but felt contributed to their self-efficacy in teaching PE while student teaching at schools. It also included experiences where participants had a chance to apply what they learned in their coursework to teach students in PE classes.

Non-teaching activities/events mentioned in the theme included organizing or managing school sport's day, students and teachers' appreciation day, parent-teacher association meeting. Further, these participating seniors were also requested by their respective schools to become an assistant manager for their team sports or managing athletes when the schools/athletes competed at the inter-school sport tournament. For example, Mamat (M, senior) stated, "…I found that besides teaching students in PE classes…the principal of the school asked me to organize the school sport's day event. It was a kind of overwhelming experience because in this school…we only have 3 PE teachers…but I felt the experience that I went through did give me a significant learning curve… It was actually a reality check for me because besides teaching students…as a PE teacher, we also needed to perform other tasks beyond our teaching responsibilities."

Some responses revealed experiences during student teaching where participants applied knowledge taken from their PETE program at UPM to teach students and believed such experiences added to their positive perceptions of confidence in teaching. For example, Nurul (F, senior) noted, "…at first, I did not think the courses such as anatomy and biomechanics that I took from (the PETE program) UPM would become so important in my teaching…but, I realized it when I needed to use the learned knowledge from these two courses to explain to students about the importance of "follow through" in the skill of soccer shooting."

Feedback. The third emergent theme consisted of 23.484% of responses provided by the 14 senior participants. This theme focused on feedback provided by their PETE professors or mentor teachers at schools. All these senior participants agreed that feedback was so important for them to improve their teaching skills, especially the feedback that was given right after they taught a PE class. For example, Rosnani (F, senior) explained, "…despite that Dr. Bob only had two time observations on my teaching…I feel that his feedback right after my class was meaningful for me to improve my teaching. He [the professor] did advise me on how I should position myself when observing my students to perform a particular skill." In addition, Maisarah (F, senior) stated, "…I was so lucky because for the first three weeks of teaching in this school, my mentor did observe me in each of the classes that I taught. He [mentor teacher] will give his feedback right after my class and we will discuss for at least 30 minutes on what I should improve for the next lesson….meaningful feedback, including how to manage students' disruptive behaviors and how to start the class with a creative anticipatory set activity. All this was very important, and I can still remember it from my previous discussion with him".

Table 20. Frequencies and percentages of themes from questions 4 and 5

Themes & subcategories	**Number of responses (*n* = 132)**	**Percentages**
Mentor teachers	53	40.151%
Varied Experiences	48	36.363%
Feedback	31	23.484%
Total responses	132	

Discussion

Using self-efficacy theory (1977, 1997) and achievement goal theory (Ames, 1984; Dweck and Leggett, 1988; Elliot and Church, 1997; Nicholls, 1989) as theoretical perspectives, the present study attempted to answer four research questions as described below. Consequently, the data reported in the study included questionnaires, video-taped lessons and interviews. In this section, all results are discussed in reference to these four research questions and then followed by the limitations, implications for practice, and directions for future research endeavors

Research Question #1: What is the reliability and validity of adapted TSES and AGQ-T?

The first research question in the present study examined the psychometric properties of the TSES (Tschannen-Moran & Hoy, 2001) and AGQ-T (Mascret, Elliot, & Cury, 2017) among Malaysian PE preservice teachers. As reviewed in the previous chapter, TSES was initially developed to assess teacher self-efficacy on inservice teacher population and has been widely adapted to assess teacher self-efficacy in educational and physical education (PE) settings (Hutzler, Zach, & Gafni, 2005; Taliaferro, 2010; Brouwers & Tomic, 2000; Dellinger, Bobbett, Olivier, & Ellett, 2008; Friedman & Kass, 2002; Gurvey & Metzle, 2009; Gao, Xiang, Chen, & McBride, 2013; Riggs & Enochs, 1990; Siwatu, 2007, 2011; Stephanou & Tsapakidau, 2007); Tschannen-Moran & Woolfolk Hoy, 2001). However, TSES has never been adopted/adapted to assess teacher self-efficacy among PE preservice teachers in Malaysia, the targeted population in the present study.

TSES consists of 24 items, which make up three subscales of teacher self-efficacy: a) classroom management, b) instructional strategies, and c) student engagement. Each subscale includes eight items. In the present study, a two-level of instrument validation was conducted: Item Response Theory (IRT) analyses at item-level, and Confirmatory Factorial Analyses (CFA)

at factorial-level. The IRT analyses revealed that all items were discriminant for subscales of self-efficacy for classroom management (*as* ranged from 6.09 to 4.76) and self-efficacy for instructional strategies (*as* ranged from 5.58 – 4.20). Nguyen, Han, Kim and Chan (2014) suggested that any item with a value of *a* smaller than 4.0 ($a < 4.0$) is considered a non-discriminant item. Additionally, as an assessment of item quality, the standardized chi-square test ($S\text{-}x^2$) revealed that none of the items ($p < .05$) was misfit or poor items in both subscales. Taken together, all items assessing self-efficacy for classroom management and self-efficacy for instructional strategies demonstrated validity at item-level.

For the subscale of self-efficacy for student engagement, however, the IRT analyses revealed that item #4 (How much can I do to help my students think critically?) was a non-discriminant item ($a < 4.0$). In addition, the standardized chi-square test ($S\text{-}x^2$) showed that this item ($p < .05$) was a misfit or poor item. Consequently, this item was deleted from the subscale. Two plausible explanations could account for this deletion. First, empirical research evidence suggests that undergraduate students in Malaysia lacked adequate level of critical thinking. (Rashid & Hashim, 2008). For example, in their qualitative study of final year diploma students (N = 61) in business management, Fadhlullah and Ahmad (2017) observed low to moderate level of critical thinking among them. Second, preservice teachers in the present study were junior and senior students in their PETE program. Their training during these years in the program primarily focused on mastering content knowledge and methods of instruction and little of their training was devoted specifically to how to teach critical thinking skills. Considered together, it was likely that this group of preservice teachers didn't have a clear understanding of what critical thinking entails. As a result, when asked about helping students thinking critically, they struggled to respond to it.

To examine the factor-level validity of TSES, two CFAs were conducted. Though the first CFA with all 24 items revealed a good fit between the 3-factor model and data, the second CFA showed that the 3-factor model even had a better fit, after item #4 was deleted from the model as the IRT analyses indicated that this item failed to demonstrate acceptable item-level validity.

Results of the IRT analyses and CFAs pointed out that the TSES in the present study demonstrated satisfactory validity at both the item- and factor-level. This finding has expanded our knowledge base on TSES as no prior work has been conducted examining its item-level validity. The reliability of the TSES was supported by Cronbach alpha coefficients as the present study found that they ranged from .72 to .90. Considered together, results of the present study provided empirical evidence that the TSES (after the deletion of item #4) was a reliable and valid measure to assess teacher self-efficacy for classroom management, instructional strategies, and student engagement among this group of Malaysian PE preservice teachers in the present study.

