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**Pre-Service Physical Education Teachers' Experience of Fitness Testing  
in Educational Settings**

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**Pre-Service Physical Education Teachers' Experience of Fitness Testing  
in Educational Settings**

**by**

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## **Abstract**

### **Pre-Service Physical Education Teachers' Experience of Fitness Testing in Educational Settings**

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Health-related fitness testing (HRFT) is not often utilized in the college setting, despite studies showing a sharp decline in physical activity (PA) between high school and college. The designed goal of HRFT is to motivate students to lead healthy and active lives. In K-12, research has identified the school physical education (PE) teachers as having a vital role in administering and setting the tone for the testing process. Due to the impact that PE teachers can have on their students, it is important to examine pre-service physical education teachers (PPETs)' experiences and preparation of HRFT implementation. However, to date, our understanding about this topic is very limited. As such, there is a need to examine this strand of research to understand if PPETs are adequately prepared to administer HRFT, in a state where has required HRFT by the state of law.

The purpose of this study was to investigate PPETs' previous and current perceptions on HRFT in schools and their level of readiness for implementing HRFT in the field. Guided by the dilemma theory, through semi-structured interviews, field observations, online discussions, and an online questionnaire, data were gathered from three PPETs enrolled in a large state university. A constant content comparison method was used to analyze the data. The following themes emerged. The first main theme, highlighting the conceptual dilemma, positive fitness testing perceptions based on appreciation for PA in K-12 programs with the lack of a thorough understanding about the real purposes of fitness testing, had one subtheme: (a) outstanding fitness testing and PA experience from athletics instead of PE, and lack of a deep understanding of the purposes of fitness testing. The second main theme, related to both the conceptual and pedagogical dilemmas, PETE provided strong content knowledge and teaching practices concerning HRFT in PE programs had two subthemes: (a) PPETs understand the fitness testing content and (b) PPETs learned how to grade student fitness testing performance. The third and final main theme, grounded in the pedagogical, cultural, and political dilemmas, lack of preparation for administering fitness testing in the field had three subthemes: (a) PPETs struggle to identify potential barriers and solutions with stakeholders and administration, (b) PPETs lack differentiation skills and motivation, and (c) PPETs had few opportunities to observe cooperating teachers (CTs') HRFT practice during their student teaching. The results showed that the PPETs each had a positive experience HRFT as a child and developed content knowledge and teaching skills through the Physical Education Teacher Education program at their university. However,



significant gaps in their learning were identified, most notably due to a lack of HRFT observations and field experience during their student teaching. It is concluded that the PPETs are not well prepared to administer HRFT on their own in the field or accommodate for a diverse group of students with different backgrounds and interests.

## Table of Contents

List of Figures .....	14
Chapter 1: Introduction .....	15
Childhood Obesity & Inactivity .....	15
College Students' Physical Activity .....	17
Statement of the Problem .....	18
Health-related fitness testing and PA in college students .....	19
Purpose of the Study .....	20
Significance of the Study .....	20
Research Questions: .....	21
Definition of Terms .....	21
Chapter 2: Literature Review .....	22
Background .....	22
History of Youth Health-Related Fitness Testing in Educational Settings ..	22
Current Youth Fitness Testing .....	23
Youth Health-Related Fitness Testing .....	24
Overview & Purpose .....	24
Components of Youth Fitness Testing .....	26
Role of the School & Teacher .....	27
Current Physical Education Teacher's Experience of Fitness Testing .....	29
Barriers with Fitness Testing .....	30
Lacking Knowledge .....	31
Public Setting .....	31

Specific Time for Testing .....	32
Lacking Connection .....	32
Time Consuming.....	33
Repetition.....	33
The Lack of Ownership .....	34
No Testing in College in the US.....	34
Summary.....	35
Conclusion .....	36
Methodological Considerations .....	36
Research Topics, Types of Research Design, and Sampling Methods.....	36
Limitations .....	38
Conceptual Framework.....	39
Dilemma Theory .....	39
Summary.....	40
Overview.....	40
Gaps in the Literature .....	41
Summary.....	42
Chapter 3: Methods.....	43
Purpose and Research Questions .....	43
Conceptual Framework.....	43
Interview questions related to conceptual dilemma.....	44
Interview questions related to pedagogical dilemma.....	45
Interview questions related to cultural dilemma.....	46

Interview questions related to political dilemma.....	46
Study Design.....	47
Sampling and Participants .....	48
Recruitment.....	48
Data Collection .....	49
Semi-structured interview.....	49
Observation.....	51
Open-Ended Questionnaire.....	51
Online Discussion.....	52
Data Analysis.....	53
Data Trustworthiness .....	53
Researcher Positionality and Bias.....	54
Chapter 4: Results.....	56
Theme 1 (Conceptual Dilemma): Positive fitness testing perceptions based on appreciation for PA in K-12 programs with the lack of a thorough understanding about the real purposes of fitness testing .....	58
Subtheme 1.1 (Conceptual Dilemma): Outstanding fitness testing and PA experience from athletics instead of PE, and lack of a deep understanding of the essential purposes of fitness testing .....	60
Theme 2 (Pedagogical and Conceptual Dilemmas): PETE provided strong content knowledge and teaching practices concerning fitness testing in PE programs .....	63
Subtheme 2.1 (Conceptual Dilemma): PPETs understand the fitness testing content.....	63
Subtheme 2.2 (Conceptual Dilemma): PPETs learned how to grade student fitness testing performance.....	65

Theme 3 (Pedagogical, Cultural, and Political Dilemmas): Lack of preparation for administering fitness testing in the field .....	68
Subtheme 3.1 (Political Dilemma): PPETs struggle to identify potential barriers and solutions with stakeholders and administration .....	68
Subtheme 3.2 (Cultural Dilemma): PPETs lack differentiation skills and motivation .....	71
Subtheme 3.3 (Pedagogical Dilemma): PPETs had few opportunities to observe CTs' fitness testing practice during their student teaching .....	76
Chapter 5: Discussion .....	79
Discussion .....	79
Conceptual Dilemma: How do pre-service teachers' past experiences influence their perception on fitness testing? .....	81
Pedagogical Dilemma: How did courses help prepare pre-service teachers to administer fitness testing prior to student teaching? .....	81
Cultural and Political dilemmas: How prepared do the pre-service teachers feel, upon completion of student teaching, to administer fitness testing as professionals in the field?.....	82
Implications .....	84
Limitations .....	85
Conclusions.....	86
Future Research .....	87
Appendix.....	88
References.....	92

## List of Figures

Figure 1:	The four dilemma categories of constructivism in practice.....	40
Figure 2:	Participant Demographics.....	48
Figure 3:	Main Themes and Subthemes.....	57

## **Chapter 1: Introduction**

### **CHILDHOOD OBESITY & INACTIVITY**

Despite the compelling evidence advocating for youth physical activity (PA), the current health status and inactivity levels of American children have quickly become a major public health concern (Bulger et al., 2001; Welk et al., 2010). According to the Centers for Disease Control and Prevention (CDC), a study done in 2018 found that childhood obesity affected approximately 14.4 million children, or roughly 20% of American Youth (Ogden et al., 2020; CDC, 2020). With the presence of the Covid-19 pandemic, researchers and medical professionals are beginning to see this percentage climb at a faster rate than before, with one study even referencing this moment in time as “pandemics colliding” (Browne et al., 2021; Jenssen et al., 2021). A further dive into childhood obesity statistics reveals another alarming concern, the disproportionate data between childhood obesity and race/socio-economic status (Ogden, 2018). Research has shown that children of low socioeconomic status and minority children are almost twice as likely to experience childhood obesity than their Caucasian peers (Ogden & Flegal, 2010; Taveras et al., 2013). Obese children are at risk of developing numerous health problems, including but not limited to, high blood pressure, type 2 diabetes, coronary artery disease, high cholesterol, and even some cancers (Eastham, 2018a; Kahn et al., 2002; McMurray & Ondrak, 2013). Countless studies have also found that obese, inactive children grow up to be obese, inactive adults (De Moraes et al., 2019; Harris & Cale, 2006, 2007; Keating, 2003; Keating & Silverman, 2009; Kemper et al., 2001; Mercier & Silverman, 2014; Morrow & Ede, 2009; Ortega et al., 2008; Phillips et al., 2017;

Sandercock & Jones, 2019). Research has not only well-documented this frightening trend but has made it very clear that for the health and safety of our youth this percentage needs to be reversed (Eastham, 2018a; Kahn et al., 2002; McMurray & Ondrak, 2013). Fortunately, research has identified PA as a prominent solution for childhood obesity. "Given the current global obesity epidemic, PA is currently used as a common intervention for weight loss and weight maintenance in youth" (Flanagan & Perry, 2018, p. 1). According to Ortega et al. (2008), physical fitness is considered one of the most important determinants of health status in children and adolescents (Flanagan & Perry, 2018). Research has suggested that a lack of physical activity has a direct correlation to childhood obesity and that PA has been identified as an extremely viable solution for both preventing and reversing obesity (Academy, 2018; Bürgi et al., 2011; Corbin, 2002; Ortega et al., 2008). These studies have found that PA has not only been shown to prevent childhood obesity but undo it, suggesting that all children can benefit from PA (Flanagan & Perry, 2018; Kumar & Kelly, 2017). According to the CDC, children should be getting 60 minutes of moderate-to-vigorous PA (MVPA) each day for maximum health benefits (Center for Disease Control, 2021). However, past research has shown that only 1/2 of school-aged boys meet these guidelines and only 1/3 of school-aged girls (Harris & Cale, 2007). These numbers indicate that while a solution has been presented, it is not being effectively utilized.

Scholars agree that inactivity is a major reason for the current childhood obesity crisis at hand (Bulger et al., 2001; Flanagan & Perry, 2018; Mercier et al., 2016). Despite America being the "home" of obesity, it is not the only country struggling with



staggering childhood obesity percentages (Kirk, 2006). According to The World Health Organization, (WHO), physical inactivity has now been identified as the fourth leading risk factor for global mortality, causing an estimated 3.2 million deaths globally (Flanagan & Perry, 2018; World Health Organization, 2018). Inactive and obese children grow up to be inactive and obese adults, which is an immediate and life-threatening problem (Harris & Cale, 2007; Keating & Silverman, 2009; Mercier & Silverman, 2014). It is critical that instant action is taken to get students healthy through increased physical activity before they enter adulthood.

#### **COLLEGE STUDENTS' PHYSICAL ACTIVITY**

As documented through research, unhealthy children are likely to grow up to become unhealthy adults (Harris & Cale, 2007; Keating & Silverman, 2009; Mercier & Silverman, 2014). In addition, research has shown that a negative impression of PA formed in childhood will likely continue into adulthood (Silverman et al., 2008; Wiersma & Sherman, 2008). A student's time spent in college represents the last chance a school setting has to instill lifelong healthy habits and provide a positive experience with physical activity.

A common misperception is that college students are a primarily healthy demographic, when in fact the traditional college age range (18-24) has been found to be a critical period of development in which individuals actually have a worse health profile than other age groups. (Lederer & Hoban, 2021, p. 1)

As of early 2021, approximately 20 million young adults were enrolled in higher education (Lederer & Hoban, 2021). However, this population continues to be overlooked when it comes to research on combating sedentary behavior and promoting PA (Sparling, 2003). The research that has examined college students found that PA during college steadily declines, with only about 40% of students meeting the recommended CDC guidelines (Calestine et al., 2017; Leslie et al., 2001; Pauline, 2013; Wilson et al., 2021). CDC findings have also reported that roughly 2/3 of the US adult population suffer from either being overweight or obese (CDC, 2021). College students could be a critical population for research to examine in order to reverse the climbing obesity statistics.

#### **STATEMENT OF THE PROBLEM**

Despite the numerous health benefits of PA, research has documented that PA among college students is so low that it is creating a significant health crisis among this population (Calestine et al., 2017; Kilpatrick et al., 2005; Leslie et al., 2001; Pauline, 2013; Wilson et al., 2021). In the K-12 school setting, HRFT has long been the predominant tool used to combat childhood obesity through monitoring fitness scores and helping encourage children to lead active and healthy lives (Mercier et al., 2016; Pate, 1991; Vazou et al., 2019). Despite being a popular tool for K-12, HRFT is not often utilized in the general college setting (excluding athletics), even though studies have shown that a sharp decline in PA is often observed between high school and college students (Chen, 2015; Leach, 2012; Liu et al., 2017; Pribis et al., 2010). Further research

needs to be done on fitness testing with general college students to see if it would yield similar results as in K-12 students, and if this would eventually decrease the number of obese adults.

In addition, given the current childhood obesity crisis and the impact physical education teachers can have, PPETs' past and present experiences and preparation need to be examined to see if they are adequately prepared to administer fitness testing in the field to K-12 students.

#### **HEALTH-RELATED FITNESS TESTING AND PA IN COLLEGE STUDENTS**

Currently, aside from athletics, college students in the United States are not required to take part in organized fitness testing (Liu et al., 2017). However, research has shown that college students in both the US and around the world are increasingly becoming more sedentary and thus more unhealthy (Leslie et al., 2001; Sa et al., 2016). As of 2016, research reported that 34.1% of American college students were either obese or overweight (Sa et al., 2016). Research has documented that like childhood habits, college student's physical activity habits and patterns are likely to continue into adulthood (Leslie et al., 2001; Sparling, 2003). As is the case with childhood obesity, college student/adult obesity can lead to several lifelong health problems and illnesses (Eastham, 2018a; Kahn et al., 2002; McMurray & Ondrak, 2013). Since college physical activity habits will likely carry over into adulthood, intervention before a student graduates is of utmost concern.

