AN EXAMINATION OF TEACHER CONFIDENCE AND MOTIVATION TO TEACH PRIMARY SCHOOL PHYSICAL EDUCATION

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Abstract

Primary school physical education can provide important opportunities for children to be active in environments that support the development of movement and sports skills. Research has highlighted that many Australian children display low levels of physical activity and motor co-ordination (Morgan et al., 2013), making the delivery of quality physical education at a primary school level even more important. In Australia, primary physical education is regularly delivered by generalist primary school teachers, who may have limited training in the curriculum area. It appears, however, that the pre-service and in-service generalist teachers who constitute critical factors in the delivery of quality physical education have low levels of confidence and also potentially lower motivation to teach in this domain. Although research consistently confirms lower levels of confidence, the measures used often lack detail of their development and supporting psychometric evaluation. Validity and reliability is not often assessed or reported and measures tend to be narrowly focused on particular areas of physical education. Although confidence has been explored, motivation has rarely been investigated in relation to teaching primary physical education, despite a range of measures of general motivation for teaching. For this reason, validated and psychometrically evaluated instruments to assess the motivation to teach physical education warrant construction.

Developing an instrument that measures both confidence and motivation would be useful because it could allow measurement of the beliefs and expectations influencing decisions of primary teachers towards delivering physical education. Confidence (or self-efficacy) is the cognitive mechanism that mediates between sources of self-appraisal and subsequent motivation. Confidence contributes to motivation in a number of ways including determining goals, intensity of effort applied, level of persistence, and resilience to failure. As a consequence, a teacher's motivation to teach physical education will be

influenced by their confidence to teach physical education. Comprehensive and systematic approaches to developing instruments to assess how beliefs and expectations influence teaching in physical education should include information on both confidence and motivation to teach physical education. Despite the capacity for confidence to have an impact on motivation, both constructs have rarely been examined simultaneously or measures designed that can assess both constructs in the physical education teaching context. This thesis aimed to develop a valid and reliable measure of confidence and motivation to teach primary school physical education and to use this measure to examine both pre-service and in-service teachers' feelings of confidence and motivation to deliver primary physical education. To achieve this, three studies were conducted to develop and refine the measure, explore variables influencing confidence and motivation to teach primary physical education, and produce a model that depicts the relationships between confidence and motivation to teach primary school physical education.

Study 1 focused on the development of the measure of teachers' confidence and motivation to teach primary school physical education. To formulate the confidence section of the questionnaire, an examination of curriculum documents, learning standards and professional standards for teachers was undertaken to create a pool of potential questions related to teaching primary physical education. The motivation section of the questionnaire was constructed in accordance with the frameworks of the Academic Motivation Scale and the Sport Motivation Scale that are based on Vallerand's (1997) interpretation of self-determination theory. Comprehensibility, face and content validity were demonstrated, indicating the questionnaire was a representative measure of confidence and motivation to teach primary school physical education. Participants were 161 pre-service teachers studying an education degree. Exploratory factor analysis (EFA) revealed the confidence section consisted of two factors and the motivation section

consisted of five factors. Adequate internal consistency was found for all of the factors within both sections of the questionnaire with test-retest reliability acceptable for both confidence factors and three of the motivation factors. This study provided preliminary support for the psychometric quality of the confidence and motivation to teach primary physical education questionnaire.

Study 2 extended the findings of Study 1 by refining the measure and examining the variables that may influence confidence and motivation to teach primary school physical education. The questionnaire developed in Study 1 was completed by 211 pre-service and 107 in-service teachers. Confirmatory factor analysis (CFA) was used to verify the factor structure of both the confidence and motivation sections of the questionnaire. The two factor structure of the confidence section of the questionnaire developed in Study 1 was confirmed with acceptable levels of fit achieved within the majority of the fit indices examined (GFI = 0.843; TLI = 0.926; CFI = 0.933; RMSEA = 0.071). The motivation model produced in Study 1 did not achieve acceptable levels of fit so structural changes were made. These structural changes led to six factors being identified; however an acceptable level of fit was still not achieved across all of the fit indices (GFI = 0.839; TLI = 0.891; CFI = 0.907; RMSEA 0.078). All the resultant factors in the questionnaire demonstrated adequate internal consistency. These findings provided positive support for a measure that is under development. The responses to the questionnaire allowed an exploration of how different variables may influence confidence and motivation to teach primary school physical education. Analysis of the demographic variables indicated a variety of personal characteristics can influence an individual's confidence and motivation to teach primary physical education. Differences in confidence and motivation to teach primary physical education were found for pre-service and in-service teacher, gender,

years of teaching, physical education specialist and non-specialist, and level of previous activity instructed.

Study 3 built upon the results of Study 2 by producing a model using the structural equation modelling technique of path analysis to analyse casual links in the relationship between confidence and motivation for teaching primary school physical education. The model also explored how demographic variables (e.g., years of teaching, type of teacher [specialist or non-specialist], activity instructed) influence confidence and motivation in the delivery of primary physical education. Two models of confidence and motivation to teach primary school physical education were examined; Model 1 was a general model that distinguishes between specialist and non-specialist physical education teachers while Model 2 is specific to non-specialist teachers. Both models achieved an acceptable level of fit in the majority of the indices (Model 1 GFI = 0.957; TLI = 0.936; CFI = 0.966; RMSEA = 0.092; Model 2 GFI = 0.949; TLI = 0.902; CFI = 0.953; RMSEA = 0.125). Demographic variables predicted both confidence and motivation, with confidence factors also predicting motivation factors.

This thesis developed a questionnaire to measure confidence and motivation to teach primary physical education. The questionnaire comprised two confidence factors: Management and Planning and Implementation and six motivation factors Intrinsic – Affective (Practice), Intrinsic – Affective (Knowledge), Extrinsic – Student Outcomes, Introjected Performance, Extrinsic – Professional Expectations, and Amotivation. Modelling using the questionnaire suggested that specific demographic variables such as type of teacher (physical education specialists or non-specialist), years of teaching and previous instruction of activity predicted both confidence and motivation with confidence factors also predicting motivation factors. Overall, the findings of the thesis are discussed in terms of the development and refinement of the measure of confidence and motivation

and how variables interacted to influence confidence and motivation to teach primary physical education. Future research directions and implications of the results in relation to professional practices associated with the confidence and motivation to teach primary school physical education are also presented.

Declaration of Authenticity

I, Sharna Spittle, declare that the PhD thesis entitled An Examination of Teacher Confidence and Motivation to Teach Primary School Physical Education is no more than 100,000 words in length including quotes and exclusive of tables, figures, appendices, bibliography, references and footnotes. This thesis contains no material that has been submitted previously, in whole or in part, for the award of any other academic degree or diploma. Except where otherwise indicated, this thesis is my own work.

Signature:  Date: 23/12/15

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CHAPTER 1: INTRODUCTION

Primary physical education can provide important opportunities for children to be active in environments that support the development of movement and sports skills (Cale, Harris, & Chen, 2014; Kirk, 2005; Morgan, 2005; Morgan & Bourke 2008). A child's access to quality physical education, however, varies around the world, which, is in part a result of the on-going marginalisation of the curriculum area (O'Sullivan & Oslin 2012). Research has highlighted that many Australian children display low levels of physical activity and motor co-ordination (Morgan et al., 2013), making engagement within high quality physical education at a primary school level an important factor to facilitate physical activity participation and motor development.

In Australia, as in many countries around the world (Telford et al., 2012; O'Sullivan, & Oslin, 2012), primary school physical education is regularly delivered by generalist primary school teachers, who may have limited training in the curriculum area. Generalist primary teachers have the responsibility of teaching across all curriculum areas, including physical education, and generally do not have specialist training in physical education (Petrie, 2010).

There is some debate in the literature as to whether generalist teachers or specialist physical education teachers are best placed to deliver physical education in a primary school environment (Coulter, Murphy, Mhuine, Sweeney, & Dawson, 2009; Faulkner, Reeves, & Chedzoy, 2004; O'Sullivan & Oslin, 2012). Several studies, however, have highlighted differences in primary school physical education delivery by specialists and non-specialists (e.g., Faucette, McKenzie, & Patterson, 1990; Morgan & Bourke, 2005), and identified deficiencies in the quality and quantity of primary physical education delivered by non-specialists in comparison to specialists (O'Sullivan, & Oslin, 2012).

Particular difficulties confronted by generalist teachers in effectively teaching primary physical education, including insufficient training, inadequate preparation, limited continuing professional development, deficient infrastructure, a scarcity of resources and support, a lack of time and interest, and the distinctive nature of physical education (Hardman & Marshall, 2006; O'Sullivan & Oslin, 2012; Rink & Hall, 2008; Telford et al., 2012). These barriers may influence confidence (Morgan & Hansen, 2005) and, potentially, motivation to teach physical education. As a consequence, those pre-service and in-service generalist teachers, who play a critical role in the delivery of quality physical education, may experience lower levels of confidence and motivation to teach primary physical education than their specialist counterparts, which as a consequence may have a negative effect on the quality and quantity of primary physical education (O'Sullivan, & Oslin, 2012).

Research has consistently confirmed lower levels of confidence in teaching physical education (Morgan & Bourke, 2005; 2008; Morgan & Hansen, 2008; Callea, Spittle, O'Meara, & Casey, 2008), however, the measures used to assess confidence have generally lacked developmental detail and supporting psychometric evaluation. Validity and reliability are not typically assessed or reported and measures tend to be narrowly focused on particular areas of physical education (e.g., the practical content areas) and not on the range of tasks involved in teaching physical education (e.g., planning lessons, performing assessment). Consequently, the development of a psychometrically validated measure of confidence to perform a range of tasks involved in teaching primary physical education is critical in advancing our understanding of confidence in teaching primary physical education.

Motivation has been studied extensively in relation to the student experience; however, the examination of motivation in teaching is quite scarce in comparison (Kaplan,

2014; Roth, 2014). Research on motivation in relation to teaching primary physical education has rarely been investigated, despite a range of measures of general motivation for teaching being available. As motivation refers to an intention to act (Gredler, Broussand, & Garrison, 2004), a teachers' motivation is an important psychological factor that influences whether physical education is delivered in primary schools, and warrants investigation. Recent research into motivation has been concerned with the quality of motivation and not the quantity, making the type of motivation underlying the behaviour important (Roth, 2014). It is imperative, that the types of motivation driving behavior in teaching primary physical education are explored. Despite the great deal of attention on autonomous motivation in teacher practice and its impacts on student outcomes there is a scarcity of research concerning teacher's autonomous motivation. As confidence is a mechanism that mediates motivation (Feltz & Oncu, 2014), the lower levels of confidence experienced by generalist primary teachers may relate to different motives to develop their physical education capabilities and subsequent choices around the delivery of physical education. To further understand the nature of motivation to teach primary physical education, a psychometrically evaluated instrument to assess motivation to teach physical education warrants construction.

Developing an instrument that examines both confidence and motivation would be advantages as it would allow the measurement of the beliefs and expectations influencing decisions of primary teachers towards delivering physical education. Confidence (or self-efficacy) is the cognitive mechanism that mediates between sources of self-appraisal and subsequent motivation, thus confidence contributes to motivation in a number of ways including determining goals, intensity of effort applied, level of persistence, and resilience to failure (Feltz & Oncu, 2014). As a consequence, a teacher's motivation to teach physical education may be influenced by their confidence in that domain. Despite the capacity for

confidence to impact upon motivation both constructs have rarely been examined simultaneously or measures designed that can assess both constructs in the physical education teaching context. There is a need for research to address issues around the relationships between processes in teaching, such as confidence and motivation and the relationships between confidence and motivation with experiences and actions (Kaplan, 2014). Comprehensive and systematic approaches to developing instruments to assess how beliefs and expectations influence teaching in physical education should include information on both confidence and motivation to teach physical education.

An individual's characteristics such as their background and previous experiences have been identified as important components that can affect the learning and teaching process (Morgan & Bourke, 2008), which could include confidence and motivation to teach primary school physical education. For example, differences have been found in levels of confidence (self-efficacy) for pre-service or in-service teachers based on teaching experience (De La Torre Cruz & Arois, 2007), and prior experience in the content domain (Carney & Chedzoy, 1998). Differences in motivation have also been found in physical education specialists for year of degree (Spittle & Spittle, 2015; Zach, Harari, & Harari, 2012) and level of interest in sport and physical activity (O'Sullivan, MacPhail, & Tannehill, 2009; Spittle, Jackson, & Casey, 2009). As such it is essential to consider how variables such as prior experience, training, and teaching area specialisation can influence an individual's confidence and motivation to teach primary physical education. Models of the interactions between personal characteristics and previous experience, confidence and motivation; and the causal links between these factors could help to clarify the relationship operating among these processes in the delivery of primary physical education.

There are challenges to conducting research in teacher education (O'Sullivan & Penney, 2014), however scholarship and research on pre-service teacher education, and in

physical education in particular, is critical to inform practice The development of a psychometrically validated measure of both confidence and motivational processes in teaching primary physical education and a model of the relationships operating in relation to confidence and motivation should extend our understanding of the confidence and motivation of specialist and non-specialist teachers in teaching physical education in primary schools. This understanding should support research and strategies to help optimise both confidence and motivation towards the curriculum area of physical education in primary schools. Determining the confidence and motivation of pre-service and in-service teachers and developing methods of assessing that confidence and motivation may provide supportive opportunities for teachers to increase their confidence and regulate their motivation to support the delivery of quality of physical education in primary schools.

Aims of the Research

The aims for this thesis are primarily linked to the development and evaluation of a measure of confidence and motivation to teach primary physical education and to use this measure to examine both pre-service and in-service teachers' feelings of confidence and motivation to deliver primary physical education. To achieve this, three studies were conducted to develop and refine a measure, explore variables influencing confidence and motivation to teach primary physical education, and develop a model that examines the relationships between confidence and motivation to teach primary school physical education.

Study 1 (Chapter 3) focuses on the development of the measure of teachers' confidence and motivation to teach primary school physical education. The aim of Study 1 was to:

i. Develop a valid and reliable instrument to measure teachers' confidence and motivation to teach primary physical education.

Study 2 (Chapter 4) extends the findings of Study 1 by refining the measure and examining the variables that may influence confidence and motivation to teach primary school physical education. The aims of Study 2 were to:

i. Further evaluate the psychometric properties and factor structure of the questionnaire; and

ii. Examine how types of confidence and motivation differ in relation to various personal characteristics and experiences, such as pre-service or in-service teacher's gender, years of teaching, year of degree, physical activity instructed, and type of teacher (specialist physical educator or non-specialist/generalist).

Study 3 (Chapter 5) builds upon the results of Study 2 by producing a model of the relationships between confidence and motivation for teaching primary school physical education. The model also explored how demographic variables influence confidence and motivation in the delivery primary physical education. The aims of Study 3 were to:

i. Develop a model that depicts the interaction of personal characteristics and previous experience, confidence and motivation; and

ii. Establish the causal links in these relationships which affect both confidence and motivation to teach primary physical education.

Thesis Structure and Chapter Organisation

Subsequent to this introductory chapter to the thesis, Chapter 2 provides a review of the literature on confidence and motivation related to teaching physical education. The review of literature discusses important concepts related to a theory of confidence, social cognitive theory and theories of motivation including the self-determination continuum, measures of confidence and motivation, research in teaching practice related to confidence

and motivation, physical education as a curriculum area, the importance of physical education, and research in physical education teaching practice related to confidence and motivation. Chapter 3 (Study 1) outlines the development of a questionnaire for measuring confidence and motivation to teach primary physical education and initial psychometric testing of the measure for reliability and validity, including exploratory factor analysis (EFA). Chapter 4 (Study 2) further investigates the development of the questionnaire and details a second phase of psychometric analyses of reliability and validity, including confirmatory factor analysis (CFA). Variables that may influence confidence and motivation to teach primary school physical education are also investigated. In Chapter 5 (Study 3) the structural equation modelling technique of path analysis is used to produce a model of the relationships between confidence and motivation for teaching primary school physical education. Models are developed for teachers in general and for non-specialist physical education teachers specifically. All three studies (Chapters 3-5) examine confidence and motivation in teaching primary physical education, with Chapters 4-5 (Studies 1 and 2) exploring the development of a measure, and Chapter 5 (Study 3) outlining a model of confidence and motivation in teaching primary physical education. Chapter 6 summarises, links, and integrates the findings of the studies, whereby implications for theories of confidence and motivation, practical applications, future research directions, and conclusions are presented and discussed.

CHAPTER 2: LITERATURE REVIEW

Engaging and high quality primary physical education programs play an important role in influencing lifelong health and physical activity attitudes and behaviours of students (Cale et al., 2014; Kirk, 2005; Morgan et al., 2013; Morgan & Bourke, 2008). Consequently, it is imperative that students have positive learning experiences during physical education through their primary school years. In Australia, it is common for primary schools not to have specialist physical education teacher or to have limited access to one, as a result, generalist primary teachers are often required to deliver physical education (O'Sullivan & Oslin, 2012; Telford et al., 2012). Inadequate training, a lack of time, limited resources, support and the distinctive nature of physical education (Morgan et al., 2013; O'Sullivan, 2006; Pickup, 2012) means that some generalist teachers often lack confidence to teach physical education. Confidence is considered to impact on motivation; low levels of confidence could result in a lack of motivation of teach physical education, which, could then influence the delivery of quality primary school physical education. This literature review will begin by exploring the constructs of confidence and motivation, the assessment of these constructs in psychology and education, physical education as a distinct area of the curriculum, and research in relation to general and physical education teaching practices associated with the constructs of confidence and motivation.

Defining Confidence and Motivation

Confidence. Confidence is defined as a "feeling of assurance, or conviction in someone, or something" (Cashmere, 2008, p.108). Duda and Treasure (2010) suggested a person who excels in their field is represented by an image, which includes this 'assurance', or confidence. Confidence has also been defined simply as an "individual's overall attitude towards their capabilities" (Duda & Treasure, 2010, p. 60).

Self-efficacy is closely related to confidence and is defined as "belief in one's capabilities to organise and execute the courses of action required to produce given attainments" (Bandura, 1997, p.3). Continuing from the overall concept of confidence, self-efficacy is specific to a particular skill and situation (Cashmere, 2008; Duda & Treasure, 2010). For example, teaching the skills associated with a particular content area in physical education such as gymnastics or athletics. In an applied context, the confidence of a teacher to teach physical education could be divided into their perceived belief about their ability to complete a range of tasks and situations that are specific to teaching physical education. Efficacy beliefs are thought to influence the challenges people undertake, the effort they expend in the activity, and their perseverance in the face of difficulties (Feltz & Oncu, 2014). "Self-efficacy judgements are important factors affecting motivation in areas ranging from academic tasks to career choice to athletic performance" (Alderman, 2013, pp.69-70).

Motivation. Motivation can be broadly defined as 'the attribute that moves us to do or not to do something' (Gredler et al., 2004, p.106). Deci and Ryan (1985) have described this attribute as being the cause of behaviour, which is undertaken to fulfil our needs. It is a multi-faceted construct that consists of beliefs, perceptions, values, interests, and actions.

The complex nature of motivation has led to various types being identified (e.g., intrinsic motivation and extrinsic motivation) along with several theories of motivation (e.g., self-determination theory, [Deci & Ryan, 1985], achievement goal theory [Dweck. 1986; 1992]) pertaining to achievement (Cokley, 2015). Motivation has also been conceived as lying on a continuum of self-determination. "Intrinsically motivated behaviors are performed out of interest and curiosity, that is, for their own sake" (Van den Berghe, Vansteenkiste, Cardon, Kirk, & Haerens, 2014b. p. 98). "Extrinsic motivation is evident when individuals perform an activity because they value its associated outcomes

(e.g., public praise, extrinsic rewards) more than the activity itself" (Ntoumanis & Mallet, 2014; pp. 69).

Theories

Confidence.

Social cognitive theory. The concept of self-efficacy was developed within the framework of a larger social cognitive theory (Feltz & Oncu, 2014). This theory views individuals as being in charge of their own cognitions and functions and allows for the reflection and evaluation of peoples' capabilities, the planning of future actions and the regulation of behaviour (Feltz & Oncu, 2014). Self-efficacy is considered to be the cognitive mechanism that mediates sources of an individual's self-appraisal and their subsequent motivation, and as a consequence their thought patterns, emotional reactions, and behaviour (Feltz & Oncu, 2014). Efficacy beliefs influence goals and aspiration (Bandura, 2004) and result from an individual making a self-appraisal based on the cognitive processing of efficacy information available from the environment (Bandura, 1997). Individuals are more likely to undertake tasks they are able to handle based on their skill level, but avoid tasks that require greater skills than they possess (Alderman, 2013). Self-efficacy beliefs also shape the outcomes people expect from their efforts; those with high efficacy expect positive outcomes and those with low efficacy expect negative outcomes (Bandura, 2004). Efficacy is believed to affect four major psychological processes of human functioning; cognitive processes, motivational processes, affective processes, and selection processes.

Cognitive processes. Cognitive processes are the thinking processes, which involve the attainment, organisation, and use of information (Bandura, 1998). Self-efficacy beliefs can have a large impact on cognitive processes as human behaviour is influenced by forethought, which often takes into account our values and goals. These goals are

frequently influenced by self-appraisal of personal capabilities. For example, if an individual has a high perceived self-efficacy they may set greater goals or challenges for themselves in relation to a situation or task. This high self-efficacy also tends to indicate a higher level of commitment to ensuring the goals are achieved compared to an individual with lower self-efficacy beliefs (Bandura, 1997, 1998, 2004).

Thought enables individuals to predict and control the way the different events can affect their lives. Research has found that a person with high perceived self-efficacy can remain on task when faced with unexpected situations, failures, and setbacks that include considerable repercussions (Beach, Barnes, & Chirstensen-Szalanski, 1986). Teachers are sometimes forced to deal with complicated tasks in difficult environments and under demanding circumstances. Consider a generalist primary teacher with limited physical education experience; they would complete the majority of their teaching in a classroom environment. When required to teach a physical education lesson, this would be outside their normal teaching environment as these lessons are often taught in a range of spaces including the gymnasium, oval or other hard surface space outside. As a result, this may cause an individual with lower self-efficacy to become inconsistent in their analytic thinking, make poor decisions due to pressure and lower their goals and quality of performance. On the other hand, an individual with higher self-efficacy is likely to continue to try and accomplish challenging goals and use good analytic thinking, resulting in a high standard of performance being achieved along with their desired goals (Bandura, 1998, 2004).

Motivational processes. Motivation is the activation of putting thought into action. An individual's perceived self-efficacy is a vital component contributing to an individual's level of motivation (Bandura, 1997, 1998). Forethought is not only responsible for guiding the action of an individual, but it also motivates a person. Individuals often anticipate the

likely outcomes based on their own beliefs, and as a result, this acts as motivation to succeed at a particular task (Bandura, 1997). Perceived self-efficacy contributes to motivation in a number of ways. It determines the goals a person sets, how much effort they apply to a task, how long they continue to persist when difficulties arise, and an individual's resilience to failure. Research (e.g., Lim-Teo, Low, Wong, & Chong, 2008) has demonstrated that individuals feel and act more motivated when they think they have the competence to meet the demands of the task at hand and believe they have some control in regard to participation (Alderman, 2013; Duda & Treasure, 2010). Competence and control are described by Deci and Ryan (1985) as basic human needs for which we all strive to satisfy. The assumption that perceptions of ability and autonomy are critical to motivational patterns is fundamental to a number of popular contemporary theories of motivation (Duda & Treasure, 2010).

Affective processes. Affective processes regulate emotional states and stimulate emotional reactions. An individual's belief in their ability to cope in difficult or threatening situation may affect the amount of stress they experience. Self-efficacy to control stressful circumstances is vital in controlling anxiety. An individual with low self-efficacy may become so distressed that they are unable to continue with the task at hand and may avoid similar situations in the future. In contrast, an individual with high self-efficacy is less likely to avoid a situation or experience anxiety, therefore, such an individual is more willing to try more threatening activities (Bandura, 1997, 1998). For example, a primary school teacher who is accustomed to a classroom teaching environment that is structured and students are in designated places, may feel threatened by having to deliver physical education content they are not familiar with, in an unfamiliar environment where it can potentially be harder to maintain class control.

Selection processes. An individual's perceived self-efficacy can impact on the types of activities and environment in which a person chooses to participate. Research has found that individuals choose to avoid activities and situations they believe are not within their coping capabilities (Bandura, 1998). For example, a primary school teacher with low self-efficacy towards teaching specific content areas of physical education may avoid these activities (e.g. gymnastics or swimming and water safety), or due to the environment in which physical education is taught and their feelings towards physical education, they may not teach it at all. A teacher with higher self-efficacy is likely to be more willing to attempt tasks and put themselves in diverse situations because they feel they are capable of doing so and being successful. In making a conscious effort to attempt a range of different tasks and activities, an individual is able to develop another range of skills, abilities and interests. If individuals believe they have the ability to produce a desired outcome through their actions, they are more likely to act and persevere in the face of difficulty. If generalist primary school teachers do not believe they will be able to successfully conduct a physical education class that will be engaging and a positive learning experience for all, they may have little incentive to continue to deliver lessons in the content area. Lack of confidence can even lead to teachers avoiding teaching physical education altogether in primary schools, which Morgan and Bourke (2008) characterised as a non-teaching ideology.

Conceptual model of self-efficacy. There are a variety of antecedents that influence an individual's self-efficacy. Bandura's (1977, 1997) conceptual model of self-efficacy brings together the concepts of confidence and expectations, outlining the main sources of information on which expectations are based (Weinberg & Gould, 2015). If Bandura's (1977, 1997) theory was applied to the scenario of a generalist primary teacher having to deliver a physical education lesson they would base their expectations on their ability to successfully complete this task on information from performance accomplishments,

vicarious experiences, verbal persuasion, imaginal experiences, physiological states, and emotional states.