Like the TSES, the psychometric properties of the Achievement Goals Questionnaire for Teaching (AGQ-T; Mascret, Elliot, & Cury, 2017) were also examined in the research question #1. Building on the 3 x 2 model of achievement goals (Elliot et al, 2011), Mascret et al. (2017) constructed the 3 x 2 model of teachers' achievement goals and developed AGQ-T to assess the six achievement goals depicted in this model: task-approach goal (TAp; e.g., focused on attaining teaching task-based competence), task-avoidance goal (TAv; e.g., focused on avoiding teaching task-based incompetence), self-approach goal (SAp; e.g., focused on teaching self-based competence), self-avoidance goal (SAv; e.g., focused on teaching self-based incompetence), other-approach goal (OAp; e.g., focused on attaining teaching other-based

competence) and other-avoidance goal (OAv; e.g., focused on avoiding teaching other-based incompetence).

The same two-level of instrument validation was implemented to assess both item- and factor-level validity of AGQ-T. Standardized chi-square tests (S-x^2) from the IRT analyses revealed that item # 18 (Avoid having failing students, assessing SAv), item #16 (Be better than before in my teaching, assessing SAp), item #2 (Avoid being worse than before in my teaching, assessing SAv), item # 17 (Be more effective than other teachers, assessing OAp) and item #14 (Avoid teaching less effectively than other teachers, assessing OAv) were problematic. However, none of the items assessing TAp goals was found either misfit or poor. These results were unexpected but understandable given that Mascret and colleagues (2017) did not utilize the IRT analysis to examine the quality of each item in AGQ-T when they developed it. Further, AGQ-T was developed and validated with a sample of French in-service female teachers only.

To examine the factor-level validity of AGQ-T, three CFAs were conducted. The first CFA with all 18 items revealed a poor fit between the 6-factor model and data. This result called for the consideration of the results of the IRT analyses, which showed that item # 18, item #16, item #2, item # 17 and item #14 were either non-discriminant or poor items. Without these items included, the second CFA with 13 items was conducted and results revealed that the model fit indices were improved but there was still a lack of a good fit between the 6-factor model and data. Guided by the modification indices provided by the second CFA, the third CFA was conducted and yielded an acceptable fit between the 6-factor model and data. As a result, the AGQ-T in the present study consisted of 13 items but all these items demonstrated satisfactory item- and factor-level validity. Cronbach alpha coefficients were also calculated and ranged from .74 to .92, indicating the AGQ-T was a reliable measure to assess the six teachers' achievement

goals among the participants in the present study. Taken together, the 13-item AGQ-T demonstrated acceptable psychometric properties in the present study.

Obviously, there was discrepancy between the 13-item AGQ-T validated in the present study and the 18-item AGQ-T developed by Mascret and colleagues (2017). One plausible reason might be that Mascret et al (2017) study was conducted in classroom settings with French in-service female teachers, whereas the present study was conducted in the PE setting with Malaysian preservice teachers, both males and females. The differences in settings and samples might have contributed to the discrepancy. Apparently, more research is needed to continue to investigate the psychometric properties of the AGQ-T in a variety of settings.

Research Question #2: What are the relationships between teacher self-efficacy, achievement goals and important educational outcomes (intention to become a PE teacher in the future among preservice teachers and GPA)?

The second research question examined the relationships between teacher self-efficacy, teachers' achievement goals and important educational outcomes. The Pearson product-moment correlations revealed that all three constructs of teacher self-efficacy (i.e., SECM, SEIS, SESE), task-approach goals (TAp), self-approach goals (SAp) and other-approach goals (OAp) were significantly and positively correlated with Int. PE, while self-avoidance goals were significantly and negatively correlated with Int.PE. Neither the three constructs of teacher self-efficacy nor the six teachers' achievement goals were correlated with GPA.

Such relationships were further examined in a full structure model of SEM in which teacher self-efficacy and teacher achievement goals served as predictors, while GPA and Int. PE served as the outcomes. Results revealed that the three constructs of teacher self-efficacy (i.e., SECM, SEIS, and SESE) emerged as significant predictors of Int.PE. Nevertheless, among the six teachers' achievement goals (e.g., TAp, TAv, SAP, SAv, OAp and OAv), only SAp emerged as a significant predictor of Int. PE in this model. However, for GPA, none of the predictors became significant.

Research has demonstrated that teachers' intention is an activator or a motivational determinant that will predict teachers' actual behavior in teaching practices (Ajzen & Madden, 1986; Ajzen, 1991; Gorozidis & Papaioannou, 2011). In addition, Gorozidis and Papaioannou (2011) posited that by knowing teachers' intention, educational researchers can anticipate or predict teachers' cognitive, affective and behavior in the future. In fact, a meta-analysis study which examined 87 studies from various education settings revealed that teachers' intention was

highly associated with actual teachers' behaviors in their related teaching practices (Sheppard, Hartwick, & Warshaw, 1988). Though no study has been found examining whether teacher self-efficacy predicted one's intention to become a PE teacher in the future (Int.PE) in physical education, research work revealed that teacher self-efficacy impacted teachers' intention to implement a new PE curriculum (Gorozidis & Papaioannou, 2011) or to promote vigorous physical activity in PE classes (Martin et al., 2001). Therefore, the finding that the three constructs of teacher self-self-efficacy predicted preservice teachers' Int. PE in the present study adds to our knowledge base on teacher self-efficacy in physical education.

Among the six achievement goals examined in the present study, only SAp goals significantly and positively predicted Int. PE. This finding suggests that PE preservice teachers who embraced the goal of teaching effectively than before were more willingly to become PE teachers in the future than their counterparts who did not embrace this goal. SAp goals were equivalent to mastery or mastery-approach goals (MAp) in the dichotomous, trichotomous, and 2 x 2 models of achievement goals. The existing body of literature focusing on these three goal models has demonstrated that MAp goals (i.e., SAp goals) were positively linked to several adaptive motivational outcomes such as teachers' willingness for help seeking, better perceived competence, and job satisfaction in their teaching career (Butler, 2007; Butler & Shibaz, 2008; Cho & Shim, 2013; Fasching et al., 2010; Gorozidis & Papaioannou, 201). Considered together, these findings provide empirical support for the notion that SAp goals are motivationally beneficial (Butler, 2007; Butler & Shibaz, 2008; Cho & Shim, 2013; Fasching et al., 2010; Gorozidis & Papaioannou, 2011;Mascret, Elliot, & Cury, 2017).

Unlike SAp goals, TAp, TAv, SAv, OAp and OAv goals failed to emerge as significant predictors of Int. PE in the model. This finding doesn't support Mascret, Elliot and Cury (2017)

who reported that these five goals positively or negatively predicted outcomes in their study. For example, TAp emerged as a significant predictor of incremental theory, mastery-oriented teaching practices and teachers' intrinsic interest; TAv emerged as a significantly negative predictor of entity theory; SAv emerged as a significant and positive predictor of entity theory; and other based goals (OAp and OAv) emerged as significant predictors of performance-oriented teaching practices. Considering that the 3 x 2 model of teachers' achievement goals is relatively new, and this study is the first study to examine this model among PE preservice teachers in Malaysia, it would be premature to make a definitive conclusion about any of these five goals. However, follow-up research is recommended to further determine the nature of these goals in prediction of PE preservice teachers' important educational outcomes in Malaysia.