In summary, current K-12 research has documented the many problems associated with HRFT (Alfrey & Gard, 2019; Cale et al., 2014; Cale & Harris, 2009a; Garrett & Wrench, 2008a; Keating, 2003). By utilizing multiple data sources, PPETs' fitness testing knowledge and preparation can be examined, as well as their ability to address common fitness testing barriers.

### **PURPOSE OF THE STUDY**

Through the lens of the dilemma theory, the purpose of this study is to investigate PPETs' previous and current thoughts on HRFT in schools and their level of readiness for implementing fitness testing in the field.

### **SIGNIFICANCE OF THE STUDY**

Research has documented that childhood obesity is a very relevant crisis that can be remedied through PA (Martin et al., 2010; Mercier et al., 2016; Welk et al., 2010). To monitor student wellness and PA, physical education teachers utilize fitness testing (Kirk, 2006; Martin et al., 2010). However, current research shows the many problems associated with fitness testing (Keating et al., 2020; Wiersma & Sherman, 2008). Research has identified the school physical education teacher as having a vital role in administering the testing and setting the tone for the entire process (Silverman et al., 2008; Stanec, 2009). Given this important role, it is critical that PPETs are prepared to enter the field and fully understand their role and responsibility in the fitness testing process.

**RESEARCH QUESTIONS:**

1. How do pre-service teachers' past experiences influence their perception on fitness testing?
2. How did courses help prepare pre-service teachers to administer fitness testing prior to student teaching?
3. How prepared do the pre-service teachers feel, upon completion of student teaching, to administer fitness testing as professionals in the field?

**DEFINITION OF TERMS**

After reading through the literature on testing across all subject areas, many content areas outside of physical education refer to this practice as an “assessment” rather than a “test.” While the term “testing” often reflects a permanent, one time-event and “assessment” reflects a series of tests, for this review they will both indicate the measurement of one’s fitness, (or a different subject area), regardless of the number of times it is measured.

## **Chapter 2: Literature Review**

The literature has shown that childhood obesity is a serious cause for concern and often follows the individual for their lifetime. Physical inactivity has been identified as a major contributing factor as physical activity can both prevent and reverse this disease. While several elements play into childhood obesity and inactivity, the following sections in this literature review will focus specifically on increased physical activity through HRFT for monitoring and improving youth health and wellness. The review begins with the origin of youth health-related fitness testing, then explores current HRFT practices and problems. The review will then detail popular methods and frameworks used in current fitness testing literature before concluding with addressing current gaps and offering future research directions.

### **BACKGROUND**

#### **History of Youth Health-Related Fitness Testing in Educational Settings**

Formal and purposeful HRFT in America first came onto the scene in the 1950s (Keating, 2003; Keating et al., 2018; Morrow et al., 2009; Silverman et al., 2008; Wiersma & Sherman, 2008). At the time, a report from Kraus and Hirschland (1954), found that America's youth fitness scores were much lower compared to that of students in Europe. Being concerned with the low scores possibly hindering the readiness and effectiveness of the military, President Eisenhower formed the "President's Council on Youth Fitness" to promote, train, and monitor youth fitness through HRFT (Morrow et al., 2009; Stein, 1988; Whitehead & Corbin, 1991; Wiersma & Sherman, 2008). President

Eisenhower's "President's Council on Youth Fitness", now known as the "PCPSF," eventually lead to the creation of the "President's Challenge," a nationally recommended fitness program that was widely utilized throughout the country until combining with another nationally available test, the FITNESSGRAM (Keating et al., 2019; Keating & Silverman, 2009; Morrow et al., 2009). While the purpose of HRFT was initially to strengthen the military, its purpose has since shifted many times since its inception in the 1950s (Morrow et al., 2009).

### **Current Youth Fitness Testing**

Currently, youth HRFT is a predominant part of many school physical education programs (Mercier et al., 2016; Pate, 1991; Vazou et al., 2019). While the initial intent of youth HRFT was to gather the necessary information to make sure the military was prepared, the purpose has changed many times throughout the years (Morrow et al., 2009). Currently, the purpose of youth HRFT is to combat the childhood obesity epidemic by helping children lead active and healthy lives as stated by Marrow, Jr. et al. (2009).

50 years after the national interest in youth physical fitness levels, youth fitness testing has come full circle. In 1954, interest focused on young people (particularly young men) as being unfit. Military fitness and chance in recruit preparation remains of interest. (Knapik et al., 2006). In 2008, many are interested in youth fitness levels (now focused on obesity.) (p. 9)

Despite utilizing youth health-related fitness tests for the past seven decades, current youth inactivity and obesity numbers do not seem to be improving, especially with the ongoing Covid-19 pandemic (Dunton et al., 2020). Given these facts, it is evident that there is a flaw in the current youth HRFT system.

Current research highlights the fact that children are inactive and at risk for many health-related complications both now and in the future (Bulger et al., 2001; Flanagan & Perry, 2018; Mercier et al., 2016). Researchers have made it clear that immediate action needs to take place, and health-related fitness testing, although problematic, has been offered as a promising solution (Cale & Harris, 2009; Dunton et al., 2020; Grao-Cruces et al., 2020; Green & Hardman, 2005; Keating et al., 2002; Lodewyk & Muir, 2017; Silverman et al., 2008; Vazou et al., 2019; Wiersma & Sherman, 2008). The following sections will provide an overview of current youth HRFT practices, the purpose, the environment, and the barriers.

## **YOUTH HEALTH-RELATED FITNESS TESTING**

### **Overview & Purpose**

According to SHAPE America, which is a major organization that sets youth fitness guidelines and supports health and physical educators, "Fitness testing is a valuable part of fitness education when integrated appropriately into a comprehensive physical education curriculum" (SHAPE America, 2017). In its most broad sense, youth HRFT seeks to assess each of the five different components of fitness: muscular strength, muscular endurance, flexibility, aerobic capacity/ cardiorespiratory fitness, and body



composition (Freedson et al., 2000). Once the results are recorded, they are used in several different ways. “These test results may provide a measure of the fitness level and identify areas that need improvement, results to be tracked over time, an indication of risk for developing certain diseases, and a teaching tool for teachers and students” (Freedson et al., 2000, p. 77). While the test results can be used in many ways, the focus point is always the same, to help motivate the students to lead healthy and active lives (Freedson et al., 2000; Mercier & Silverman, 2014).

Youth HRFT is typically conducted in a large group, during school physical education class, and is fully driven by the physical education teacher (Cale & Harris, 2009b; Eastham, 2018a; Flohr & Williams, 1997; Garrett & Wrench, 2008b; Liu et al., 2017; Petray, 1989; Vazou et al., 2019; Wiersma & Sherman, 2008). Currently, there is only one nationally recommended youth fitness test battery that dominates the field, the FITNESSGRAM (Keating et al., 2018; Keating & Silverman, 2009; Mercier et al., 2016; Morrow et al., 2009). A criterion-referenced test, the FITNESSGRAM is a comprehensive health-related fitness and activity assessment and is designed to measure each of the 5 health-related components of fitness through various tests (Cooper Institute for Aerobics Research, 1999; Harris & Cale, 2006). Since its creation in 1982, thousands of students across the nation from 3rd grade-12th grade have completed the FITNESSGRAM (Ernst et al., 2006; Plowman & Meredith, 2013). Noticeably, FITNESSGRAM is not affiliated with any educational organization, which is different from any other tests implemented in schools. While the initial purpose of youth HRFT appeared promising, many are now wondering if we may have missed the mark given the

decline in health-related fitness shown in all age groups among students. The following sections will explore what the research has found concerning current fitness testing practices.

### **Components of Youth Fitness Testing**

As previously mentioned, the FITNESSGRAM is currently the preferred test when it comes to youth HRFT in schools (Mercier et al., 2016). The FITNESSGRAM consists of five components, each measuring a different health-related component of fitness: muscular strength, muscular endurance, flexibility, cardiorespiratory fitness, and body composition (Freedson et al., 2000; Plowman & Meredith, 2013). Plowman & Meredith (2013) explained in-depth how each test is conducted in their FITNESSGRAM Reference Guide 4th Edition. Aerobic capacity is measured through the PACER test (similar to a 20m shuttle run) or the 1-mile run. Body composition is measured through a bioelectrical impedance analysis or skinfold assessment, both of which measure the percentage of fat in the body. Body mass index (BMI) derived from weight and height is also used to assess body composition. Muscular strength and endurance are measured through push-ups and curl-ups. Finally, flexibility is measured using the sit and reach, a test similar to having students reach for their toes (Plowman & Meredith, 2013). While each specific test can be beneficial to students and teachers, research has shown that incorrect administration of each test ultimately does more harm than good and can result in a lifelong negative view of physical education and PA (Eastham, 2018; Harris & Cale,

2007; Keating et al., 2002; Keating, 2003; Keating & Silverman, 2009; Martin et al., 2010; Mercier et al., 2016; Morrow & Ede, 2009; Stanec, 2009).

### **Role of the School & Teacher**

The responsibility of conducting youth HRFT has nearly always fallen to schools, more specifically the physical education teachers (Bulger et al., 2001; Mercier & Silverman, 2014a; Pate, 1991; Vazou et al., 2019). Schools were given this responsibility as they have a set time devoted to physical education and have the ability to reach a large number of students, potentially providing the best opportunity for combating childhood obesity (Cooper, 2010; Ferguson et al., 2007; Mercier & Silverman, 2014). Schools have also been credited as having an “expert” (physical education teacher) available who would be able to interpret student’s scores and offer recommendations and guidelines for improvement (Ferguson et al., 2007; Leach, 2012; Tulgar, 2017). The physical education teacher is also tasked with leading the fitness test, making the entire experience teacher-driven (Silverman et al., 2008). With the hope of reaching a large number of students in order to combat childhood obesity, schools were handed the responsibility of conducting teacher-driven, large-scale youth HRFT (Keating & Silverman, 2009).

It is incredibly well-documented in research that the physical education teacher administering the fitness test plays an extremely critical role in the HRFT process itself and how students perceive both the test and PA in general (Alfrey & Gard, 2019; Bulger et al., 2001; Cale et al., 2014; Cale & Harris, 2009; Corbin et al., 1995; Ernst et al., 2006; Ferguson et al., 2007; Grao-Cruces et al., 2020; Harris & Cale, 2007; Keating et al.,

2002, 2008; Keating & Silverman, 2009; Lodewyk & Muir, 2017; Mercier et al., 2016; Mercier & Silverman, 2014; Phillips et al., 2017; Silverman et al., 2008; Starr, 1959).

One of the most important physical education teacher facets to consider is their attitude toward youth HRFT in general (Ferguson et al., 2007; Keating et al., 2018; Martin et al., 2010; Mercier & Silverman, 2014). Research has documented the “importance of the teacher’s role in developing student attitudes toward physical education” and determined that “understanding teacher attitudes is crucial” (Mercier et al., 2016, p. 181). Studies have shown that the students of the physical education teacher with a positive outlook on fitness testing typically have a better outlook on physical activity not only at the time of the test but throughout their lifetime (Mercier et al., 2016; Mercier & Silverman, 2014a). Furthermore, “findings suggest that teachers with positive and negative attitudes toward HRFT vary in their implementation and use of fitness tests. Teachers with more positive attitudes reported more frequently using fitness concepts, and teachers who thought HRFT was important indicated they were more likely to send fitness test results home” (Mercier et al., 2016, p. 179). This alarming fact reveals that despite having specific guidelines for testing, some teachers may choose not to follow them, which can ultimately turn students away from PA by having a poor experience with fitness testing (Keating & Silverman, 2004; Mercier et al., 2016; Pangrazi, 2003). With this in mind, understanding how these teachers come to develop their outlook is imperative.

The existing literature reveals that the physical education teacher’s own experiences as a child with youth HRFT is often the most significant factor playing into their current attitude on HRFT (Lawson, 1983; Pike & Fletcher, 2014; Pugach, 1992). If the teacher

had a positive experience, they are likely to have a positive attitude. However, if they had a negative experience, they often have a negative attitude. Furthermore, the same has been found to be true in PPETs. Even when in a strong Physical Education Teacher Education program, PPET's own experiences as a K-12 student tend to have the strongest influence on their present attitudes (Garrett & Wrench, 2008b; Liu & Keating, 2021; Pike & Fletcher, 2014; Yan & Brown, 2017). In addition, teachers and pre-service teachers mention a lack of training as another serious factor hindering their ability to conduct HRFT (Bulger et al., 2001; Cale et al., 2014; Cale & Harris, 2009b; Eastham, 2018; Keating & Silverman, 2009; Morrow & Ede, 2009). It is evident that the physical education teacher's attitude and the many challenges they face not only hinder their ability to test their students, but most alarmingly, it could quite possibly give their students a lifelong negative perception of PA (Silverman et al., 2008).