Performance accomplishments. Performance accomplishments are believed to be the most influential determinant of self-efficacy (Alderman, 2013; Duda & Treasure, 2010) as they are based on an individual's mastery experiences (Weinberg & Gould, 2015; Feltz & Oncu, 2014). They are direct evidence of whether an individual has the required skills to be successful at the task (Alderman, 2013). If experiences are generally successful they may raise an individual's level of self-efficacy, 'success breeds success' (Duda & Tresaure, 2010, p.59) and if these experiences are seen as failures self-efficacy will decrease (Feltz & Oncu, 2014). It is the interpretation of the experience that is a direct influence on efficacy and not the source itself (Bandura, 1997). Research has identified mastery experiences and social/verbal persuasion as important sources of self-efficacy for pre-service teachers (Mulholland & Wallace, 2001; Onofre & Jardim, 2008; Poulou, 2007).

Vicarious experience. Vicarious experience refers to watching someone else perform a skill (Spittle, 2013). For example, a teacher watching another teacher deliver a lesson in physical education so that they are able to learn from their observation (Duda & Treasure, 2010). This gives teachers the opportunity to learn about a variety of factors such as how to instruct a specific set of skills, how to teach in a non-classroom based environment, and how to manage students in this environment. Efficacy is moderated by the degree to which the observer identifies with the performer (Bandura, 1977; Martins, Costa, & Onofre, 2015); the more closely the observer identifies with the performer the greater the impact on efficacy. When a performer who the observer identifies with is successful or performs well, efficacy is enhanced with the reverse being the case if the performance is poor or difficulties occur (Alderman, 2013). For example or this implies, a primary generalist teacher's efficacy could be more influenced by watching another

primary generalist teach physical education compared to observing a specialist physical education teacher. The success or failure of this generalist may then have the potential to increase or decrease the efficacy of the observing teacher.

The opportunity to watch another teacher deliver physical education is most likely to occur during teaching rounds or practical placement while completing an undergraduate degree. This could be very important in the level of efficacy that is developed, as Hoy (2000) describes the time in which teachers are training and the induction years as the most crucial in teacher efficacy development. Bandura's theory of self-efficacy supports this through the suggestion that efficacy may be most impressionable in early learning, making the years of training and the first years of teaching critical to long-term efficacy development (Martins et al., 2015). If while on teaching rounds a student teacher observes their mentor teacher attempt and fail to deliver an effective physical education lesson their efficacy towards teaching this content area of the curriculum may be negatively impacted. Similarly if they don't have opportunities to observe successful teaching experiences in physical education, they are unlikely to develop efficacy expectations towards this content area.

Verbal feedback. Verbal feedback, or sometimes called verbal persuasion, includes evaluative feedback, expectations by others, self-talk, and other cognitive strategies (Feltz & Oncu, 2014). This feedback or motivational statements from a credible source (e.g., an experienced teacher) can have a positive impact on an individual's self-efficacy (Martins et al., 2015; Weinberg & Gould, 2015). A 'boost' in someone's self-efficacy through verbal persuasion can lead to a person attempting a new task, trying new strategies, or applying themselves to ultimately achieve success (Bandura, 1982). The more credible the sources, the stronger the efficacy information is to the individual.

Imaginal experience. Imaginal experiences are believed to impact on an individual's perceived self-efficacy as many situations are processed as anticipatory scenarios. If the individual imagines themselves performing successfully in the situation the expectations may be increased; conversely negative images may reduce self-efficacy (Spittle, 2013). For example, if the primary teacher imagines a successful physical education lesson, they may be more likely to have expectations that they can effectively deliver the lesson than if they have imagined negative outcomes for a lesson.

Physiological state. An individual's physiological state "corresponds to the internal signs that a person experiences during the course of action that contributes to reinforce competence self-perception" (Martins et al., 2015, p.264). Self-efficacy is influenced when individuals associate negative physiological arousal with poor performance, perceived incompetence, and perceived failure. In contrast, if physiological arousal is seen as positive or facilitative to performance self-efficacy can be enhanced (Weinberg & Gould, 2015). If a teacher perceives their nervousness prior to teaching physical education as them being stressed and anxious, this could make them feel less confident. If, however, the teacher perceived this nervous energy as being "ready to go" then their efficacy may be enhanced.

Emotional state. An individual's emotional state prior to attempting a task is also important to take into consideration, as this may affect an individual's level of perceived self-efficacy and their ability to be successful at the task. For example, if a teacher is in a bad mood or has been having a bad day or week, they may be more likely to feel less efficacious and positive about delivering a physical education lesson than if they are in a good mood.

Self-efficacy applied to teaching practice. Self-efficacy is described as 'perceived operative capability' (Bandura, 1997). In education, self-efficacy is a context- and task-specific level of self-confidence (Bandura, 1977) and has a strong relationship to

performance (Moritz, Feltz, Fahrbach, & Mack, 2000). When applied to teaching, teacher self-efficacy is defined as "a teacher's belief in his or her ability to affect change in students' learning outcomes" (Garvis & Pendergast, 2010, p.7). Teacher self-efficacy focuses on the teacher's beliefs in their ability to elicit change and less on their actual abilities (Bandura, 1977). Teacher efficacy has two components (Ashton & Webb, 1986); the first refers to general teaching efficacy or beliefs about what teachers can accomplish in general, while personal teaching efficacy is a judgement about the extent they can affect student learning (Alderman, 2013). As self-efficacy is a predictor of future actions, high levels of self-efficacy are desirable as they allow teachers to make decisions about what they are capable of while performing a task or solving a problem and have the required knowledge and skills to execute the solution effectively (Garvis & Pendergast, 2010).

Bandura's (1997) antecedents are critical to understanding teacher self-efficacy. It has already been established that mastery experiences are the most influential antecedent in self-efficacy development and this is also true when examining teacher self-efficacy. In teaching, these experiences occur when a teacher perceives their teaching as having a positive influence on student learning outcomes. Such an experience can create confidence about similar future teaching tasks leading to increased motivation to continue teaching at this level. This increased confidence can also result in teachers persisting with tasks they may initially find challenging (Tschannen-Moran, Hoy, & Hoy, 1998). The other antecedents (vicarious experiences, verbal persuasions and physiological arousal) are also influences on teacher self-efficacy (De Vries, 2013) and should be considered when attempting to further current understanding of teacher self-efficacy.

Motivation. Motivational theories have been proposed to explain why behaviour occurs, and have fallen along a continuum ranging from mechanistic theories to organismic theories. Mechanistic theories view behaviour as being entirely controlled by outside

influences, while organismic theories propose that individuals manipulate their environment to meet their needs (Deci & Ryan, 1985). Initial ideas of motivational theory were influenced by Freud (1925) and Hull (1943), who proposed that organisms have innate drives, and behaviour is instigated to reduce these drives (Deci & Ryan, 1985).

Theories intended to explain motivation in achievement situations have consisted of drives and "action" (Atkinson, 1957 as cited in Molden & Dweck, 2000). Individuals are believed to seek achievement because they have an emotional desire or a 'need' for it (McCelland, Atkinson, Clark, & Lowell, 1953 as cited in Molden & Dweck, 2000). Initial theories of achievement identified basic motives that have now been expanded on to include a greater breadth of psychological mechanisms believed to be included in achievement motivation (Molden & Dweck, 2000). Achievement motivation has been used to examine motivation for learning and more recently teaching.

A drives based approach, however, fails to explain why individuals engage in play and exploration type behaviour and as such the concept of intrinsic motivation was developed (Deci & Ryan, 1985). Self-determination theory (SDT) was initially developed to investigate how external events impact intrinsic motivation, and has expanded to the extent that it has become a wide reaching theory concerning motivation and personality (Deci & Ryan, 1985).

Achievement motivation. Achievement motivation explores how people approach or avoid certain achievement situations and refers to an individual's "effort to master a task, achieve excellence, overcome obstacles, perform better than others, and take pride in exercising talent" (Weinberg & Gould, 1999, p.73). Achievement motivation relates favourably to the physical education environment, as variables in an individual's achievement behaviours are visible, whereas in some other learning areas such as mathematics, performance is not always visible to others. Thus, the need to demonstrate

competence is vital. Physical education's practical nature means an individual's performance is always on display. In this environment some individuals will be motivated by internal factors, such as pleasure and satisfaction; whereas others will be motivated by external factors, such as rewards, praise and social recognition. These factors, both internal and external, can influence an individual's level of intrinsic motivation and can also impact on initial and continued physical activity participation.

Achievement goal theory. The Achievement Goal Theory (AGT) has featured heavily in the motivational paradigm in the area of physical activity and sport psychology in the past two decades (Harwood, Cumming, & Fletcher, 2004; Roberts, 2001; Roberts & Papaioannou, 2014). It has had a less significant impact in the area of physical education with limited research in education relating directly to the content area (Gimeno & Garcia-Mas, 2010). AGT is centred on the premise that motivation and achievement-related behaviours can be explained by considering the reasons or purpose for engaging in an academic task (Ames, 1992a; Cho, Weinstein, & Wicker, 2011; Dweck, 1986). As individuals enter situations for various reasons, it is possible that they will interpret achievement differently and have different ideas about what causes success and failure (Molden & Dweck, 2000). It is, therefore, important to consider someone's reasons or purpose for engaging in a task, as this could identify the achievement behaviour. Pre-service teachers have identified reasons, such as having a career that allows them to be physically active and to emulate a positive role model as reasons for undertaking a physical education degree (O'Sullivan et al., 2009; Spittle et al., 2009). Someone who has chosen the profession to be physically active may measure achievement as being an active participant while teaching or by simply having a job that lets them be active. Alternatively, someone who chooses teaching to emulate a role model may not see having a physically active job as an achievement.

Early research into AGT was based on the notion that individuals engage in academic tasks for one of two reasons or purposes. These reasons were identified as being either task goal orientations or ego goal orientations (Nicholls, 1989), and more recently described consistently as mastery goal orientations and performance goal orientations (Butler, 2007; Wolters, 2004; Zusho & Clayton, 2011) or mastery and ability goals (Ames, 1992a, 1992b). Mastery goals see an individual attempt to acquire or improve an ability, whereas performance goals, see an individual attempt to outperform others, or mask inferior ability (Ames & Ames, 1984; Dweck, 1986; Nicholls, 1984; Nicholls, 1989; Zusho & Clayton, 2011). Both goals have been identified as important determinants of students' motivation and learning (Zusho & Clayton, 2011).

The two goal orientations "have been shown to be orthogonal from a statistic point of view (Nicholls, 1989) so that each individual presents both orientations, with the intensity of the motivational pattern (mastery and performance simultaneously) being able to vary" (Gimeno & Garcia-Mas, 2010, p. 584). This means that a certain amount of each orientation is present when individuals engage in physical activity and is expressed in the various sports practiced. Based on this, it is important to explore the interaction between the objectives of execution and results, and trying to investigate how these objectives must be combined in order to increase motivation and improvement (Harackiewicz, Barron, Pintich, Elliot, & Thrash, 2002).

Goals have the ability to create defined motivational systems, which students often use to define and evaluate success, process information, and control behaviour, which highlights their importance (Butler, 2007). Mastery goals are self-referenced, with the evaluation of competencies being relative to the demands of the task, outcomes attributed to by effort, and by seeking assistance when needed (Alderman, 2013). Self-referenced activities often have a greater adherence (Ntoumanis, 2001) as individuals are able to

compare themselves against self-referenced criteria, of which they have greater internal control (Gill, 2000; Weinberg & Gould, 2015). These types of activities also promote task engagement and intrinsic value for learning (Alderman, 2013). Performance goals are ability-referenced and orientate students to define and measure their competencies in comparison to others, and that only one person can be the best (Anderman, Austine, & Johnson 2001). This may negatively affect motivation and lead to participation drop out if competence is not perceived. A student who, when receiving their mark for an assignment is more concerned with how they did compared to their peers as opposed to viewing the mark as a reflection of their effort or knowledge, is performance goal orientated.

Previous research measuring an individual's goals has found that those who have an orientation toward a performance goal are more affected by failure than those who have a mastery orientation (Roberts & Papaioannou, 2014). When an individual is primarily concerned with demonstrating their level of ability and is unsuccessful they are more likely to see this failure as measuring an aspect of themselves and may experience feelings of disappointment. When individuals are more concerned "with increasing their level of ability, setbacks are more likely to be seen as a natural part of learning – as information about their effort or strategy – and as an incentive for greater effort" (Molden & Dweck, 2000, p.134). This is further supported by findings that performance goal orientations are associated with lower levels of task enjoyment and a reduced desire to continue when success has been achieved or setbacks have been encountered compared to those with mastery orientations (Hulleman, Schrager, Bodmann, & Harackiewicz, 2010). Categorising mastery orientations as potentially positive and performance orientations as potentially negative or harmful could allow for a motivational environment to be created "which considers winning or losing as an undesirable educational experience, if the aim, in

general, is to promote the adherence and continuity of a sportsperson or physical education student in the initiation years" (Gimeno & Garcia-Mas, 2010, p. 585).

When entering an achievement situation with a strong orientation towards a performance goal, an individual can sometimes experience an impaired performance along with diminished intrinsic motivation compared with those who enter situations with a desire to learn (Alderman, 2013; Molden & Dweck, 2000). With regard to generalist teachers, this could mean those who enter a situation, such as teaching a physical education class, with the intention of not demonstrating their incompetence, are more likely to experience low levels of enjoyment towards the task and may wish to discontinue teaching physical education whether success has been achieved or not. If the individual perceives failure to have occurred they are likely to see this as a direct reflection upon themselves. If generalist teachers could be encouraged to look at teaching a physical education class as a learning exercise and take a mastery orientation towards the situation they would view their setbacks and times when things haven't gone to plan as a part of the learning process. Continued engagement in the task of teaching a class would provide information to the individual about their effort or strategy and encourage incentive for greater effort.

Student motivation for participation in physical education has been explored using the theoretical framework of AGT (Carpenter & Morgan, 1999, Corrion, D'Arripe-Longueville, Chalabaev, Schiano-Lomoriello, Roussel, & Cury, 2010; Gimeno & Garcia-Mas, 2010; Halvari, Skjesol, & Bagoien, 2011; Treasure and Roberts, 2001; Warburtton & Spray, 2013; Xiang, Bruene, & McBride, 2004; Xiang, McBride, & Solmon, 2003). Research conducted in physical education environments has suggested a positive link between task orientations and intrinsic motivation (Treasure & Roberts, 2001; Zahariadlis & Biddle, 2004). Zahariadis and Biddle (2004) found that a task orientation was related to skill development and team motives, indicating that motivation as likely to enhance

through the promotion of task orientation, as it facilitated greater effort and improvement motives. A similar study also conducted in a physical education environment (Treasure & Roberts, 2001) found that high-task orientated students believed that success was achieved by intrinsic interest and high effort. These factors are all within an individual's control, which has the potential to enhance individual self-determination. Gill (2000) stated that "task orientation offers a sense of internal control leading to greater intrinsic motivation" (p.122); therefore, if a student feels they have greater control over the perceived outcomes of a unit, this might positively enhance their motivation for continued physical activity participation.

Recently, researchers have begun to extend AGT to try to explain motivation of teachers to teach (Butler, 2007, Butler, 2012, Butler & Shibaz, 2008; Malmberg, 2008). Butler (2007) proposed that the goal structure of a classroom is also an achievement arena for teachers, who aim to be successful in their profession. It would, however, be expected that a teacher's goals and success would be different to students in this environment.

Intrinsic motivation. An important aspect of motivated behaviour in physical education and sport involves intrinsic motivation (Mitchell, 1996). Like achievement motivation, intrinsic motivation has also been explored in the areas of education, physical activity, and sport participation. When an individual is intrinsically motivated they show interest and experience enjoyment in an activity (Barkoukis, Tsorbatzoudis, Grouios, & Sideridis, 2008; Deci & Ryan, 1985 Guay, Morin, Litalien, Valois, & Vallerand, 2015; Pelletier, Fortier, Vallerand, Tuson, Briere, & Blais, 1995; Ntoumanis, 2001; Taylor, 2015; Weinberg & Gould, 2015). Enjoyment, interest, effort, importance, and perceived competence are all positive predictors of intrinsic motivation, whereas pressure and tension can be negative predictors.

A theoretical framework, the Cognitive Evaluation Theory (CET; Deci & Ryan, 1985) has been used to measure motivation in physical activity and sport. CET was developed through the investigation of the impact of external rewards on the human predisposition towards intrinsic motivation (Taylor, 2015). CET suggests that intrinsic motivation is based upon an individual's perceived competence (belief about one's own ability) and self-determination (perceiving choice to determine one's behaviour). The CET anticipates a positive relationship between perceived competence and intrinsic motivation, in that the more confident one is about their own ability to perform a task, the higher the intrinsic motivation (Weiss & Ferrer-Caja, 2002). However, Deci and Ryan (1985) stated that this relationship will only be developed and maintained if the activity is appropriately challenging and the environment allows participant choice over the situation. Based on this, for a generalist teacher to maintain a high level of intrinsic motivation towards teaching physical education, they must have sufficient confidence to deliver the required content and feel as though they have some control or choice over what they are teaching.

Research has found that humans present spontaneous behaviours driven by curiosity, play, and exploration that appear not to be done for any reason other than for the positive experiences (Ryan & Deci, 2000b). Although spontaneous, these behaviours appear to be expressed in certain conditions. The exploration of intrinsic motivation has focused on the conditions that elicit, sustain, and enhance as well as those that subdue or diminish it. SDT is framed in terms of social and environmental factors that facilitate and undermine intrinsic motivation.

Research on the effects of environmental events on intrinsic motivation has focused on the issue of autonomy versus control rather than of competence. Extrinsic rewards can undermine intrinsic motivation as they can cause a shift from a more internal to external perceived locus of causality (Sarrazin, Boiche, & Pelletier, 2007; Taylor, 2015). Threats,

deadlines, directives, and competition also diminish intrinsic motivation as they are perceived as controllers of behaviour. Choice and opportunity of self-direction appear to enhance intrinsic motivation as they afford a greater sense of autonomy.

The importance of autonomy versus control for the preservation of intrinsic motivation has been observed in research exploring classroom learning (Hagger, Chatzisarantis, Barkoukis, Wang, & Baranowski, 2005). Teachers who are able to be autonomy-supportive can facilitate intrinsic motivation, curiosity, and a desire for a challenge in their students. Over control can result in a loss of initiative and negatively influence overall learning, especially if the task is complex or requires creative processing (Benware & Deci, 1984; Grolnick & Ryan, 1987 as cited in Ryan & Deci, 2000a). CET outlines that environments can enhance intrinsic motivation by promoting autonomy and competence (Taylor, 2015). This has been illustrated in physical education, where a task-involving motivational climate has been related to enjoyment through perceptions of competence and intrinsic motivation (Gråstén, Jaakkola, Liukkonen, Watt, & Yli-Piipari, 2012). Ryan and Deci (2000) highlighted that the principles of CET only apply when an individual holds an intrinsic interest for the activities.

The CET is one of three sub-theories that have been combined to develop SDT (Deci & Ryan, 1985, 2000). These three sub-theories; Basic Needs Theory, Cognitive Evaluation Theory, and Organismic Integration Theory have been used to describe the extent to which an individual believes their behaviour is volitional, internally driven, and based on choice (Kauffman, Soylu, & Duke, 2011).

Self-determination theory. SDT (Deci & Ryan, 1985; 2000), a macrotheory of human motivation, examines areas such as "personality development, self-regulation, universal psychological needs, life goals and aspirations, energy and vitality, nonconscious process, the relations of culture to motivation, and the impact of social environments on

motivation, affect, behaviour, and well-being" (Deci and Ryan, 2008, p.182). SDT promotes the assertion that humans exhibit differing types of motivation depending on the extent to which behaviour is self-determined, and the subsequent manner in which it is regulated (Guay et al., 2015; Ryan & Deci, 2000b). SDT is built upon the idea that humans require certain psychological experiences, competence, relatedness, and self-determination for optimal functioning and psychological health (Pelletier, Rocchi, Vallerand, Deci & Ryan, 2013; Ryan & Deci, 2000b). The premise is that when these basic needs are met, individuals are able to internalise and integrate behavioural regulations (Ryan, 1995). "The degree that individuals experience support and satisfaction for autonomy, competence, and relatedness within a given domain or activity, the more likely they are to internalise and take responsibility and ownership of their actions" (Pelletier et al., 2013, pp. 330). Self-determination is achieved when an individual perceives that they are the origin of their behaviour. The more self-determined behaviour is, the better the motivational results. The type of motivation, rather than the amount of motivation, is believed to be a more accurate predictor of outcomes (Baumeister & Vohs, 2007).

At the centre of SDT is the distinction between autonomous motivation and controlled motivation (Deci & Ryan, 2008). Autonomous motivation consists of intrinsic motivation and certain types of extrinsic motivation such as identified regulation and integrated regulation. Individuals who are autonomously motivated, "experience volition or a self-endorsement of their actions" (Deci & Ryan, 2008, p. 182). Controlled motivation consists of external regulation and introjected regulation which are both types of extrinsic motivation. In controlled situations individuals are often under pressure to think, feel, or behave in certain ways to either receive a reward or avoid punishment, or to gain approval, increase one's ego or avoid shame. SDT makes the presumption that the underlying regulatory processes and their accompanying experiences are different between

autonomous and controlled motivation (Gagne & Deci, 2005). Both types of motivation are intentional which is opposite to amotivation, the lack of intention of motivation.

As previously mentioned, SDT is comprised of three sub-theories. Basic Needs Theory is based on the concept that the human needs for competence, autonomy, and relatedness guide individual behaviour Deci & Ryan, 2008; Quested, Duda, Ntoumanis, & Maxwell, 2013; Reeve, Jang, Carrell, Jeon, & Barch, 2004; Taylor, 2015). The need for competence is the level of understanding an individual has with regard to completing certain tasks and the amount of confidence they possess to do so. The need for autonomy is the engagement in activities that are self-selected, self-regulated, and personally endorsed and the need for relatedness refers to how an individual feels they are able to connect with others (Kauffman et al., 2011). For example, the higher the level of competence, autonomy and relatedness, the greater the motivation is towards the behaviour.

CET assumes that people have an inherent need for self-determination (Deci & Ryan, 1985). An individual's motivation is dependent upon whether they view their behaviour as being controlled or guided by their own personal sense of self (Taylor, 2015). The existence of control aspects along with informational aspects can occur both externally (coexist within external situations) and internally (occur within the person). However, these perceptions of the environment may hold different levels of significance for each individual, in that one person may identify a factor as an informational aspect within an activity, whereas another person may perceive it as a controlling aspect. For example, an external reward (e.g., money, trophy) may be perceived by one person as an indicator of competence; in contrast, another person might view the reward as a constraint or a coercion to hold him/her in the activity (Weiss & Ferrer-Caja, 2002). Therefore, individuals who perceive external factors as informational rather than controlling should have higher levels of intrinsic motivation and perceived competence. More control and

higher levels of competence towards an activity may result in higher levels of intrinsic motivation. Events that occur within the person (intrapersonal) can also have an influence on an individual's perceived competence and intrinsic motivation. Self-determination and intrinsic motivation may be decreased when internally controlling events, such as self-imposed pressure or guilt, are evident. In contrast, internally informational events (e.g., self-rewarded and self-regulation) may augment perceived competence and, therefore maintain or enhance intrinsic motivation (Weiss & Ferrer-Caja, 2002).

The premise for Organismic integration theory (OIT) is that behaviour is not always intrinsically driven, it can be extrinsically driven through self-determination (Taylor, 2015). Behaviour that is extrinsically motivated becomes self-determined through the development process of internalisation and regulation (Kauffman et al., 2011). Sport participation, training, and competition are often driven by contingent motives, such as the importance of training for successful performance, the yearning to impress others, or the desire to win competitions (Taylor, 2015). OIT specifies that the types of motivation; amotivation, extrinsic (including all its different forms), and intrinsic motivation, range in terms of the extent to which the motivation is self-determined (i.e., emanating from one's self) (Ryan & Deci, 2000a, 2000b). Known as the self-determination continuum (Ryan & Deci, 2000a, 2000b), behaviour can be identified as amotivated or lying somewhere between being purely intrinsic to purely extrinsic (Reeve, et al., 2004).

Continuum of self-determination.

Amotivation. Amotivation, the least self-determined type of motivation lies at one end of the continuum and represents the absence of intrinsic and extrinsic motivation (Ntoumanis & Mallett, 2014; Stover, de la Iglesia, Boubeta & Liporace, 2012). It is associated with behaviour that lacks intention to act and a sense of personal causation (Cokley, 2015; Deci & Ryan, 2002; Ryan & Deci, 2000a, 2000b). Amotivation can result

when no value is placed on an activity (Ryan, 1995), when individuals do not feel competent to do it (Bandura, 1986), or when they are expecting not to produce the desired outcome (Ryan & Deci, 2000b). Amotivated behaviour is dictated by forces and influences perceived to be outside an individual's control (Petrie & Govern, 2013). The forces may be either outside an individual, such as unpredictable and uncontrollable environmental events, or within, such as strong emotions that are unable to be regulated (Deci & Ryan, 1985). Inadequate self-regulation can lead to amotivated behaviour when forces from within exceed an individual's self-regulatory capacity. When individuals experience amotivation, they are no longer able to identify any good reason for continuing with the activity (Jackson-Kersey & Spray, 2013; Pelletier, et al., 1995; Vallerand, Pelletier, Blais, Briere, Senecal, & Vallieres, 1992). For example, teachers who experience amotivation will have a lack of motivation or desire to engage in teaching and may feel there is no reason for them to continue (Perlman, 2013). A generalist teacher who experiences amotivation towards the content areas of physical education will not value the activity, not feel competent to teach it, or not believe it will result in a desired outcome. This may lead them to stop teaching physical education altogether.