Research Question #3: To what extent is teacher self-efficacy related to observed teaching behaviors among PE preservice teachers?

The third research question examined the extent to which teacher self-efficacy is related to observed teaching behaviors with the data provided by 14 preservice teachers who student taught at schools and therefore, they were referred to as student teachers in the discussion. Results of Poisson regression analyses showed that teacher self-efficacy for classroom management (SECM) emerged as a significant predictor of observed classroom management teaching behaviors, explaining 17.6% of its variance. This finding suggests that student teachers who perceived efficacious to classroom management actually demonstrated behaviors of classroom management such as managing students' disruptive behaviors, establishing gym's routines and giving instructions to students for them to adhere the class rules.

Results of Poisson regression analyses also revealed that teacher self-efficacy for student engagement (SESE) emerged as a significant predictor of teaching behaviors of student engagement, including promoting students to engage an activity, asking questions to foster critical thinking among the students, and maintaining students' interest or motivation. The variance accounted for by SESE was 1.7%, which is considered small. However, 1.7% of explained variance in teacher self-efficacy for student engagement would be resulting in 2.13 occurrences of teaching behaviors for student engagement, showing how much student teachers' self-efficacy impacted their actual teaching behaviors in student engagement. Given this, the finding that teacher self-efficacy for student engagement predicted observed teaching behaviors for student engagement is considered meaningful and significant.

Unlike teacher self-efficacy for classroom management and teacher self-efficacy for student engagement, teacher self-efficacy for instructional strategies failed to emerge as a significant predictor of teaching behaviors of instructional strategies, included modifying lessons, checking students' understanding and using a variety of assessment/strategies/evaluations. Three plausible explanations might account for this unexpected result. First, among the three types of observed teaching behaviors in the present study, teaching behaviors of instructional strategies had the lowest frequencies of observations (20.22%; 254 out of 1256 teaching behaviors), suggesting that student teachers did not often apply instructional strategies during student teaching. This might have impacted the relationships between teacher self-efficacy for instructional strategies and observed teaching behaviors of instructional strategies examined in the present study.

Second, this group of student teachers primarily learned to use Teaching Game for Understanding (TGfU; Bunker & Thorpe, 1982; Werner, Thorpe, & Bunker, 1996) as the teaching style in their PETE program. As a result, they lacked exposure to and opportunity to practice different teaching styles during their training years in the PETE program. Research has demonstrated that preservice teachers' teaching styles are primarily determined by the type of teaching style that they learned in the teacher education program and the opportunity they had to practice learned teaching styles during student teaching (e.g., Macado & Wang, 2019; Mader, 2009; Nielson-Jihson, 2007; Taylor, 1994; Xiang, Gao, & McBride, 2011).

Third, three teaching behaviors of instructional strategies that were recorded and observed on The Observation Form of Preservice Physical Education Teacher's Self-Efficacy (OBPE-TSE; Appendix E) included modifying lessons to meet students' needs, checking students' understanding, and using a variety of assessments to evaluate students. Research

evidence shows that student teachers are primarily concerned about classroom management (e.g., Ingersoll & Smith, 2003; Klopfer, Scott, Jenkins, & Ducharme, 2019, Sugai, Sprague, Horner, & Walker, 2000) during student teaching. The low frequency of these three teaching behaviors observed in this study added another support for this evidence. Also, such low frequency might have impacted the result that there was no relationship between teacher self-efficacy for instructional strategies and observed teaching behaviors of instructional strategies among this group of preservice teachers. Perhaps future research needs to expand or modify teaching behaviors of instructional strategies on the OBPE-TSE to further determine the nature of this relationship.

Previous studies that linked teacher self-efficacy to teaching behaviors used self-reported teaching behaviors. In contrast, teaching behaviors reported in the present study were actual teaching behaviors demonstrated by preservice teachers. As a result, findings of the present study filled this gap in the literature and provide stronger evidence for the relationship between teacher self-efficacy and teaching behavior.

Research Question #4: What experiences did pre-service teachers perceive contributing to their self- efficacy in their PETE program?

The final research question in the present study aims to understand and explore contributors that preservice teachers perceived to their self-efficacy in the PETE program. As a result, two interview phases occurred. At phase one, preservice teachers at both junior and senior years were asked three questions (i.e., Questions 1, 2 and 3; see Appendix F). These questions focused on why they chose PE as a major, what level of confidence (i.e., self-efficacy) they felt for teaching PE classes, and whether they perceived that the training they received from their PETE program prepared them for teaching PE. Responses to these three questions provide background/contextual information to understand self-efficacy-related perceptions among this group of preservice teachers in the present study. At phase two, only preservice teachers who student taught were interviewed with two questions (i.e., Questions 4 and 5; Appendix J). The two questions focused on self-efficacy change and related contributors as the results of their 14 weeks student teaching at schools.

Findings from the first interview question revealed two themes that influenced this group of preservice teachers to choose PE as a major while studying at UPM. They were sport backgrounds (i.e., prior involvements and achievements in sports) and influences from coaches and parents. Such influences have been well documented in the research literature on the socialization of physical education teachers (Hutchinson, 1993; Lawson, 1983) and are best captured by Spittle and Spittle (2014), who asserted,

> "…students [preservice teachers] were most likely to become primary physical education specialists [PE teachers] because they wanted sport and physical activity to be part of

their job, because they were confident and enjoyed helping others in a school setting, and to emulate a teacher, physical education teacher, or significant other". (p.2)

The second and third interview questions asked about the preservice teachers' confidence level to teach PE and how their PETE program prepared them to teach PE. Reflected on the second interview question, 9 out of 11 juniors perceived of lack of confidence or below midpoint of 3 (some confident), indicating that they had low self-efficacy to teach PE. On the other hand, most of the seniors perceived highly confidence (above midpoint 3; some confident), indicating they perceived high self-efficacy to teach PE. This discrepancy of confidence levels between juniors and seniors was parallel with previous research. Spittle, Jackson and Casey (2009) demonstrated that the third year students (i.e., Junior cohort) were normally perceived lack of confidence and motivation to teach PE compared to the fourth year students (i.e., Senior cohort). Additionally, the themes emerged from their responses to both questions were discussed together. Reflected in the *professors' support* as the first emergent theme, the preservice teachers indicated that their professors' support in their program played the most important role in preparing them to teach PE, as this was the most recurring theme emerged from the data. Professors' support mentioned by these preservice teachers included that they were friendly, modeled effective teaching, made students feel welcomed warmly, and served as the role of mentor. A great deal of research has demonstrated that instructor or professor support from teacher education programs plays a significant function in preparing preservice teachers to become teachers in the future (e.g., Aelterman, Vansteenkiste, Keer, De Meyer, Berghe, & Haerens, 2013; Jang, Kim, & Reeve, 2016; Menon & Sadler, 2018; Moulding, Stweart, & Dunmeyer, 2014). Additionally, the preservice teachers also responded that their exposures to a variety of extracurricular activities and course offerings focusing on content knowledge were

critical in developing their confidence to teach PE. Reflected in the e*xtra-curricular activities* as the second emergent theme, and o*ffered content-knowledge courses* as the third emergent theme, these themes were consistent with previous qualitative research conducted in both general education and PE settings that revealed variety exposure to activity and subject-matter courses offered by the department, and had a significant impact on preservice teachers' confidence to teach (e.g. Barnes, 2006; Tsangaridou, 2008). Considered together, these findings seem to suggest that if the PETE programs focus on mastery of content knowledge and provision of various activities, including those outside from the lecture/class hours, preservice teachers are likely to feel confident in teaching at school settings.