### **Current Physical Education Teacher's Experience of Fitness Testing**

Current physical education teachers report disliking their experience with fitness testing, likely stemming from their own negative experience being tested as a K-12 student (Ferguson et al., 2007). As stated earlier in the literature review, a physical education teacher's own bad experience with fitness testing as a child can lead to a lifelong negative attitude toward fitness testing (Ferguson et al., 2007; Keating et al., 2018; Martin et al., 2010; Mercier & Silverman, 2014). A physical education teacher's attitude towards fitness testing has also been shown to factor into how effectively they administer fitness testing with their students (Keating et al., 2008).

Most alarmingly, studies have shown that physical education teachers have reported that they do not find the FITNESSGRAM results to be useful (Ferguson et al., 2007). Current physical education teachers have also reported a lack of knowledge regarding the fitness testing process and expressed the need for adequate training (Cale et al., 2014; Eastham, 2018; Harris & Cale, 2006). Research states that the goal of fitness testing is to motivate students to be active (Eastham, 2018). With a lack of knowledge and disinterest in the results, research cautions that physical education teachers could be part of the reason why this goal is not being met (Eastham, 2018). Further barriers regarding fitness testing will be discussed in depth below.

### **Barriers with Fitness Testing**

We [also] know that past generations of students have less than fond memories of fitness testing as a result of inappropriate practices that have likely turned them off to physical activity, and that it can be difficult to convince school administrators, physical activity researchers, and parents who are the product of these generations that testing can be positive and enjoyable. If physical fitness testing practices are done thoughtlessly, and if conditions lead to negative reactions in youth, then testing should not be done. (Wiersma & Sherman, 2008, p. 16)

Despite its positive intent to monitor student fitness, to date, a number of barriers have been identified within HRFT (Cale & Harris, 2009b; Grao-Cruces et al., 2020).

While the literature examined above has established that the role of the teacher in

facilitating the fitness test can be a significant barrier, research has unfortunately brought to light several additional barriers within fitness testing. The following sections will identify and explain each common barrier.

### ***Lacking Knowledge***

When speaking with students about their experience with fitness testing, some unfortunate information was uncovered.

Perceptions of fitness testing have shown an overall dislike because they do not understand why they are taking the test, do not like how it is administered, do not feel they are successful after taking the test, and simply because they do not think it is fun. (Graser et al., 2011, p. 10)

Numerous other studies have echoed the above finding (Alfrey & Gard, 2019; Cale et al., 2014; Cale & Harris, 2009; Garrett & Wrench, 2008; Keating, 2003; Keating & Silverman, 2009; Silverman et al., 2008). These studies reveal that students are lacking HRFT knowledge, and therefore do not understand the purpose behind what they are doing, which leads to negative testing perceptions (Silverman et al., 2008).

### ***Public Setting***

Students who have a negative fitness testing experience can have a negative perception of PA for the rest of their life (Silverman et al., 2008; Wiersma & Sherman, 2008). When digging deeper into exactly why students disliked how the fitness test was administered, researchers found that the students did not enjoy taking the test in a public space, where their peers could see them. This led to feelings of anxiety, embarrassment,

and shame for those that had what they considered “bad” scores, which left the student with a very negative impression (Cale et al., 2007, 2014; Fox & Biddle, 1988; Garrett & Wrench, 2008b; Harris & Cale, 2006, 2007; Leach, 2012; Lodewyk & Muir, 2017; Phillips et al., 2017; Silverman et al., 2008; Wiersma & Sherman, 2008).

### ***Specific Time for Testing***

As uncovered through the literature on the topic, several students stated that on the day of the test they were sick, tired, or were not wearing the proper clothes/shoes, but still required to take the test, again resulting in a negative impression (Hopple & Graham, 1995; Keating et al., 2020). Some of these students were even given the nickname “test dodgers” in reference to their strong dislike of being tested as they had such an aversion to testing that they skipped or gave fake excuses in order to avoid the test altogether (Hopple & Graham, 1995).

### ***Lacking Connection***

As documented earlier, physical education teacher’s regard for HRFT is highly correlated with their own personal experience with HRFT (Lawrence et al., 2016; Pike & Fletcher, 2014; Pugach, 1992). Unfortunately, further research suggests that fitness testing is often not connected with fitness education as both teachers and students alike were not prepared to take or administer the test (Eastham, 2018; Keating & Silverman, 2009). This shows that not only are many physical education teachers nonchalant or negative regarding the testing, but that they also significantly lack the training necessary to administer an effective test. “Fitness testing is commonly used with the purpose to



motivate students to be active” (Eastham, 2018a, p. 390) but teachers really do not know how to motivate their students through the test implementation (Keating, 2003; Silverman et al., 2008). The lack of teacher training is not allowing this goal to be met.

### ***Time Consuming***

Research has indicated that HRFT is very time consuming for physical education teachers, many of whom are already struggling with limited instructional time, the lack of help, and large class sizes (Flohr & Williams, 1997; Keating et al., 2020; Liu et al., 2017). Fitness testing must be worked into an already packed curriculum, and oftentimes additional time is required as the physical education teachers usually administer the test alone (Keating, 2003; Keating & Silverman, 2009). Furthermore, some testing items can be done with the whole class while others, such as BMI, require one on one time with the teacher (Keating, 2003).

### ***Repetition***

Since its creation in 1982, the FITNESSGRAM test battery has relatively remained the same (Ernst et al., 2006; Plowman et al., 2006). Physical education teachers are required to test a student’s BMI, flexibility, muscular strength and endurance, and aerobic capacity (Plowman et al., 2006). According to the Texas Association for Health, Physical Education, Recreation, and Dance (TAHPERD), it is required by Texas law that the FITNESSGRAM be given to students from grades 3 through 12 each school year (TAHPERD, 2022). As such, research has brought to light concerns regarding student boredom due to testing repetition (Cale et al., 2007; Keating, 2003). Students growing up

in Texas (and other states mandating the FITNESSGRAM) could potentially take the exact same fitness test for 10 years in a row.

### ***The Lack of Ownership***

Scholars have found a significant lack of ownership regarding HRFT and results, as testing results are often not treated as serious learning outcomes (Keating et al., 2020; Zhu et al., 2018). Teachers are not being held accountable for both the fitness test administration process and student results (Keating et al., 2020; Zhu et al., 2018). More alarmingly, current research has found that teachers often falsify results, either putting all students in the “healthy fitness zone” category or giving obscure or impossible scores (Zhu et al., 2018). With the purpose of fitness testing not being fully understood by teachers or students, it is evident that minimal effort is made during the entirety of the fitness testing process (Keating et al., 2020).

### ***No Testing in College in the US***

As previously mentioned in this review, there is no formal, required HRFT for the general (not on athletic teams) college population (Chen, 2015; Leach, 2012; Liu et al., 2017; Pribis et al., 2010). It is still unclear why college students are not required to take health-related fitness tests on a regular basis in higher education in the US while Chinese college students are mandated to take such a test each year (Liu et al., 2017). Little data are available concerning American college students’ health-related fitness. Further research regarding HRFT needs to be conducted with this population.

## Summary

Unfortunately, all of these barriers can lead to a negative “lasting impression” of PA in the eyes of the students (Silverman et al., 2008). Silverman et al. (2008) goes on to warn that:

Inappropriate implementation of fitness education and tests can influence children in ways for which we would not want to take credit. This experience makes it clear that fitness education and, especially, fitness testing can be conducted in ways that are detrimental to children and their future physical activity. (p. 147)

If the goal of youth HRFT is to help students be active and healthy for a lifetime, then improper implementation of HRFT and negative experiences are doing the exact opposite.

Despite the many barriers, research still agrees that it is important to fitness test as physical education teachers need to use the data to intervene and help students make positive, lifelong choices (Cohen et al., 2015). Ernst et al., (2006) makes a strong case for HRFT and how the data can be used effectively:

Teachers and educational personnel benefit because results provide information that can be used in planning curriculum. When used properly, individual test results allow teachers to work with individual children to help them develop a personal plan for improving in areas of need. The testing and reporting experience provides the teacher with an excellent opportunity to teach youth (and their parents) about the health benefits of exercise. (p. 94)

With the childhood obesity epidemic climbing, it is critical that current HRFT practices be scrutinized, and stronger alternatives be presented.

## **Conclusion**

After more than seven decades of regular HRFT in the educational setting, significant increases in students' overall health-related fitness and their fitness related behaviors remain to be seen. Although problems with the current HRFT practices have been widely known for years, it seems that effective solutions for these problems are unclear. Further research needs to be conducted to identify solutions for each barrier discussed. Remarkable improvement in youth HRFT has not been made in the past seven decades, even though a number of research studies on the topic have been published. It is time to examine a different way of implementing youth fitness testing.

## **METHODOLOGICAL CONSIDERATIONS**

This portion of the literature review will focus on the types of research, sampling methods, and limitations found within the youth HRFT body of literature.

### **Research Topics, Types of Research Design, and Sampling Methods**

**Research topics.** The most researched topic is attitudes toward HRFT of physical education teachers, preservice physical education teachers, and students in K-12 programs using a questionnaire or qualitative method (Silverman, 2017). The development of the questionnaire for measuring attitudes toward fitness tests has enabled researchers to investigate attitudes toward HRFT for more than two decades. To date, there are validated attitudes questionnaires for students (Mercier & Silverman, 2014b),

preservice physical education teachers (Keating et al., 2002b), and pre-service teachers (Keating et al., 2008; Mercier et al., 2016), respectively. Regardless of the education levels, the attitudes of students and teachers toward fitness testing have been found to be only slightly positive.

After more than seven decades of youth fitness testing, surprisingly, little information about how fitness tests have been used is reported in the literature. Unfortunately, it has been well-documented that teachers have inappropriately used fitness testing, rather through falsifying results, not teaching students about fitness, or accepting improper form in an effort to better student scores (Hopple & Graham, 1995; Zhu et al., 2018). While research has thoroughly expressed what physical education teachers should be doing with the fitness testing data, only a limited number of studies show what physical education teachers have done (Silverman et al., 2008). Within the research an emphasis has been placed on the importance of educating physical education teachers on both implementation of fitness testing and how to effectively use the results (Corbin et al., 1995; Ernst et al., 2006; Ferguson et al., 2007). In essence, it is still unknown how teachers use fitness testing for their students' fitness education. Effective approaches that should be used have not become the focus of research on the topic. The effects of fitness testing on students' health-related fitness and fitness behaviors also remain unknown. There is a lack of research on solving the existing problems identified in the literature.

***Types of research design.*** Much of the current work surrounding youth HRFT is experimental and has selected either the physical education teachers, PPETs, or physical

education students as the target population. It was rare to find a piece that examined different populations in one study. As a result, the literature reviewed was a mix of qualitative, quantitative, or mixed methods, depending on what specific factor the researchers wanted to analyze. For the qualitative studies, open-ended questionnaires, interviews, field notes, and observations were most heavily utilized (Graser et al., 2011; Hopple & Graham, 1995). For the quantitative research, surveys and quizzes were mainly used (Keating & Silverman, 2009). Mixed method work typically involved interviews, observations, and surveys (Lodewyk & Muir, 2017). Overall, the number of research studies on the topic is relatively low in comparison to studies on other topics such as motivation and preservice teacher preparation.

***Sampling Methods.*** In a majority of the studies, convenience sampling was utilized (e.g., Keating & Silverman, 2009). Researchers often selected physical education teachers who they knew and either recruited them or their students for participation in their studies. One particular researcher was also working as a physical education teacher at the time of the study and simply used the students in their class (Graser et al., 2011). Schools in close proximity to the research team were also recruited if observations and field notes were needed (Hopple & Graham, 1995). Large scale studies have not been reported, limiting our understanding about the entire picture of youth fitness testing.

### **Limitations**

One limitation frequently brought to light was the utilization of convenience sampling (Graser et al., 2011). Researchers wondered about potential bias by working

with teachers they had prior relationships with, and if the results would transfer to other settings. It was also noted that in many studies the students volunteered to participate. It was questioned if these student's results would be comparable to others or not. The second limitation was the lack of experimental studies on using different ways of teaching students to test their own fitness. There is also a lack of studies on how to solve the lasting problems found in the current youth fitness testing in educational settings.

## CONCEPTUAL FRAMEWORK

### **Dilemma Theory**

The dilemma theory “builds a framework of dilemmas” that explore the “conceptual, pedagogical, cultural, and political planes of the constructivist teaching experience” (Windschitl, 2002, p. 131). Within this framework, a phenomenological approach is taken in order to appreciate an individual's lived experiences (Windschitl, 2002). While current work utilizing the dilemma theory has primarily been focused on teachers, there have been reported successes with pre-service teachers as well (Windschitl, 2002). The four dilemmas first highlight the “personal and intellectual concerns of the teacher” and then move more broad to the “structural and public concerns of the school and community (Windschitl, 2002, p. 132). The dilemma theory not only explores each separate dilemma, but how they interact and overlap, before eventually highlighting the different difficulties constructivist teachers and pre-service teachers face (Windschitl, 2002). The following chart (*figure 1*) explains each of the four dilemma categories of constructivism in practice (Windschitl, 2002):

Conceptual Dilemmas	Pedagogical Dilemmas	Cultural Dilemmas	Political Dilemmas
Grasping the underpinnings of cognitive and social constructivism; reconciling current beliefs about pedagogy with the epistemological orientations necessary to support a constructivist learning environment.	Honoring students' attempts to think for themselves while remaining faithful to accepted disciplinary ideas; developing deeper knowledge of subject matter; mastering the art of facilitation; managing new kinds of discourse and collaborative work in the classroom	Becoming conscious of the culture of one's own classroom; questioning assumptions about what kinds of activities should be valued; taking advantage of experiences, discourse patterns, and local knowledge of students with varied cultural backgrounds; managing the collective transformation of students' beliefs and practices in accordance with constructivist norms.	Confronting issues of accountability with various stakeholders in the school community; negotiating with key others the authority and support to teach for understanding.