Extrinsic motivation. Extrinsic motivation relates to activities undertaken for reasons other than inherent interest in the activity (Deci & Ryan, 1985; Guay et al., 2015; Vallerand & Ratelle, 2002). For example, an individual who chooses to become a teacher because it is a paid profession, involves coaching and members of their family were teachers, would be said to be extrinsically motivated because the outcomes of a regular salary, coaching, and continuing a family legacy are the individual's primary motives for choosing the profession (Kauffman et al., 2011).

Organismic Integration Theory has defined different forms of extrinsic motivation along with "the contextual factors that either promote or hinder internalisation and

integration of the regulation for those behaviours" (Ryan & Deci, 2000a, p.61). Internalisation involves the individual taking in a value or regulation, while integration is the process by which an individual transforms the regulation into their own regulation giving it a sense of self (Ryan & Deci, 2000b). The process of internalisation can be depicted as a continuum describing how motivation can influence one's behaviour ranging from amotivation or an unwillingness to undertake the task or activity, to an active decision from the person. As internalisation increases, so do attributes such as persistence, positive self-perceptions and the quality of engagement. The following are different types of extrinsic motivation, which differ in their underlying level of self-determination (Guay et al., 2015), listed in order of increasing self-determination: external regulation, introjection, identification, and integration (Deci & Ryan, 1985; Ryan & Deci, 2000, 2000b).

External regulation is the least autonomous form of extrinsic motivation (Ryan & Deci, 2000a). Behaviour is controlled by external sources, with participation in the activity motivated by rewards or avoiding negative consequences, such as punishment or criticism (Deci & Ryan, 2000; Pelletier et al., 1995; Vallerand et al., 1992). A generalist primary school teacher whose motivation for teaching a particular content area such as physical education is external regulated may say 'I only teach physical education because the curriculum dictates I must'.

Introjected regulation is governed by rewards and restrictions implemented by the individual themselves, for example, actions performed under pressure to avoid feelings of guilt or anxiety or to build up their ego and feelings of self-importance (Ryan & Deci, 2000a). Individuals who participate in physical activity and fitness activities because they feel ashamed or embarrassed when they do not have a certain physique represent an example of introjected regulation (Pelletier et al., 1995). A generalist primary teacher who

feels failure or guilt if they do not include physical education within the weekly class scheduled is also an example of being motivated by introjected regulation.

Identified regulation describes situations in which the individual is motivated to undertake an activity because they identify that an activity is worthwhile (Ryan & Deci, 2000a; Petrie & Govern, 2013). Extrinsic reasons are still the motivation for performing the activity; however, it is internally regulated and self-determined (Pelletier et al., 1995). "A boy who memorises spelling lists because he sees it as relevant to writing, which he values as a life goal, has identified with the value of this learning activity" (Ryan & Deci, 2000a, p. 62). A teacher who is willing to integrate physical education into their teaching because they acknowledge that it is fun for students and has short and long term health benefits is also an example of identified regulation.

Integrated regulation is the most autonomous form of extrinsic motivation. Integration occurs when an activity is recognised as worthwhile and is integrated into the person's behaviour, but as a means to an end rather than for intrinsic pleasure (Ryan & Deci, 2000a, 2000b). An example of this is a teacher that views physical education as an expected part of their professional responsibilities as a generalist primary teacher and as such is always willing to include it as part of their teaching.

Researchers creating instruments to measure motivation in academic and sport settings such as The Academic Motivation Scale (AMS; Vallerand, et al., 1992) and The Sport Motivation Scale (SMS; Pelletier et al., 1995) have not included integrated regulation in the instruments. The reasons for not including this type of extrinsic motivation in the instruments were that integrated regulation did not come out as a perceived reason for participating in educational activities or sport (Pelletier et al., 1995; Vallerand, et al., 1992), and in a factor analysis on experimental forms of the AMS,

integrated regulation was not distinguishable from identified regulation (Vallerand, et al., 1992).

Ryan and Deci (2000) emphasised that the continuum of types of extrinsic motivation is not a developmental continuum, as individuals do not have to progress through each stage of internalisation with regard to a particular regulation. A new behaviour regulation along the continuum can be influenced by previous experiences and other situational factors. For example, an individual may in the first instance be exposed to an activity because of an external regulation (i.e., reward), however, this exposure could allow the individual to experience the activity's intrinsically interesting properties, resulting in an orientation shift.

Research by Ryan and Connell (1989) supported the notion that different types of motivation lie along a continuum of relative autonomy. These findings have been extended further with researchers reporting that "more autonomous motivation is associated with greater engagement (Connell & Wellborn, 1990), better performance (Miserandino, 1996), less dropping out (Vallerand & Bissonnette, 1992), higher quality learning (Grolnick & Ryan, 1987), and greater psychological well-being (Sheldon & Kasser, 1995)" (Ryan & Deci, 2000a, p. 63).

Intrinsic motivation. Intrinsic motivation is displayed when an activity is undertaken out of interest, enjoyment, or inherent satisfaction, rather than a separable consequence (Ryan & Deci, 2000a; Deci & Ryan, 2002; Vallerand & Ratelle, 2002) and is the most self-determined form of motivation (Guay et al., 2015). Individuals who are intrinsically motivated to teach are more likely to choose to take part in teaching-related activities even if no reward is apparent. Previous research showed that those who are intrinsically motivated perform at higher levels and are more likely to persevere in

challenging circumstances than individuals who are extrinsically motivated (Ryan & Deci, 2000a; Vallerand, Fortier, & Guay, 1997).

Generally, intrinsic motivation is viewed as global construct, however, some researchers have suggested that intrinsic motivation can be separated into more specific motives (Vallerand, et al., 1992). This lack of separation of intrinsic motivation led Vallerand, Blais, Briere, and Pelletier (1989) to hypothesise an intrinsic motivation taxonomy based on the previous literature. The researchers distinguished between three types of intrinsic motivation; intrinsic motivation to know, intrinsic motivation towards accomplishment, and intrinsic motivation to experience stimulation, which were then researched on an independent basis (Vallerand, et al., 1992).

Intrinsic motivation to know relates to exploration, curiosity, learning goals, and intrinsic motivation to learn, in addition to the desire to know and understand (Gottfried, 1985; Harter, 1981; Pelletier et al., 1995 Vallerand et al, 1992). Intrinsic motivation to know can be described as "performing an activity for the pleasure and satisfaction that one experiences while learning, exploring, or trying to understand something new" (Vallerand et al., 1992, p. 1005). A student who reads the additional reading material for a course for the pleasure they experience while learning something new or a teacher that extends the physical education curriculum to include outdoor experience activities because they themselves enjoy them and think it would provide positive learning experiences for the students are examples of intrinsic motivation to know.

Intrinsic motivation toward accomplishment refers to the interaction individuals have with the environment to gain a sense of achievement, capability, and competence (Deci & Ryan, 1985). Intrinsic motivation toward accomplishment involves engaging in an activity for the joy and fulfilment experienced when attempting a new task or when creating something (Pelletier et al., 1995; Vallerand et al., 1992). A gymnast trying to

master a particularly difficult skill in order to experience the satisfaction of being able to do the skill successfully or a teacher offering to run additional practice sessions for a sport they have little experience in so as to help the students perform at their best at the interschool sports carnival are examples of intrinsic motivation toward accomplishment.

Intrinsic motivation to experience stimulation involves participating in an activity for pleasure or sensations that may be felt (Vallerand et al, 1992). Individuals who join a book club to experience the excitement of engaging in a stimulating discussion about a book or to experience the excitement of helping a student learn a new movement skill or sequence is an example of someone who is intrinsically motivated to experience stimulation (Pelletier et al., 1995; Vallerand et al., 1992).

Motivation applied to teaching practice. Motivation constitutes a construct that can support the explanation of the direction, intensity, and duration of an individuals' behaviour (Mitchell, 1982 as cited by Carson & Chase, 2009). In the context of teaching, motivation is the psychological process that underpins what a teacher chooses to do, how much effort a teacher puts into what they do and how long they will persist in the face of difficulty (Carson & Chase, 2009). All of these elements have the potential to impact on the behaviour of a teacher.

Similar to self-efficacy, the importance of the 'context' or a situation is becoming increasingly important when examining motivation (Visser-Wijnveen, Stes, & Van Petegem, 2014). The relational perspective of motivation implies that motivation is a construct that might change depending on the context. In teaching, the delivery of one subject area is likely to be very different from another. For example, teaching English in a classroom-based learning environment is very different to teaching a predominantly practical activity based learning area such as physical education, which can take place in a

variety of spaces such as a gymnasium, basketball court or oval. These differences are likely to impact on an individuals' motivation towards each of the tasks.

The primary goal in reviewing the major definitions and conceptualisation of confidence and motivation is to clarify their role in the establishment of a theoretical framework. This knowledge and understating is important when evaluating measures that have been developed to examine confidence and motivation.

Measures

Confidence. Perceived self-efficacy is task and situation specific (Bandura, 1997). Therefore, to measure self-efficacy, questions need to be specific to the desired behaviour. Consequently, a global measure of self-efficacy has not been established and is unlikely to be. This has meant that researchers have had to design appropriate questionnaires to answer the specific aims of their research.

When attempting to assess teacher efficacy it is recommended that a range of task demands be included so that individuals are able to indicate the strength of their efficacy beliefs despite impediments or obstacles and provide a broad range of response options (Bandura, 1997). Measures of self-efficacy have been criticised as being too 'general' in that they do not provide an assessment of a teacher's competence across the wide range of activities and tasks they are required to perform (Hoy, 2000; Tschannen-Moran et al., 1998).

In the construction of self-efficacy scales, Bandura (2006) describes the importance of developing items that accurately reflect the construct. The phrasing of items is highlighted as an area of importance with the recommendation that the terms "can do" rather than '"will do" be used because self-efficacy is concerned with perceived capability. It is also recommended that the object of each statement be "I" as the aim of a scale is to assess each teacher's subjective belief about their own capability (Bandura, 2006).

Self-report questionnaires that incorporate Likert scales have been the most commonly used tool for assessing self-efficacy as they are the most effective way of collecting information from a large sample of participants. A number of measures have been created to assess teacher efficacy including the; Teachers' Sense of Efficacy Scale (Tschannen-Moran & Woolfolk Hoy, 2001), Dutch teacher self-efficacy scales (Meijer & Foster, 1988), Teacher Efficacy Scale (Gisbon & Dembo, 1984), Teacher Efficacy Scale (Woolfolk & Hoy, 1990), Teacher Confidence Scale (Hoy, 2000), Science Teaching Efficacy Belief (Riggs & Enochs, 1990), Bandura's Teacher Efficacy Scale (Bandura, 1997), and the Physical Education Teaching Efficacy Scale (Humphries, Hebert, Daigle, & Martin, 2012). Each of these questionnaires was designed to assess specific task and situation related behaviours (e.g., teaching science, teaching special education, teaching physical education).

The physical education teaching efficacy scale. The Physical Education Teaching Efficacy Scale (PETES; Humphries et al., 2012) was developed as multi-dimensional instrument of teaching efficacy specific to physical education. The Initial Physical Education Teacher Education Standards (NASPE, 2009) were used along with other multi-factor efficacy surveys to develop an item pool that addressed the major aspects of teaching physical education. An initial version of the scale was evaluated by 19 physical education teacher candidates who completed the 74 item instrument, assessed the clarity and gave feedback on the response scale. Following the evaluation, the PETES consisted of 80 efficacy items answered using a 10-point scale.

Following this initial evaluation, 595 physical education teacher candidates recruited from 11 institutions across the United States completed the scale. The data gathered was then randomly split into two samples to be used to conduct firstly an EFA and then a CFA. The results of the EFA revealed a seven-factor structure of 53 items with

factor loadings ranging between .42 to .77. The 27 items with factor loadings below .42 were removed from the scale. Internal consistency of the scales ranged from .77 to .94 with test-retest reliability ranging from .63 to .88. This structure was then confirmed using CFA with results indicating an inadequate fit based on the fit indices not meeting commonly used criteria. To try and achieve a model with more adequate fit, modifications were made, which, involved the removal of items with low loadings on a particular factor. These modifications were found to improve the overall model fit with the fit indices getting closer to their 'ideal' range. Despite these improvements the model still appears to only have a mediocre level of fit with the value of some indices still not reaching the ideal cut off. For example, a CFI .86 was recorded falling short of the recommended .90 criteria and the RMSEA was .08, which is at the upper limit of the range for this index. The authors refer to a statement made by Marsh, Hau, and Wen (2004) to help justify these inadequacies and support their reasons for not making too many modifications to the model. The statement makes reference to the impossibility of achieving acceptable fit when analyses are done at an item level and there are multiple factors >5, each with a reasonable number of items >5, results in at least 50 items overall (Marsh et al., 2004). As the original scaled had 53 items, 7 factors with 4 to 20 items per factor, they believed their results were consistent with Marsh's et al.'s (2004) observations. The process of removing of items, which, would see construct validity sacrificed for the sake of obtaining adequate goodness of fit was not favoured by the authors. Using goodness of fit indices as a means of making decisions about results over logical coherence and evaluation has previously been criticised (Marsh et al., 2004).

The final model consisted of 35 items in seven factors with each factor containing around 4 – 6 items. All of the factors had acceptable internal consistency with Cronbach's alpha ranging from .77 to .91. The factors were labelled: Efficacy about PE content

knowledge, Efficacy for applying scientific knowledge in teaching PE, Efficacy about accommodating skill level difference, Efficacy for teaching students with special needs, Efficacy about instruction, Efficacy for using assessment and Efficacy for using technology.

Despite shortening the scale to 35 items, there are still a large number of items and items that are very specific to certain contexts. For example, Efficacy about teaching students with special needs includes five items and uses statements such as 'I know how to include a student with cerebral palsy in a regular PE class'; 'I know what to do with a student with mental retardation in my PE'; and 'If I had a student with a vision problem in one of my PE classes, I can find ways for the students to participate with the rest of the class successfully'. The authors comment that when constructing items they sought to provide a context for the respondent, for example, the skill of planning and adapting instruction for diverse students. To address this idea items were created that required participants to provide efficacy estimations for effectively developing activities for low- or high-skilled students, or for students with specific disabilities. The rationale for doing this was based on the idea that efficacy judgements are likely to vary depending on the content taught or based on student characteristics. Humphries et al., (2012) state that this is consistent with the recommendations of Bandura (2006), Bong (2006), and Pajares, Hartley, and Valiante (2001), 'that self-efficacy items be specific enough to give meaningful context but not so specific as to preclude generalizability' (p.287). Considering this, some of the items above appear to be very specific, referring to particular conditions such as cerebral palsy and mental retardation. The efficacy about teaching students with special needs is not the only subscale in the PETES that contains items that appear to be very specific taking away some of the generalisability of this measure.

Motivation. Researchers have developed several instruments to measure motivation in education and sport based on SDT. The AMS has become a widely used instrument to assess an individual's intrinsic motivation as a multidimensional construct, as it includes both extrinsic motivation and amotivation, in an academic setting. This scale was the first of its kind to assess the continuum of motivation, including different forms of intrinsic motivation, extrinsic motivation, and amotivation.

Prior to the development of the AMS other scales were used to assess motivation in educational settings. For example, Harter's (1981) Intrinsic vs. Extrinsic Orientation Scale measured five components of motivation related to challenge, curiosity, mastery, judgement and criteria on internal and external dimensions. In the design of this scale intrinsic motivation was set in opposition to extrinsic motivation on the same continuum. As such, this scale failed to acknowledge and measure the different types of extrinsic motivation, and amotivation (Vallerand, et al., 1992).

Gottfried's (1985) Children's Academic Intrinsic Motivation Inventory measured academic intrinsic motivation towards learning in a range of different subject areas in secondary schools students. It was found that students with higher levels of academic intrinsic motivation displayed higher school achievement, lower academic anxiety, and more favourable perceptions of their academic competence. Similar to the Intrinsic vs. Extrinsic Orientation Scale it also failed to assess different types of intrinsic, extrinsic and amotivation. In addition, this measure was designed to assess academic intrinsic motivation at a secondary level in which motivation was viewed as variable between subjects or learning areas. Gottfried (1990) extended her research by developing the Young Children's Academic Intrinsic Inventory. An alternative measure was developed to assess whether academic intrinsic motivation is less differentiated in young children as well as the relations between academic intrinsic motivation and achievement. Young children's

motivation for learning was found to be influenced by the subject area and the relation between motivation and achievement increased with advancing grade. Motivation was also found to be related to academic achievement and that "achievement appears to be a more consistent predictor of motivation than the reverse" (Gottfried, 1990, p. 538).

Harter's (1981) and Gottfried's (1985, 1990) work measured motivation in primary and secondary education settings. An absence of an instrument to measure motivation in post-secondary settings as well as one which was grounded in strong theoretical conceptualisation and accounted for several motivational constructs led to the development of the AMS.

The Sport Motivation Scale (SMS; Pelletier et al., 1995) is an example of the same basic scale used in the AMS but applied to a sport setting. Similar to the academic setting for the AMS, pre-existing measures used in sport, such as Weiss, Bredemeier, and Shewchuk's (1985) instrument and Dwyer's (1988) Sport Intrinsic Motivation Scale, failed to assess multiple components of motivation (Pelletier et al. 1995). The SMS was developed to solve a similar problem as the AMS had been designed for, in that at the time there was no measure underpinned by theory that permitted the examination of motivation and all its constructs in the area of sport.

Academic motivation scale. The significance of motivation in educational settings along with the importance of developing an instrument based on strong theoretical knowledge led to the development of the AMS, a scale that was designed to measure all of the components of motivation in a post-secondary setting (Vallerand et al, 1992). Originally written and validated in French (the Echelle de Motivation en Education, AKA the EME), the AMS has since been translated and validated by the same authors into English.

The AMS consists of 28 Likert scale questions of seven subscales with four items each, assessing the three types of intrinsic motivation (intrinsic motivation to know, to accomplish things, and to experience stimulation), three types of extrinsic motivation (external, introjected, and identified regulation), and amotivation (Guay et al., 2015; Vallerand et al., 1992). Although four categories of extrinsic motivation have been identified (Deci & Ryan, 1985; Petrie & Govern, 2013), integration is not measured by the AMS. Integration was excluded, as initial surveys failed to show that it was a reason for involvement in education, and early factor analyses were unable to separate identified regulation from integrated regulation (Vallerand et al, 1992). The item stem of the scale asks 'Why do you go to college?' with the individual items representing answers to the question, which reflect the different types of motivation (Vallerand, et al., 1992).

The EME was translated into English and given the new title of the AMS and validated through reliability and confirmatory factor analysis. Results of the reliability analysis found the Cronbach's alpha values displayed adequate internal consistency (ranging from .83 to .86, with the exception of the identification subscale ($r = .62$), and were comparable to those of the original (EME) scale (.76 to .86) (Vallerand, et al., 1992). The test re-test reliability over a one month period was reported to range between .71 and .83 for the various subscales and the mean test re-test reliability was .79. These are similar to the test re-test reliability results reported for the EME. The confirmatory factor analysis exhibited the same seven factor structure of the AMS as the EME had shown previously and as expected in the model (Vallerand, et al., 1992).

Pelletier et al. (1995) believe the AMS is superior to other motivational scales due to its ability to measure seven subtypes of motivations, which allows for a more detailed analysis to take place compared to using an instrument with only a few broad categories (i.e., intrinsic and extrinsic) of motivation. Following its initial development, research

(Cokley, Bernard, Cunningham, & Motoike, 2001; Fairchild, Horst, Finney, & Barron, 2005; Smith, Davy, & Rosenberg, 2012) has sought to confirm the original seven-factor structure proposed by Vallerand et al. (1992). An examination of the factor structure using an American student sample found the seven-factor model structure did not have adequate model fit, but was better than other configurations of five, three, two, and one factor models (Cokley et al., 2001). Fairchild at al. (2005) also found the seven-factor model outperformed other configurations and this has been more recently supported by Stover et al. (2012). In slight contrast to Cokley et al. (2001), the seven-factor model was also found to have better fit indices than the other configurations. Similar reliability scores to those reported by Vallerand et al., (1992) were found including a lower reliability score for the identified regulation subscale (Cokley at al., 2001; Fairchild et al., 2005).

In contrast to these findings, Smith et al. (2012) examination of an alternative configuration for the AMS found a four-factor configuration emerge with subscales that appeared to be generally congruent with SDT. This structure consisted of the amotivation subscale, two extrinsic subscales and one intrinsic subscale. The amotivation subscale contained its original four items. One of the extrinsic subscales contained all four items based on external regulation with the other consisting of two from the identified regulation and two from the introjected regulation subscale. The intrinsic motivation subscale contained four intrinsic motivation to experience stimulation scale items plus two of the items from intrinsic motivation to know items. All other items were excluded from the scale due to cross-loadings on at least two factors. Acceptable internal consistency for each of the four subscales was found with Cronbach's alpha ranges from .74 to .89 along with item-total correlation all above .60 supporting the construct validity of the reconfigured sale.

The simple structure of the AMS hypothesised by Vallerand et al. (1993) has not been fully substantiated with research continuing to examine the psychometric properties of the measure (Cokley, 2000; Fairhchild, 2005). Vallerand et al. (1993) hypothesised that a simplex pattern would be revealed among the ordered subscales of the AMS as one moved along the motivation continuum. The adjacent motivation subscales would have the strongest relationship, with relationships weakening as distance between types of motivation became greater, and that the motivation subscales at opposite ends of the continuum (specifically amotivation and intrinsic motivation) should exhibit negative relationships with one another (Fairchild et al., 2005; Guay et al., 2015). Vallerand et al. (1993) failed to fully support these relationships with the intrinsic motivation to experience stimulation subscale having a stronger positive relationship with the introjected subscale than the identified regulation subscale, to which it is adjacent. The amotivation subscale was also found to have a stronger negative relationship with the identified regulation subscale than with the intrinsic motivation to experience stimulation subscale, which is at the opposite end of the continuum. Despite these findings, Vallerand et al. (1993) suggested that the results provided support for the validity of the instrument.

Research by Cokley (2000) and Fairchild et al. (2005) found the strongest negative correlations to be between amotivation and identified regulation an extrinsic motivation subscale and not between amotivation and the three subscales of intrinsic motivation. The three intrinsic motivation scales were more strongly positively correlated with introjected regulation than with identified regulation, which is situated closer to intrinsic motivation on the continuum. There was also a stronger positive correlation between intrinsic motivation to accomplish and introjected regulation than between introjected regulation and identified regulation which are adjacently positioned on the continuum (Smith et al., 2012). These results have led to the suggestion that intrinsic and extrinsic motivation, as

measured by the AMS, may not be as distinct constructs as suggested by the SDT. Fairchild et al. (2005) raised specific concerns suggesting either a limitation of the scale construct or in the theoretical foundation.

Smith et al. (2012) conducted a study in which a four-factor structure emerged and repeated consistent findings regarding the simplex structure of the previous studies. They found amotivation to have the highest negative correlation with external regulation and not intrinsic motivation. This discrepancy is believed to be caused by the instructions and wording of the items in some of the AMS subscales. All other subscales in the four-factor structure appear to support the SDT theory with the strongest positive correlation for intrinsic motivation being identified regulation. The strongest positive correlation for identified regulation being with external regulation and the most negative correlation for external regulation being with amotivation.

Sport motivation scale. The SMS was developed so that the relations between determinants, motivation, and consequence in the sport domain could be measured using an instrument with proven reliability and validity (Pelletier et al., 1995). Like the AMS, the SMS was originally written and validated in French (l'Echelle de Motivation vis-à-vis les Sports AKA the EMS) and was later translated into English and renamed the SMS.

EFA performed on the scales revealed a seven-factor solution, where each factor had four items, for a total of 28 items (Pelletier et al., 2013). This is the same structure as the AMS, with the scale questions of the seven subscales assessing the three types of intrinsic motivation, the three types of extrinsic motivation and amotivation (Pelletier et al., 1995). The item stem of the scale asks 'Why do you practice your sport?' with the individual items representing answers to the question, which reflect the different types of motivation (Pelletier et al., 1995).

Reliability analyses and confirmatory factor analysis were used to validate the translated EMS into the SMS. Adequate internal consistency was displayed, with Cronbach's alpha values ranging from .74 to .80, with the exception of the identification subscale which had a Cronbach's alpha value of .63. These values were slightly lower than those obtained with the original scale, which were all above .71 (Pelletier et al., 1995). The test re-test reliability over a one month period was reported to range between .58 and .84 for the various subscales and the mean test re-test reliability was .70, which are similar to those observed with the EMS. The confirmatory factor analysis revealed the same seven factor structure of the SMS as the EMS.

Similar to the AMS, an advantage of the SMS is that it assesses seven types of motivation on an independent basis. In addition, since its development, the usefulness of the SMS has been confirmed by continued research. Various athlete population groups (e.g., Jackson, Ford, Kimiecik, & Marsh, 1998) have been used to provide support for the construct reliability and validity of the scale (Pelletier et al., 2013). The SMS has also been tested with a variety of populations to confirm its appropriateness. Results from studies that have made use of the scale have found the scale has consistently maintained its internal consistency, construct validity, and simplex-like pattern (Chatzisarantis, Hagger, Biddle, Smith, & Wang, 2003). A meta-analysis comparing the SMS subscale correlation coefficients, from 21 studies, provided support for the construct reliability and validity of the scale (Pelletier et al., 2013).

In contrast, research examining the psychometric properties of the SMS has not always shown full support for the factor structure of the measure (Mallett, Kawabata, Newcombe, Otero-Forero, & Jackson, 2007). A criticism of the measure is that it does not include integrated regulation. Consequently, it does not represent all aspects of the SDT framework, hence is not an accurate representation of this theory. An analysis of the

research on the SMS by Mallet et al. (2007) has revealed a consistent problem with the lack of factorial validity (Martens & Webber, 2002; Riemer, Fink, & Fitzgerald, 2002), and low reliability reported by (Martin & Cutler, 2002; Pelletier et al., 1995; Raedeke & Smith, 2001; Vlachopoulos, Karrageorghis, & Terry, 2000).