Student teaching represents the final stage of preservice teachers training in the PETE program, where this avenue serves as an opportunity for preservice teachers to practice all the previously acquired knowledge and learned teaching skills in real school settings. Given the significance of student teaching in teacher education programs, the second interview phase, which consisted of Question 4 and Question 5, solely focused on student teaching. As a result, their responses to the two questions were discussed together. When asked to compare their confidence level (i.e., self-efficacy level) to teach PE between the beginning and at the end of student teaching, all of them responded that their self-efficacy significantly improved as a result of their student teaching experiences at schools. The increased self-efficacy perceived by these preservice teachers seems to imply that student teaching played a vital role in the development of their self-efficacy in teaching PE at schools. The present finding is consistent with previous studies documenting that student teaching experiences played a key role to develop teacher self-efficacy among preservice teachers (e.g., Dassa & Nichols, 2019; Gao, Xiang, Chen, & McBride 2013; Tsangaridou, 2008). It also adds additional empirical evidence to support Hoy and Spero

(2005), who contended, "…some of the most powerful influences on the development of teachers' sense of efficacy are experiences during student teaching and the induction year". (p.344)

The seniors' responses on both questions revealed that *mentor teachers* (i.e., cooperating teachers) at schools as the key theme to the development of their self-efficacy during student teaching. Specifically, they reported that their mentor teachers guided them to understand what was required to become a PE teacher, advised them on teaching-related activities, and giving assistance when they were engaged in school administrative tasks. A great deal of research work reveals that the role of mentor-teachers for preservice teachers during student-teaching is pinnacle to develop teacher self-efficacy and teaching confidence in the future (e.g., Clark, Brynes, Sudweeks, 2015; Colson, Sparks, Berridge, Frimming, & Willis, 2017; Kola & Sunday, 2015; Martin, Costa, & Onofre, 2015; Talvitie, Peltokallio, & Mannisto, 2000). The present finding adds to this line of research in which the roles of mentor-teacher to develop preservice teachers' self-efficacy during student teaching have been well documented. In addition to the influence of mentor teachers, preservice teachers also felt the impact of *varied experiences* on their self-efficacy. During student teaching, this group of preservice teachers had opportunities to get engaged in a variety of teaching and non-teaching tasks, including becoming an assistant manager for team sport competition, managing and organizing Teachers' Day and Parent-Teacher Association (PTA) meeting, and organizing fund-raising activity to collect funding for students that come from low-income family. Such varied experiences fostered their sense of mastery or accomplishment in these tasks. In his self-efficacy theory, Bandura(1977, 1997) posits that mastery experience or direct experience to various of tasks can be a source of self-efficacy to develop one's self-efficacy. Clark, Brynes and Sudweeks (2015) noted that,

"…interns [preservice teachers] have more opportunities for various of mastery experiences, and therefore have higher levels of perceived teaching ability". (p.80). Because of having experienced various teaching and non-teaching tasks during student teaching, this group of preservice teachers felt that their self-efficacy increased from the beginning to the end of student teaching. Finally, preservice teachers recognized that *feedback* provided by mentor teachers or PETE professors was impactful to the development of their self-efficacy during student teaching. This finding is congruent with Bandura's view that positive feedback or comments increase self-efficacy (1977,1997). Numerous studies have been conducted to examine the effect of feedback to improve teaching effectiveness among the preservice teachers (e.g., Panadero, Alonso-Tapia, & Reche, 2013; Brown, Peterson, & Yao, 2016; Koka & Hein, 2003), and revealed the importance of feedback in developing teaching effectiveness among the preservice teachers.

To sum up, the interview data revealed that PETE program professors, school mentor teachers, course offerings, varied experiences, and feedback provided by professors and mentor teachers during student teaching contributed to the development of self-efficacy in teaching PE among this sample of preservice teachers. The data also showed that preservice teachers perceived that their self-efficacy in teaching PE increased as a result of student teaching. These findings support the existing body of literature on teacher self-efficacy. Informed by them, faculty members may become more effective in training preservice teachers in their PETE programs, which in turn may lead to higher quality of school physical education programs in Malaysia.

Implications for Practices and Future Research

Teacher self-efficacy has been documented as an important construct to understand motivation and related cognitive, affective, and behavioral responses among teachers and pre-service teachers in both classroom and physical education settings. However, little work in this area of inquiry has been done in Malaysia, particularly in PE settings. To address this issue, the present study examined the psychometric properties of the Teachers' Sense of Efficacy Scale (TSES; Tschannen-Moran & Hoy, 2001), a most often used measure to assess teachers' self-efficacy in the literature. Teacher self-efficacy assessed by TSES is comprised of three constructs: self-efficacy for classroom management, teacher self-efficacy for instructional strategies, and self-efficacy for student engagement. Consistent with previous research studies, results of the present study revealed that these constructs emerged as three distinct constructs from the data and the TSES demonstrated acceptable reliability and validity at both item- and factor levels after the item (How much can I do to help my students think critically?) was removed. This finding suggests the TSES validated in the present study can serve as a reliable and valid measure to assess PE preservice teachers' self-efficacy in Malaysia.

After the TSES demonstrated acceptable psychometric properties, relationships between teacher self-efficacy, intention to become a PE teacher in the future, GPA and teaching behaviors were examined. Perhaps the most important finding is that teacher self-efficacy not only predicted preservice teachers' intention to become a PE teacher in the future but also predicted some of their actual teaching behaviors observed during student teaching. This finding provides empirical evidence that teacher self-efficacy can influence preservice teachers' intention and actual teaching behaviors. An implication is that faculty members in PETE programs in Malaysia should be aware of the impact of teacher self-efficacy on preservice teachers and find effective

ways to help them develop high teacher self-efficacy in physical education.

Achievement goals represent another important construct to understand and explain motivation and related cognitive, affective, and behavioral responses among teachers and preservice teachers in schools. The 3 x 2 model of teachers' achievement goals has recently been developed (Mascret, Elliot, & Cury, 2015), which proposes six goals that teachers can adopt in teaching: task approach, task-avoidance, self-approach, self-avoidance, other approach, and other avoidance. However, the application of this model is unknown in Malaysia, particularly in the physical education setting. Therefore, the present study examined the psychometric properties of the Achievement Goals Questionnaire for Teaching (AGQ-T), which assesses six achievement goals described in the 3 x 2 model. Results of the study revealed the six achievement goals emerged as distinct constructs from the data only after five items were removed and several modifications were made. Given that this is the first study to examine AGQ-T among PE preservice teachers in Malaysia, follow-up research is needed to provide additional data so the psychometric properties of AGQ-T can be further determined.