Figure 1: The four dilemma categories of constructivism in practice

## SUMMARY

### Overview

As detailed in this literature review, childhood obesity and inactivity are serious, urgent issues that need to be addressed immediately (Bulger et al., 2001; Welk et al., 2010). If left unaddressed, our youth are at risk for developing numerous unhealthy lifestyle patterns and health complications that could last them a lifetime (Cale et al., 2007; De Moraes et al., 2019; Harris & Cale, 2006; Keating, 2003; Keating & Silverman,



2009; Kemper et al., 2001; Mercier et al., 2016; Morrow et al., 2009; Ortega et al., 2008; Phillips et al., 2017; Sandercock & Jones, 2019). Research has suggested that one of the best ways to combat and reverse childhood obesity is through physical activity (Flanagan & Perry, 2018; Kumar & Kelly, 2017). However, inactivity itself seems to be the main reason for the obesity crisis in the first place (Bulger et al., 2001; Flanagan & Perry, 2018; Mercier et al., 2016). Based on the literature, researchers agree that youth HRFT can be an important tool in helping students develop healthier and more active lifestyles (Cohen et al., 2015; Ernst et al., 2006). However, current youth HRFT practices have been shown to actually leave students with a negative impression of PA, rather than a positive one (Cale et al., 2014; Cohen et al., 2015; Lodewyk & Muir, 2017; Silverman et al., 2008). Alarming, research shows that students with a negative perception of PA often carry this for the rest of their life.

### **Gaps in the Literature**

Looking at the body of literature, future work should focus on longitudinal studies to better understand student perceptions on PA and HRFT from elementary school through adulthood. Since a major concern has been that students develop lifelong negative perceptions of PA as a young student it would be crucial to see if those who experience positive fitness testing still feel the same way as an adult.

Since teachers play such a significant role in the testing process, professional development should be considered as a way to equip teachers to provide quality fitness testing to their students. Many teachers cited lack of training as a barrier to performing

their testing duties, so before having them implement testing it would be of utmost importance to provide them with a comprehensive professional development explaining all facets of the fitness testing process.

### **Summary**

Lifelong physical activity will take place beyond the K-12 schooling experience. For individuals to be able to assess their own fitness levels beyond the physical education domain, they need to be able to self-assess and not only rely on teachers to monitor their activity levels. If adults want to develop a fitness plan, they would benefit from the ability to self-assess their current level and measure progress toward fitness goals. (Mercier & Silverman, 2014, p. 2)

Childhood obesity is a major public health problem and an alarming cause for concern. However, physical activity is a cure that is not being effectively utilized. Since responsibility has fallen onto schools, it is imperative that teachers and researchers find effective ways to test and assist students in leading healthy, active lifestyles.

## **Chapter 3: Methods**

Fitness testing has long been the gold standard in K-12 physical education programs to monitor and combat obesity. Having been demonstrated to be effective in some K-12 physical education programs, the following study will focus on fitness testing as it relates to PPETs.

### **PURPOSE AND RESEARCH QUESTIONS**

Through the lens of the dilemma theory, the purpose of this study was to investigate pre-service physical education teachers' previous and current perceptions on fitness testing in schools and their level of readiness for implementing fitness testing in the field. In order to determine what PPETs knew, the following research questions were explored:

1. How do pre-service teachers' past experiences influence their perception on fitness testing?
2. How did courses help prepare pre-service teachers to administer fitness testing prior to student teaching?
3. How prepared do the pre-service teachers feel, upon completion of student teaching, to administer fitness testing as professionals in the field?

### **CONCEPTUAL FRAMEWORK**

For this study the dilemma theory was utilized. The dilemma theory "builds a framework of dilemmas" that explore the "conceptual, pedagogical, cultural, and political planes of the constructivist teaching experience" (Windschitl, 2002, p. 131). Within this

framework, a constructivist approach was taken in order to appreciate an individual's lived experiences and how it has shaped who they are now (Windschitl, 2002). Each of the four dilemmas (conceptual, pedagogical, cultural, political,) highlighted specific challenges pre-service teachers face in regard to fitness testing.

Using the dilemma theory as a guideline, each of the following interview questions was asked:

### **Interview questions related to conceptual dilemma**

1. What is your current understanding of fitness testing? (Purpose, effects, importance, etc.)
2. How do you feel your childhood experiences have shaped your views of fitness testing?
3. What are the effects of your coursework or experience in the UT PETE program on your understanding about fitness testing in schools? If no effects, please explain why?
4. Do you think that fitness testing is needed or not needed in elementary schools? Secondary schools? Why or why not?
5. What is your opinion on the effects of fitness testing?
6. How should fitness testing results be used?
7. What has changed in your understanding about fitness testing because of the PETE program? (i.e., purpose, implementing in teaching, etc.)

### **Interview questions related to pedagogical dilemma**

1. What problems have you encountered when teaching students how to take the Fitnessgram?
2. What pedagogical skills and knowledge do you think you need to use fitness tests effectively in your teaching? What skills and knowledge do you think that you need but do not have right now?
3. How did the PETE program help you gain the knowledge and skills needed to effectively use Fitnessgram? What kind of professional training (course work, field experience, student teaching) makes you believe that you can implement fitness tests effectively?
4. What is your role when implementing fitness testing?
5. What is your opinion on having students to construct or discover their own knowledge through fitness testing?
6. Should we put a limit on students' construction of their own ideas in regard to fitness testing? Should they be able to choose how to test each component? Why or why not?
7. What teaching skills do you have to make fitness testing meaningful for your students?
8. Since fitness testing is mandated in a specific way in Texas, do you think that students should internalize those components instead of creating their own?
  - a. Do you feel they should have a say in their fitness testing? In preparation? Why or why not?

### **Interview questions related to cultural dilemma**

1. What kind of fitness tests would you implement to foster fitness learning in your class?
2. What cultural differences have you encountered when implementing fitness tests?
3. What cultural issues (i.e., PE is not important, girls should not be too muscular, embarrassment of performing in front class, being a “loser” when finished last, etc.) prevent you from using Fitnessgram effectively?
4. How do you address cultural differences in implementing fitness tests in your class?
5. What would you do when the school culture is that fitness testing is not serious?
6. How do your past images of what fitness testing looked like prevent you from seeing the potential for a different kind of learning environment?
7. How can you accommodate students’ different interests and life experiences during fitness testing?
8. How can you encourage students to be “active learners” while participating in fitness testing?

### **Interview questions related to political dilemma**

1. What have you learned about gaining support from the administrators for supporting appropriate fitness testing? If nothing, please say so.

2. As a pre-service teacher, how will you become more aware of the bigger political stakeholders at play concerning fitness testing in schools?
3. How will you gain support of administrators and parents to fitness test in a non-traditional (constructivist) and more unfamiliar way?
4. What would you do if your school did not help you with fitness testing?
5. How can you take a constructivist approach (let students build their own knowledge) to fitness testing while also meeting state and curriculum standards?
6. How will you handle any conflict from administrators, parents, or other teachers?

#### **STUDY DESIGN**

Due to the nature of the study, a qualitative approach was taken. When analyzing the interview data, a “basic interpretive study” or “basic qualitative study” design was employed (Merriam & Tisdell, 2015, p. 24). Within this design, “researchers simply describe their study as a “qualitative research study” without declaring it a particular type of qualitative study” (Merriam & Tisdell, 2015, p. 23). In this type of study, the researcher is specifically interested in “how people interpret their experiences,” a hallmark characteristic of a basic qualitative study design (Merriam & Tisdell, 2015, p. 24). The overall purpose of basic qualitative study grounded in constructivism is to “understand how people make sense of their lives and experiences” (Merriam & Tisdell,

2015, p. 24). Within this study, the researcher sought to understand how the participants made sense of fitness testing and PA.

### **SAMPLING AND PARTICIPANTS**

Convenience sampling was used for this study. Convenience sampling is “selecting a sample based on time, money, location, availability” (Merriam & Tisdell, 2015, p. 98). In essence, the population selected is “convenient” for the researcher. For this study, the participants were undergraduate PPETs, (n=3).

Participants	Gender	Ethnicity	Classification
Sandra	Female	Latino	Senior
Francisco	Male	Latino	Junior
Gabriel	Male	Latino	Senior

Figure 2: Participant Demographics

It should also be noted that this while all students enrolled in the PPET course were required to participate in the observation, discussion board, and questionnaire, only the students who provided consent through an IRB were interviewed and their data were used for the study.

### **RECRUITMENT**

Upon gaining IRB approval, the researcher introduced the study to the PPETs. It should be noted that the researcher was not affiliated with the class as a TA or instructor. Students were informed of all study procedures and requirements through a short lecture at the beginning of the semester. Students interested in the study were given a consent



form to read over. After reading over the consent form, the students interested in the study turned the consent form back in to their instructor, indicating they were willing to participate in the study. Electronic copies were also made available at the student's request. Students were given two weeks to sign and return the consent form to one of their instructors. At the end of the two weeks, the study moved forward with the students who returned and signed the consent form. Students who did not return the consent form were no longer recruited for participation in the study. However, all students participated in the study activities as part of the course. Only the responses of the students who provided consent were used for research purposes.

#### **DATA COLLECTION**

In this study, a triangulation process was utilized in order to best understand the emerging findings (Merriam & Tisdell, 2015). By triangulating the data, the researcher legitimized the data by proving it was not found from a single source alone or by chance or happenstance. The methods of data collection for this study were a semi-structured interview, observation, open-ended questionnaire, and an online discussion board.

#### **Semi-structured interview**

One round of semi-structured interviews took place after all participants taught their fitness testing lesson. As suggested by Merriam & Tisdell, (2015), questions first consisted of asking for "neutral, descriptive information" before digging into the participant's experience. "Yes and no" questions were avoided as the researcher sought to dig deeper to understand the participant's thoughts and experiences (Merriam & Tisdell,

2015). Due to the ongoing Covid-19 pandemic, the 60-minute interviews were audio recorded and took place via ZOOM. Once completed, the interview transcript was downloaded from Zoom and saved to the researcher's password-protected computer. All transcriptions will be deleted after 5 years. If the participant's name was used in the interview, it was substituted for a pseudonym as soon as the transcript was downloaded. Only the researcher had access to the key identifying each participant to their pseudonym. This was also saved on the researcher's password-protected computer and will be deleted after 5 years.

The semi-structured format was appropriate as it allowed the researcher both guidance and flexibility as the interview took place. In this type of interview, "either all of the questions are more flexibly worded or the interview is a mix of more and less structured questions" (Merriam & Tisdell, 2015, p. 110). The researcher had some "guiding questions" and "issues to be explored," but was also able to respond to the "emerging worldview" from the participant (Merriam & Tisdell, 2015). Within this study, the semi-structured format allowed for the researcher to ask both clarifying questions and additional questions to encourage the participants to provide further explanation. For example, during the interviews, many of the pre-service teachers were unable to answer questions regarding observed interactions between their CT stakeholders and administrators. As a result, they were then instead asked how they would anticipate these interactions, despite not having witnessed any. In addition, if a participant stated that as a student, he/she took the Fitnessgram, he/she was then asked to explain each component they were tested over and what the process looked like.

## **Observation**

On the day the PPETs were administering fitness testing, the researcher assumed the role of a “careful observer”. As a “careful observer”, the researcher developed a “systematic” observation plan by determining exactly what to pay attention to and writing “descriptive” field notes (Merriam & Tisdell, 2015, p. 138). During the observation, careful attention was paid to each pre-service teacher’s verbal and non-verbal cues during the lesson, as well as their ability to perform each test correctly. The observation happened face-to-face and was not recorded. The researcher only utilized written field notes which detailed each participant’s demeanor, knowledge of the content, interaction with students, specific things said, and their ability to correctly demonstrate each item in the Fitnessgram. All field notes collected served as a guideline for discussion with the peer debriefer and were used as supporting evidence for the different themes that emerged from the study.

Due to the Covid-19 pandemic and strict guidelines regarding visiting public schools, the observation happened on the college campus, and only included the pre-service teachers, their instructor, and the researcher. Each pre-service teacher was assigned one of the 5 Fitnessgram components and tasked with teaching it to the rest of their class. All the tests were held in the assigned classroom except for the mile run, which took place at an on-campus indoor track.

## **Open-Ended Questionnaire**

All participants were given an open-ended questionnaire after teaching fitness testing to their peers (See Appendix Item 2). “By using open-ended questions,

participants are able to express and articulate opinions that may be extreme, unusual, or simply ones that the researcher did not think about when creating the survey” (Allen, 2017, p.1). The goal of utilizing an open-ended questionnaire was to gain “rich, relevant data” for the study and allow participants the opportunity to let the researcher know exactly what they believe (Allen, 2017, p. 1).