The three intrinsic motivation factors present a factorial validity issue as they are not empirically distinguishable from one another and there are items that either cross-load or do not load adequately onto the hypothesised factor (Mallet et al., 2007). A possible explanation offered for these problems is a loss in meaning in the translation from the French version (EMS) to the English version (SMS). Mallet et al., (2007) tried to improve the SMS by addressing the issues mentioned above and developing a revised six factor structure. The development of the revised six factor motivation structure involved the development of items to measure integrated regulation and items to potentially replace the problematic items identified. The results of research deemed the development of the six factor motivation structure successful with satisfactory levels of construct validity demonstrated. The factorial validity of the scale improved with the removal of items identified as problematic, replacement with improved items, and collapsing of the three intrinsic motivation subscales into one.

More recently a revised sport motivation scale (SMS-II; Pelletier et al., 2013) has been developed in response to concerns raised about the measure by Mallet et al. (2007) and Lonsdale, Hodge, & Rose (2008). Despite commenting that they had decided not to implement any specific item changes recommended by the above mentioned studies it appears many of the other modifications made by Mallet et al. (2007) have been adopted in some way into the SMS-II (Pelletier et al., 2013). A review of the SMS found that many items were wrongly classified, contained a mix of goal contents and were not clear enough. Face validity was also reviewed with some items found not to adequately fit the theoretical

constructs of SDT, which resulted in items being removed and new items created. An integration regulation subscale was also added and the three intrinsic motivation subscales were collapsed into one, with the option using all three if the researcher so desired. The SMS-II was found to display adequate psychometric properties with the validity of the measure being substantiated by the factor analysis, internal consistency, and correlations among the different types of motivation.

A modified version of the SMS was used by Carson and Chase (2009) in an investigation into physical education teachers' self-determined motivation. The stem was reworded to ask 'Why do you teach physical education?' with all 28 items from the 7 subscales included. Within some items certain words were substituted for ones that were deemed more suitable for the context of physical education. One item from each of the subscales was presented demonstrating the changes that were made. For example 'for the pleasure of discovering new training techniques' which is an item from the intrinsic motivation to know subscale was changed to 'for the pleasure of discovering new teaching techniques'.

A CFA was performed in an attempt to verify the pre-existing seven factor structure. The authors stated that "reasonably good fit indices" (p. 342) were reported with a χ^2/df ratio of 2.35, RMSEA = .07, CFI = .87. The χ2/df ratio and RMSEA values were within the acceptable ranges. The CFI however did not reach the recommended cut off of .90. This demonstrates the utility of using the SDT framework and SMS as a measure of intrinsic and extrinsic motivation in physical education. The use of such a scale also highlights the need for measures of this type in physical education.

The work tasks motivation scale for teachers. The Work Tasks Motivation Scale for Teachers (WTMST; Fernet, Senecal, Guay, Marsh, & Dowson, 2008) was developed to measure teachers' motivation towards specific work tasks. An initial pilot study was

conducted in which an item pool was developed based on the task descriptors of elementary and high school teachers from the Quebec Ministry of Education. A list of tasks that make up teachers' work were identified with these tasks then being classified in categories by a panel of teachers. Forty-two participants (school teachers) then rated the importance of each task and the amount of time spent on each. The results led to six main tasks being identified; class preparation, teaching, evaluation, classroom management, administrative tasks, and complementary tasks.

The main study involved developing items to assess intrinsic motivation, the three forms of extrinsic motivation, and amotivation in relation to the six tasks identified in the pilot study. A committee of experts developed five items to assess the five different types of motivation to identify the underlying reasons for engaging in each of the six tasks, thus the same five items were used across the six tasks (creating a total of 30 items). These 30 items where then presented to a panel of experts who selected 15 items for each motivational construct for each task. This resulted in a total of 90 items (15 items x 6 tasks). 690 participants respond to the question "Why are you engaged in the following tasks?" using a 7-point Likert scale ranging from 1 (does not correspond at all) to 7 (corresponds completely).

Preliminary analyses found the internal consistency values of the five types of motivation to be adequate with ranges above the criterion of .70 with the exception of introjected regulation which had a range of .64 to .87. This is inconsistent with previous research (Pelletier et al., 1995; Vallerand et al., 1992) which has found the identification subscale as having a low internal consistency score. To test the factorial structure of the measure, CFA was conducted on a 30-factor model (five types of motivation x six types of work tasks). The model was reported to provide a good fit to the data with fit indices such as CFI and NNFI >.90 and RMSEA <.5.

Convergent validity was supported by positive correlation on the same motivation variable related to different tasks, for example intrinsic motivation for evaluation and classroom management. Discriminant validity was supported by higher positive correlations on convergent variables than between contrasting motivation variables on the different tasks, i.e., higher overall convergent correlation than divergent correlations. For example, higher relations between intrinsic motivation for class preparation and teaching tasks than between amotivation and intrinsic motivation for teaching tasks. The five subscales for each work task demonstrated a simplex pattern representative of the SDT continuum. The adjacent subscales were found to correlate more positively than to those a greater distance away, further supporting the simplex pattern proposed by SDT. Results of the research found that it is possible to assess the different types of motivation a teacher may have towards a specific work task along with an observed pattern of correlations among motivational components.

Motivation to teach scale. More recently The Motivation to Teach Scale (MTS; Kauffman et al., 2011) has been developed and validated to assess pre-service teachers' intrinsic and extrinsic motivation to teach. Development of the scale involved the creation of a pool of 160 items, comprising 80 intrinsic and 80 extrinsic items. The items were developed by the research team based on what they believed assessed intrinsic and extrinsic motivation. The pool was then reduced by assessing the theoretical consistency, conceptual clarity, and ease in interpretation of each item. Items also had to be written so they worked within the framework of a 6 point Likert-type scale with strongly agree and strongly disagree as the anchors. A 6 point scale was selected to force participants to either agree or disagree with each of the items. The previously mentioned procedures resulted in the pool being reduced to 40 items; 20 intrinsic and 20 extrinsic. Pilot testing resulted in a

further reduction of the item pool down to 12 items; 6 intrinsic and 6 extrinsic, with items that seemed to replicate each other or that were deemed confusing removed.

Participants were 147 education majors recruited from an undergraduate Educational Psychology course. Approximately 54% were early childhood or elementary education majors planning to teach in a preschool or elementary school and 46% were secondary education majors with a variety of specialities who indicated they wanted to teach in a middle or high school setting. To assess the convergent, discriminant, and concurrent validity of the MTS participants also completed The Teacher Self-Efficacy Scale (Schwarzer, Schmitz, & Daytner, 1999), the Approaches to Learning scale (Miller, Greene, Montalvo, Ravindran, & Nichols, 1996), and the AMS (Vallerand et al., 1992). EFA, using principal component analysis, revealed a two factor structure accounting for 54% of the variance. Results of the reliability analysis found the Cronbach's alpha values displayed adequate internal consistency (intrinsic sub-scale a =.86 and extrinsic sub-scale a = .76). Construct validity was established by showing positive correlations between the subscales of the MTS and the respective subscales of the other scales.

Despite the MTS displaying adequate reliability and validity, caution must be exercised with regard to its structure. The structure of the developed scale was investigated using EFA, which is statistical technique used to explore the possible underlying factor structure of a set of observed variable. The scale has not undergone CFA, so the proposed factor structure has not been verified.

Extrinsic motivation is defined as a single construct in the MTS going against theoretical constructs such as SDT (Deci & Ryan, 1985) and many other measures (AMS; Vallerand et al., 1992; SMS; Pelletier et al., 1995; Roth et al., 2007) which have substantiated the existence of four categories of extrinsic motivation. This limitation has also been recognised by the Kauffman et al., (2011) who defend the use of a single factor

construct for extrinsic motivation. Kauffman et al., (2011) cited previous research to support the use of a single factor extrinsic motivation construct over a multi-factor one. Much of the research cited, however, is quite dated with three out of the four papers dating pre 2000 (e.g., Amabile, Hill, Hennessey, & Tighe, 1994; Covington & Müeller, 2001; Pintrich, 1999). There have been a number of more recent studies (e.g., Carson & Chase, 2009; Fernet et al., 2008; Hein et al., 2012; Roth, Assor, Kanat-Maymon & Kaplan, 2007) that have provided support for the multi-factor construct of extrinsic motivation.

Although the MTS has been designed to examine motivation to teach it does so in a general sense without taking into account different teaching environments such as primary and secondary. The questionnaire has been designed to assess pre-service teachers' motivation to teach, which may mean it is not suitable for assessing the motivation of other teaching populations such as those who are currently teaching.

Autonomous motivation for teaching. Roth et al. (2007) developed a measure to examine autonomous motivation for teaching. The measure consisted of 16 questions; four questions for each type of motivation: external, introjected, identified, and intrinsic. Two question stems related to common tasks performed by an elementary teacher and one referred to teachers' effort investment in general. For each task-specific stem, there were four responses that represented the four types of motivation with the one general stem having eight responses. Participants used a 5-point scale to indicate the extent to which they agreed with each of the responses.

Participants were 132 female teachers from Jewish elementary schools along with their students from 62 classes. The participants completed a number of measures in the form of questionnaires, including the measure developed to assess autonomous motivation for teaching. Smallest space analyses (SSA), a well-established technique of multidimensional scaling (Shye et al., 1994 as cited in Roth et al., 2007), which, maps the

location of each variable/item in a multidimensional space was chosen over a factor analytic method as it allows multiple constructs to be distinguished. Results indicated that teachers were able to differentiate between items belonging to the four types of motivation with each set of motivation items falling along a horizontal continuum in its expected location in accordance with SDT. The alienation coefficient, which serves as a goodness-of-fit indicator in SSA, was reported as being satisfactory with a value of .12.

Revised model. Hein et al. (2012) used the questionnaire (Autonomous Motivation for Teaching) developed by Roth et al. (2007) to investigate how teacher's motivation to teach is related to different teaching styles. Participants included 167 physical education teachers of students aged from 13 to 18 years from five European countries. Due to the cultural diversity of the participant group the measure had to be translated for use with Estonian, Hungarian, Latvin, Lithuanian, and Spanish samples. To assess the measure's suitability of use in the study, a CFA was conducted with initial results indicating the model could be improved. Examination of the factor loadings, modification indices and reliability scales indicated the removal of items would improve the model fit. Along with the removal of items, it was decided to collapse the four factor structure into three due to the number of items with crossloadings on the intrinsic and identified scales. Hein et al. (2012) supported their decision to combine both the intrinsic and identified scales by stating that previous research (Hagger, Chatisarantis, & Biddle, 2002; Ryan & Connell, 1989) had also found the two constructs to be highly correlated and difficult to differentiate in factor analysis. These modifications saw the revised model approach criteria for satisfactory fit with CFI and NNFI indices >.90 and RMSEA <.50. The revised teacher motivation model comprised three factors of 14 items; intrinsic motivation (7 items), introjected regulation (4 items), and external regulation (3 items).

The findings of the CFA not achieving adequate 'model fit' is not surprising considering the sample used for model development was substantially different from the sample used for CFA. The autonomous motivation for teaching scale measures motivation for teaching in a very general sense with no mention of tasks specific to any group or teacher (e.g., primary or secondary teacher or specialisation teachers). The measures was originally validated with a small sample and quite a distinct population group (i.e., female Jewish elementary school teachers), which was very different for the participants used in the CFA who were all physical education teachers teaching students aged between 13 – 18, which could be categorised as secondary students.

What is Teaching Practice

Teaching has been described as a complex, multifaceted activity (Capel, 2010; Kim & Cho, 2014; Richards, Templin, & Gaudreault, 2013) that includes the promotion of learning, management, administration, and pastoral care (Bailey, 2010). Effective teaching requires an informed and reflective practitioner who is committed to their own learning and professional development and views this as a lifelong process which begins in initial training and continues throughout a career (Bailey, 2010). Teaching as a profession along with the type of knowledge and skills that teachers must possess is continually evolving (Mayer et al., 2014).

The profession of teaching is described as being situated in a constantly changing environment in which learning occurs through social and professional change (Mayer et al., 2014). Teachers are required to balance students' learning needs with their own learning, typically developed in the workplace. Teachers witness and must manage the contemporary debates about learning while they experience learning to teach and beginning to teach.

Studies in the area of pre-service teacher practices have explored the strengths and difficulties of beginning teachers (Delamarter, 2015; Flores, 2015; Wallace & White, 2014). Many teachers report having great expectations of themselves, whereas, others have conveyed a lack of self-confidence (Shoval et al., 2010). Those with positive expectations display enthusiasm and excitement (Moir, 2000), while those struggling with confidence may experience stress, anxiety, confusion, and uncertainty (Reichenberg, Lazovsky, & Zeiger, 2000). Teacher education programs are designed to equip teachers with the knowledge and skills needed to cope with the many challenges of the teacher profession, however, many experience varying degrees of reality shock during their first few years of teaching (Kim & Cho, 2014). During their teacher training pre-service teachers often encounter educational experiences which put into question their current beliefs about teaching (Webster, 2011). These pre-established beliefs and sentiments towards teaching have been developed over a lifetime as a student and as such are often strong and resistant to change during teacher education.

Physical education has been described as being different from other teaching and curriculum areas due to its greater focus on motor skills rather than verbal-academic skills. Global concerns have been expressed about the initial preparation of, and ongoing support available for primary school teachers to teach physical education (Harris, Cale, & Musson, 2012). In-service teachers have identified inadequate teacher preparation as a reason for not feeling confident to teach physical education (Morgan & Hansen, 2008). The amount of time spent on physical education in teacher training programs varies and can be limited to only 5 – 10 hours in particular courses. In Ireland, for example, it is estimated that only 5 or 6 of the 240 credits for teacher preparation are allocated to physical education (O'Sullivan & Oslin, 2012). It is acknowledged, however, that the quality of teacher training program is more than just the volume of contact hours and also includes the

philosophical approach to and the content of the training (Pickup 2006). Ofsted (2000) comments that the time restrictions that are often imposed on physical education results in the content areas of games, gymnastics and dance being covered whereas areas such as athletics, swimming and outdoor education receive limited attention. It is interesting that gymnastics and dance is a content area that Ofsted (2000) identifies as potentially receiving significant coverage in physical education training. Previous research highlights this particular area of the curriculum is one that teachers do not feel confident to teach and exacerbated is by the lack of knowledge they feel they have in the area (Armour & Duncombe, 2004; DeCorby, Halas, Dixon, Wintrup, & Janzen, 2005; Fletcher & Mandigo, 2012; O'Sullivan, 2006; O'Sullivan & Oslin, 2012). Pre-service teacher education has been identified as a crucial stage in their careers as it is a time in which they are often confronted with educational experiences which cause them to reassess their values and beliefs about teaching (Webster, 2011).

Research in Teaching Practice

Confidence.

Teachers' self-efficacy and student academic performance. A review of literature from 1974 – 1997 by Tschannen-Moran et al., (1998) on teacher efficacy found that teachers' sense of efficacy was related to student outcomes such as achievement and motivation. It was also found that the amount of effort teachers put into teaching and their willingness to utilise new methods of delivery was affected by efficacy. Teachers with greater efficacy levels have also been found to be less critical of students when they struggle with the task at hand and are able to work with those students for longer periods of time (Jimenez-Silva, Olson, Jimenez Hernandez, 2012).

Jarvis and Pell (2004) examined the changing attitudes and cognitions of primary teachers during a two-year science in-service programme and their effect on their student's

attitudes and perceived self-efficacy in the curriculum area. Changes in perceived self-efficacy, attitudes, and science understanding of a sample of 70 primary teachers were tested before and after an in-service programme. Similar to other studies (e.g., Humphries et al., 2012; Tschannen-Moran & Woolfolk Hoy, 2001) which have examined self-efficacy, the perceived self-efficacy and attitudes of teachers were measured using a questionnaire with a 5-point Likert scale. The questionnaire measured teachers' understanding of four main science units which were also covered in the in-service programme. Students were pre- and post- tested on perceived self-efficacy and attitude, as well as cognitive knowledge questionnaires that were related to the questionnaires given to their teachers. Jarvis and Pell (2004) found that teachers' perceived self-efficacy and attitudes towards science increased from before to after the in-service. These results were mirrored by the students of the teachers who were attending the in-service, with their attitudes and perceived self-efficacy towards science remaining stable throughout the academic year. The attitudes and perceived self-efficacy of students in the control group was found to deteriorate. Increases in the participating teachers' cognitive understanding of science units from pre- to post-testing were also found. This was once again reflected by the students of the participating teachers' who showed an increase in understanding across the year levels compared to those in the control group.

Ross, Hogaboam-Gray, & Hannay, (2001) also found correlations between teacher efficacy and student performance. Their study examined the effects of primary school teacher perceived self-efficacy on kindergarten to year three students' computer skills and cognitions. A sample of 385 students completed assessments associated with computer skills and computer perceived self-efficacy at the end of a school year that was taught by one teacher and then again after the following school year that was taught by a different teacher. Participating teachers also answered questions about expectations of personal

ability to teach students how to use computers, and answering questions on confidence to teach a variety of computing skills. Ross et al. found that "Teacher efficacy variables explained 7% - 9% of the students outcome variance" (2001, p.141). Results showed that students who moved from a teacher with low perceived self-efficacy to a teacher with high perceived self-efficacy were more likely to improve their computer skills than those who moved from a teacher with high efficacy to a teacher with low efficacy. Student efficacy was also found to be affected, with a greater chance of efficacy increasing when moving from a teacher with low perceived-efficacy to a teacher with high efficacy and vice-versa. These findings highlight the impact a teacher's self-efficacy can have on student outcomes. Teachers with high perceived self-efficacy in a content area is desirable as this is likely to assist with increasing students' knowledge and skills as well as their self-efficacy.

Research into teacher efficacy has examined primary school teacher confidence and perceived self-efficacy within many teaching disciplines such as music education (De Vries, 2013), science (Riggs & Enochs, 1990), technology (Fanni, Rega, & Cantoni, 2013), and physical education (Ashy & Humphries, 2000; Humphries & Ashy, 2006; Callea et al., 2008). Similar concerns have been expressed amongst researchers in relation to primary teachers not being equipped or possessing high levels of self-efficacy in their ability to teach a specific curriculum area (Reys & Fennell, 2003; Ross et al., 2001).

Callea et al. (2008) conducted research to examine primary school teachers' perceived self-efficacy to teach fundamental motor skills (FMS). They aimed to establish the areas of teaching FMS that primary school teachers lacked perceived self-efficacy and if any relationships existed between those levels and gender, qualifications, school status, level of participation in physical activity, and level of interest in physical activity. Participants included pre-service and in-service teachers from public and private schools. Perceived self-efficacy was measured using the Teaching Fundamental Motor Skill Self-

Efficacy Questionnaire (TFMSSQ). The content of the questionnaire was derived from the Victorian Institute of Teaching Standards and Professional Practice for Full Registration with six of the eight standards being used, which related to professional knowledge and professional practice. The overall TFMSSQ was reported to have high internal consistency, with each individual standard area also found to have high internal reliability. Overall, it was found that around 32% of primary school teachers were not self-efficacious to teach FMS. Males were found to be more self-efficacious than females when it came to teaching FMS as well as being more interested in physical activity. A moderate (r = .52) positive relationship was also found between an individual's perceived self-efficacy to teach FMS and their interest in physical education. Participation in physical activity and perceived self-efficacy to teach FMS also reported a small (r = .31) positive relationship.

The 32% of teachers found not to be self-efficacious to teaching FMS were consistent with the results of a previous study that found 23% of teachers were uncomfortable teaching either physical education or physical activity (Telford, Walkley, & Salmon, 2005). This is further supported Xiang, Lowy, & McBride, (2002) reporting 72% of pre-service primary school teachers not wanting to teach physical education with 20% these teachers feeling unequipped to do so.

Despite Callea et al. (2008) providing valuable information on teachers' efficacy levels towards teaching FMS, it is important to recognise that FMS are only one part of the physical education curriculum. The importance of FMS proficiency has been highlighted in research through continued participation and lifelong health benefits (Cale et al. 2014; Gallahue & Donelly, 2003; Gallahue & Ozmum, 2001; Kirk, 2005; Lloyd, Saunders, Bremer & Tremblay, 2014; Morgan & Bourke, 2008). Although it was found that primary school teachers were, in general, self-efficacious towards teaching FMS, we have no

indication of how they feel about delivering other areas or components of physical education

A study by De Vries (2013) focused on generalist teachers' self-efficacy in primary school music teaching with the aim of identifying their current practise in teaching music and particularly their self-efficacy in relation to teaching music. Similar to physical education, music in the majority of Australian primary schools is taught by a generalist teacher. It is up to individual schools as to whether they choose to employ a specialist teacher to deliver this program. Specialist programs such as music and physical education are addressed as part of an undergraduate education program with the expectation that these specialists programs may be required to be delivered by a generalist teacher. Initial stages of the research indicated that only 37% of teachers taught music on a regular basis. Survey and interview data identified a number of reasons for teachers not delivering music lessons on a regular basis. These included inadequate training during undergraduate studies, lack of time to deliver in a crowded curriculum, inability to access resources, suitable teaching spaces, and appropriate professional development.

The preliminary findings of De Vries led to further research, which involved follow up interviews aimed to identify the current practice of teachers teaching music. The data was analysed using what is described as a 'problem-solution approach'. In basic terms this involved five stories being created for each of the participants that began with the problem and finished with the resolution. The narratives identified a number of practices being used to deliver music in a primary school setting including; teaching music to the entire school, running choirs, using a CD to sing along to with children, the use of technology to facilitate music composition, the integration of music into other content areas and the establishment of extra curricula activities such as a school rock band. A range of factors that impacted on these practices support previous research that has also identified musical

background, current engagement in music making, access to music professional development, access to resources, and music in pre-service teacher training as impacting in music teaching.

The factors impacting practice outlined above are aligned with findings from previous research that has examined confidence (not self-efficacy specifically) of generalist teachers to teach physical education. Morgan (2005) also found that inadequate training, a lack of time, limited resources and support were some of the major reasons cited for not teaching physical education. The research findings in this area may provide some insight into ways in which confidence in particular areas of teaching can be improved. For example, schools that do not have specialist teachers for certain subjects may need to invest heavily in suitable resources for teachers to use to assist them in the delivery of particular specialist content areas or provide greater opportunities for professional development. It may also be beneficial for schools to explore the option of pooling their resources with other schools to get an advisory teacher that can provide vicarious teaching influences through demonstrations and verbal persuasion when observing a generalist (De Vries, 2013).

Humphries and Ashy (2006) found that teaching experiences, in this case practicum experiences in which pre-service teachers were given the opportunity to observe, assist and teach, had a positive impact on participants' perceptions of teaching physical education. Participants were 183 education majors who completed a questionnaire on perceptions of their skills in teaching physical education, perception of changes in their skill level, perceptions on how and why those changes took place, level of understanding of physical education, and comparisons of teaching in a classroom to teaching physical education. Following a methods course in physical education, which consisted of theoretical content delivered on campus and two practicum placements in local schools, participants perceived

their skills in teaching physical education as positive with positive attitudes expressed towards teaching physical education. Participants also believed they become more confident over time and as such had great ability to motivate their students. This is consistent with Woolfolk Hoy and Spero (2005) who also found that self-efficacy increased throughout a teacher education program, mainly during the teaching practicum. Perceptions of their strengths as teachers related more to affect and management than to instructional skills and content knowledge. Instructor feedback, practice and a supportive environment were identified by participants as contributing to the development of their ability to teach physical education. As most participants failed to acknowledge content in their response it is difficult to make generalisations about their learning. We can assume that as content wasn't acknowledged, in this case it was not a crucial factor in improving confidence. Although content knowledge did not seem to impact on confidence towards teaching physical education, previous research has found it to be a crucial factor. A limited amount of training within the speciality area has been found to leave teachers feeling uncomfortable and unqualified to teach physical education (Cundiff, 1990; Hardman & Marshall, 2006; Hickey, 1992; O'Sullivan & Oslin, 2012; Petrie, 2010).

Motivation. Examining the initial and ongoing motivation of teachers has become an important field of research (Mansfield & Beltman, 2014). Kaplan (2014) stated that "theory and research on motivation in educational settings have been primarily concerned with students" (p.52). Research in this area has focused on teachers' actions that have been hypothesised to motivate students to learn and achieve. In doing so, motivation for teaching, which directs the application of these actions has been neglected.

Brouse Basch, LeBlanc, McKnight, and Lei (2010) investigated college students' academic motivation based on demographic variables such as gender, year of study, and source of tuition funding. Thirty courses out of a possible 167 offered at the university

were randomly selected as sources for participant recruitment. Participants included 856 students; 52% females and 48% male with a relatively even spread across year of study; freshman (1st year) 32.2%, sophomore (2nd year) 20.9%, junior (3rd year) 23.7% and senior (4th year) 21.5% and were completing a variety of majors including education, liberal arts, sciences, and business. The AMS (Vallerand et al., 1992) was used to measure students' motivation. Significant gender differences were found on all of the motivation subscales except for the extrinsic external regulation scale. Females scored higher on all of the measures of intrinsic motivation and also higher on all of the extrinsic motivation measures with the exception of external regulation. Males were found to have higher scores on the amotivation measure. Significant differences were also found between the year levels on both the intrinsic and extrinsic scales with the amotivation not being significantly different. Significant differences were found between freshman and seniors with the freshman having higher levels of motivation on both the intrinsic and extrinsic scales. The researchers (Brouse et al., 2010) comment that demographic variables such as gender and year level have been consistently used to examine motivation. The varied results seen in these areas (i.e., gender and year level) could be explained by the different participant groups that completed the questionnaire in each of the studies. These results also demonstrate the ability of the AMS (Vallerand et al., 1992) to distinguish between different sub groups within a cohort (i.e., year levels within a course group), which is desired when using and developing a measure.