After the removal of five items from the AGQ-T examined in the present study, the scores of six achievement goals were calculated and the reliability and validity of these scores were acceptable. These results prompted the examination of relationships between achievement goals, intention to become a PE teacher in the future and GPA. Only self-approach goals (SAp) emerged as a positive predictor of preservice teachers' intention to become a PE teacher in the future. This finding is consistent with previous work that documented beneficial effects of SAp, such as facilitating student motivation and learning (Mascret et al., 2017; Ning, 2016; Wang, Wang, Liu, Sun, & Chua, 2017) and promoting teachers' interest (Mascret et al., 2017). Considered together, these findings call for the promotion of self-approach goals among

preservice teachers in PETE programs. Suggested strategies may include striving for mastery of learning, emphasizing personal improvement, encouraging doing one's best, and focusing on the development of new knowledge, skills and competencies.

Unlike SAp goals, task-approach goals (TAp), task-avoidance goals (TAv), self-avoidance goals (SAv), other-approach goals (OAp) and other-avoidance goals (OAv) failed to emerge as significant predictors of preservice teachers' intention to become a PE teacher in the future. This result is not consistent with some research work documenting differential roles these goals played in the prediction of motivational outcomes with college student populations (e.g., Elliot, Muruyama, & Pekrun, 2011; Mascret et al, 2017; Wang et al, 2017). Considering that the 3 x 2 model of teachers' achievement goals is relatively new and the present study is only the second study to examine this model and its corresponding measure, AGQ-T, in the field of physical education, it would be premature to derive any definitive conclusion about these goals in understanding teachers and preservice teachers in physical education. Therefore, more research is needed.

The interview data revealed several contributors to preservice teachers' self-efficacy in physical education. The most salient contributors were PETE program professors and mentor teachers during student teaching at schools, highlighting their vital roles in the development of teacher self-efficacy among this group of preservice teachers. The interview data also showed that preservice teachers reported increased self-efficacy at the end of student teaching. This finding provides additional support to the view that student teaching can improve preservice teachers' self-efficacy (e.g., Colson et al 2017; Gao et al , 2013; Gurvey & Metzle, 2009; Knoblauch & Hoy, 2008). Considered together, these findings point out the importance of PETE faculty members, school mentor teachers, and student teaching in the development of

teacher self-efficacy among this group of preservice teachers in physical education. To effectively develop teacher self-efficacy among preservice teachers, PETE programs must ensure that faculty members have clear understanding of professional responsibilities in training preservice teachers and possess competencies to fulfill these responsibilities. Additionally, PETE programs must carefully select school mentor teachers so they can become an influential force on preservice teachers' self-efficacy during student teaching. Finally, PETE programs must work with school mentor teachers to structure student teaching experiences in a way that can help preservice teachers improve their teacher self-efficacy during student teaching in physical education.

It is important to note that the present study has several limitations. First, PE preservice teachers in the present study were a sample representing only one PETE program in Malaysia. As such, findings reported in the present study may have limited generalization. Future research should recruit more PETE programs to improve the generalizability of the findings. Second, this study is descriptive and correlational in nature. Therefore, relationships between variables observed in the study are not causal-effect ones and readers must keep this in mind. Third, the sample size in the present study is considered small in terms of statistical analyses used to analyze the data. This might have impacted the results of the study. Though the present study has these limitations, results of the study expand the literature on teacher self-efficacy to a sample of PE preservice teachers in Malaysia. Additionally, results of the study provide a more complete picture of teacher self-efficacy among preservice teachers in physical education than previous research as they came from the data provided by questionnaires, interviews and videotaped lessons. Finally, results of this study may inform faculty members of their practices to enhance

teacher self-efficacy and promote achievement goals among preservice teachers in PETE program.

CHAPTER III

CONCLUSION

In the present study, four research questions were proposed to understand teacher self-efficacy, teachers' achievement goals and their relations to some important educational outcomes among PE preservice teachers in Malaysia. The first research question examined the psychometric properties of the TSES and AGQ-T to determine whether they could reliably and validly assess teacher self-efficacy and teachers 'achievement goals, respectively. The second research question investigated relationships between teacher self-efficacy, teachers' achievement goals and important educational outcomes (i.e., intention to become a PE teacher, and GPA). The third research question examined the relationship between teacher self-efficacy and observed teaching behaviors. Consequently, questionnaires and videotaped lessons during student teaching were collected and analyzed. The fourth research question explored experiences/factors that preservice teachers perceived contributing to the development of their self-efficacy in the PETE program. To address this question, two phases of interviews were conducted with selected preservice teachers and content analysis was then performed to explore themes that could emerge from the interview data. The importance of the present study is summarized below.

First, this study represents the first attempt to examine the psychometric properties of TSES and AGQ-T among PE preservice teachers in Malaysia. For both TSES and AGQ-T, Item Response theory analysis examined the item-level validity, while CFA examined the factorial-level validity. Such examinations ensured a rigorous validation process. The TSES was found to be a reliable and valid measure to assess the three teacher self-efficacy constructs (classroom management, instructional strategies and student engagement) as conceptualized in the 3-factor

model of the TSES (Tschannen & Hoy, 2001). Compared to the TSES, the psychometric properties of the AGQ-T were less satisfactory as five items had to be deleted and several modifications were made to achieve acceptable validity at both item- and factorial-levels. After the deletion and modifications, the AGQ-T demonstrated acceptable reliability and validity among this group of preservice teachers in the present study.

Second, this study is the first study to examine the relationships between teacher self-efficacy, teachers' achievement goals and some important educational outcomes among PE preservice teachers in Malaysia. Two most significant intriguing findings emerged. First, all three constructs of teacher self-efficacy were found to positively predict preservice teachers' intention to become a PE teacher in the future. Second, only self-approach goals were found to positively predict this intention outcome. The two findings support both theoretical and empirical work that teacher self-efficacy and teachers' achievement goals are influential in motivation and related cognitive, affective, and behavioral responses among teachers and preservice teachers (e.g., Butler & Shibaz 2008, 2010; Gao, Xiang, Chen, & McBride, 2013; Hoy & Burke Spero, 2005; Tschannen-Moran & Hoy, 2001).

Third, this study represents the first research that attempted to examine the relationship between teacher self-efficacy and actual teaching behaviors among PE preservice teachers in Malaysia. Results generally support self-report data that established the link between teacher self-efficacy and teaching behaviors as teacher self-efficacy for classroom management and teacher self-efficacy for student engagement were found to predict the occurrence of teaching behaviors that focused on classroom management and student engagement in PE classes that were observed in the present study. This finding provides the first empirical evidence that teacher self-efficacy predicted some actual teaching behaviors.