The participants completed the questionnaire online via Canvas assignments and were not able to view their peer’s responses. They were asked to submit their responses as soon as possible, but no later than one week after teaching so the researcher could have their views as close to completing the fitness test as possible to maintain accuracy. The questionnaire consisted of 3 key questions, with the expectation that participants would thoughtfully reflect upon their experiences to thoroughly answer each question. Typed responses were saved on the researcher’s password-protected computer and will be deleted after 5 years. Participant names were removed from the questionnaire before responses were saved.

### **Online Discussion**

Participants were asked to express their opinions on fitness tests used in schools and their previous experience with fitness testing in K-12 programs through an online Canvas discussion board consisting of 4 questions (See Appendix Item 1). All participants were able to read their peer’s responses after making their initial post, as well as post replies. Participants were also given the opportunity to add any additional

comments/suggestions concerning HRFT after posting and reading their peer's comments.

### **DATA ANALYSIS**

Once all data was collected, responses from the multiple data sources were grouped by question and any identifying information revealing the participant was removed. The analysis was driven by a constant content comparison between the sources to generate themes. During this process the researcher and peer debriefer met during every step of coding data (open, axial, final coding). A schedule was set in order to stay in constant communication throughout the entire coding process. First, manual open coding was conducted to identify patterns across the different data collection methods. During this phase the researcher made notes throughout all the different data sources and began to identify patterns. Many of the early codes highlighted the participants' childhood experience, their enjoyment for PA and organized sports, and the lack of experience with fitness testing in the field. Next, multiple rounds of axial coding were done to find connections and similarities between the patterns found during open coding. At this stage, several themes started to emerge about the participants' opinion on fitness testing, their lack of preparation, and the purpose of fitness testing. Once all rounds of axial coding were complete, final coding was done to generate overarching themes.

### **DATA TRUSTWORTHINESS**

It is important for trustworthiness to be carefully established in qualitative work (Erlandson et al., 1993). One way to establish trustworthiness is through member

checking. Member checking allows the participants the “chance to indicate whether the reconstructions of the inquirer (themselves) are recognizable” (Erlandson et al., 1993, p. 142; Merriam & Tisdell, 2015, p. 246). Essentially, member checking gives the participant the opportunity to check that what they stated was correctly understood by the researcher. In this study, member checking was done at the conclusion of each “section” during the interview. After all questions were asked from a specific section, the researcher recapped what they believed the participant stated, asked clarifying questions, and make sure they had an accurate depiction of what the participant indicated. The researcher did not move on to the next section of questions until the participant agreed that they had an accurate representation of what they stated.

In addition to member checking, the primary researcher also met with the peer debriefer at each phase during the research process. During the study, the primary researcher met with colleagues and university professors at set points to discuss and analyze all data gathered (Gerdes & Conn, 2001). The peer debriefer also discussed all observations and data gathered by the researcher to clarify interpretations and look for any potential bias (Hanson & Newburg, 1992).

### **RESEARCHER POSITIONALITY AND BIAS**

Banks, (1998), describes the need for researchers to be transparent in their positionality and recognize how it could impact their work. It should be noted that I was both the primary researcher and the teaching assistant (TA) for the course the participants were enrolled in for the first study. I am a white woman with a positive experience in

physical education and frequently participate in and enjoy physical activity. I have a unique background in that I have experience teaching as a classroom teacher, physical education teacher, and working as a coach for both public school and private club swimming teams. I am currently enrolled in a Physical Education Teacher Education (PETE) doctoral program at the same university in which the studies were conducted.

In order to eliminate bias and generate honest student responses, I made it known to all students that participation in the study was completely voluntary and not at all tied to their final course grade. All graded assignments were made known to the students at the beginning of the semester through the syllabus and a short lecture so they had a clear picture of how their grade will be generated and further understand that participation in this study was completely voluntary and would not impact their grade.

To further control any researcher bias, I kept a reflective journal documenting my experience before and after the observation, and before and after conducting each interview. This information was discussed with my peer debriefer to ensure I was remaining neutral and not allowing any potential bias to affect the study. I made sure to have open and honest communication with my peer debriefer throughout each phase of my study. I also sent my interview questions to my supervisor prior to beginning the interviews and shared the transcripts with my peer debriefer to make sure I did not make any statements due to my bias which could lead to inaccurate responses. It was and always is my goal to be constantly aware of my biases and stay as neutral as possible

## Chapter 4: Results

Guided by the dilemma theory, several main themes and subthemes emerged. As such, this section is organized by the main themes and the subthemes as subsections within the main themes (See Figure 3). The first main theme, highlighting the conceptual dilemma, positive fitness testing perceptions based on appreciation for PA in K-12 programs with the lack of a thorough understanding about the real purposes of fitness testing, had one subtheme: (a) outstanding fitness testing and PA experience from athletics instead of PE, and lack of a deep understanding of the purposes of fitness testing. The second main theme, related to both the conceptual and pedagogical dilemmas, PETE provided strong content knowledge and teaching practices concerning fitness testing in PE programs had two subthemes: (a) PPETs understand the fitness testing content and (b) PPETs learned how to grade student fitness testing performance. The third and final main theme, grounded in the pedagogical, cultural, and political dilemmas, lack of preparation for administering fitness testing in the field had three subthemes: (a) PPETs struggle to identify potential barriers and solutions with stakeholders and administration, (b) PPETs lack differentiation skills and motivation, and (c) PPETs had few opportunities to observe cooperating teachers (CTs') fitness testing practice during their student teaching.



Figure 3. Main Themes and Subthemes

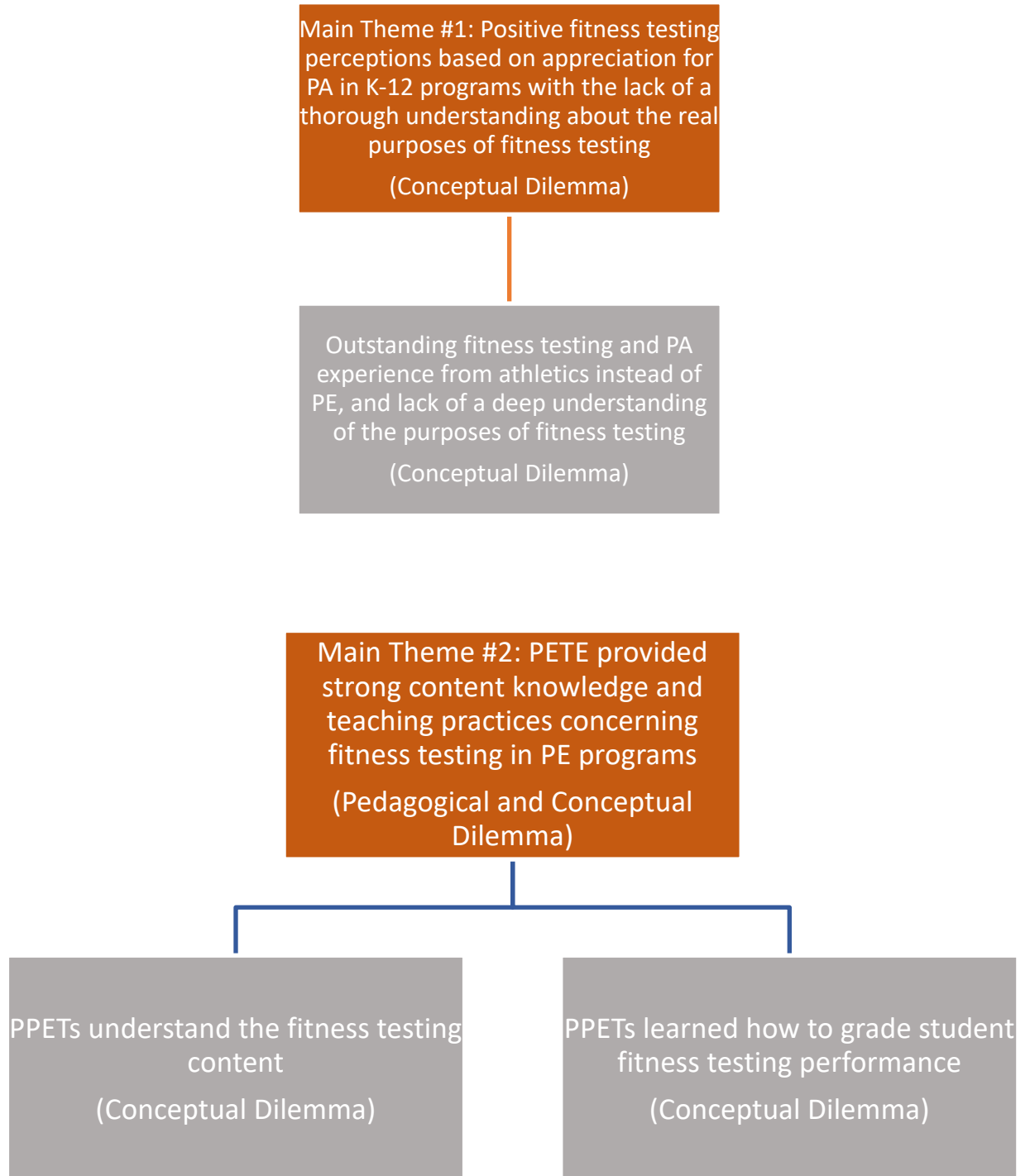
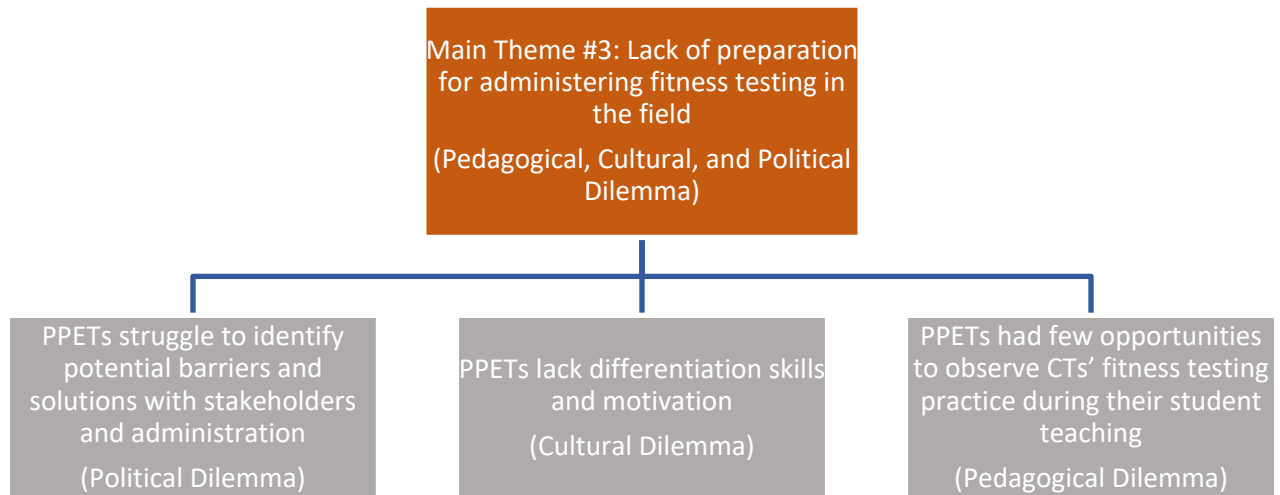


Figure 3. Main Themes and Subthemes, cont.



**THEME 1 (CONCEPTUAL DILEMMA): POSITIVE FITNESS TESTING PERCEPTIONS BASED ON APPRECIATION FOR PA IN K-12 PROGRAMS WITH THE LACK OF A THOROUGH UNDERSTANDING ABOUT THE REAL PURPOSES OF FITNESS TESTING**

This theme is associated with the component of conceptual dilemma in the dilemma theory. After examining each of the data sources, it became evident that the PPETs each enjoyed physical activity and physical education class from an early age. As a result, they all described a positive experience participating in fitness testing when they were K-12 students. Sandra summed it up nicely in her online discussion post by stating “I would say it (fitness testing) was a positive experience because I enjoyed being active.” Fernando echoed this same sentiment by saying in his online discussion post that “I always liked to run so the pacer test was fun for me.” Gabriel had such a positive

experience that in his online discussion post he described not even knowing he was being graded.

From what I can remember, the beginning days of fitness testing I had no idea we were being graded. Luckily for me, I love PE so anything that was asked for me to do I would simply do it. I then found out that we were being graded. I did not feel any type of pressure at all. On the other side, I felt motivated to do my best. I want to say fitness testing in middle school was a positive experience.

Each of the PPETs had an early love for physical activity, which in turn made the testing process enjoyable for them. After observing them each teach fitness testing to one another, it was obvious that they were excited about the fitness testing component they were teaching, and their demonstrations were accurate and effective. It was apparent that the PPETs still had the same appreciation and enjoyment for physical activity that they did in elementary and secondary schools.

The first main theme, positive fitness testing perceptions based on appreciation for PA in K-12 programs with the lack of a thorough understanding about the real purposes of fitness testing had one subtheme: (a) outstanding fitness testing and PA experience from athletics instead of PE, and lack of a deep understanding of the purposes of fitness testing.