Demographic variables such as gender and teaching level have also been used to examine the motivation of teachers towards work tasks (Fernet et al., 2008). Following the analysis of the factorial structure of the WTMST using CFA a structural equation path model was used to examine the interactions of gender and teaching level with work task motivation. Females had higher levels of identified regulation and lower amotivation than

males for class preparation and administrative tasks. Elementary teachers had higher amotivation towards class preparation than high school teachers, whereas high school teachers had higher intrinsic and identified regulation towards complimentary tasks. High school teachers also had higher external regulation towards class management. Male high school teachers had higher intrinsic motivation and identified regulation and lower external regulation than male elementary teachers. Female high school teachers had lower identified regulation and higher amotivation than female elementary teachers. This indicates the personal characteristics such as gender and type of teacher (elementary or high school) can demonstrate an influence on the types of motivation towards teaching tasks. The same set of relationships in the context of primary physical education teaching has not been investigated.

Roth et al. (2007) in their study of motivation and self-determination in teaching reported that autonomous motivation for teaching was associated with desirable teacher behaviours and positive student attributes. This supports the importance of autonomous forms of motivation in teaching for student learning. Exploring different types of motivation in teaching physical education, in particular autonomous forms of motivation is important in developing our understanding of how motivation influences teaching in this domain.

Confidence and motivation. The relationship between confidence and motivation in teaching was recognised by Visser-Winjveen et al. (2014) who stated "that teachers' motivations rely both on their expectations of how well they will perform in teaching and on the value they place upon the teaching activity" (p.645). As acknowledged by Bandura (1977, 1997) the conceptual model of self-efficacy brings together the concepts of confidence and expectations. As such the exploration of both confidence and motivation together is important as self-efficacy has the potential to influence motivation.

The interaction and influence of motivation, competence, and confidence to teach has been explored in student teachers (Lim-Teo et al., 2008). In an exploratory study that aimed at assessing the impact of an initial teacher training program on beginning teachers the constructs of competence, confidence and motivation were used to measure its effectiveness. Participants included 258 student teachers who were enrolled in a Post Graduate Diploma in Education (PGDE). This program was a one year program designed to prepare graduates for careers as primary school teachers with all participants already holding a bachelor's degree. The instrument used to collect the data was described as consisting of three parts; Part A, open-ended questions and Part B, a series of statements rated on a 5-point Likert scale examining the perceptions, feelings, opinions, and beliefs of student teachers as teachers and the teaching profession. Part C also used statements and asked participants to rate their level of knowledge about teaching and their skills in teaching using a 5-point Likert scale. A similar combination of response methods; select response and open-ended questions was used by Morgan and Bourke (2005) in examining the confidence of generalist teachers to teach physical education. Like Morgan and Bourke (2005), Lim-Teo et al. (2008) reported limited information about the instrument. Neither the select response nor open-ended questions are supplied in the research, no detail is provided as to the construction of the instrument, no justification for the questions included is provided and the validity and reliability of the measure is not reported.

Participants completed the measure at the beginning of the PGDE program and again at the end. For the purpose of this publication the researchers chose to only publish the data collected at the end of the program for one of the open-ended questions in Part A. The item asked the participants their perceptions of their motivation to be a teacher, their teaching competence, and their confidence as a teacher had changed during the PGDE program at to provide reasons to justify their responses. Results in the area of motivation

found that over half (58.9%) of the student teachers felt their motivation had increased by the end of the program. Reasons for these increases were attributed to the effect of the PGDE program with the student teachers commenting they "felt better motivated because they believed that they were better prepared or equipped to teach. In addition, the skills and knowledge acquired also gave them greater confidence that increased motivation" (Lim-Teo et al., 2008, p. 48). Increases in motivation were also attributed to the interactions student teachers had with people they felt were significant; this included pupils, tutors, peers and senior teachers.

Competence was also found it increase during the program with 245 of the 258 participants indicating they felt their teaching competence increased. Reasons for increases in competence were credited to the teaching skills, strategies, or techniques learnt during the teacher education program. Confidence was also found to increase with the majority believing the teacher education program was the reason. The student teachers frequently mentioned "being equipped with pedagogical skills and strategies" (p. 51) and simply feeling better prepared (Lim-Teo et al., 2008). Increases in confidence were also linked to the practice acquired during teaching practicum. The decision by the researchers (Lim-Teo et al., 2008) to measure motivation, competence and confidence is a positive acknowledgement of the relationship that exists between the three areas. A criticism of this research is that each of the constructs (motivation, competence and confidence) was examined separately with any potential links between failing to be identified.

Research into teacher efficacy beliefs and motivation by Ahmad (2011) has acknowledged the relationship between confidence and motivation and sought to investigate the construct of teacher efficacy and its effect on teacher motivation. Teacher efficacy was assessed through two constituent dimensions; teaching efficacy and personal efficacy. Participants were 227 secondary school teachers who were completing their

M.Ed. training. Task motivation and ability attribution were found to be strong predictors of teaching efficacy with personal efficacy being predicated by ability attributions and incremental ability percept in the inverse direction. Personal efficacy was found to be different or independent from teacher efficacy. This finding is significant as it means an individual with a high level of personal confidence may not necessarily have a high level of teaching efficacy. These findings also reinforce the task specific nature of efficacy highlighting that an individual's confidence to teach may be different to their confidence to teach physical education. Consequently, it is important that measures are available that are task specific and allow researchers to measure confidence in particular areas of teaching, such as physical education as well as being specific to tasks within this area; for example teaching different content areas such as fitness, athletics, and gymnastics as well as other duties such as planning sessions and conducting assessment specific to physical education. Findings from this research also call to attention the impact that teaching efficacy and confidence (or personal efficacy) can have on teacher motivation. The research suggests the use of strategies that focus on developing teacher efficacy could be instrumental in increasing teacher motivation.

Physical Education as a Curriculum Area

The curriculum area of physical education has been charged with many important roles, including the physical, social, and emotional development of a child (Jenkinson & Benson, 2009), and is considered an essential content area within the broader school curriculum (Graber, Locke, Lamdbin, & Solmon, 2008; Hunter, 2006; Kirk, 2005). Physical educators recognise that the motor domain is not the only domain of learning in physical education. The unique contribution of physical education to the educational curriculum is in the motor domain (Gallahue & Cleland Donnelly, 2003; Rink, 2006). Health and Physical Education is the only learning area in the curriculum that focuses on

developing movement skills and concepts in children. Primary school has been identified as the ideal setting for the development of fundamental motor skills, which are imperative for continued participation in physical activity (Bailey, Armour, Kirk, Jess, Sandford, & Education, 2009; Graber et al., 2008; Hunter, 2006; Lloyd et al., 2014; Rink & Hall, 2008). For the development of FMS to occur, schools need to be offering quality physical education programs that focus on physically educating students and not just having them 'play' a range of different sports. There is little consensus as to whether generalist teachers or specialist physical education teachers are best placed to deliver physical education in primary schools (Faulkner et al.,2004; O'Sullivan & Oslin, 2012). Within the majority of Australian primary schools physical education is taught by a generalist classroom teacher, which, appears to be similar practice throughout the world (Fletcher & Mandigo, 2012; O'Sullivan & Oslin, 2012; Petrie, 2010; Telford et al., 2012).

There is much debate over whether generalist or specialist teachers are best placed to deliver physical education in primary schools (Coulter et al., 2009; Faulkner et al., 2004; O'Sullivan & Oslin, 2012). Irrespective of this debate, it is unlikely that the use of specialist teachers to deliver physical education will become widespread (Locke & Graber, 2008; Morgan & Hansen, 2007) as primary schools, especially smaller primary schools, do not have budgets to hire specialist physical education teachers (Petrie, 2010).

The requirement to teach primary physical education provides challenges to pre-service teacher education programs to equip generalist teachers to be prepared, confident, and motivated to teach physical education (Freak & Miller, 2015). Concerns regarding the preparedness of generalist teachers to teach physical education have been raised for more than a decade (Bailey, 2006; Bailey et al., 2009; Graber et al., 2008; Griggs, 2012; Hardman, 2008; Hunter, 2006; Rink & Hall, 2008), with many classroom teachers feeling ill-prepared to teach physical education (Fletcher & Mandigo, 2012). The lack of time

given to the learning area during teacher training has been identified as a major concern (Warburton, 2001 as cited in Griggs, 2012) with low levels of confidence from generalist teachers to teach physical education (Morgan & Bourke, 2005) believed to be an outcome of this lack of training (O'Sullivan & Oslin, 2012).

The importance of primary physical education. The need for high-quality physical education in the primary schools is described by Pickup (2012) as being "more evident than ever before" (p. 13). One can assume the interpretation for this need stems from the 'lack of' physical activity participation and increased rates of obesity among the population. Unfortunately for physical education, there appears to be a global lack of understanding of the nature, aims, and outcomes of the subject, with individuals often confusing it with perceptions or memories of sport. The subject matter of physical education does not have a high status and few people care about what happens within the curriculum area (Beddoes, Prusak & Hall, 2014). Physical education is described as being under- practiced and under-researched, which in turn has resulted in a lack of theory development in the domain (Hunter, 2006).

Research into children's experiences in physical education has found that they can be heavily influenced by the experiences of their teachers which may not have always been positive (Morgan & Bourke, 2005). As previously mentioned, these individuals often receive limited training within the subject area and the training that they do receive often fails to address their feelings of inadequacy (Garrett & Wrench, 2007). The low status of physical education in the curriculum, inadequate facilities, inappropriate curriculum content, fragmented delivery and the teaching of physical education by generalist teachers are some of the challenges faced by the subject area (Tinning & Hawkins, 1988; Graham, 1991; Curtner-Smith, 1999; Hardman & Marshall, 2001; DeCorby et al., 2005; Griggs, 2007).

Despite these challenges, physical education has the opportunity and potential to have a significant impact on the lives and learning endeavours of children. For children, primary school physical education should offer the opportunity for children to learn how to lead health lifestyles and provide opportunities for physical activity (Fletcher & Mandigo, 2012). Schools that profess to taking a 'whole child' approach to learning must be delivering a high quality physical education program that are meaningful, well planned and have a consistent focus on teaching and learning in the physical domain (Pickup, 2012).

Distinctive environment of physical education. The specific environment in which physical education is taught imposes unique demands on those who are used to teaching in the classroom (Pickup, 2012). The array of content that is delivered in the learning area necessitate teaching that occurs in a range of physical spaces such as the gymnasium, basketball court, oval, or swimming pool, all of which present both challenges and opportunities in creating engaging learning experiences.

Assessment in physical education is also different compared with other curriculum areas. Due to the diverse nature of physical education The Australian Council for Health Physical Education and Recreation (ACHPER) established its own guidelines to reflect the practices and procedures that are considered acceptable in a physical education learning environment. These standards are specific to teaching physical education and are to be considered in conjunction with the Victorian Institute of Teaching (VIT) Standards for Graduating Teachers. Similar to the VIT Standards for Graduating Teachers the ACHPER standards are arranged into three broad themes and eight standards demonstrating the diversity of the curriculum area of physical education. This document highlights that teaching physical education is more than just playing games or delivering the main content areas (i.e., athletics, fitness, aquatics, fundamental movement skills, team sports, dance, gymnastics and outdoor adventure activities). As such, when assessing an individual's

confidence and motivation in physical education a range of tasks specific to the area must be considered, such as safety precautions specific to the environment, appropriate assessment methods, and how to make modifications to activities to increase participation

Physical education and lifelong participation. There is a growing body of literature that details the process through which quality physical education programs can play an important role in influencing adult health behaviours (Cale et al., 2014; Kirk, 2005; Lloyd et al., 2014; Morgan & Bourke, 2008). As adolescents finish high school the greatest decline in rates of physical activity occur. It is important, therefore, that good physical activity habits are developed during the early years of education (Lloyd et al., 2014). Kirk (2005) put forward the argument that early learning experiences are crucial to continuing involvement in physical activity. This idea was later supported by Morgan and Bourke (2008) who examined the impact that physical education experiences can have on an individual's involvement in physical activity later in life. They found strong relationships existed between the quality of primary physical education programs, outcome attainment in primary physical education, experience in secondary physical education and commitment to sport and physical activity relating to primary school physical education, secondary school physical education, and commitment to various physical activities. Findings highlighted the role that physical education can play in the development of health behaviours and reinforced the potentially negative effects that poor quality physical education programs can have on an individual's health behaviours. The researchers also concluded that a person is more likely to be physically active and have a positive attitude towards physical activity, both during childhood and later in life, if they have experienced success and enjoyment during physical education programs at school.

Quality physical education programs that focus on physically educating young people in an enthusiastic, supportive, and encouraging environment have the opportunity to

foster positive health behaviours and enjoyment in physical activity at the present time and into the future (Bailey et al., 2009; Green, 2008). It is during the primary school years that confident attitudes towards physical activity should be encouraged. While some children are able to take advantage of the range of community-based sports and physical activity available, some will be excluded from these out of school hours experiences for a range of social or economic reasons (Pickup, 2012). This can include lack of encouragement or support from parents/caregivers, money to facilitate participation, or opportunities available within the particular geographic location.

The need for quality physical education programs in primary schools is strongly supported by the proposition that sport and physical education are influential factors in motor skill development and refinement during childhood and adolescence (Gabbard, 2008). As children have the potential to reach a mature stage in a majority of FMS by the age of six or seven, this 'phase' of motor development is a critical time for movement skill development within travelling, object control, balance and coordination categories of movement (Gallahue, Ozmun, & Goodway, 2012). Late childhood (7 - 10 years of age) is distinguished by the emergence of sport skill behaviours (Gabbard, 2008). These skills are the advanced version of the basic skills developed in earlier childhood. If these basic skills are not mastered, then individuals are unable to begin to develop more sport - oriented skill behaviours. Proponents of the importance of establishing acceptable levels of fundamental motor skills have suggested that the attainment of these skills allow children to successfully participate in sport and physical activity throughout their lives (Gallahue & Donelly, 2003; Gallahue & Ozmum, 2001).

As Australian children are already attending primary school at the age of five, they have the potential to master or achieve a mature stage in most FMS between the years of prep and grade two. Research assessing primary schools students' mastery of FMS

indicates that many students are not at the mastery level at the designated ages. A large of number of students have still not mastered their fundamental motor skills by as late as grade six or well into their Secondary Education (Booth et al., 1999; Walkley, Holland, Treloar, & Smith, 1993). These findings indicate that the development and mastery of FMS is age-related, and not age-dependent, and is also influenced by external factors such as opportunity to practice.

Without the successful attainment of fundamental motor skills, and the consequential development of sport specific behaviours, many children find it extremely difficult to experience success and enjoyment in physical activity. An individual's ability to competently perform motor skills appears to be a major reason for children engaging in physical activity and sport (Barnett, Morgan, van Beurden & Beard, 2008). As previously stated, those who have positive experiences as a child and are engaged in physical activity are more likely to continue to lead an active lifestyle beyond their schooling years. A study by Lopes, Rodrigues, Maia, and Malina (2011) found that children with limited motor skill ability were less physically active and spent less time in social settings with their peers. This once again highlights the importance of quality physical education programs and the influence they can have on children and the implications for health related behaviour later in life.

A focus on the development of fundamental motor skills is identified by Pickup (2012) as beneficial to the overall educational efficacy of primary physical education. He proposed that the use of group work to solve problems and master new skills provides teachers with unique tools to facilitate learning in social, cognitive, and affective domains. The vocabulary used to describe movement encourages children to consider where, how, and with whom actions will be carried out.

Socialisation in physical education. Physical education in schools has previously been described as being based on a sport model (Capel, 2007). Capel describes this model as being one that focuses largely on playing team games and sports as well as the performance of associated skills. The use of such a model sees the fundamentals of sport taught through traditional physical education curriculum. An unfortunate outcome of such practice is that many students do not enjoy or feel comfortable participating in physical education which, restricts their participation in physical activity (Kirk & Macdonald, 1998). Kirk and Macdonald also commented that this sport based structure limits the transferability of knowledge for use outside of school when one of the aims is to prepare young people to continue healthy and active lifestyles.

The strong sport based model that exists within physical education could be explained through socialisation; the process by which people learn from others. It is possible, therefore, that physical education pre-service teachers already have preconceived ideas about what teaching physical education involves and it's content before they undertake any training in the area. These ideas and beliefs are based on their experiences as a school student and from participating in sport and physical activity (Bowles & O'Sullivan, 2012; Fletcher & Mandigo, 2012; Lawson, 1983; Lim-Teo, et al., 2008; Pajares, 1992). Students who experience physical education as a sport based curriculum throughout their schooling are likely to believe that is what physical education should look like; consisting of games and sport and practicing skills associated with these activities. Prior experiences of what and how individuals are taught may limit the impact of physical education pedagogy during their teacher training, resulting in teachers reproducing what they experienced as a student or sport participant (Green, 2008, Lim-Teo et al., 2008, Morgan & Hansen, 2008; O'Sullivan et al., 2009).

The socialisation process can become particularly significant for generalist teachers as they receive minimal preparation in the physical education content area (O'Sullivan & Oslin, 2012). The limited amount of training they receive in physical education doesn't allow for 'perceptions, values, beliefs, attitudes, behaviours and practices about content, teaching and teaching philosophies to be influenced' (Capel, 2007, p. 495). This, therefore, forces generalist teachers to rely on their previous knowledge and/or experiences. In terms of physical education, generalist teachers may examine their own physical education experiences for ideas and inspiration which if they were taught a sport based curriculum may consist primarily of games and sports. The teaching of such activities by these teachers allows this socialisation process to continue. That is, they experienced a curriculum based on games and sports, now they are teaching based on games and sports. This in turn means their students are experiencing a curriculum based on games and sports which may become their memories of physical education.

The socialisation process in physical education is recognised as being very influential as it impacts on the knowledge pre-service teachers identify as being important to develop and, therefore, what knowledge they actually develop (Capel, 2007). For a specialist teacher, implementing new pedagogical approaches in physical education can be challenging and can force teacher to confront their personal beliefs and assumption about physical education (Pope & O'Sullivan, 1998), this is also true for the generalist who is confronted with a new curriculum area such as teaching primary physical education.

Research in Physical Education Teaching Practice

There are challenges to conducting research on teacher education (O'Sullivan & Penney, 2014), however, scholarship and research on pre-service teacher education, and in physical education in particular is critical to inform practice. An area of interest in physical education teaching practice is the ability of generalist primary school teachers to deliver

'quality' physical education programs along with their attitudes towards teaching the curriculum area (Petrie, 2010). Research in this area has examined both pre-service and in-service teacher groups and looked at various aspects of teaching physical education such as the investigation of teaching behaviours, the impact of professional development programs, the use of alternative curriculum models, perceptive teachers' perceptions of physical education and pre-service teachers' view of their training and placement experience in physical education (Tsangaridou, 2012).

Confidence. Early work in this area of teaching behaviour has found that primary teachers struggle to engage students and make effective use of lessons, with the majority of class time being spent with all students involved in game-type activities and a very limited amount of time on skill practice (Buschner, 1985; Faucette & Hillidge, 1989; Faucette & Patterson, 1989; Faucette et al., 1990). These teaching practices can be attributed to the lack of knowledge generalist teachers feel they possess, which in turn creates feelings of uncertainty about what they are doing (DeCorby et al., 2005; Hart, 2005). These thoughts of uncertainty are influenced by an individual's feelings and perception of their own motor skills. Teachers have indicated that their confidence is affected when they perceive themselves to lack the required motor skills and an understanding of rules, tactics and techniques required to teach the wide range of sporting activities covered in the curriculum (DeCorby, et al., 2005; Hart, 2005; Morgan, 2008; Morgan & Burke, 2008; O'Sullivan, 2006; O'Sullivan & Oslin, 2012; Siedentop, 2007 Xiang et al., 2002). In contrast, those who participated in activities themselves were more effective at developing student management (Capel, 2007). Previous experience and activity instruction appear to be important to confidence to teach physical education.

Teachers who do not describe themselves as being the 'sporty' type and have very little interest in physical education have reported low levels of confidence in teaching

physical education and expressed concerns about the safety involved when delivering particular activities (e.g., gymnastics) (Armour & Duncombe, 2004; Morgan & Hansen, 2008). In contrast it has been reported that those who are personally more active tend to dedicate more time to physical fitness in their classes and also have higher quality physical education lessons compared to those who are inactive (McKenzie & Kahan, 2008). The increased quality of these physical education sessions may be a result of the value these particular teachers place on physical activity. If they themselves are still physically active it would be assumed they understand the importance this has on leading a healthy lifestyle and as a result these teachers may devote more time to the curriculum area and also put in more effort when planning and running the lessons. In contrast Parks, Solmon, and Lee (2007) proposed that participation in physical activities does not significantly impact upon a teachers' willingness to deliver a physical activity type program, whereas being involved in the teaching of physical activities through practices such as coaching can promote confidence. This may still mean that a holistic physical education curriculum is not being delivered as those teachers with experience in teaching physical activities may only deliver content/areas of physical education they have had prior experience. For example, someone with coaching experience in soccer may teach a lot of soccer and ball type sports and not provide any learning experiences in any others areas of the curriculum such as fitness, swimming and water safety, or gymnastics.

Research in this area has also compared the teaching behaviours of generalist teachers and physical education specialists with physical education specialists displaying higher levels of effective teaching behaviours and significantly higher levels of activity in classes (Rink & Hall, 2008). These findings are not surprising based on the amount and levels of training each specialist and generalist teacher group would have experienced (O'Sullivan, 2006) with a generalist potentially only engaging in one unit of physical

education studies in their teacher training and specialists in most cases having a minimum of six (Freak & Miller, 2015).Teachers often identify feelings of inadequacy with regard to their knowledge in physical education as a result of inadequate levels of training (Armour & Duncombe, 2004; DeCorby, et al., 2005; O'Sullivan, 2006; O'Sullivan & Oslin, 2012). In a study conducted by Armour and Duncombe (2004) a newly qualified teacher reported that his pre-service teacher training for physical education only included a 'couple of afternoon sessions'. He went on to say that although the sessions he did participate in were very good he felt that he needed considerably more; between 10 and 20. Another teacher in this study; an experienced teacher also commented on this teacher training as lacking in substance and consisting of around two hour weekly sessions across three terms.

Limited knowledge of the content areas in physical education is a topic that has been explored by Morgan and Bourke (2005) who found that generalist teachers possessed only moderate levels of confidence towards teaching certain content areas. Morgan and Bourke investigated the perceived confidence of both pre-service and in-service teachers to teach physical education and examined the physical education content areas that participants felt most confident to teach. This study also investigated teacher perceptions of the adequacy of their physical education teacher education for individual physical content areas and the relationship of this and their perceptions of confidence to teach physical education. A sample of 485 pre-service and in-service teachers participated, with all pre-service teachers completing a double degree, Bachelor of Arts/Bachelor of Teaching, majoring in primary education. A criticism of this study is that only pre-service teachers from one degree at one university were represented in this study. In-service teachers included a random sample of classroom teachers from both government and non-government schools. Based on the information it is unclear if the sample included a representation of rural, regional, and metropolitan schools.

The principal method of inquiry involved a questionnaire, which was largely quantitative. The questionnaire consisted of three key sections, which made use of both select-response and open-ended questions. The first area of questioning assessed the self-perceived levels of confidence in teaching within seven content areas of physical education. Responses were graded using a six-point Likert type scale; with response options ranging from strongly disagree to strongly agree. The use of a Likert scale is consistent with many other measures that have been developed to assess perceived self-efficacy. Participants responded to the statement: 'If I were to teach PE, I would feel confident and competent teaching ….'. The phrasing of the stem complies with Bandura's (2006) recommendations that terms representing "can do" rather than "will do" be used along with "I" being used as the object of the statement. The potential problem of the question stem, however, is that it appears to be double barrelled statement as it refers to two concepts: confidence and competence. It is, therefore, difficult to ascertain whether it is confidence that has been measured or competence. The use of the seven physical education content areas could also be seen as very limiting in that teaching physical education is more than just delivering content. As physical education is taught in an environment other than a classroom it requires different management skills and instructional styles to be used.

The second and third sections of the questionnaire included both selected response and open-ended questions that referred to the quality of the components of an individual's physical education teacher education course. Participants reported that they were moderately confident to teach within the seven examined content areas of physical education. Of the content areas, motor skills was the area participants felt the most confident to teach followed by major games and fitness, with the areas of gymnastics, aquatics and athletics being those in which they felt least confident. The results indicated a

training effect was present, with those in later years of study reporting greater levels of confidence to teach within the assessed content areas than those in earlier years. There was, unfortunately, a lack of detail provided on the construction of the measure with no validity or reliability information provided.

Freak and Miller (2015) investigated pre-service generalist teachers' confidence and preparedness to teach physical education using a survey in addition to structured interviews with a small sub-sample of participants. The survey was designed as part of the PhD thesis that formed the basis for the study, The Preparation to Teach Physical Education in Primary School Survey. The survey had no psychometric evaluation reported in the current study and very limited detail was provided on the questions asked of participants. Items were reported as being related to specific aspects of the physical education learning area and syllabus in New South Wales, Australia, specifically: games and sport skills, dance, gymnastics and "sport generally" (Freak & Miller, 2015, p.8). This again indicates a focus on content domains, rather than a measure that adequately addresses areas of teaching practice in physical education, such as planning lessons and delivering curriculum.

Participants were 400 pre-service generalist teachers enrolled in Primary teaching degree programmes completing one or more units of study in physical education, health, and sport. Results of the survey indicated that after completion of their most recent unit of study in physical education that 84.5% of the pre-service teachers felt prepared to teach primary physical education with 84.8% feeling confident to plan and program for safe and effective learning. Most pre-service generalist teachers felt that they were prepared to teach games and sports (93.1%), movement skills (87.0%), dance (75.4%), and gymnastics (61.1%). These findings suggest that dance and gymnastics are areas of lower perceptions of being prepared.