Finally, this study explored experiences/factors that preservice teachers perceived that contributed to the development of their self-efficacy in the PETE program. The interview data revealed that professors in the PETE program, school mentor teachers, and student teaching were identified as the most important contributors to the development of teacher self-efficacy for this group of preservice teachers. Considering this finding, faculty members are encouraged to find effective ways to use their influence as well as the influence of school mentor teachers to help preservice teachers build their self-efficacy in PETE programs. Faculty members are also encouraged to work with school mentor teachers closely to design student teaching experiences that can result in enhanced self-efficacy among preservice teachers when they student teach at schools.

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APPENDIX A

PERSONAL INFORMATION SHEET

1. **Name: _____**
2. **Date of birth: _____**
3. **Gender: M F**
4. **Race: Malay Chinese Indian Native Sabah/Sarawak Other**
5. **Degree Classification: 1st year 2nd year 3rd year 4th year**
6. **Completed as of today course credit hours: _____**
7. **CGPA: _____**
8. **What is the name of your university? (Please check one only)**
   a) **UPM**
   b) **UiTM**
   c) **UPSI**
   d) **Teaching College Institute: _____**
9. **Have you taken any Teaching Method Courses? Yes No**
10. **If Yes, what teaching method courses that you have taken?**

_____

11. **Have you ever taught physical education classes to elementary school students?**

Yes No

If yes, please describe your role and was it a positive experience? (e.g., When, where, duration of the teaching)

_____

_____

_____

12 Have you ever taught physical education classes to high school students?

Yes No

If yes, please describe your role and was it a positive experience? (e.g., When, where, duration of the teaching)

_____

_____

_____

13. Have you ever coached any sport?

Yes No

If yes, please describe your role and was it a positive experience? (e.g., When, where and duration of the coaching)

_____

_____

_____

14. What is the main purpose for you to study in this program? (Check all applicable)

(a) Required for degree _____

(b) To obtain teaching certification _____

(c) To improve teaching performance _____

(d) For personal career development _____

(e) Other_____ and please specify_____

15. If you agree to be interviewed individually, please write down your phone number, e-mail and available time and circle the days below. Thank you for your kind cooperation.

Phone number: _____ Email: _____

Available time: _____, Mon Tue Wed Thurs Fri Sat Sun

APPENDIX B

PRESERVICE TEACHERS' SELF-EFFICACY IN TEACHING PHYSICAL EDUCATION

How much can I do?						
1	**2**	**3**	**4**	**5**	**6**	**7**
Nothing	**Very Little**	**Little**	**Quite a bit**	**Very Much**	**Very Very Much**	**Absolutely**

When I am teaching PE…

		Nothing → Absolutely						
1.	How much can I do to manage the most difficult students?	**1**	**2**	**3**	**4**	**5**	**6**	**7**
2.	How well can I respond to difficult questions from my students?	**1**	**2**	**3**	**4**	**5**	**6**	**7**
3.	How much can I do to control students' disruptive behaviors?	**1**	**2**	**3**	**4**	**5**	**6**	**7**
4.	How much can I do to help my students think critically?	**1**	**2**	**3**	**4**	**5**	**6**	**7**
5.	How much can I measure student comprehension of what I have taught?	**1**	**2**	**3**	**4**	**5**	**6**	**7**
6.	To what extent can I make my expectations clear about student behavior?	**1**	**2**	**3**	**4**	**5**	**6**	**7**
7.	How much can I do to motivate students who show little interest in physical education?	**1**	**2**	**3**	**4**	**5**	**6**	**7**
8.	To what extent can I create good questions for my students?	**1**	**2**	**3**	**4**	**5**	**6**	**7**
9.	How well can I establish routines to keep activities running smoothly?	**1**	**2**	**3**	**4**	**5**	**6**	**7**
10.	How much can I do to help my students value learning?	**1**	**2**	**3**	**4**	**5**	**6**	**7**
11.	How much can I do to adjust my lessons to the appropriate level for individual students?	**1**	**2**	**3**	**4**	**5**	**6**	**7**
12.	How much can I do to calm a student who is disruptive or noisy?	**1**	**2**	**3**	**4**	**5**	**6**	**7**
13.	How much can I do to promote student creativity?	**1**	**2**	**3**	**4**	**5**	**6**	**7**

14.	How much can I use a variety of assessment strategies?	**1**	**2**	**3**	**4**	**5**	**6**	**7**
15.	How much can I get children to follow in class?	**1**	**2**	**3**	**4**	**5**	**6**	**7**
16.	How much can I get students to believe they can do well in physical education class?	**1**	**2**	**3**	**4**	**5**	**6**	**7**
17.	To what extent can I provide alternative explanations or examples when students are confused?	**1**	**2**	**3**	**4**	**5**	**6**	**7**
18.	How well can I keep a few problematic students from ruining an entire lesson?	**1**	**2**	**3**	**4**	**5**	**6**	**7**
19.	How well can I implement alternative strategies in my classes?	**1**	**2**	**3**	**4**	**5**	**6**	**7**
20.	How well can I establish a class management system with each group of students?	**1**	**2**	**3**	**4**	**5**	**6**	**7**
21.	How well can I respond to disruptive students?	**1**	**2**	**3**	**4**	**5**	**6**	**7**
22.	How much can I improve the skills of a student who is failing?	**1**	**2**	**3**	**4**	**5**	**6**	**7**
23.	How much can I assist families in helping their children do well in school?	**1**	**2**	**3**	**4**	**5**	**6**	**7**
24.	How well can I provide appropriate challenges for very capable students?	**1**	**2**	**3**	**4**	**5**	**6**	**7**

APPENDIX C

PRESERVICE TEACHER'S ACHIEVEMENT GOALS FOR TEACHING

1	2	3	4	5	6	7
Strongly Disagree	**Disagree**	**Somewhat Disagree**	**Neither Agree nor Disagree**	**Somewhat Agree**	**Agree**	**Strongly Agree**

When I'm teaching physical education, I try to …

		Strongly disagree → Strongly agree						
1.	Promote the success of my students.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
2.	Avoid being worse than before in my teaching.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
3.	Teach more effectively than before.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
4.	Avoid causing my students to fail.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
5.	Be better than other teachers.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
6.	Avoid being a worse teacher than other teachers.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
7.	Enable my students to succeed.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
8.	Avoid teaching less effectively than before.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
9.	Be a better teacher than other teachers.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
10.	Avoid student failure.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
11.	Avoid teaching less effectively than I did before.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
12.	Avoid being less effective than other teachers.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
13.	Teach better than I did before.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
14.	Avoid teaching less effectively than other teachers.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
15.	Ensure that my students succeed.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
16.	Be better than before in my teaching.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
17.	Be more effective than other teachers.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
18.	Avoid having failed students.	**1**	**2**	**3**	**4**	**5**	**6**	**7**

APPENDIX D

PRESERVICE TEACHER INTENTION FOR TEACHING PE

1	2	3	4	5	6	7
Strongly Disagree	**Disagree**	**Somewhat Disagree**	**Neither Agree Or Disagree**	**Somewhat Agree**	**Agree**	**Strongly Agree**