**Subtheme 1.1 (Conceptual Dilemma): Outstanding fitness testing and PA experience from athletics instead of PE, and lack of a deep understanding of the essential purposes of fitness testing**

The physical education pre-service teachers enjoyed their experience with fitness testing since they enjoyed being active and considered themselves to be good at different physical activities. The data revealed that while the PPETs enjoyed their experience with fitness testing, they also had outstanding performances in both fitness testing and different physical activities in general. As athletes who all performed very well in their different sports, all three of the PPETs discussed being members of a sports team during high school and how that often tied into their fitness testing experience. In Sandra's interview she explained how her soccer coach used student's fitness testing scores to decide which soccer team to place them on.

In high school I also only did it (fitness testing) in soccer class. I remember doing it maybe once or twice during my high school four years in soccer, during athletics because I didn't take PE. I would say though that it was a positive experience for me. In high school I guess they used it as a "level" thing for varsity. So, if you wanted to be on varsity, you had to be able to get "this" many pushups or "this" many laps for the pacer tests.

In her online discussion post, Sandra described how while she had a positive fitness testing experience, she felt a lot of pressure from her coach to meet the varsity team standard. "My coach would use this test to motivate us for tryouts. She would set goals that she expected the varsity level should reach and made it feel like it was super important. This added a ton of pressure." Despite the pressure she felt, she ultimately

succeeded and made the varsity team. In Gabriel's interview, he shared how being an athlete made his physical education class more enjoyable. "I had a cool PE teacher, and I was one of his favorites just because I was one of his soccer players." Gabriel went on to explain in his interview that "fitness testing was a positive experience because of how good I was at it." Sandra's outstanding performance in fitness testing allowed her to make the varsity soccer team and Gabriel's experience as an athlete made the testing process enjoyable and allowed him to be one of the physical education teacher's favorite students.

In his interview Fernando recalled playing high school soccer and competing for the track and cross-country teams. While his sports experience did not directly tie into his fitness testing experiences, he found success with both. In his online discussion post he remembered that "my experience (fitness testing) in secondary school was so little. I believe I only did it twice. Once my freshmen year then once my sophomore year of high school. But one thing I do remember is that's when I did the most (reps)." In his interview he remembered being able to motivate himself to complete each component of the fitness test to the best of his ability, despite not liking his physical education teacher. "Yeah, he (the PE teacher) wasn't as motivating. I think for me personally, I was just like, "whatever" about it. I could see other students be like, "oh man, this sucks, this is not fun." Even though Fernando enjoyed fitness testing and performed well, observing how other students felt made him consider how the physical education teacher can significantly contribute to the student's overall testing experience.

Well, I mean, I feel like the PE teacher shouldn't be rigid and strict. I feel like the energy aspect is super important when teaching and, you know, they're students. I feel like maybe my teacher wasn't being mean, but they're kids. So, it's like if you raise your voice, they think they're yelling at you. So, I don't know. Just having that energy, having more of that motivation aspect for me, I feel would just be a good way for the students to increase reps and just be better. I feel like that's the most important thing for me.

Despite experiencing a negative fitness testing atmosphere, Fernando's outstanding performance and enjoyment of physical activity ultimately overrode any negativity experienced during fitness testing.

Overall, it is apparent that fitness testing was implemented in the participants' athletic classes for their high-level sports performance instead of health-related fitness. Although the participants did very well with fitness testing in k-12 schools, they did not have the opportunity to use the fitness testing results to improve their own fitness. Therefore, their understanding of fitness testing in PE classes was limited. Because they were high performers in fitness testing and did not take it in PE classes with classmates who did not do well in Fitnessgram, they lacked the basic understanding of students who struggled in scoring high enough to simply pass the tests. The conceptual dilemma, viewing fitness testing as a tool for assessing athletic abilities, stemmed from their early sports-related fitness testing and the absence of attending PE classes.

## **THEME 2 (PEDAGOGICAL AND CONCEPTUAL DILEMMAS): PETE PROVIDED STRONG CONTENT KNOWLEDGE AND TEACHING PRACTICES CONCERNING FITNESS TESTING IN PE PROGRAMS**

After analyzing the PPETs personal experience with fitness testing, it was important to examine the effects of the physical education teacher education (PETE) program on participants' pedagogical knowledge about fitness testing. While not yet graduated from the program, the pre-service teachers still had many things to share in regard to what they have learned and what they are still working to develop. The second main theme consisted of two subthemes: (a) PPETs understand the fitness testing content and (b) PPETs learned how to grade student fitness testing performance.

### **Subtheme 2.1 (Conceptual Dilemma): PPETs understand the fitness testing content**

The research data revealed that participating in the PETE program allowed the PPETs to thoroughly learn the fitness testing content. All participants were taught the Fitnessgram test battery, the state-mandated fitness test for grades 3-12. When asked to explain the Fitnessgram in her questionnaire, Sandra was able to answer in detail.

Physical education only has one program to measure a student's level in the class. In all other classrooms, students are being tested frequently on specific topics whereas with PE, they only get tested once a year. With that being said, the test we utilize in our classroom is known as the Fitnessgram Test. This test is composed of the five health-related fitness components including aerobic capacity, muscular endurance, muscular strength, flexibility, and body composition. The tests remain the same for every grade level with slight increases in goals as the students get older. Although the tests are the same in elementary

and secondary education, they are very different when it comes to explaining the rules, student participation, and student engagement.

When asked in his interview how he would define the Fitnessgram, Fernando stated, “I would say it's an assessment of the student's fitness.” Gabriel also kept it to the point in his interview by explaining “To start off, I would just say that it's a test for students in physical education that lets the teacher know the student’s level of physical activity. That's the big picture of it, that's it for my short answer.”

While observing the participants’ teaching the Fitnessgram to one another, it was evident that they each understood the testing content and the proper way to test each component. During her practice teach Sandra taught the “sit and reach,” a test designed to measure students’ flexibility. Sandra gave a detailed explanation, explained the correct technique, and was able to answer all “student” questions. Gabriel was assigned to teach push-ups. He was also able to give a thorough explanation, and then broke it down further by giving step-by-step instructions. During the test he called out different cues for students so they could easily recall the correct technique. Fernando led the 1 mile-run test. Like the other pre-service teachers, he gave a detailed explanation, but he took it one step further by also defining important terms such as “endurance” and “pulse.” He explained the rules and then had the students repeat them back so he could check for understanding. After observing each pre-service teacher and analyzing each of their provided data sources, it was clear that they had a thorough understanding of the Fitnessgram content.



### **Subtheme 2.2 (Conceptual Dilemma): PPETs learned how to grade student fitness testing performance**

In the conceptual dilemma, a teacher's practice is rooted in their beliefs and assumptions. While each PPET's own experience was the most significant factor in their decision making, the PETE program contributed to a better understanding of fitness testing by shifting their ideas surrounding grading.

Upon entering the PETE program, each PPET believed that when administering fitness testing, students should only be graded on their effort instead of performance. However, after going through the PETE program they have shifted their perspective from only grading on effort to grading based on improvement. In his interview, Fernando described his thought process.

I think one thing that changed my perspective on it (grading) was my professor. I always felt like, "oh, the students should do as many (reps) as possible." But my professor was saying, "it's an assessment, you're teaching it, so you grade it on how much they do," instead of saying just (grade on) effort. Now I'm kind of in the middle. Before I was just like (grade on) only effort, but now I'm in the middle cause I understand her point of view.

In her online discussion, Sandra shared a similar viewpoint.

I believe all students are different and it is unfair to test students on health-related fitness. However, it is helpful to track students' progressions and allow them to set goals for themselves. I don't think we should grade them based on performance but instead maybe track their performance throughout the year and grade based off improvements.

Gabriel agreed in his online discussion post that grading on individual improvement is the best option. “When it comes to grading, I feel that you should have a grading scale for every student. What I mean by that is that you should not fail a student because he/she cannot do 10 push-ups. Instead grade the student on the improvement they had from the last time they did push-ups.” Gabriel explained his thoughts further in his interview.

I used to be a big on “Fitnessgram should be tested on effort.” But then I thought about it a little bit more and I'm like, “yes, effort counts and stuff, but, if I'm teaching them every day the proper way of doing it, I have to get in some numbers, so I have to test on some numbers.” My professor actually helped me really think a lot about it. She was telling me about the numbers. I think she likes to advocate for the numbers. She actually changed my mind a little bit.

In her interview Sandra explained how the professor also helped shift her stance on grading.

Because of the PETE program and just being able to talk to other people that are also in the PETE program I got a lot of outside perspectives. One thing that I learned, or well the professor brought this up to us and said that we should start grading fitness tests seriously because it's not fair for us to just give out free (points) for participation. That's why PE isn't really taken that seriously either because they're not actually being graded and it's just really hard to grade somebody on their physical abilities. I don't know, it's just, it's really hard to do that but it's also never going to be better for PE if we don't start taking it seriously like that. So that's something that I did come to realize, maybe she does have a

point because at first, I was on the side of “no, you can't measure people's physical abilities.” It's not fair. Not everybody's the same but I do see both sides now. So yeah, that's something that helped me kind of shape an opinion on fitness testing.

While each PPET shifted their grading perspective because of the PETE program, Fernando still had some concerns surrounding grading and making sure that each of his future students had a positive experience with fitness testing. He expressed his concerns in his questionnaire. “I think overall just finding another way to test students on fitness other than trying to see how many reps they can do is key because in the years to come all this testing could make students hate physical education and that is not the purpose of PE. The purpose of PE is to teach students healthy life habits. So, I think it’s important to find another way.”

After going through the PETE program each of the physical education pre-service teachers has moved from only grading students based on effort to also factoring student performance into the grade.

The pedagogical dilemma refers to a teacher’s process of negotiating and implementing their desired pedagogical practices (Harvey et al., 2015, p. 246). In subthemes 2.1 and 2.2, the PPETs have clearly begun to develop the content knowledge to help them effectively administer fitness testing, but still lack the ability to give students any decision-making power.

### **THEME 3 (PEDAGOGICAL, CULTURAL, AND POLITICAL DILEMMAS): LACK OF PREPARATION FOR ADMINISTERING FITNESS TESTING IN THE FIELD**

After exploring the PPETs personal experience with fitness testing and time in the PETE program, the focus was turned to their experience student teaching in the field. Unfortunately, having limited opportunities to observe fitness testing in the field led to significant barriers and left many unaddressed questions.

The third and final theme main theme, lack of preparation for administering fitness testing in the field had three subthemes: (a) PPETs struggle to identify potential barriers and solutions with stakeholders and administration, (b) PPETs lack differentiation skills and motivation, and (c) PPETs had few opportunities to observe CTs' fitness testing practice during their student teaching.

#### **Subtheme 3.1 (Political Dilemma): PPETs struggle to identify potential barriers and solutions with stakeholders and administration**

Relationships and handling conflicts with administration, parents, and other potential stakeholders are important for pre-service teachers to consider and plan for. During the field placements, the PPETs seldom had the chance to interact with administration or parents. In addition, many of the CTs failed to explain the importance of professionally handling conflict, navigating relationships, and dealing with a lack of administrative support. When asked about how he would interact with future administrators and advocate for fitness testing during his interview, Francisco answered, "Yeah, I really never observed that. I wouldn't have too much information on that one. Maybe explaining the benefits? I think that would probably be the one idea I have." In his interview Gabriel stated he also believes that to advocate for fitness testing he would

share the benefits with his future administration but struggles with preparing for this possible interaction.

You want to have a good relationship with your principal and stuff like that. So, all that comes into play. I would just try and be the most professional I can and be respectful and have something to back my arguments with. I would be like, "okay, this is what I have them doing. It's important." I need to tell them (administration) why it's important. I need to have something to prove to them.

In her interview Sandra shared the same struggles when she described what she would do if she had a principal that did not support her fitness testing the students.

If the school didn't care, that would be very sad first for the students. It would definitely be a challenge to try to get everything done, I guess. But, if you are the teacher, I think you have to overcome those challenges for your students. So, having to go out of your way. I'll do the best I can, I guess. I don't know. That's also hard to think about. If the whole entire school does not like PE or doesn't really care about it or for fitness testing, it's really hard. That's your support system, the school.

Thinking about handling conflict with their future student's parents also proved challenging for the pre-service teachers. During Francisco's interview he explained how he would defend fitness testing to a parent.

I feel like with parents, letting them know that you're doing it (is important). Having good communication with all parents I feel is important. Just saying, "oh, we're doing Fitnessgram testing, this is what's going to be happening." So, they

kind of know more or less like, okay, "this is about to go down" you know, so they have an idea.

He followed up by sharing that he honestly wasn't too sure how he would handle conflict.

I didn't see any conflict going on (in the field placement) and I really don't know how I would deal with it. I don't think I would know until I actually deal with it.

Of course, you want to be as relaxed as possible. You don't want anything to go down of course. But compromising I feel would probably be the best thing.

In her interview, Sandra also struggled to think about how she would handle conflict.

"That's tough because if parents are questioning me.... they should want this (fitness testing) for their kid! I can see them questioning me, but I don't know. That's a hard question." In his interview Gabriel explained how he would defend fitness testing. "I would say something like, "the Fitnessgram is mandatory to do." So, I'm like why... question it? Because then there's going to be someone like, "why do you have my students test?" I'm like, "well, the same way it's mandatory for them to be tested on other subjects. It's the same way here."