Pre-service and in-service teachers of either generalists and specialist backgrounds often identify gymnastics and dance as areas of the curriculum they feel the least confident to teach (Armour & Duncombe, 2004; Freak & Miller, 2015; Morgan & Bourke, 2005; Russell-Bowie, 2013). Faucette et al. (1990) found that students who had a classroom teacher for physical education had fewer opportunities to participate in gymnastics, dance and fitness-related activities compared to students taught by a physical education specialist.

The investigation of personal perceptions of physical education and previous experiences has identified issues in the area of physical education. Early research by Allison, Pissanos, and Sakola (1990) described the institutional biographies of prospective primary teachers. The participants were asked to report their most memorable moments of primary school physical education. For each memory they were asked to state the grade they were in, the setting, how they felt about the experience, and why it was memorable. Results of the study found the majority of memories to be associated with embarrassment, injury, gender inequality, special events and equipment. Memories of teachers were also not positive. It was concluded that early experiences in physical education can be very powerful in the development of teachers' perceptions of physical education and recommended that pre-service teachers be given the opportunity to discuss, confront and analyse some of their previous experiences during their teacher training.

The impact previous experience can have on teachers and their feeling towards physical education has further been supported by Morgan and Bourke (2008), who examined teachers' personal school experiences in physical education. Participants included both pre-service and in-service primary teachers and examined the nature of their school experiences on their confidence to teach physical education. Results of a select-response and open-ended questionnaire were discussed under the theme headings of

memories of primary and secondary school physical education, the influence of personal school experience in physical education on involvement in physical activity, the influence of personal school experience in physical education on perceived confidence teaching in physical education and major reasons provided for and against feeling confident and competent teaching physical education.

Participants rated their primary school physical education experiences higher than their secondary school experience with many believing the lessons reflect 'sport' participation. The programs were described as being dominated by major games, with minimal evidence of 'teaching and learning'. The authors make particular note that participants "who were involved in PE lessons, with limited variety, that focused on sports rather than skills, and rated the quality of teaching as low, were more likely to indicate low levels of outcome attainment in primary PE" (Morgan & Bourke, 2008, p. 18). Overall a moderate level of physical education teaching confidence was reported, with males tending to score more highly on the perceived confidence teaching constructs than females. Males also reported having a greater involvement in sporting activities and having more favourable school physical education experiences. Age appeared to have an impact on confidence levels with younger participants reporting greater confidence across a number of physical education content areas compared to their older counterparts. Commitment to sport and physical activity was also linked to previous experiences in school. Those who less committed reported a less positive experiences in school physical education, which then saw them report lower confidence and competence in their ability to teach various content areas effectively.

Morgan and Hansen (2008) extended this research and explored the relationship between personal school experiences and current teaching practices in physical education. This study examined personal school physical education experiences, feelings about

physical education, current teaching practice and the relationships between experiences, feelings and practices of 189 classroom teachers. When recalling memories of the types of activities the teachers took part in during their primary school years, major games was cited as an activity they participated in 'quite often', with fundamental motor skills, athletics and fitness participated in 'sometimes' and gymnastics and dance participated in 'now and then'. In secondary school, major games and fitness were the activities participants reported participating in 'quite often' and all the others only 'sometimes'.

Similar to the research by Morgan and Bourke (2008), participants were found to have had negative physical education experiences. High school teachers were reported as being more committed and knowledgeable than primary school teachers and as such were perceived as being better at teaching content such as fundamental motor skills rather than just playing games. The participants (teachers) also commented that they felt they hadn't learnt anything in physical education; lessons consisted of playing games and sports with no time given to learning and practicing the skills required to play successfully.

Teachers were found to have positive attitudes towards physical education and expressed strong beliefs about the importance of physical education in the curriculum. For some, the enjoyment of teaching physical education was a result of seeing students who may struggle in other areas of their schooling successfully engaged in classes. Enjoyment in teaching physical education was found to be linked to sport enjoyment throughout life. Games and sports was reported as being the area they had the highest teaching confidence scores, with dance and gymnastics the areas they felt the least confident. Teachers commented on feeling as though they did not possess the necessary physical skills to teach physical education and that their pre-service training was too brief and did not adequately prepare them to teach certain content areas (i.e., fundamental motor skills, gymnastics, and dance). No significant difference in confidence to teach physical education was found

between the genders. Significant differences were found, however, on attitude to teaching physical education with males possessing more positive attitudes.

Motivation. Motivated teachers have been identified as playing key roles in the effective functioning of schools that deliver strong learning outcomes for their students (Carson & Chase, 2009). The motivation of physical educators to teach has been explored by Hein et al. (2012) who examined the relationship between motivation to teach and different teaching styles. Motivation was measured using an instrument (Autonomous Motivation for Teaching) developed by Roth et al. (2007) and teaching styles were assessed using teachers' self-reported data according to the description of teaching styles presented by Curtner-Smith et al. (2001). Teachers were found to be more intrinsically motivated than extrinsically with significant differences in intrinsic motivation, introjected motivation, and external regulation found between the teachers from different countries. Intrinsic motivation was positively related to productive teaching styles and negatively related to reproductive styles. A negative correlation was found between introjected motivation and reproductive styles. The results of the study confirmed the hypotheses that those who are more autonomously motivated adopt more student-centered or reproductive teaching styles and those who are not autonomously motivated use a more teacher-centered or productive styles. This suggests that teacher motivation is related to teaching practice, so that understanding the types of motivation driving teaching in primary physical education is important to advancing the practice of physical education in primary schools.

Teacher motivation is a domain of inquiry that is still emerging (Kaplan, 2014). Much of the work that has been done on motivation in the field of physical education has examined the relationship motivation has with different constructs such as need support, need satisfaction, student motivation and outcomes in physical education and physical activity. Van den Berghe et al. (2014b) undertook an analysis of 74 SDT- grounded peer

reviewed studies conducted in the field of physical education published between 2000 – 2010. The studies were categorised according to the main variable assessed with nine studies focused on antecedents (i.e., pressures from above, below, or within) of teacher need support and the explanatory role of teacher need satisfaction and motivation, 29 studies investigated relationships between need support provided by teachers and need satisfaction in students, 51 studies investigated relationships between need satisfaction and motivation of students, and 47 studies highlight the existence of a positive relationship between autonomous motivation and positive outcomes in physical education and/or physical activity (some studies were believed to fit into more than one category based on what they measured and their results). Although these studies have examined motivation in teaching, there are few studies using SDT that have explored motivation to teach physical education and more specifically the motivation of teachers to teach primary physical education.

Van den Berghe et al. (2014b) comment that contextual factors related to physical education such as the characteristics of the physical education program, class and student characteristics, teacher characteristics, and features of facilities and equipment are only considered in a limited number of studies. Teachers' personal and professional characteristics such as their age, sex, teaching experiences, and degree were also not frequently included in the method section. The absence of such detail in the methods section would imply that these teacher characteristics were not used in any analysis and their potential to influence motivation has not been explored. Van den Berghe et al. (2014b) confirm that "this descriptive information was only minimally mentioned in several studies and the effects of these factors on SDT-related motivational variables were hardly studied" p.111). The absence of demographic information in the examination of motivation is in contrast to comments by Brouse et al. (2010) who observe characteristics

such as gender and year level as being frequently used. Recommendations of the review conducted by Van den Berghe et al. reinforce that future research using SDT in physical education should take into account the possible influence of contextual factors and relevant physical education contextual factors.

Carson and Chase (2009) highlighted that researchers have only just begun to explore motivation or related psychological concepts in regards to physical education teaching. An area of teacher motivation that has emerged as a field of interest is why individual choose teaching as a career. Spittle and Spittle (2014; 2015) examined motivation in pre-service teachers using the AMS (Vallerand et al., 1992). In their examination of reasons why pre-service students opted to specialise in primary physical education they found the strongest motivation to study or attend university was identified extrinsic motivation. This was then followed by intrinsic motivation – to know, extrinsic motivation – introjected, extrinsic motivation – external regulation, intrinsic motivation – toward accomplishment, and intrinsic motivation – to experience stimulation and amotivation. No significant differences were found for any of the motivation types based on gender or other teaching method. Differences were found between the year levels; with second year students having significantly higher identified extrinsic motivation than third year students and third year students being significantly more amotivated than first year students.

In addition to examining motivation, Spittle and Spittle (2014) also analysed the relationships between attractors and facilitators and motivation. Confident interpersonal service, family and low perceived demand were found to be the main predictors of intrinsic motivation. Confident interpersonal skills refers to being confident and helping other people. These finding show a relationship existing between both confidence and motivation and in this case demonstrates how confidence can be a predictor of motivation.

Confidence and motivation. Much of the research examining confidence and motivation in the area of the physical education has done so by examining teacher's confidence and its impact on student motivation (Pan, 2014). Pan (2014) sought to confirm the relationship between self-efficacy and motivation in an exploration of teacher's self-efficacy and students' learning motivation, learning atmosphere, and learning satisfaction in physical education in high school students. Based on reviewing relevant literature Pan (2014) hypothesised that teachers' self-efficacy directly influences student learning motivation, learning atmosphere and learning satisfaction. It was also posited that the relationship between teachers' self-efficacy and students' learning satisfaction is mediated by learning motivation and learning atmosphere. Structural equation modelling was used to test the above hypothesis. The hypothesised model was found to have an acceptable level of fit which substantiates the positive casual relationship among teachers' self-efficacy, and students learning motivation, learning atmosphere, and learning satisfaction in physical education.

A physical education teacher's self-efficacy was found to have a positive direct effect on students' learning motivation, learning atmosphere, and learning satisfaction. Teachers' self-efficacy was also found to indirectly influence student learning satisfaction through the mediating variables of learning motivation and learning atmosphere. These findings highlight how increases to a teacher's self-efficacy can have a positive impact on a student's learning satisfaction, their motivation and the learning atmosphere. The study also produced a model that showed the casual relationships links between a teachers' self-efficacy, student motivation, the learning atmosphere, and learning satisfaction.

In an effort to establish knowledge and understanding in the area of motivation and teaching physical education Carson and Chase (2009) examined whether physical educators' perceived fulfilment of autonomy, competence, and relatedness were related to

their self-determined motivation. They also sought to carry on the work of Nix (1998) and explore the impact of personal characteristics (e.g., educational background, teaching experience), professional characteristics (e.g., professional membership, conference attendance) and environmental factors (e.g., facilities, equipment) on physical educators' fulfilment of autonomy, competence, and relatedness. Participants included 247 physical education teachers who were teaching across a range of school levels; 5 – 18 year olds. The participants (physical education teachers) completed a number of measures which collected information on their personal characteristics and school/environment which they teach in; their feelings of relatedness within the social setting of teaching; their perceived competence in teaching physical education; their perception of autonomy on the job and their perceived reasons for teaching physical education. Physical educators' perceptions of teacher autonomy, competence, and relatedness were found to be positively and strongly associated with intrinsic and extrinsic motivation but not amotivation . This suggests feelings of competence and confidence are related to motivation to teach. In addition, attending conferences, giving professional presentations, teaching in primary schools, using quality equipment, and having a supportive school leadership were related to perceptions of autonomy, competence, and relatedness. This reinforces the importance of teaching experience, training, and profession development to confidence and motivation to teach physical education.

Summary

The literature identifies physical education as an essential content area within the school curriculum (Graber et al., 2008; Hunter, 2006; Kirk 2005). As children have the opportunity to reach a mature stage of development in FMS by the age of six to seven (Gabbard, 2008) this makes primary school the ideal time to acquire these movement skills (Bailey et al., 2009;Barnett et al., 2008; Graber et al., 2008; Rink & Hall, 2008). The

attainment of FMS is necessary for the development of sport specific behaviours (Gallahue et al., 2012). If children fail to acquire base movement skills (i.e., FMS), they may find it difficult to attain sport specific movement skills, which can impact on their success and enjoyment when participating in physical activities (Cale, et al., 2014). Early positive learning experiences are believed to be crucial to continuing involvement in physical activity (Kirk, 2010).

The need to create positive learning experiences through quality physical education is highlighted, with positive experiences believed to impact on health behaviours for now and into the future (Fletcher & Mandigo, 2012; Pickup, 2012). Barriers to the delivery of quality physical education programs have been identified and include the low status of physical education in the broader school curriculum, inadequate facilities, fragmented delivery and the teaching of physical education by generalist teachers (Tinning & Hawkins, 1988, Graham, 1991; Curtner-Smith, 1999; Hardman & Marshall, 2001; DeCorby et al., 2005; Griggs, 2007).

Generalist teachers have been found to possess low levels of confidence physical education (Faucette et al., 2002; Morgan & Bourke, 2005). Factors such as their perception of their own motor skills (Morgan, 2008; Morgan & Bourke, 2008; Xiang et al., 2002), a lack of training and knowledge (DeCorby et al., 2005; Hardman & Marshall, 2006; Morgan & Bourke, 2005 O'Sullivan & Oslin, 2012), and previous experiences (Morgan & Bourke, 2008) have been found to contribute to these feelings of uncertainty towards physical education.

Research in the this area appears to have neglected to examine an individual's confidence to teach all aspects of physical education, such as planning lessons, assessing students' performance and managing the learning the environment and only focused on confidence to teach the practical content areas such as FMS, games and sports, and

athletics. This incomplete exploration could be attributed to the lack of measures available to assess teachers' confidence in physical education. Research that has examined confidence to teach physical education has often done so with measures that do not have their reliability or validity reported and the psychometric properties unknown.

Teachers' motivation has also been identified as a key component to the effective function of a school (Carson & Chase, 2009). Limited research has been conducted regarding teachers' motivation specific to physical education, with much of the literature focusing on student motivation (Kaplan, 2014; Roth, 2014). A range of global measures of motivation for teaching exist, however none are specific to physical education. The distinctive environment of physical education requires specific investigation. The quality of motivation and not quantity has been recognised, highlighting SDT as an important motivation theory to consider when examining motivation to teach physical education.

Efficacy is believed to affect the motivational process of human functioning, as such the low levels of confidence identified in generalist primary teachers may affect different motives for teaching physical education. Despite the capacity for confidence to impact on motivation, limited research exists examining both constructs. This highlights a need for measures and research on confidence and motivation to teach primary physical education.

CHAPTER 3: DEVELOPMENT OF A MEASURE OF CONFIDENCE AND MOTIVATION TO TEACH PRIMARY SCHOOL PHYSICAL EDUCATION (STUDY 1)

Introduction

Study 1 is designed to develop an instrument to assess teachers' confidence and motivation to deliver primary school physical education. Confidence has been depicted as an individual's mindset toward their capabilities (Duda & Treasure, 2010). Perceived self-efficacy is closely related to confidence and is described as an individual's belief about their capability to complete a task (Bandura, 1977), that is, it is specific to a particular skill and situation (Duda & Treasure, 2010) (e.g., confidence to teach gymnastics in physical education). Consequently the confidence of a teacher to teach physical education is their perceived belief about their ability to complete a range of specific tasks and handle situations when teaching physical education. Confidence is important because it influences the challenges people undertake, the effort they expend in the activity, and their persistence in the face of difficulties (Feltz & Oncu, 2014). Motivation is a multi-faceted construct that consists of beliefs, perceptions, values, interests and actions that drive our behaviour (Deci & Ryan, 1985). It is an important psychological construct because it influences the choices people make and the effort they invest in those choices.

The literature on confidence in teaching has suggested that teachers' sense of efficacy is related to student outcomes such as achievement and motivation, and teacher behaviour, including the amount of effort teachers put into teaching and their willingness to utilise new methods of delivery (Jimenez-Silva et al., 2012; Tschannen-Moran et al., 1998). Thus, there are very good reasons for exploring confidence to teach. The research on teachers has been criticised for investigating confidence as a global construct as opposed to examining it across a range of specific tasks and situations relevant to teaching

(Hoy, 2000; Tschannen-Moran et al., 1998). This has led to researchers developing measures of teaching confidence that are specific to content areas, such as science, music, and technology, as well as some initial research in physical education.

Research into the confidence of primary school teachers to deliver primary school physical education has suggested that some teachers do lack confidence (Callea et al., 2008), or were uncomfortable or ill equipped to teach physical education (Telford et al., 2005; Xiang et al., 2002). Physical education imposes unique demands on teachers who typically teach in other curriculum areas where classroom-based teaching is regularly used (Pickup, 2012). This could be challenging for the primary school teacher and reflect lower confidence and subsequent motivation to teach. Because these beliefs can influence teacher behaviour and student outcomes, the possibility exists of a consequential impact on the delivery of quality physical education in primary schools, which is essential in motor skill development and refinement (Gabbard, 2008). Primary school has been identified as the ideal setting for the development of fundamental motor skills, which are imperative for continued participation in physical activity (Bailey et al., 2009; Graber et al., 2008; Hunter, 2006; Lloyd et al., 2014; Rink & Hall, 2008). In addition, there is a growing body of literature that details the process through which quality physical education programs can play an important role in influencing adult health behaviours (Kirk, 2005; Morgan & Bourke, 2008). Research into children's experiences in physical education has found that they can be heavily influenced by the prior experiences of their teachers, which may not have necessarily been positive (Morgan & Bourke, 2005). Consequently, it is important that these teachers are confident and motivated to teach in this curriculum area.

Although research exists examining confidence in teaching physical education (e.g., Morgan & Bourke, 2005), a criticism of the studies is the lack of detail and psychometric evaluation of the measures they have used to collect their data. Generally,

validity and/or reliability data have not been provided or assessed. The measures used have also focused on narrow areas of physical education teaching, such as examining the confidence to deliver specific content areas of physical education (e.g., FMS; Callea et al. 2008) while not assessing other tasks involved in teaching physical education, which include managing the learning environment and planning appropriate learning experiences. The partial evaluation of curriculum content and pedagogical practices is a limitation to the comprehensive assessment of confidence in physical education teaching. A psychometrically validated measure of confidence to teach physical education that encompasses the range of specific tasks required to teach physical education will assist in developing an understanding of confidence in relation to teaching physical education.

Motivation is an attribute that determines our actions; it moves us to act in particular way or not to undertake particular behaviours (Gredler et al., 2004). As such, knowledge of motivation towards teaching primary physical education can provide an important insight into why or why not the curriculum area is taught. Motivation for teaching physical education has rarely been explored in relation to SDT, so this type of theoretical framework may be useful in extending understanding of the underlying motivation of primary teachers to engage in the delivery of physical education curriculum. Use of a theoretical framework may allow for more research to identify socialisation processes to motivational development in teaching physical education in addition to identifying the development of motivational characteristics specific to teaching primary physical education.

Research on teacher motivation has expanded as an area of examination (Mansfield & Beltman, 2014). Researchers have investigated constructs such as what motivates individuals to study (Brouse et al., 2010), and reasons for choosing to specialise in a particular area of teaching (Spittle & Spittle, 2014). Despite several studies (Carson &

Chase, 2009; Hein et al., 2012; Spittle & Spittle, 2014; 2015; Van den Berghe et al., 2013) directed toward the investigation of teacher motivation and its influence on teacher engagement and behaviour, research on the motivation of primary school teachers and the teaching of physical education is much less evident in the literature. Currently, a range of measures of general motivation and teaching motivation exist, however, none specific to physical education were identified. For this reason, validated and psychometrically evaluated instruments to assess the motivation to teach physical education warrant development.

An instrument that measures both confidence and motivation would be valuable because it would allow measurement of the beliefs and expectations influencing decisions of primary teachers towards delivering physical education. Confidence or belief about success on a task can influence motivation to perform that task (Bandura, 1997, 1998), so self-efficacy is the cognitive mechanism that mediates between sources of self-appraisal and subsequent motivation (Feltz & Oncu, 2014). Perceptions of self-efficacy contribute to motivation in a number of ways, such as determining goals, intensity of effort applied, level of persistence, and resilience to failure. Individuals feel and act more motivated when they think they have the competence to meet the demands of the task at hand and believe they have some control in regard to participation (Duda & Treasure, 2010). When applied to teaching, a teacher's motivation to perform a task depends on their expectations of how they will perform on that task (Visser-Winjveen et al., 2014). Comprehensive and systematic approaches to developing instruments to assess how beliefs and expectations influence teaching in physical education should include information on both confidence and motivation to teach physical education.

Aims

The aim of Study 1 was to develop a valid and reliable instrument to measure teachers' confidence and motivation to deliver primary school physical education. The procedures of instrument development in Study 1 offer a comprehensive and systematic approach to assessing both confidence and motivation to teach physical education based on existing confidence and motivation frameworks.

Method

Participants

Participants were 161 pre-service teachers studying an education degree at a Victorian university (male: $n = 31$; female: $n = 130$) with a mean age of 24.66 years ($SD = 4.69$). From the sample, 132 indicated they were studying to become a generalist primary teacher (not a specialist physical education teacher) and 29 indicated they would be specialising in primary physical education. A specialist primary physical education teacher completes specific training; most often a minimum of six discipline units must be completed to specialise in this area.

Instrumentation

Two measures were used to collect the following information: basic demographic details; and the confidence and motivation of pre-service education students to teach primary school physical education.

Demographics information sheet. The demographics information sheet contained twelve questions and is presented as Appendix G. Participants circled answers or wrote short responses to indicate their gender, age, which University they were attending, which campus they were attending, their year level, how many units of physical education they had completed, whether they were training to be a physical education specialist, the number of hours of physical education they had taught on teaching rounds, if they had

undertaken any other professional development in physical education, and their previous and current involvement in physical activity.

Confidence and motivation to teach primary physical education questionnaire (CMTPPEQ). The questionnaire consisted of two sections that included questions that addressed confidence and motivation. Each section was developed independently. The confidence section was developed by the research student (in consultation with her supervisors) and the motivation section was an adaptation of the pre-existing framework of the AMS (Vallerand et al., 1992) and the SMS (Pelleitier et al., 1995).

Confidence scale. The construction of the confidence section of the questionnaire involved the development of an item pool. To develop the item pool the following documents were examined: (a) The Victorian Essential Learning Standards, Health and Physical Education, Levels 1 – 3 (VCAA, 2012); (b) The ACHPER Professional Standards for Graduate Teachers of Physical Education, Primary generalist Year Prep to 6 (ACHPER, 2010); (c) National Professional Standards for Teachers, Draft 12 February 2010 (AITSL, 2011); and (d) VIT Standards of professional practice for full registration; Standards for graduating teachers (VIT, 2010).

During the initial examination of the documents any similarities found between the materials were highlighted as important topics or attributes that needed to be formulated into questions for inclusion in the item pool. Following the initial analysis, it was decided that the eight standards found within the ACPHER Professional Standards for Graduate Teachers of Physical Education, Standards for Professional Practice for Full Registration and Standards for Graduating Teachers would be used as headings for the development of subscales of questions. The eight standards were selected as headings for the development of items as they appeared to provide a holistic view of the roles/duties required to be performed by a teacher.

There was at least one question under each of the headings:

1. Teachers know how students learn and how to teach them effectively
2. Teachers know the content they teach
3. Teachers know their students
4. Teachers plan and assess for effective learning
5. Teachers create and maintain safe and challenging learning environments
6. Teachers use a range of teaching practices and resources to engage students in effective learning
7. Teachers reflect on, evaluate and improve their professional knowledge and practice
8. Teachers are active members of their profession.

There were also a number of other attributes that had been identified and written into questions that clearly did not fit within any of the subscale headings e.g., 'understand the relationship between physical activity and health'. A total of 43 items were written into questions that could be used to assess teacher confidence to teach physical education in primary schools. These 43 items were then analysed for similarities by the researcher in consultation with the principal supervisor. Items found to be addressing the same question were then removed from the item pool. Following this analysis the number of items dropped to 24. These 24 items, which related to the global question 'I am confident in my ability to', were then compiled to create section one of the questionnaire.

Motivation scale. The motivation section of the questionnaire used the framework of the AMS (Vallerand et al., 1992) and SMS (Pelletier et al., 1995). The AMS (Vallerand et al., 1992) is a measure of intrinsic, extrinsic and amotivation for going to 'college,' or in Australian terminology, 'university'. The SMS (Pelleitier et al., 1995) measures motivation for participating in sport. Both scales consist of 28 Likert scale style questions related to

seven different subscales of motivation. Three subscales measure various types of intrinsic motivation, three measure various types of extrinsic motivation, and one measures amotivation. The AMS has been found to have adequate temporal stability with test-retest correlations ranging from .71 to .83, and acceptable internal consistency with Cronbach's alpha values ranging from .83 to .86 with the exception of one subscale, identification which has a value of .62 (Vallerand, et al., 1992). The SMS has also been found to have adequate internal consistency with Cronbach's alpha values reported between .74 to .80 with the exception of one subscale, identification which had a value of .63 (Pelleitier et al., 1995). The individual items in each of the AMS (Vallerand et al., 1992) and SMS (Pelletier, et al. 1995) were used as a base to develop the questions to assess motivation for teaching primary physical education. In the adapted form of the measure the item stem "Why you would teach physical education" was used.

All items developed were combined to create the CMTPPEQ as presented in Appendix H. The two part questionnaire consisted of 51 items to examine an individual's confidence to teach (24 items) and motivation to teach (28 items), primary physical education. The questionnaire incorporated a 6 point Likert Scale as the response technique ranging from 1 (*strongly disagree)* to 6 (*strongly agree).*

Comprehensibility. An initial version of the CMTPPEQ was reviewed for clarity. Undergraduate students (n = 5) completing a Bachelor of Education (P-12) who had chosen Primary Physical Education (P-6) as one of their teaching methods read the initial version of the questionnaire. Students were asked to read the instructions at the beginning of each section and examine each individual item indicating whether they felt the question was comprehensible (easy to understand). Specific words or phrases that students did not understand were highlighted and additional space was provided for comments. No specific

areas of concern were identified regarding the language used in the measure by the students.