		Strongly disagree → Strongly agree						
1.	If I could start college/university all over again, I would still choose physical education teaching as my major without any hesitation.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
2.	I`m looking forward to teaching physical education after graduating from this physical education teacher education (PETE) program.	**1**	**2**	**3**	**4**	**5**	**6**	**7**
3.	I`m willing to teach physical education in a school after graduating from this PETE program.	**1**	**2**	**3**	**4**	**5**	**6**	**7**

APPENDIX E

THE OBSERVATION FORM OF PRESERVICE PHYSICAL EDUCATION TEACHERS' SELF-EFFICACY (OBPE-TSE)

This instrument is designed to notate and record the frequencies of preservice teacher's teaching behaviors during student-teach at a school. The observed teaching behaviors are as follow:

a) **Classroom management**

b) Student engagement

c) Instructional strategies

Instructions:

Following the Academic Learning Time in Physical Education (ALT-PE) coding protocol, each of the two coders will view all videotaped lessons and code the targeted teaching behaviors for each and every 2-minute interval until the length of the videotaped lesson is ended (Siedentop, Birdwell, & Metzler, 1984). During the coding process, in each 2-minute interval, which is signaled by a recorded audiotape, each time one of the teaching behaviors is observed, a tally will be made. Thus, the number of tallies for each of the targeted teaching behaviors (e.g., classroom management, instructional strategies and student engagement) will be determined by frequency. For instance, if a preservice teacher asks a student to stay quiet within a 2-minute interval, a tally will be made. However, no tally will be marked when none of the targeted teaching behaviors occur.

Observed Teaching Behaviors:

a) Classroom Management

a) This teaching behavior focuses refers to teaching behaviors with goals to run the gymnasium, playground or classroom smoothly. They include establishing routines, making expectations clear to students and dealing with disruptive behavior of students. For instance, the preservice teacher demonstrates a verbal communication or gesture that is clearly designed to managing students' behavior during a lesson. "Stop hassling him, or you will be put on sideline, John!"

b) Instructional Strategies

This teaching behavior refer to a variety of teaching approaches that the teacher takes to increase student learning. Examples of instructional strategies include allowing students choices of learning and making learning meaningful to students. For instance, the preservice teacher provides a choice or option to the students on completing a task., "Guys, in two groups! You can start this rugby passing drill with the short passing station or the long passing station. Either one is fine, but no drop ball or fumble during the activity!

c) Student Engagement

This teaching behavior refers to teaching behaviors that aim to motivate and promote student engagement. They include providing a variety of learning activities to accommodate with different skill levels of students and checking students' understanding through questions. For instance, the preservice teacher probing or questioning students such as, "Guys! Why do you think when you are shooting a grounded shot skill to the goal post, your kicking leg needs to be directed to the target and your body is slightly bend over?"

THE OBSERVATION FORM OF PRESERVICE PHYSICAL EDUCATION TEACHERS' SELF-EFFICACY (OBPE-TSE)

Teacher: **Date:** **Lesson Activity:**
Observer: **Number of Student:**
Beginning Time: **Ending Time:**

Teaching Behavior	Frequency																				Total Frequency
1. Classroom Management	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Have students listen to the teacher																					
Have students to follow and adhere class rules																					
Establish routines to run the/play group smoothly																					
2. Student Engagement																					
Able to promote students to engage an activity																					
Ask questions to promote critical thinking among students																					
Maintain students' interest/motivation																					
3. Instructional Strategies																					
Modify lessons to better meet students' need																					
Check students' understanding																					
Able to use variety of assessment strategies/evaluations																					

APPENDIX F

INTERVIEW QUESTIONS (FIRST PHASE)

1) Why did you choose physical education as your major?

Not at all confident 1	Little confident 2	Some confident 3	Confident 4	Very confident 5

2) Based on this teaching confidence scale, if you were to teach a PE class now, (e.g., 4th or 8th grader), how confident do you feel about teaching it? Why?

3) Do you think your teacher education program has prepared you to teach physical education? How so/not

APPENDIX G

INTERVIEW QUESTIONS (SECOND PHASE)

4) You have almost completed your student teaching. I would like to know whether your confidence level of teaching PE has changed as a result of this student teaching experience. Here is a scale of confidence from 1 to 5, with 1 meaning that you do not feel confident in teaching PE at all, and 5 meaning that you do feel very confident

Not at all confident 1	Little confident 2	Some confident 3	Confident 4	Very confident 5

Please tell me where you were on this scale the first week when you taught. Also, please tell me where you are on this scale at this moment.

Do you feel any changes in your confidence level to teach PE between the beginning and end of your student teaching?

If so, what changes occurred? What are some factors that contributed to these changes?

5) Do you feel this student teaching experience has contributed to your confidence to teach PE? How so/not?

APPENDIX H

CONSENT FORM:

TEXAS A&M UNIVERSITY HUMAN SUBJECTS PROTECTION PROGRAM

Project Title: Self-Efficacy and Achievement Goals among Malaysian Physical Education (PE) Preservice Teachers

You are invited to take part in this study being conducted by Nasnoor Juzaily Bin Mohd Nasiruddin, a doctoral student from Sport Pedagogy Program in Health & Kinesiology Department, Texas A&M University. The information in this form is provided to help you decide whether or not to participate. If you decide to participate in the study, you will be asked to sign this consent form. If you decide not to participate, there will be no penalty to you, and you will not lose any benefits you normally have.

Why Is This Study Being Done?
The purpose of this study is to examine the relationships of Malaysia Physical Education preservice teachers` self-efficacy, achievement goals and important educational outcomes. In a practical stand-point, it is our hopes for the physical education teacher education (PETE) program instructors might be able to use the findings from this research; to shape a better teacher training programs for the future PE teachers in Malaysia.

Why Am I Being Asked To Be In This Study?
You are being asked to be in this study because you are enrolled in this PETE program, and thus you are considered a physical education preservice teacher.

How Many People Will Be Asked To Be In This Study?
All Junior students that currently enrolled in the PETE program are invited to participate in this study.

What Are the Alternatives to being in this study?
There are none; the alternative to being in the study is not to participate.

What Will I Be Asked To Do In This Study?
Your participation will involve completing a survey that consists of five sections. At the first phase, you will be asked to complete 15-20 minutes survey that is designed to measure your confidence level (i.e., self-efficacy) and achievement goal experiences during your years in the PETE programs. If you have given your consent to be interviewed by the researchers. At the second phase, it will be involving an interview with the researchers. The researchers will schedule an appointment with you to be interviewed at the department. This interview purpose is to explore your confidence level to teach PE and will take about 20 minutes of your time.

Will Photos, Video or Audio Recordings Be Made of me during the Study?
If you have given the consent to be interviewed, the researcher will record an audio recording during the interview. So that the interview data can be transcribed verbatim for the researchers to analyze your responses on the interview questions.

_____ I want to participate in completing the survey, to be interviewed and audio recorded during my interview for the purposes of this research study.

_____ I want to participate in completing the survey, but **NOT** to be interviewed or audio recorded for the purposes of this research study.