When asked if they had seen their CT address any conflicts or gotten any advice on how to handle other relationships, all of the pre-service teachers had the same answer. In her interview, Sandra responded "Not that I can remember. I did see at the high school, the AP (assistant principal) would come in and observe but not during fitness testing. Maybe he does do it during fitness testing, but I wasn't there. I haven't seen any relationships even in the elementary school." Francisco also got right to the point in his interview and stated, "no, she (CT) never explained it (relationships)." In his interview,

Gabriel shared that he did not observe conflict, but he would be able to handle it. “I don't think I'll let that affect me. I mean, it'll hurt me, but I feel like I would want to continue with it (fitness testing) just because I can see student progress and I can see how my teaching can affect a student either positively or negatively. So, I would do my best. That, that's just me.”

Without witnessing conflict or having the CT model or explain relationships, the pre-service teachers were left guessing, sometimes to no avail, as to how they would handle future conflict and lack of support from administrators.

### **Subtheme 3.2 (Cultural Dilemma): PPETs lack differentiation skills and motivation**

After completing their field placements, the physical education pre-service teachers still lack the knowledge, skills, and motivation to differentiate for different student populations. Upon analyzing all data sources, it was evident that they were unable to figure out how to adjust their teaching and planning to allow students to be active learners and construct their own knowledge by engaging in their own interests. During their observation, each teacher explicitly followed the Fitnessgram guidelines and did not allow the students any freedom or flexibility. Francisco's thoughts regarding differentiation during his interview were echoed throughout each data source across all the pre-service teachers. “I feel like everybody should do it (fitness testing) no matter what. Males, females, people who consider themselves another gender, I feel like it's important for them. Everyone should see where they're at. That's the way I see it.”

When asked in his interview about any cultural barriers he noticed in the field, Gabriel shared what he observed.

I would say for elementary and secondary (middle) school, I would say language. Language is a big issue. I was at two title one schools where there were a lot of Hispanic students. They didn't know English, so when the teacher was teaching it in English, they couldn't understand. So, it was a good thing I was there just because I was able to translate and demonstrate. If I wasn't there, students probably wouldn't have learned. So, I would say that's a problem.

When asked what he would do in his own teaching to prevent a situation like this, he responded, "I have this cool ability of being bilingual, so, being there for the student." When questioned further and asked about students who did not speak Spanish or English he responded, "I could have pictures. That could always work. That's all I can think about." Sandra had a similar experience during her fieldwork which she recalled in her interview.

Cultural differences? Yeah, I have not seen any, nor would I know what that looks like for fitness testing...Actually, I did have to translate for one of our third graders. She only spoke Spanish. I remember during the Pacer test you hear the different sounds, and you just hear him talking like, "okay, we're moving on to level" and then "ding." She obviously did not know what the heck he said. So, I had to show it on my phone and be like, "okay, this first noise, that's your start. When you hear this one"- and I would play the other one, and say "okay, that's level whatever." I had to tell her in Spanish. I guess that is one barrier that I did



see. If you don't have a Spanish speaking teacher, you probably only rely on your other Spanish speaking students.

Like Gabriel, Sandra had the same game plan for having future students who spoke different languages.

If I had students that didn't speak English (or Spanish), then I would probably beforehand talk to those students one-on-one and explain it. I did have some students that only spoke Mandarin. So, if I need an outside translator or something, then I would probably do that beforehand so that everybody's on the same page. That's really the only cultural difference I can think of that would probably affect fitness testing.

Francisco could not recall any cultural barriers he observed but did compare the culture of his fieldwork placement school to his own elementary school.

I mean the important thing, I guess this would be from my own experience, back when I was young compared to when I taught. I remember when I was young it (fitness testing) was a lot of my PE teacher correcting us. I grew up in a pretty bad neighborhood. So of course, students, you know, the behavior, it's a little bit worse. When I was teaching, the students were amazing. I knew it was a more of a nicer area. So, students and families were involved and so the students were excited. They already knew what they were going to do. There were no corrections at all. So, I feel like that's more of an area-wise issue as far as cultural differences. I don't know, maybe it might be a little bit of a cultural issue because

like where I'm from, it's more Hispanics, more minorities. When I taught it was predominantly more white students.

Each of the PPETs agreed that in theory, it would be nice to allow students to construct their own knowledge through fitness testing and incorporate student's interests during the testing process. However, when it came down to explaining how they would allow this to happen, the pre-service teachers all agreed that this would require too much work, and it would be easier to follow the traditional Fitnessgram instead. In her interview, Sandra explained how providing a different testing experience for each student based on their needs and interests would not be practical.

I like it, I just don't like it for grading purposes because it's not fair if not all the students are doing the same thing. That's hard. That's a hard question because I do like that. I really like it and I think giving students the option will also increase their want to do it. If they got to choose, I think that would increase participation, and definitely increase scores. If that were the case, then fitness testing would just be more individualized, I guess. It wouldn't be as broad, like my entire class, compared to more this individual student and this individual student, etc. It wouldn't be a bad thing because we're already individual people but it's just harder on the teacher for grading purposes.

In his interview, Francisco shared similar thoughts. "I feel like as far as Fitnessgram and all that, I feel like just staying to the guidelines is a little bit better (than students constructing their own knowledge) just because it's there for a reason. So, I feel like personally, I'll just stick to the Fitnessgram guidelines." He continued by explaining, "I

feel like it's hard to manage if a student wants to do something else. I think it would be cool, but in reality, if a student wants to do something else it might take up too much time. So, as a PE teacher, you might have to work even a little bit harder to do that. I feel like the PE teacher should be the one that's in charge of it instead of the child.” Gabriel agreed with his colleagues when asked if he would let students construct their own testing experience or instead go by the book during his interview.

I would say (test) by the book, but part of me wants to say that I think there are different ways we can test their muscular strength and their flexibility and stuff. I wouldn't want the students to change one of the components for me. I mean this is not how it works. Right? I would like to hear what a student has to say like, "Hey, why don't we try this as flexibility?" Or, “why don't we incorporate this?” But if I had to choose one, I'll just, stick by the book as well. Just follow how it has to be. Despite struggling to figure out how to let students take ownership within fitness testing, the pre-service teachers had a few ideas on how they could incorporate students’ interests during the testing process. In her interview Sandra suggested incorporating characters the students were familiar with and adding technology. “Maybe (have) Minecraft or Mario or some random little characters that would get students interested. Maybe have students run in place and on the screen, YouTube, it just shows they're running through a forest or something when they're really just standing in the gym.” In his interview Gabriel suggested having the students draw or act out different parts of fitness testing. “It's hard just because every student has different interests. They have different experiences. So, I don't know. I would do, for each component, I would think of something completely

different from something else. So, drawing with some acting. That's how I would accommodate something like that. Just what I would like to explore.” In his interview, Francisco explained the importance of finding something to motivate the students.

I feel like the thing with that one is experiences. Some students might not be interested in sports or activities. I don't know that's a hard one. I feel like no matter what different backgrounds, if you're going to teach it, everyone should be doing it and that's the bottom line. What you can change is maybe explaining it like, okay, like this is important because, you know, if you want to get into sports, you got to do these things. If they're not interested in any sports, you can just be like, look, you know, the older you get, the stronger you're going to get and you know, like trying to explain it in a different way. Say you might have to pick up the couch or something, you want to be able to do it. You know, do pushups, and end up helping your mom or something. So, explaining it that way could help as well. You might have to help your mom lift the couch because your mom is old.

### **Subtheme 3.3 (Pedagogical Dilemma): PPETs had few opportunities to observe CTs' fitness testing practice during their student teaching**

Across all data sources it was made abundantly clear that the PPETs had little to no chances to observe the Fitnessgram during their field experience. In her questionnaire, Sandra recapped her elementary field experience.

Unfortunately, I was only able to experience the aerobic capacity test and the muscular strength test during my elementary school placement. For the aerobic capacity section, we used the Pacer test instead of the mile. This was used as a

student learning objective, therefore, my cooperating teacher did not explain the rules as thoroughly. The students were told what the sounds meant, and we emphasized that this test is tracking your pace, and that it is not a race against the other students. The muscular strength test I observed was push-ups. The students were taught the proper form for a push-up, and we allowed modifications where needed.

When asked about her secondary field experience Sandra shared in her questionnaire, “I have not had the opportunity to observe any Fitnessgram tests at the secondary level.” Francisco had a very similar experience in both his elementary and secondary placements. In his questionnaire, he stated, “During my elementary placement I only viewed the pacer test with the 5th graders. All the other exercises I did not see during my placement.” He then explained his secondary experience. “During my secondary placement, which I am currently in, we have not done any pacer tests or fitness testing. They (the teachers) plan on doing it in December.” In Gabriel’s interview, he explained his elementary field experience. “So, in my elementary school, I felt like my CT let the students know it (fitness testing) was important for them. The students knew they were getting tested, and I felt like she did it in a fun way for them.” When asked in his questionnaire what specific tests he saw, he explained that he watched his CT “spend one whole day doing the Pacer test with every single student.” In his interview he recounts his secondary field experience

For my secondary students, of course they knew they were getting tested, but I didn't see any motivation for it. I didn't feel like it was being taught to them

because I did some of the testing. It was a trunk lift and a sit and reach, and I was telling students, “Okay, we're going to do our trunk lift test and we're going to do our sit and reach test for the Fitnessgram.” I had some feedback from them saying “I don't know what this is. I don't know what to do.”

In summary, after analyzing each of the data sources, it was discovered that the only time the PPETs observed the Fitnessgram in its entirety was during the observation when they taught one another.

The political dilemma describes the “aspects of education that are linked with the exercise, distribution, preservation, or redistribution of power among ...participants in an educational enterprise” (Windschitl, 2002, p. 251). As made clear in subtheme 3.1, the PPETs have severely limited experience with stakeholders and are unable to plan for how to negotiate with or handle future confrontations.

The cultural dilemma highlights the struggle teachers face with incorporating different student cultures in their classroom and taking advantage of student's lived experiences (Windschitl, 2002). Subtheme 3.2 brought to light that the PPETs lack the motivation and skills to differentiate for the different students in their classroom.

## Chapter 5: Discussion

### DISCUSSION

The purpose of this study was to investigate pre-service physical education teachers' previous and current perceptions on fitness testing in schools and their level of readiness for implementing fitness testing in the field. The research questions that guided the research study were as follows:

1. How do pre-service teachers' past experiences influence their perception on fitness testing?
2. How did courses help prepare pre-service teachers to administer fitness testing prior to student teaching?
3. How prepared do the pre-service teachers feel, upon completion of student teaching, to administer fitness testing as professionals in the field?

The findings in this study both support and add to the current body of literature discussed in previous chapters. This discussion will address the themes that emerged within the data, the dilemmas they represent, and how these themes match up with or differ from the findings of previous studies published in the literature.

As explored in the literature review, researchers have identified the school physical education teacher as having a vital role in administering fitness testing and setting the tone for the entire process (Silverman et al., 2008; Stanec, 2009). Furthermore, current literature has found that the physical education teacher's own experiences as a child with youth HRFT is often the most significant factor playing into their current attitude on HRFT (Lawson, 1983; Pike & Fletcher, 2014; Pugach, 1992). This same ideal

has been found to be true in PPETs. Even when in a strong Physical Education Teacher Education program, pre-service teacher's own experiences as a K-12 student tend to have the strongest influence on their present attitudes (Garrett & Wrench, 2008b; Liu & Keating, 2021; Pike & Fletcher, 2014; Yan & Brown, 2017). Despite not having a strong field observation experience, each of the PPETs had a positive childhood experience with fitness testing and are anxious to recreate their childhood experience with their future students.

The barriers physical education teachers encounter with fitness testing were reflected in this study. In previous literature, teachers mention a lack of training as a serious factor hindering their ability to conduct HRFT (Bulger et al., 2001; Cale et al., 2014; Cale & Harris, 2009b; Eastham, 2018; Keating & Silverman, 2009; Morrow & Ede, 2009). In this study, the pre-service teachers discussed in-depth how their lack of training and field experience has made them believe that they are unprepared to administer fitness testing in the field on their own.

This study works to fill a gap in the literature by utilizing the dilemma theory. While not commonly used in physical education, the dilemma theory was important in recognizing different barriers the pre-service teachers face within each of the four dilemmas: pedagogical, conceptual, cultural, and political. Given the important role physical education teachers have, it was critical to gauge the PPETs' level of preparedness and determine if they fully understood their role and responsibility in the fitness testing process.



### **Conceptual Dilemma: How do pre-service teachers' past experiences influence their perception on fitness testing?**

As documented in literature, a physical education teacher's current perception on fitness testing is most heavily influenced by their childhood experience (Lawson, 1983; Pike & Fletcher, 2014; Pugach, 1992). This study demonstrated that each PPET had a positive experience with fitness testing, based on their enjoyment for PA and the high scores they achieved during fitness testing. As a result, each PPET currently views fitness testing in a positive light and wants to give their future students the same experience they had.