Face and content validity. Feedback provided during the comprehensibility review resulted in minor grammatical changes being made to the questionnaire. The revised version of the questionnaire was then reviewed by five expert practitioners and researchers in the area of physical education and teacher education. Experts were asked to indicate whether they felt each item was firstly appropriate and secondly comprehensible. They were also able to provide any general comments or feedback about each item if they felt it necessary. Some of the main suggestions were the rewording of questions to make them more descriptive, use terminology/language more consistently, include examples of items for clarification, and to consider adding an item that addressed self-reflection. Suggestions and modification considered to be beneficial in the refinement of the questionnaire were incorporated into the final draft.

Procedures

Ethics approval for the research was granted by the Arts, Education & Human Development Human Research Ethics Committee (AEHD HREC) of Victoria University. While not expected, unease and anxiety at the completion of the questionnaire was identified by the committee as a potential negative consequence arising from participation. To help minimise the possible psychological risk, a thorough explanation of the research and how the gathered data would be handled and used was provided. It was made clear to participants that they could withdraw from the study at any time. During the explanation of the project participants were informed they could contact the researcher for a referral to counselling services if they did experience any form of anxiety as a result of answering the questions. This information was also provided in the plain language statement given to all participants.

Following consultation and approval from the unit coordinator and tutors, questionnaires were administered during tutorials in the compulsory health and physical education unit all students complete in the Bachelor of Education (P-12) course during week 9 of semester 2. The time schedule was structured to avoid busy times for students, and respondents were encouraged to complete the questionnaires during a brief allotted period of class time. Participants were asked to answer the questionnaire honestly without deliberating too long over any one section. The researcher was available for questions prior to the commencement of the questionnaire. The researcher then waited outside the room while students were completing the questionnaires. Twenty minutes of time for completion was the maximum expected as explained on the plain language information statement, however, most students comfortably completed the questionnaire in less than fifteen minutes. During the invitation, the researcher informed potential participants both verbally and by their information statement that participation was voluntary, and that their consent was implied by the return of the completed questionnaire.

Design

A simple cross sectional single measure administration design was used to evaluate the psychometric properties of the CMTPPEQ.

Data Analysis

Data analysis was undertaken with the goal of evaluating the reliability, validity and factor structure of the questionnaire. Statistical analyses of each of the confidence and motivation sections, involved the following procedures:

1. Descriptive analysis to determine the mean, standard deviations, skewness and kurtosis for each of the items and subscales in each section.
2. EFA to examine the factor structure of each section of the questionnaire.

3. The assessment of internal consistency for each of the subscales using Cronbach's alpha coefficients. Cronbach's alpha greater than .70 were considered acceptable (Nunnally, 1978).
4. Item-subscale correlation and item-deleted alpha coefficients to examine the degree to which each item is a good exemplar of the subscale it is proposed to belong to.
5. A reliability coefficient of stability was calculated using Pearson's correlation for the test-retest data.

The purpose of factor analysis is to apply statistical techniques to a "single set of variables when the researcher is interested in discovering which variables in the set form coherent subsets that are relatively independent of one another" (Tabachnik & Fidell, 2013, p. 612). Related variables that are independent of other subsets of variables are combined into factors.

To examine the factor structure of the confidence and motivation sections of the questionnaire, principal axis factoring extraction was used. Principal axis factoring extraction was selected as the appropriate factor extraction method as it allows for communality estimates that include an error term within the model, which avoids the assumption within principal component analysis that the variables are perfectly reliable (Costello & Osborne, 2005). It was also selected as it requires no distributional assumptions and is able to be used if the data is not normally distributed (Fabrigar et al., 1999 as cited in Beavers et al., 2013). As all variables in the confidence section of the questionnaire explored confidence (albeit, in different areas of teaching physical education), and all variables in the motivation section explored motivation to teach physical education, there is a high possibility that correlations between the variables within each section of the questionnaire may exist. This makes oblique rather than orthogonal rotation a more appropriate rotation method (Costello & Osborne, 2005, Gorsuch, 2013).

To assist with the final factor structure logical analysis, a procedure that most appropriately details the important characteristics warranting consideration in establishing validity during the initial stages of development was used (Marsh, 1998). “Logical analysis examines the logical consistency of the construct definition, the construction of items based on this definition, the acceptability of the measure’s instructions, item format, scoring procedures etc.” (Marsh, 1998, p. xvi). This procedure also outlines the importance of addressing developmental, maturational, cultural, and ethical concerns in this early stage of test construction.

Results

Confidence

Descriptive statistics for the individual items. The means and standard deviations for each item in the confidence section of the questionnaire are presented in Table 3.1. Mean scores ranged from 3.03 to 5.01 on the 6 point Likert scale, with only one item recording a mean above five. Pre-service teachers training as physical education specialists scored higher than those training as non-specialist teachers across all items in the confidence section of the questionnaire.

Table 3.1

Means and Standard Deviations for the Items in the Confidence Section

Item		Total (N = 161)		Non-specialist (n = 132)		Specialists (n = 29)	
		M	*SD*	*M*	*SD*	*M*	*SD*
1.	Teach motor skills and complex movements	4.13	1.32	3.92	1.30	5.10	0.90
2.	Demonstrate an understanding of assessment in physical education in relation to the curriculum	3.66	1.42	3.45	1.42	4.66	0.94
3.	Teach outdoor experience activities (e.g., bushwalking and basic orienteering)	3.55	1.47	3.48	1.51	3.83	1.23
4.	Plan a physical education program across a unit, term, and year to match the learning outcomes of the curriculum	3.80	1.51	3.55	1.50	4.93	0.96
5.	Teach the movement skills of dance (e.g., responding to movement stimuli such as rhythm and beat and reproducing movement sequences)	3.75	1.58	3.54	1.59	4.72	1.31
6.	Teach the skills and activities of team games and sports (e.g., tactics, sports-specific skills, rules and the roles of various positions)	4.34	1.33	4.13	1.33	5.31	.081
7.	Establish clear, challenging and achievable learning goals for students in physical education	4.24	1.18	4.03	1.15	5.21	0.77
8.	Understand the relationship between physical activity and health	5.01	1.06	4.87	1.09	5.66	0.55
9.	To use a range of technologies (e.g. ICT, heart rate monitors, movement analysis tools) to support and engage student learning in physical education	3.65	1.38	3.48	1.38	4.38	1.12
10.	Identify the prior knowledge and the learning strengths and weaknesses of students in physical education	4.01	1.18	3.80	1.16	4.93	0.75
11.	Use my knowledge of resources and organisations to assist with the development of the physical education curriculum	3.89	1.23	3.70	1.22	4.72	0.88
12.	Effectively communicate information to students, teachers and parents about student achievement in physical education	4.24	1.22	4.08	1.23	5.00	0.80

(continued)

Table 3.1 (continued)

Means and Standard Deviations for the Items in the Confidence Section

Item	Total (N = 161)		Non-specialist (n = 132)		Specialist (n = 29)	
	M	*SD*	*M*	*SD*	*M*	*SD*
13. Teach the movement skills of gymnastics	3.03	1.48	2.80	1.41	4.07	1.33
14. Use my knowledge of effective pedagogical approaches and learning styles to the areas of physical education	3.70	1.27	3.55	1.30	4.38	0.78
15. Understand the educational rationale for the inclusion of physical education in the school curriculum	4.24	1.33	4.03	1.35	5.17	0.71
16. Maintain accurate records of students learning in physical education	4.22	1.20	4.06	1.23	4.93	0.70
17. Teach the movement skills of athletics (e.g., javelin, discus, high jump, running events)	3.79	1.50	3.58	1.47	4.76	1.24
18. Create and maintain a learning environment which is student centered and maximises physical activity and participation	4.24	1.31	4.02	1.31	5.24	0.79
19. Teach the skills and knowledge of swimming and water safety	3.61	1.56	3.46	1.60	4.28	1.19
20. Teach fitness related skills and activities	4.43	1.32	4.18	1.29	5.55	0.74
21. To use a range of protocols to assist classroom management strategies that are unique to physical education (e.g., safety rules, putting away equipment, stop signal)	4.62	1.24	4.46	1.24	5.34	0.90
22. To self evaluate and revise the learning activities in physical education	4.16	1.18	3.98	1.17	4.93	0.88
23. Address the learning needs of all students in physical education including the gifted. Talented, disadvantaged or disabled	4.05	1.30	3.84	1.28	5.00	0.93
24. Demonstrate an understanding of the need for the mastery of fundamental motor skills as an important factor in children's participation in physical education	4.12	1.30	2.95	1.29	4.86	1.06

Exploratory factor analysis.

Preliminary analysis. The skewness and kurtosis values of the preliminary analysis indicated that the data was not normally distributed. As factor analysis is different from other multivariate procedures with dependent and independent variables not being separated, this allows the relationships between the variable to be examined without the specifications of one variables' influence upon another (Beavers, Lounsbury, Richards, Huck, Skolits, & Esquivel, 2013). Consequently, normality is not required when using factor analysis so variable transformation was considered unnecessary.

The Kaiser-Meyer-Olkin Measure of Sampling (KMO) and Bartlett's Test were examined for partial correlations. "Kaiser (1974) recommends a bare minimum of 0.5 and that values between 0.5 and 0.7 are mediocre, values between 0.7 and 0.8 are good, values between 0.8 and 0.9 are great and values above 0.9 are superb" (Hutcheson & Sofroniou, 1999 as cited in Field, 2009, p. 659). As a value of .96 was found, which falls into the range of superb, there was support that the sample size was adequate for factor analysis (Field, 2013). As there are fewer than five cases per variable, Bartlett's Test of Sphericity was also performed (Tabachnick & Fidell, 2007). Bartlett's test was significant ($p < .001$), suggesting that there were some relationships between the variables proposed to be included in the analysis. Finally, the communalities were all above .30, further confirming that each item shared some common variance with other items. Given these overall indicators, factor analysis was deemed to be suitable with all 24 items.

Exploratory factor analysis. Kaiser's (1958) criterion of eigenvalues of one or greater was used to determine the initial number of factors to be rotated, which was three. After determining the initial number of factors to be rotated, principal axis factoring extraction with oblimin rotation was performed. These initial eigenvalues indicated that the first factor explained 55% of the variance. The second and third factors had eigenvalues

just over one, and explained 6% and 4% of the variance respectively. Solutions for two and three factors were examined using direct oblimin rotation. The two factor solution, which explained 55% of the variance, was the preferred solution because of: (a) the 'levelling off' of eigenvalues on the scree plot after 2 factors; (b) the insufficient number of primary loadings and (c) difficulty of interpreting the third factor.

Principal axis factoring resulted in the extraction of two factors with eigenvalues greater than one, accounting for 55% of the total variance. Direct oblimin rotation converged in 13 iterations. Items with loadings greater than or equal to .40 were then used to interpret the factors. The factors were labelled as Factor 1: Management and Planning; and Factor 2: Implementation. Table 3.2 displays the results of the EFA for confidence

Table 3.2

Factor Loadings for the Exploratory Factor Analysis with Oblimin Rotation of the Confidence Section

Items	Factor 1: Management and Planning	Factor 2: Implementation
15. Understand the educational rationale for the inclusion of physical education in the school curriculum	**.97**	-.27
18. Create and maintain a learning environment which is student centered and maximises physical activity and participation	**.87**	-.09
22. To self evaluate and revise the learning activities in physical education	**.85**	-.02
14. Use my knowledge of effective pedagogical approaches and learning styles to the areas of physical education	**.84**	-.11
12. Effectively communicate information to students, teachers and parents about student achievement in physical education	**.80**	.06
20. Teach fitness related skills and activities	**.73**	.17
24. Demonstrate an understanding of the need for the mastery of fundamental motor skills as an important factor in children's participation in physical education	**.70**	.10
8. Understand the relationship between physical activity and health	**.66**	.04
10. Identify the prior knowledge and the learning strengths and weaknesses of students in physical education	**.66**	.27
4. Plan a physical education program across a unit, term, and year to match the learning outcomes of the curriculum	**.65**	.16
23. Address the learning needs of all students in physical education including the gifted. Talented, disadvantaged or disabled	**.65**	.18
21. To use a range of protocols to assist classroom management strategies that are unique to physical education (e.g., safety rules, putting away equipment, stop signal)	**.64**	.05
17. Teach the movement skills of athletics (e.g., javelin, discus, high jump, running events)	**.61**	.51
16. Maintain accurate records of students learning in physical education	**.61**	.08
11. Use my knowledge of resources and organisations to assist with the development of the physical education curriculum	**.58**	.27
7. Establish clear, challenging and achievable learning goals for students in physical education	**.56**	.37
2. Demonstrate an understanding of assessment in physical education in relation to the curriculum	**.49**	.37
6. Teach the skills and activities of team games and sports (e.g., tactics, sports-specific skills, rules and the roles of various positions)	**.42**	.41

(continued)

Table 3.2 (continued)

Factor Loadings for the Exploratory Factor Analysis with Oblimin Rotation of the Confidence Section

Items	Factor 1: Management and Planning	Factor 2: Implementation
3. Teach outdoor experience activities (e.g., bushwalking and basic orienteering)	-.11	**.77**
5. Teach the movement skills of dance (e.g., responding to movement stimuli such as rhythm and beat and reproducing movement sequences)	.10	**.56**
13. Teach the movement skills of gymnastics	.15	**.49**
9. To use a range of technologies (e.g., ICT, heart rate monitors, movement analysis tools) to support and engage student learning in physical education	.36	**.45**
1. Teach motor skills and complex movements	.40	**.41**
19. Teach the skills and knowledge of swimming and water safety	.27	**.40**

Descriptive statistics, internal consistency and Pearson's correlation coefficient of the confidence factors. Descriptive statistics, internal consistency (Cronbach's alpha) and Pearson's correlation coefficients were computed for the identified confidence factors. The total scale score and average score per item for each factor are provided. The average score per item for management and planning was 4.15 and for implementation it was 3.81. Both of the factors returned adequate Cronbach's alpha values (Nunnally, 1978) and significant correlations with adequate reliability (Miller, 2002).

Table 3.3

Means, Standard Deviations, Internal Consistency and Pearson's Correlation Coefficients for the Confidence factors

	Total Scale Score		Average Score Per Item		Internal Consistency	Test Re-test (*r*) (*N* = 25)
Factors	*M*	*SD*	*M*	*SD*		
Management and Planning	62.19	14.80	4.15	0.99	.95	.65
Implementation	34.27	9.42	3.81	1.05	.89	.70

Motivation

Descriptive statistics for the individual items. The mean and standard deviations for each of the items in the motivation section of the questionnaire are shown in Table 3.4. When examining the results from the entire sample, the means ranged from 1.96 to 5.22 with only one item having a mean above five on the 6 point Likert scale. Pre-service teachers training to be physical education specialists scored higher than those training as generalist teachers scored higher on 18 of the 28 items.

Table 3.4

Means and Standard Deviations of the Items in the Motivation Section

	Total (N = 161)		Non-specialist (n = 132)		Specialist (n = 29)	
Item	*M*	*SD*	*M*	*SD*	*M*	*SD*
1. For the excitement I feel when I am teaching physical education	4.06	1.33	3.86	1.32	4.97	0.94
2. Because it allows me to build a good reputation as a teacher	3.85	1.37	3.71	1.38	4.48	1.12
3. Because teaching physical education is fun	4.51	1.28	4.33	1.30	5.31	0.76
4. To prove to myself that I am capable of teaching physical education	4.16	1.23	4.13	1.21	4.28	1.31
5. It is unclear to me why I need to teach physical education	2.24	1.52	2.35	1.50	1.76	1.50
6. For the pleasure it gives me to learn more about the activities that I am teaching	4.06	1.21	4.01	1.25	4.31	1.00
7. Because other classroom teachers teach physical education	2.80	1.42	2.93	1.38	2.21	1.47
8. For the satisfaction I feel while improving my teaching within physical education	4.11	1.27	3.95	1.28	4.83	0.97
9. Because I would feel bad if I wasn't taking the time to teach physical education	3.32	1.56	3.42	1.51	2.86	1.71
10. Because physical education promotes positive relationships between teacher and student	4.74	1.15	4.59	1.17	5.41	0.73
11. For the enjoyment of discovering new teaching strategies	4.50	1.56	4.45	1.14	4.69	1.23
12. I am not sure of physical educations value within the curriculum	2.32	1.55	2.45	1.55	1.76	1.43
13. Because it is a learning area I am required to teach within the curriculum framework	3.41	1.44	3.47	1.37	3.14	1.73
14. Because I like the feeling of being involved in the activity that I am teaching	4.39	1.29	4.19	1.30	5.28	0.80
15. Because teaching physical education makes me feel like I am adequately fulfilling my role as a teacher	4.02	1.34	3.88	1.34	4.66	1.17
16. For the satisfaction that I experience in broadening my knowledge about areas of physical education	4.33	1.21	4.15	1.22	5.14	0.79
17. For the enjoyment I have in seeing my students achieve their goals	4.78	1.11	4.65	1.15	5.34	0.72
18. Because what students learn in physical education is important	4.92	1.02	4.77	1.03	5.62	0.56
19. For the satisfaction that I feel while teaching tasks I find difficult	4.10	1.27	4.08	1.28	4.17	1.26

(continued)

Table 3.4 (continued)

Means and Standard Deviations of the Items in the Motivation Section

	Total (N = 161)		Non-specialist (n = 132)		Specialist (n = 29)	
Item	*M*	*SD*	*M*	*SD*	*M*	*SD*
20. I do not think I am capable of teaching physical education effectively	2.73	1.64	3.00	1.63	1.48	0.99
21. Because teaching physical education allows me to continue to learn about things that interest me	4.17	1.38	3.99	1.32	4.97	1.35
22. Because physical education is required to be taught in schools	4.02	1.47	4.06	1.39	3.86	1.83
23. For the satisfaction I experience when I am teaching physical education	4.28	1.35	4.11	1.33	5.07	1.19
24. I feel that I am wasting students time teaching physical education	1.96	1.39	2.09	1.44	1.38	0.94
25. Because physical education allows me to experience a personal satisfaction in my teaching career	4.11	1.31	3.89	1.29	5.10	0.86
26. Because my students expect to participate in physical education sessions	4.16	1.31	4.18	1.30	4.07	1.39
27. Because physical education is important in a child's development	5.22	1.02	5.12	1.00	5.66	1.01
28. Because I would feel guilty that I hadn't taught physical education to my students	3.53	1.63	3.68	1.54	2.83	1.85

Exploratory factor analysis.

Preliminary analysis. Preliminary analysis procedures adopted to examine the confidence section of the questionnaire were used on the motivation section to determine whether factor analysis was appropriate. Similar to the confidence section of the questionnaire, the skewness and kurtosis values indicated the data was not normal. As normality is not essential when using factor analysis (Tabachnick & Fidell, 2013), variable transformation was considered unnecessary. A KMO value of .90 was found, indicating that the sample size was adequate for factor analysis (Field, 2009). Bartlett's test was found to be significant ($p < .001$), suggesting that relationships existed between the variables. Examination of the correlation matrix also found several sizeable correlations above the minimum of .3, which further confirms that items shared some common variance with other items. These results indicated that the 28 items were suitable for factor analysis.

Exploratory factor analysis. Kaiser's (1958) criterion of eigenvalues of one or greater was used to identify an initial six factors or rotation. Principal axis factoring extraction with oblimin rotation was performed with the initial eigenvalue for the first factor explaining 36% of the variance. The second, third, fourth, fifth, and sixth factors also had eigenvalues over one and explained 13%, 6%, 5%, 4%, and 4% of the variance respectively. Solutions for four and five factor structures were examined using direct oblimin rotation. The six factor solution described above was chosen as the preferred solution. The five factor solution failed to have a sufficient number of primary loadings making it difficult to interpret the fifth factor and the four factor solution had a large number of the items loading on one factor causing difficulty in interpretation.

Table 3.5

Factor Loadings for the Exploratory Factor Analysis with Oblimin Rotation for the Motivation Section

Post Analysis Factors	EFA Factor Loadings					
Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
23. For the satisfaction I experience when I am teaching physical education	**0.83**	0.02	-0.02	0.00	0.12	-0.07
25. Because physical education allows me to experience a personal satisfaction in my teaching career	**0.81**	-0.01	-0.04	-0.14	0.06	-0.02
21. Because teaching physical education allows me to continue to learn about things that interest me	**0.75**	-0.03	0.00	-0.06	0.03	-0.05
14. Because I like the feeling of being involved in the activity that I am teaching	**0.59**	-0.05	0.25	0.05	0.10	0.10
15. Because teaching physical education makes me feel like I am adequately fulfilling my role as a teacher	**0.45**	-0.21	-0.15	-0.21	0.19	0.34
16. For the satisfaction that I experience in broadening my knowledge about areas of physical education	**0.44**	-0.17	0.10	0.04	0.27	0.26
17. For the enjoyment I have in seeing my students achieve their goals	**0.44**	-0.05	0.24	0.14	0.09	0.27
19. For the satisfaction that I feel while teaching tasks I find difficult	**0.39**	0.18	0.25	-0.06	0.01	0.23
5. It is unclear to me why I need to teach physical education	-0.01	**0.73**	0.02	0.04	0.04	-0.05
20. I do not think I am capable of teaching physical education effectively	-0.06	**0.72**	0.13	0.04	-0.27	0.07
12. I am not sure of physical educations value within the curriculum	0.04	**0.58**	-0.22	-0.14	0.12	-0.02
24. I feel that I am wasting students time teaching physical education	-0.01	**0.58**	-0.25	0.02	-0.01	0.20
27. Because physical education is important in a child's development	0.01	-0.18	**0.80**	-0.04	-0.05	0.04
18. Because what students learn in physical education is important	0.30	-0.11	**0.50**	0.14	0.08	0.19
11. For the enjoyment of discovering new teaching strategies	0.14	-0.08	**0.38**	-0.07	0.34	0.06

(continued)

Table 3.5 (continued)

Factor Loadings for the Exploratory Factor Analysis with Oblimin Rotation for the Motivation Section

Post Analysis Factors	EFA Factor Loadings					
Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
4. To prove to myself that I am capable of teaching physical education	0.00	0.00	-0.10	-0.04	**0.76**	0.09
8. For the satisfaction I feel while improving my teaching within physical education	0.10	-0.10	0.07	0.00	**0.66**	0.13
2. Because it allows me to build a good reputation as a teacher	0.17	0.01	-0.13	-0.04	**0.61**	0.06
1. For the excitement I feel when I am teaching physical education	0.36	-0.01	0.09	0.08	**0.58**	-0.15
3. Because teaching physical education is fun	0.28	-0.04	0.21	0.02	**0.55**	-0.16
6. For the pleasure it gives me to learn more about the activities that I am teaching	0.14	0.10	0.41	-0.22	**0.49**	-0.27
10. Because physical education promotes positive relationships between teacher and student	0.14	-0.20	0.18	0.02	**0.46**	0.26
9. Because I would feel bad if I wasn't taking the time to teach physical education	0.08	-0.16	-0.12	**-0.73**	-0.01	0.02
7. Because other classroom teachers teach physical education	-0.02	0.31	0.00	**-0.59**	0.18	-0.04
28. Because I would feel guilty that I hadn't taught physical education to my students	0.10	0.03	0.15	**-0.50**	-0.14	0.10
13. Because it is a learning area I am required to teach within the curriculum framework	-0.22	0.16	0.10	**-0.44**	0.32	0.18
26. Because my students expect to participate in physical education sessions	0.13	0.15	0.14	-0.12	-0.02	**0.46**
22. Because physical education is required to be taught in schools	-0.09	0.06	-0.02	-0.21	0.12	**0.43**

Principal axis factoring resulted in the extraction of six factors with eigenvalues greater than one, accounting for 36% of the total variance. Direct oblimin rotation converged in twenty-one iterations. Variables with loadings greater than .40 were used to interpret the factors. The identity of some of the factors was not clear with some variables not loading on the factor that they would logically belong too.

Factor 1 retained its original structure produced by the EFA. It contained eight items and was labelled Personal Satisfaction. Factor 2 also maintained its original structure produced using the EFA. It contained four items and was labelled Amotivation. Factor 3 originally contained three items, however, it was considered that item 11 did not logically fit with the other items in the factor. As item 11 was moved into the fifth factor as it appeared to relate more to the other items in it. This move was logically coherent as item 11 loaded strongly on both the third and the fifth factor. The finalised third factor contained two items and was labelled Learning and Development. Factor 4 originally contained four items and Factor 6 originally contained two items. Logical analysis found that these items would be best represented as one factor instead of two so these factors were combined to make Factor 4, which was labelled Expectations, Requirement, and Guilt. Factor 5 maintained its original structure with the addition of item 11. This factor was labelled as Fun, Improvement and Relationships. The final factor structure of the motivation section contained 5 factors.

Descriptive statistics, internal consistency and Pearson's correlation coefficient of the motivation factors. Descriptive statistics, internal consistency (Cronbach's alpha), and Pearson's correlation coefficients were computed for the five motivation factors. The total scale score and average score per item for each scale are provided. The means for the average score per item range from 2.31 to 5.07. The Cronbach's alpha values were found to be adequate (Nunnally, 1978) and the majority of

the correlations were found to be significant (r = >.60). Only a moderate relationship between the variables (r = <.60) was demonstrated for the learning and development and Expectation, Requirements and Guilt factors.