_____ I do not want to participate in this research study.

Are There Any Risks To Me?
There is a minimal risk of confidentiality breach from your voluntary participation in this study. However, the researchers are committed to secure all your personal information and audio recordings related to this study at a well-secured cabinet in a room. Only researchers that named in this study will have access to this room. In addition, your decision to participate or not will not benefit or harm your performance in class.

Will There Be Any Costs To Me?
Aside from your time, there are no costs for taking part in the study.

Will I Be Paid To Be In This Study?
You will not be paid for being in this study.

Will Information From This Study Be Kept Private?
The records of this study will be kept private. No identifiers linking you to this study will be included in any sort of report that might be published. Research records will be stored securely and only the involved researchers have access to the records. Information about you will be stored in locked file cabinet; computer files protected with a password. This consent form will be filed securely in an official area. People who have access to your information include the Principal Investigator and research study personnel. Representatives of regulatory agencies such as the Office of Human Research Protections (OHRP) and entities such as the Texas A&M University Human Subjects Protection Program may access your records to make sure the study is being run correctly and that information is collected properly.

Who may I Contact for More Information?
You may contact the Principal Investigator (PI) in this study, **Dr. Ping Xiang** at her email **ping-xiang@tamu.edu.** You also may contact **Nasnoor Juzaily Bin Mohd Nasiruddin**, to tell him concerning your complaint related to this research at **+1 269-447-9144** or **samba959@tamu.edu**.

For questions about your rights as a research participant, to provide input regarding research, or if you have questions, complaints, or concerns about the research, you may call the Texas A&M University Human Subjects Protection Program office by phone at 1-979-458-4067, toll free at 1-855-795-8636, or by email at irb@tamu.edu.

What if I Change My Mind About Participating?
This research is voluntary, and you have the choice whether or not to be in this research study. You may decide to not begin or to stop participating at any time. If you choose not to be in this study or stop being in the study, there will be no effect on your student status, medical care, employment, evaluation, relationship with Texas A&M University, etc. Any new information discovered about the research will be provided to you. This information could affect your willingness to continue your participation.

Statement of Consent
I agree to be in this study and know that I am not giving up any legal rights by signing this form. The procedures, risks, and benefits have been explained to me, and my questions have been answered. I know that new information about this research study will be provided to me as it becomes available and that the researcher will tell me if I must be removed from the study. I can ask more questions if I want. A copy of this entire consent form will be given to me.

_____ _____
Participant's Signature Date

_____ _____
Printed Name Date

INVESTIGATOR'S AFFIDAVIT:
Either I have or my agent has carefully explained to the participant the nature of the above project. I hereby certify that to the best of my knowledge the person who signed this consent form was informed of the nature, demands, benefits, and risks involved in his/her participation.

_____ _____
Signature of Presenter Date

_____ _____
Printed Name Date

TEXAS A&M UNIVERSITY HUMAN SUBJECTS PROTECTION PROGRAM

Project Title: Self-Efficacy and Achievement Goals among Malaysian Physical Education (PE) Preservice Teachers

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Why Is This Study Being Done?
The purpose of this study is to examine the relationships of Malaysia Physical Education preservice teachers` self-efficacy, achievement goals and important educational outcomes. In a practical stand-point, it is our hopes for the physical education teacher education (PETE) program instructors might be able to use the findings from this research; to shape a better teacher training programs for the future PE teachers in Malaysia.

Why Am I Being Asked To Be In This Study?
You are being asked to be in this study because you are enrolled in this PETE program, and thus you are considered a physical education preservice teacher.

How Many People Will Be Asked To Be In This Study?
All Senior students that currently enrolled in the PETE program are invited to participate in this study.

What Are the Alternatives to being in this study?
There are none; the alternative to being in the study is not to participate.

What Will I Be Asked To Do In This Study?
In the first phase: your participation will involve completing a survey that consists of five sections. You will be asked to complete 15-20 minutes survey that is designed to measure your confidence level (i.e., self-efficacy) and achievement goal experiences during your years in the PETE programs. If you have given your consent to be interviewed and video recorded by the researchers. Then, the researchers will schedule an appointment with you to be interviewed at the department.
In the second phase: your participation will be involving in two interview sessions with the researchers. This interview purpose is to explore your confidence level to teach PE and will take about 20 minutes of your time. The purpose of this first interview is to explore your teaching confidence experiences before you start student teach at a school, whereas the second interview is to examine your teaching confidence after having a 12-week of student teach experience at the school.
In the third phase: if you have given the consent for the researchers to video record your teaching behaviors at a school. During your 12 weeks of student teach at that school, the researchers will record your teaching behaviors' video while you are teaching a PE class. In this

phase, the researcher will video record your teaching behaviors for 3 consecutive times (approximately 40 minutes of a PE class session) during your student teach period at the school.

Will Photos, Video or Audio Recordings Be Made of me during the Study?
If you have given the consent to be interviewed and videotaped, the researcher will record an audio recording during the interview and video recorded you for 3 consecutive times while teaching your PE class. So that the interview data can be transcribed verbatim for the researchers to analyze your responses on the interview questions. Further, the video recorded will be used by the researcher to analyze your teaching behaviors for the purpose of this study.

_____ I want to participate in completing the survey, to be interviewed, audio recorded during my interview and video recorded while I am teaching in my PE class for the purposes of this research study.

_____ I want to participate in completing the survey, but **NOT** to be interviewed, audio and video recorded or for the purposes of this research study.

_____ I do not want to participate in this research study.

Are There Any Risks To Me?
There is a minimal risk of confidentiality breach from your voluntary participation in this study. However, the researchers are committed to secure all your personal information and audio recordings related to this study at a well-secured cabinet in a room. Only researchers that named in this study will have access to this room. In addition, your decision to participate or not will not benefit or harm your performance in class.

Will There Be Any Costs To Me?
Aside from your time, there are no costs for taking part in the study.

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Will Information From This Study Be Kept Private?
The records of this study will be kept private. No identifiers linking you to this study will be included in any sort of report that might be published. Research records will be stored securely and only the involved researchers have access to the records. Information about you will be stored in locked file cabinet; computer files protected with a password. This consent form will be filed securely in an official area. People who have access to your information include the Principal Investigator and research study personnel. Representatives of regulatory agencies such as the Office of Human Research Protections (OHRP) and entities such as the Texas A&M University Human Subjects Protection Program may access your records to make sure the study is being run correctly and that information is collected properly.

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Statement of Consent
I agree to be in this study and know that I am not giving up any legal rights by signing this form. The procedures, risks, and benefits have been explained to me, and my questions have been answered. I know that new information about this research study will be provided to me as it becomes available and that the researcher will tell me if I must be removed from the study. I can ask more questions if I want. A copy of this entire consent form will be given to me.

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Participant's Signature Date

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Printed Name Date

INVESTIGATOR'S AFFIDAVIT:
Either I have or my agent has carefully explained to the participant the nature of the above project. I hereby certify that to the best of my knowledge the person who signed this consent form was informed of the nature, demands, benefits, and risks involved in his/her participation.

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Signature of Presenter Date

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Printed Name Date