Within the conceptual dilemma, it is documented that teacher's beliefs, assumptions, and understandings heavily inform their teaching practice (Harvey et al., 2015). In the present study the pre-service teacher's beliefs, often formed based on their personal experience, heavily influenced their teaching practices. Given that the participants' previous fitness testing experiences were associated with high levels of performance in sports programs instead of physical education, it is necessary to ensure that preservice physical education teachers fully understand how fitness tests are used in physical education programs.

### **Pedagogical Dilemma: How did courses help prepare pre-service teachers to administer fitness testing prior to student teaching?**

Research has indicated the importance of coursework in the professional training of preservice physical education teachers (Hodeges et al., 2022; Phelps et al., 2021). In this study, the PETE program and accompanying coursework helped the pre-service teachers understand the fitness testing content and purpose, how to structure grading, and allowed them to develop and identify important characteristics of an effective teacher. Despite having a strong "classroom" experience, the PPETs had a difficult time translating what

they learned in the classroom to the field given that they did not have the hands-on experience to either observe or use fitness tests during their entire student teaching semester. Although all students in the state are required to take part in fitness testing each year and fitness education is part of the curriculum, unfortunately the fitness testing period happened during the transitional time of these preservice physical education teachers. As such, none of them had the field experience with fitness testing in schools. The lack of field experience with fitness testing is documented throughout literature (Hodges et al., 2022; Stephenson, Stark, & Hamilton,) and explained as a “tension in attempting to bridge the often differing cultures of the school and the university” (Behets & Vergauwen, 2006; Harvey et al., 2015, p. 248).

Within the pedagogical dilemma, pre-service teachers learn to “negotiate and implement” their teaching practices, while being influenced by various factors such as their personal beliefs and experiences, coursework, and field experiences (Harvey et al., 2015, p. 246). According to Harvey et al. (2015), in keeping with the present study, past studies have also indicated that a lack of experience teaching, or teaching a specific content, can play a big role in how pre-service teachers navigate different pedagogical issues. It was also found that thoroughly understanding the content was critical for pre-service teachers to first know before approaching other issues. In the current study the pre-service teachers, guided heavily by their own experiences, had a strong content knowledge but were still developing their teaching practices.

**Cultural and Political dilemmas: How prepared do the pre-service teachers feel, upon completion of student teaching, to administer fitness testing as professionals in the field?**

The present study revealed significant gaps in the PPET’s preparation for administering fitness testing due to a lack of fitness testing observation. They struggle to

identify barriers and solutions with administration and stakeholders and lack both differentiation skills and motivation.

When considering other studies using the dilemma theory with pre-service teachers, it was found that this study replicated similar results. It has been documented both in past work and the current study that pre-service teachers struggle with the political dilemma as they are only able to focus on their immediate environment and are unaware of other parties or stakeholders at play (Harvey et al., 2015). Cultural dilemmas also appear to be the most cited dilemma by pre-service teachers as they struggle to work within a “wider cultural context” (Harvey et al., 2015, p 248).

In a similar study, pre-service teachers were asked to teach a physical education class and put the students at the center of the lesson. As a result of not delivering a traditional teacher centered lesson, the pre-service teachers had a difficult time working through different pedagogical barriers and pushing students to be active learners (Harvey et al., 2015). In the present study, the pre-service teachers also had a difficult time solving different problems that arose and allowing students to take an active role in the learning process.

Addressing the political and cultural dilemmas with the PPETs were confirmed to be challenging as they were unable to thoughtfully speak much to either dilemma due to the lack of first-hand experiences during their student teaching, even though they were supposed to observe field fitness testing practice of their CTs'. They expressed feeling unprepared and struggled to think about potential challenges, solutions, and differentiating for a diverse group of students. Without working through these dilemmas

in coursework or fieldwork they couldn't explain what they would do in different challenging situations.

## **IMPLICATIONS**

Even with the compelling evidence advocating for youth physical activity (PA), the current health status and inactivity levels of American children have quickly become a major public health concern (Bulger et al., 2001; Welk et al., 2010). According to the Centers for Disease Control and Prevention (CDC), a 2018 study found that childhood obesity affected approximately 14.4 million children, or roughly 20% of American Youth (Ogden et al., 2020; CDC, 2020). With physical activity being identified as a solution to this crisis, it was critical to examine the PPETs' readiness to implement fitness testing during physical education and the potential impact it could have on their future students.

Despite having a positive experience with fitness testing as a student and a strong knowledge base from the PETE program, the PPETs are not prepared to administer fitness testing in the field and are unable to account for a diverse group of students with different interests. Further action is critical as research has shown that the physical education teacher sets the tone for fitness testing, and negative student experiences can affect students' PA habits for a lifetime (Alfrey & Gard, 2019; Bulger et al., 2001; Cale et al., 2007; Cale & Harris, 2009b; Keating & Silverman, 2004). With alarming childhood obesity numbers, it is crucial that students have a positive experience in physical education and fitness testing, and develop an early appreciation and enjoyment for PA.

This study supports current literature on the topic of PPETs and their level of readiness for implementing fitness testing in the field. There were no studies that used the dilemma theory to study PPETs and fitness testing. The findings give an opportunity for further work with pre-service teachers and fitness testing utilizing the dilemma theory.

#### **LIMITATIONS**

The most significant limitation was that the PPETs had little to no experience observing fitness testing in the field. At the time of the study, they had completed their elementary placements, and had just begun secondary. When the researcher and current PETE instructors investigated why this happened, it was discovered that the majority of the CTs only conduct the Fitnessgram during the spring semester, while this study and all fieldwork was done during the fall. The PPETs might be much more prepared to implement the Fitnessgram had they seen it modeled in the field.

The second limitation was that the PPETs only had experience with the Fitnessgram. Since they all completed their K-12 schooling in the same state they are attending college, the Fitnessgram was all they experienced as a student and during their PETE classes. Not every state uses the Fitnessgram, so if they went to teach in a different state, they could have a different level of readiness based on the fitness test they are required to give.

The final limitation was the small sample size. Since the study was only conducted at one university, only the students enrolled in the PETE program were

eligible to participate. Had the study expanded to different universities, a larger, more diverse sample size could have been achieved.

## **CONCLUSIONS**

The purpose of this study was to investigate PPETs' previous and current perceptions on fitness testing in schools and their level of readiness for implementing fitness testing in the field. By utilizing the dilemma theory, the study examined how each of the 4 dilemmas: conceptual, pedagogical, cultural, and political, played a role in the pre-service teacher's experience in and preparation for fitness testing.

It is encouraging that participants felt the PETE program changed their opinions on how to implement and grade fitness tests in schools. They no longer think it is ok to implement the test without any preparation or grade solely based on student effort. While the PPETs all had a positive experience with fitness testing as a student since they enjoyed physical activity, they lack the confidence and skills necessary to effectively administer fitness testing in the field. Students had strong content knowledge for the five different components of the Fitnessgram, but their lack of observation opportunities have left them guessing as to how they would implement fitness testing in their future classes and account for a diverse group of students.

What made this study unique was that the dilemma theory has seldom been used with PPETs. In this study it was critical to highlight the potential and current dilemmas the pre-service teachers face(d) before having their own classrooms. Understanding what

dilemmas they face and highlighting the gaps in their learning is important for PETE faculty to recognize and address before certifying the pre-service teachers.

#### **FUTURE RESEARCH**

Future research should first be conducted with PPETs who have had the opportunity to observe both elementary and secondary fitness testing in the field. If this study were to be repeated, it would be very beneficial to gather data after the pre-service teachers have had every opportunity to learn and see fitness testing in the field. In addition, it could be informative to collect many rounds of data at various points throughout the field placement to see how pre-service teachers' ideas are shifting. Student perceptions should be gathered before, during, and after placements to note any changes taking place and track the pre-service teacher's progressions.

In this study, the dilemma theory was used to highlight the various dilemmas the PPETs face as they prepare for their future teaching role. Other theories could be utilized to examine other aspects in regard to their future teaching. Future research could use a critical lens to further explore topics such as gender and diversity from a variety of perspectives. Future research could work to uncover why each pre-service teacher views physical activity and fitness testing the way they do, and how that impacts them administering fitness testing to students. Another suggestion would be to examine how each teacher views their role as a physical educator through demographic variables such as race, ethnicity, and gender.

## Appendix

### Item 1 - Discussion Board Prompt

Please answer the following questions:

1. What was your experience with Fitnessgram/fitness testing during your elem. school years? Was it a positive or negative experience? Why?
2. What was your experience with Fitnessgram/fitness testing during your secondary school years? Was it a positive or negative experience? Why?
3. What are the barriers for you to implement Fitnessgram in the school that you are currently student teaching?
4. What is your opinion about using Fitnessgram to test students' health-related fitness?

### Item 2 – Questionnaire

#### Fitness Testing in Schools

**General Information:** Purpose of the assignment: help students independently inquire how fitness tests have been used in elementary and secondary schools, respectively, and the effects of fitness testing on promoting student health-related fitness behaviors.

**Driving question:** How fitness tests are used in elementary and/or secondary physical education programs, respectively, what are the effects of fitness testing on promoting fitness behaviors among elem., and/or secondary school students?

#### Key elements

1. Describe how Fitnessgram is used in elem. and secondary schools, respectively.
2. Explain what barriers teachers have encountered when using Fitnessgram.
3. Identify appropriate use of Fitnessgram



### **Item 3 – Consent Form**

#### **Consent to Participate in Research**

Title of the Project: Pre-Service Physical Education Teachers' Perceptions on Fitness Testing

Principal Investigator: Dr. Xiaofen Hamilton, Ph.D., University of Texas at Austin

Faculty Advisor: Dr. Xiaofen Hamilton, Ph.D., University of Texas at Austin

#### **Invitation to be Part of a Research Study**

You are invited to be part of a research study. This consent form will help you in choosing whether or not to participate in the study. Feel free to ask if anything is not clear in this consent document. This study has been approved by the University of Texas at Austin IRB.

#### **What is the study about and why are we doing it?**

The primary purpose of the study is to investigate pre-service physical education teachers' previous and current perceptions on fitness testing in schools.

#### **What will happen if you take part in this study?**

If you agree to take part in this study, you will be asked to participate in 1 60-minute interview and be observed for 1 45-minute lesson over fitness testing. While all students will take place in the requirements listed above (as part of the course,) only those who want to participate in the research project will allow the research team to compile all data gathered for the study.

#### **How long will this study take and how many people will be in the study?**

The study will take place from September-December 2022 and include 3 participants.

#### **What risks and discomforts might you experience from being in this study?**

There are no known risks.

#### **How could you benefit from this study?**

You will receive no direct benefit from participating in this study; however, participation in this study could help you develop strategies for effectively implementing fitness testing in schools.

#### **What data will we collect from you?**

As part of this study, we will conduct 1 interview after teaching fitness testing, as well as 1 observation. The observation will not be audio or video recorded. Only written notes

will be taken. You will also be asked to complete a discussion board and post and questionnaire.

### **How will we protect your information?**

The following ways will protect the identity and privacy of study participants.

1. Pseudonyms will be used to refer to all participants reports of the research in order to maintain confidentiality.
2. To avoid sharing your personal responses, all information will be transcribed immediately and kept confidential. After transcription by the research team, all audio will be destroyed.
3. All recordings and documentation collected during the study will be maintained in a locked filing system via the program Folderlock.
4. Only members of the research team will have access to the research documents collected
5. All interviews will be conducted in a private room, or private phone/zoom call.

Your name and any other information that can directly identify you will be stored separately from the data collected as part of the project. We plan to publish the results of this study. To protect your privacy, we will not include any information that could directly identify you.

### **How will we compensate you for being part of the study?**

You will not receive any type of payment for your participation.

### **Your Participation in this Study is Voluntary**

It is totally up to you to decide to be in this research study. Participating in this study is voluntary. Your decision to participate will not affect your relationship with The University of Texas at Austin [add as appropriate: and your school, your doctor, or healthcare provider, etc.]. You will not lose any benefits or rights you already had if you decide not to participate. Even if you decide to be part of the study now, you may change your mind and stop at any time. You do not have to answer any questions you do not want to answer.

If you decide to withdraw before this study is completed, please let the program coordinator know and she will not include your data in the study.

### **Contact Information for the Study Team and Questions about the Research**

If you have any questions about this research, you may contact:

Dr. Xiaofen Hamilton

Phone: 512 232 3565

Email: [xk93@austin.utexas.edu](mailto:xk93@austin.utexas.edu)

Brooke Doherty  
Email: [brooke\\_doherty@utexas.edu](mailto:brooke_doherty@utexas.edu)

Contact Information for Questions about Your Rights as a Research Participant

If you have questions about your rights as a research participant, or wish to obtain information, ask questions, or discuss any concerns about this study with someone other than the researcher(s), please contact the following:

The University of Texas at Austin  
Institutional Review Board  
Phone: 512-232-1543  
Email: [irb@austin.utexas.edu](mailto:irb@austin.utexas.edu)

Please reference the protocol number found at the top of this document.

Your Consent

By signing this document, you are agreeing to be in this study. Make sure you understand what the study is about before you sign. We will give you a copy of this document for your records. We will keep a copy with the study records. If you have any questions about the study after you sign this document, you can contact the study team using the information provided above.

I understand what the study is about, and my questions so far have been answered. I agree to take part in this study.

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Printed Subject Name

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Signature

Date

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