Table 3.6

Means, Standard Deviations, Internal Consistency and Pearson's Correlation Coefficients for the Motivation Factors

	Total Scale Score		Average Sore Per Item		Internal Consistency	Test Re-test (r) (N = 25)
Factors	*M*	*SD*	*M*	*SD*		
Personal Satisfaction	34.16	8.08	4.27	1.01	.91	.76
Amotivation	9.25	4.69	2.31	1.17	.77	.84
Learning and Development	10.14	1.84	5.07	0.92	.77	.53
Expectations, Requirement and Guilt	21.24	5.89	3.54	0.98	.75	.54
Fun, Improvement and Relationships	33.98	7.66	4.25	0.96	.90	.75

Correlational analysis. Table 3.7 present the pattern of correlations among the motivation subscales. The correlations suggest some evidence of a simplex like pattern and appear to be somewhat congruent with the self-determination continuum. As would be expected, personal satisfaction correlated most strongly with fun, improvement and relationships (.78) and had a negative correlation with amotivation (-.27). If the pattern was as per the self-determination continuum, fun, improvement and relationships should also be strongly related to learning and development (.35), although it had a stronger correlation with expectations, requirement and guilt (.49). Learning and development also had a stronger correlation with personal satisfaction (.60). Expectations, requirement and

guilt had its strongest correlation with fun, improvement and relationships (.49). The strongest negative correlation for amotivation was with learning and development (-.37) followed by personal satisfaction, which is somewhat consistent with the continuum.

Table 3.7

Correlations Between Motivation Subscales

	1	2	3	4	5
1. Personal satisfaction	1.00	.78**	.60**	.33**	-.27**
2. Fun, Improvement and Relationships		1.00	.35**	.49**	-.23**
3. Learning and development			1.00	.13	-.37**
4. Expectations, Requirement and Guilt				1.00	.26**
5. Amotivation					1.00

** p<.01

Discussion

The confidence of generalist or non-specialist teachers to teach primary school physical education is an area that has previously been explored (Callea et al., 2008; Cundiff, 1990; Hickey, 1992; Morgan & Bourke, 2005, 2008; Xiang et al., 2002). These research studies revealed that many primary trained teachers do not feel confident to effectively deliver the content area of physical education. Investigations of teaching confidence in physical education have predominantly been undertaken using quantitative survey measures, often asking teachers about specific areas of teaching physical education, such as fitness, dance or fundamental motor skills, rather than looking at the content area as a whole (Callea et al., 2008; Morgan & Bourke, 2005). In addition, previous investigations of the confidence of teachers to teach physical education have rarely reported the reliability and validity characteristics associated with the psychometric adequacy of the measure. This leads to the possibility that results from these studies may

be based on data that is not valid or reliable. It is important, therefore, that suitable measures of confidence to teach physical education are developed.

Although confidence to teach physical education has been analysed regularly (Callea, et al., 2008; Cundiff, 1990; Hickey, 1992; Humphries et al., 2012; Morgan & Bourke, 2005, 2008; Xiang et al., 2002) an individual's motivation to teach physical education has yet to be extensively investigated (Kaplan, 2014; Roth, 2014). A large body of literature exists around motivation to engage in domains such as academic study or sport participation, with a number of psychometrically evaluated measures developed to assess the construct (Pelletier et al., 1995; Vallerand et al., 1992). In contrast, valid and reliable measures examining the motivation of students and pre-service teachers to teach physical education are currently limited. As such, no existing theoretical model or new model has been applied or emerged to explain how motivation for entering the teaching profession influences various aspects of teaching both directly and indirectly (Kauffman et al., 2011) particularly in relation to teaching physical education. This first study in this thesis provides preliminary evidence of the psychometric qualities of a measure devised specifically to assess the confidence and motivation of individuals to teach primary school physical education.

Relationship with Research and Theory

Analysing the measure. Much of the current research that has sought to measure confidence in teachers has done so using a framework of self-efficacy or explored confidence as a general term. There are several studies that have conducted statistical evaluation of their measures through approaches such as factor analysis (e.g., Humphries et al., 2012; Russell-Bowie, 2013; Webster, Erwin, & Park, 2013). Specifically, factor analysis was used in this phase of the research to identify groups or clusters of variables in

the questionnaire relative to the measurement of the confidence and motivation of generalist primary school teachers to teach physical education.

Confidence. The results of the initial EFA of the confidence section did not provide a clear indication of the number of factors that should be retained. Kaiser's (1958) criterion indicated there were three factors with eigenvalues greater than one, however, only two factors were retained in the final solution. The decision not to use Kaiser's criterion alone to determine the number of factors to be rotated was based on criticisms it has received in the literature. For example, Kaiser's (1958) criterion has been criticised for producing the incorrect number of factors to be retained (Costello & Osbourne, 2005) with Beavers et al. (2013) accusing the estimation of both over and under-extracting the number of factors. Field (2013) also stated that, generally speaking, Kaiser's criterion overestimates the number of factors to be retained; but that it can be accurate when the data meets certain criteria, for example, sample size exceeds 250. In addition, Beavers et al. (2013) state that Kaiser's criterion should only be used in component analysis. The scree plot was also examined to determine the number of factors to be retained in this study. This was because the three factor solution produced in this study failed to provide sufficient primary loadings across all three factors, there was difficulty in interpreting the third factor, the sample was less than 250, and principal axis factoring was used.

Cattell's scree plot method of extraction receives praise in the literature, being described by some authors as the best choice for researchers regarding factor extraction (Costello & Osbourne, 2005). As the number of factors retained based on Kaiser's criterion did not produce clearly interpretable and comprehensible results, the process described by Costello and Osbourne (2005), which incorporates both methods, Kaiser's criterion and Cattell's scree plot was used to determine the number of factors. Kaiser's criterion identified three factors to be retained, whereas the scree plot was seen to level off after two

factors. With this in mind, solutions for two, three, and four solutions were examined. The two factor solution was considered to provide the most interpretable and logical factor structure. Both factors contained at least three to five items (management and planning: 15 and implementation: 9) and had items with loadings of greater than .50, demonstrating the strength and stability of each factor (Costello & Osbourne, 2005). These results infer that the participants perceived differences in activities associated with teaching practice and delivery of content specific to areas of physical education.

Factor 1, Management and Planning contained items that could be described as common roles/duties that a teacher would perform, with the items written in the context of physical education. For example item 2 'demonstrate an understanding of assessment in physical education in relation to the curriculum' and item 4 'plan a physical education program across a unit, term, and year to match the learning outcomes'. These appear to relate to teaching practice common across all content areas, but applied to physical education. These management and planning activities were perceived as different from the implementation of specific content. Factor 2, labelled implementation contains items that appear to refer to delivering content specific to physical education, for example item 3 'teach outdoor experience activities (e.g., bushwalking and basic orienteering), and item 13 'teach the movement skills of gymnastics'. The only item that doesn't refer to teaching a specific content area of physical education that loaded strongly on this factor was item 9 'to use a range of technologies (e.g., ICT, heart rate monitors, movement analysis tools) to support and engage student learning in physical education'. This may have been interpreted as using specific technologies to physical education (e.g., heart rate monitors, and movement analysis), accordingly it was viewed as physical education specific knowledge or skill. It also still refers to the delivery of content, which logically fits under the label of implementation.

Item 17 ‘to teach the movement skills of athletics (e.g., javelin, discus, high jump, running events)’ and item 20 ‘to teach fitness related skills and activities’ are both items that would probably be regarded as referring to the content areas of physical education, but both had greater loadings on Factor 1 than Factor 2. Based on the groupings of the other items it would have been expected that these items would have also loaded on Factor 2 with the other items that referred to the delivery of specific content in physical education. Fitness was identified earlier as having one of the highest mean scores, which is also consistent with previous research (Morgan & Bourke, 2005). This high mean could be attributed to the participants feeling as though they have an adequate level of knowledge to deliver this particular content area. These feelings of confidence towards this area could also contribute to the reasons item 20 had a greater loading on Factor 1. As previously explained, Factor 1 items appear to be related to teaching in general despite specific reference to physical education. If these items have grouped together because participants feel more comfortable about these aspects of teaching, it make sense that an item on fitness would also cluster here as it received one of the highest mean scores, indicating participants feel a level of confidence towards teaching in this particular area.

Item 17 ‘to teach the movement skills of athletics’ also had a higher loading on Factor 1 than Factor 2. It is important to note that the loadings between the two factors for this item were similar (.10 higher on Factor 1 than Factor 2). The mean total for this item indicated participants are only moderately confident in this area so the reasons for it loading on this Factor are unclear. Item 6 ‘teach the skill and activities of team games and sports’ also had a greater loading on Factor 1 (only by .01) than Factor 2, where we would have expected it to load. Unlike item 17 ‘to teach the movement skills of athletics’ the team games and sports item, similar to fitness, also had a high mean score which could explain why it has loaded on Factor 1. Item 1 ‘teach motor skills and complex movement’

did have a greater loading on Factor 2 which is logically where we would expect it to load; however, it also had a very similar loading on Factor 1 (the difference between the two loadings was only .01). Similar to team games and sports and fitness, this item also had a high mean score, which is probably why it had similar loadings on each factor.

Item 6 'team games and sports' and item 17 'athletics' had cross-loadings of greater than .40, which Schonrock-Adema, Heijne-Pennings, Van Hell, and Cohen-Schotanus (2009) recommended as criteria to remove an item. The content areas of physical education that these items represent are core components of the physical education curriculum and as such it is considered that these items are needed to give a true representation of what is involved in teaching physical education. Beavers et al. (2013) proposes that theoretical knowledge is equally as important as the statistical coherence of measure; with this is mind items were not removed from the questionnaire. In keeping with the previous point, item 20 'fitness' item 17 'athletics' and item 6 'games' were moved into Factor 2 where they are believed to logically fit. This resulted in 15 items in Factor 1 (management and planning) and 9 items in Factor 2 (implementation).

Factor 1 Management and Planning had a higher mean score than Factor 2 Implementation. As previously mentioned, the items in Factor 1 appear to describe the roles/duties common to the profession of teaching in the context of physical education. As the participants were all completing an undergraduate degree in education they may have felt that the skills and knowledge that they have gained while undertaking their studies would allow them to adequately perform these roles even though they are specific to physical education. These are also activities that they have most likely performed in other domains, which relates to Bandura's (1977) self-efficacy theory where performance accomplishments are believed to positively influence an individual's self-efficacy (Duda & Treasure, 2010). Previous mastery experiences in managing and planning for teaching in

other domains may contribute to the expectation of future success (Hoy, 2000). For example, in response to 'establish clear, challenging and achievable learning goals for my students in physical education' the participants may have felt they would be able to perform this task. This may occur even though they may have little experience in physical education because they have successfully done this before in other areas of their teaching. The concept of performance accomplishments and mastery experiences could also explain the lower total mean score for Factor 2 Implementation. As the participants are likely to have limited previous experience in implementing the specific activities of physical education this may undermine their confidence to perform these tasks (Weinberg & Gould, 2015). For example, never having taught gymnastics before gives little frame of reference for being able to teach the skills of gymnastics.

Overall, the findings of Study 1 indicated that the development of the measure was successful. There were differences in scores for the total sample and each participant group (i.e., non-specialist and specialist) for the items in the confidence section of the questionnaire, with the non-specialist group recording the lowest total means, and the specialist group recording the highest. The total participant group means for each item fell between the non-specialist and specialist group item means on all occasions. These findings demonstrate the ability of the measure to distinguish between the non-specialist and specialist pre-service teacher course groups in a pattern that would be expected, given their contrasting levels of training in the area of physical education. That is, participants who had chosen to specialise in physical education and had more training indicated high levels of confidence. These participants reported that they had undertaken five or more units in the area of physical education, which should provide the opportunity to gain knowledge and practical experience that is essential for teaching in the learning area of physical education. Non-specialist teachers reported undertaking one unit in the area of

physical education, hence it is to be expected that the limited amount of training they have received would be reflected in their lower overall confidence to effectively deliver physical education.

In the present study, the items designed to assess an individual's confidence to teach the content areas of aquatics and gymnastics received the lowest mean scores for the non-specialist participant group. This is consistent with findings from previous research (Freak & Miller, 2015; Morgan & Bourke, 2005; Morgan & Hansen, 2008) that also reported these content areas were the lowest areas of confidence for generalist teachers. A general education degree will often only have one to two units that are devoted to the learning area of physical education with these units also covering health (Freak & Miller, 2015; O'Sullivan & Oslin, 2012). As such, these units are probably designed to provide an overview of the content area of health and physical education and focus on introducing students to the curriculum and pedagogy required for effective teaching in the area, rather than how to teach the skills and concepts of the various content areas (e.g., gymnastics and aquatics). This can mean that pre-service teachers do not undertake learning in all of the content areas of physical education or have very limited exposure to health and physical education. They may have had very little exposure to specific areas such as aquatics and gymnastics. Teachers have been found to be more likely to teach a particular activity or content area if they themselves experienced it is as student (Morgan & Hansen, 2008). Gymnastics and aquatics are areas that teachers recall only participating in every 'now and then' during their time at school compared to an area such as major games which they participated in 'quite often' (Morgan & Hansen, 2008).

There is a significant relatedness between curriculum and instruction (O'Sullivan, 2013), so that both knowledge of the content area and pedagogy within the content area can influence decisions in primary physical education about what is taught, how it is

taught, and even whether it is taught. Limited content and instructional knowledge may lead to decisions that limit the quantity and quality of physical education delivered by non-specialist teachers. A lack of confidence may develop from this restricted content knowledge, so that instruction of physical education is also limited.

Teachers have often cited a lack of knowledge and comfort level as reasons they do not teach gymnastics as part of their physical education program (Hickey, 1992; Mitchell, Davis & Lopez, 2002; Morgan & Bourke, 2008; Thompson, 1996). Some teachers even went as far to say that they "felt very insecure in these areas and often ended up ditching the lesson plan to play dodge ball or going back to the classroom early because the children had 'forgotten' how to listen" (Armour & Duncombe, 2004, p. 7). There may be a lack of self-assurance in teaching these areas because of the technical skill requirements and safety concerns, which may appear more obvious in gymnastics and aquatics than other areas. It is also possible that these concerns are heightened in generalists who have less specific training. Generalist teachers have reported feeling that their pre-service training in games and sports and active lifestyle to be 'fair to average' with their training in dance and gymnastics only being 'fair' (Morgan & Hansen, 2008).

The content area that the non-specialist participant group rated highest for confidence was fitness followed closely by team sports and then motor skills. Previous research has identified motor skills, major games and sports and fitness to be the content areas individuals have the greatest confidence to teach (Freak & Miller, 2015; Morgan & Bourke, 2005). The section of the questionnaire developed to measure confidence has produced results consistent with similar research, which, has sought to measure the confidence of a similar participant group (Freak & Miller, 2015; Morgan & Bourke, 2005; 2008; Morgan & Hansen, 2008). This indicates that the questionnaire is measuring a

similar construct to other questionnaires that have been used to measure confidence, supporting its validity as a measure of confidence.

Fitness, team sports, and motor skills may have been rated highest for confidence as a result of participants having pre-conceived ideas about what is involved in teaching these content areas. Currently physical education in schools is based around participation in games and sports and the development of sport specific skills (O'Donovan & Kirk, 2008). This means that in physical education many of these participants would have participated in some type of fitness activities and/or team sports and games and as such may believe they have some knowledge and understanding of what is involved in teaching the content area. Green (2008) explains this idea as a socialisation process, whereby physical education teachers tend to replicate what they have experienced during their childhood, school, and other physical education experiences. This in turn creates a curriculum that consists of activities and experiences the students have had or participated in themselves (Bowles & O'Sullivan, 2012). These experiences appear to consist of traditional curriculum relating to sports (O'Donovan & Kirk, 2008), which may mean that students perceive physical education to be all about sports (Green, 2008). It may also be that there are a wide variety of resources available to develop curriculum and lessons in these areas that are easy to interpret and implement. The emphasis on team games and sports may also explain the lower scores in the areas of aquatics, gymnastics and dance. Green (2008) proposed that the socialisation process may lead students to perceive that team games and sports are important areas of the curriculum, therefore, the current participants were prepared for experiences of this nature in physical education, however, they may not expect content within broader conceptualisations of physical education, for example gymnastics and dance, and aquatics. Being required to do activities outside of these expectations may be confronting especially if they have limited experience of these

activities. For specialist teachers, implementing new pedagogical approaches in physical education can be challenging and can force teachers to confront their personal beliefs and assumptions about physical education (Pope & O'Sullivan, 1998), this is also true of a generalist teacher who is confronted with a new curriculum area such as teaching primary physical education.

Motivation. For motivation, the number of factors to be retained was determined using a combination of Kaiser's (1958) criterion along with Cattell's scree plot as described by Costello and Osbourne (2005) as per the analysis of the confidence section of the questionnaire. Using Kaiser's (1958) criterion six factors were identified to be rotated, with the scree plot appearing to level off after five. Solutions for four, five, and six factor solutions were examined, with the six factor solution providing an interpretable factor structure. All of the factors appeared robust, as they had at least three items with loadings greater than .50 (Costello & Osbourne, 2005) with the exception of factor 6, which only had two items both with loadings less than .50. The five factor solution wasn't selected as it also failed to have a sufficient number of primary loadings, with only one item loading on the third factor and the four factor solution saw the majority of the items load on one factor, making it difficult to interpret.

The motivation section of the questionnaire was developed using the framework of the AMS (Vallerand et al., 1992) and SMS (Pelletier et al., 1995), which are based on Vallerand's (1997) interpretation of SDT (Bandura, 1985; 2000). Factor 1, labelled personal satisfaction, consisted of 8 items, which described participants' feelings of satisfaction of learning about and teaching physical education. For example, item 23 'for the satisfaction I experience when I am teaching physical education'. All of the items on Factor 1, personal satisfaction, were based on intrinsic motivation items from the AMS (Vallerand et al., 1992) and SMS (Pelletier et al., 1995) with the exception of item 15

‘because teaching physical education makes me feel like I am adequately fulfilling my role as a teacher’ which was based on an extrinsic motivation item. This result infers that this item may have reflected intrinsic motivation for teaching physical education as it loaded with these items. This could be because the item incorporates internal regulatory processes related to satisfaction in the role, i.e., ‘makes me feel like I am’. The grouping of these items appears to make logical sense, as the relevant regulatory processes associated with intrinsic motivation are interest, enjoyment, and inherent satisfaction, which are represented by the items in this factor.

Factor 2, labelled amotivation comprised 4 items relating to being unsure of the importance and value of physical education and not being capable of teaching it. For example, item 5 ‘it is unclear to me why I need to teach physical education’ and item 24 ‘I feel that I am wasting students’ time teaching physical education’. All four items were based on amotivation items in the AMS (Vallerand et al., 1992) and SMS (Pelletier et al., 1995). These items, therefore, all seem to represent a lack of motivation towards teaching physical education.

The third factor, labelled learning and development consisted of 2 items describing the importance of physical education in children’s learning and development. For example, item 18 ‘because what students learn in physical education is important’ and item 27 ‘because physical education is important in a child’s development’. These items were based on extrinsic motivation items from the AMS (Vallerand et al., 1992) and SMS (Pelletier et al., 1995), specifically identified regulation. This type of extrinsic motivation involves regulatory processes of personal importance and conscious valuing. These items appear to reflect this type of motivation as they describe the importance of physical education in the learning and development of children and loaded together in the factor analysis.

Expectations, requirement and guilt was the fourth factor and comprised 6 items representing feelings of an obligation to provide physical education based on personal, student, and curriculum expectations and requirements. For example, item 22 ‘because physical education is required to be taught in schools’, item 26 ‘because my students expect to participate in physical education sessions’ and item 28 ‘because I would feel guilty that I hadn’t taught physical education to my students’. These items were based on external and introjected regulation items from the AMS (Vallerand et al., 1992) and SMS (Pelletier et al., 1995). The items in the factor appear conceptually congruent with external regulation as they represent feelings of being required to deliver physical education.

Factor 5, labelled fun, improvement and relationships consisted of 8 items related to enjoyment, positive experiences and developing relationships in teaching physical education. For example, item 1 ‘for the excitement I feel when I am teaching physical education’ and item 10 ‘because physical education promotes positive relationships between the teacher and student’. The items in this factor were based on both intrinsic and extrinsic items from the AMS (Vallerand et al., 1992) and SMS (Pelletier et al., 1995). Five of the items were based on intrinsic motivation items with two based on identified regulation and one on introjected regulation. The majority of the items appear to be conceptually congruent with intrinsic motivation as they represent enjoyment and satisfaction. There is also a personal importance that is valued for internal rewards, which reflects the identified and introjected regulation involved. Item 6 in this factor was the only item that had a cross-loading greater than .40, which, based on the Schonrack-Adema et al. (2009) criteria, indicates the item should be removed. As the item logically fits with the other items in the factor and it had the greatest loading on this factor it was deemed unnecessary to remove it.

Five factors emerged from the EFA phase of the motivation section of this study. Results of the EFA demonstrated that although the questionnaire was created to measure motivation it does not fit the exact configuration of the AMS (Vallerand et al., 1992) and SMS (Pelletier et al., 1995) but still measures the differential states along the motivational continuum conceptualised by SDT. In order of increasing self-regulation per SDT, these factors are amotivation; expectations, requirement and guilt; learning and development; fun, improvement and relationships; and personal satisfaction (Figure 3.1).

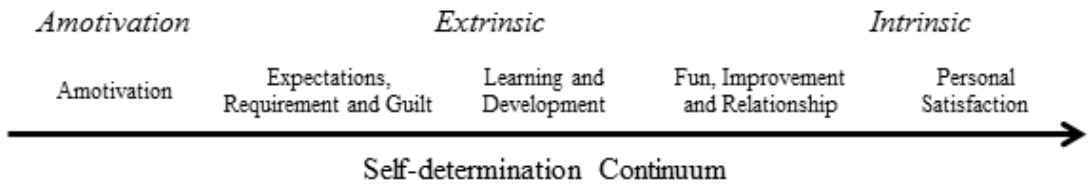

Figure 3.1

Self-determination Continuum of Motivation Factors

Expectations, requirement and guilt consisted of items based on external regulation and introjected regulation subscales, effectively seeing the merging of these into a single factor. This clustering of items from different subscales of the AMS has been observed in previous research. For example, Smith, Davey, and Rosenberg (2012) collapsed the introjected subscale, resulting in a final EFA consisting of amotivation, external regulation, identified regulation, and intrinsic motivation factors. Although consistent with previous research, the findings are not in line with how the AMS (Vallerand et al., 1992) and SMS (Pelletier et al., 1995) extrinsic motivation subscales are expected to align according to SDT as hypothesised by Vallerand et al. (1993) (Smith et al., 2012). The continuum of self-determination arranges the extrinsic motivation subscales as follows; external regulation, introjected regulation, and identified regulation. As these regulatory styles of

external regulation and introjected regulation are located side by side on the continuum and SDT proposes that motivation is a continuum and not distinct blocks, it seems plausible that there would be some cross over.

Despite items in the motivation section of the questionnaire being modelled on the three intrinsic motivation subscales of the AMS (Vallerand et al., 1992) and SMS (Pelletier et al., 1995), three purely intrinsic factors were not produced by the EFA. The factor labelled personal satisfaction appears to be the most self-regulated factor as the items within it describe the relevant regulatory processes of interest, enjoyment, and inherent satisfaction. All the items within this factor were initially based on intrinsic questions from the AMS (Vallerand et al., 1992) and SMS (Pelletier et al., 1995) with the exception of item 15, which was originally based on an introjected regulation question. Item 15 'because teaching physical education makes me feel like I am adequately fulfilling my role as a teacher' could be interpreted as an intrinsic motivation item as the question encompasses aspects of inherent satisfaction. As all the intrinsic subscales are represented in this factor; intrinsic motivation to accomplish, intrinsic motivation to know, and intrinsic motivation to experience stimulation, this substantiates SDT with regard to intrinsic motivation being a global construct. Previous research has also found intrinsic motivation can be represented in one subscale (Fernet et al., 2008; Mallet et al., 2007; Smith et al., 2012).

The factor fun, improvement and relationships is situated between personal satisfaction and learning and development on a continuum of self-determination. This factor consists of a mix of items originally conceived of as intrinsic and extrinsic. It appears, however, that the factor items represent internal perceptions of control over the behaviour rather than being externally regulated as conceived, as well as items related to intrinsic motivation in relation to the activity.

Support for a SDT continuum would be demonstrated by a simplex pattern wherein adjacent subscales are strongly related, while subscales at opposite ends of the continuum would have low or no relationship or be negatively related. The motivation factors produced as a result of the EFA do not fully substantiate a perfect fit for the simplex pattern because for the motivation questionnaire as the factors as adjacent items do not always have the strongest positive correlations. The pattern, however, is somewhat consistent with what would be expected. The strongest negative correlation was seen between amotivation and learning and development, which represents identified regulation. This is consistent with previous research (Cokley, 2000; Fairchild et al., 2005; Smith et al., 2012) that also found the strongest negative correlation between amotivation and identified regulation. Smith et al. (2012) also found the strongest negative correlation was not between amotivation and intrinsic motivation but amotivation and external regulation. Expectations, requirement and guilt, representing external regulation, correlated most strongly with fun, improvement and relationships, (which is believed to lie somewhere between intrinsic and extrinsic motivation on the continuum) and personal satisfaction (which represents intrinsic motivation) (see Figure 3.1). If a simplex pattern was present, the strongest correlation for expectations, requirement and guilt should have been with learning and development and amotivation, which are positioned on either side. The weakest correlation for learning and development was with expectations, requirement and guilt, its adjacent external scale and the strongest correlation was with personal satisfaction (the most intrinsic scale and not the other adjacent subscale). The highest correlation for fun, improvement and relationships was with an adjacent scale, personal satisfaction, however, personal satisfaction, had a stronger correlation with learning and development than with fun, improvement and relationships. The correlation for personal satisfaction

declined along the continuum, with amotivation having a negative correlation, which is what would be expected in a simplex structure.

A reason for the deviation from the simplex pattern could be the language or wording used in the individual items. For example, items 2, 10, 18 and 27 in the motivation section of the questionnaire were based on the identified regulation subscale. Items 18 and 27 were written with a focus on the importance of physical education to a child whereas items 2 and 10 focus on relationships that can be built through physical education. The two distinct themes within the one factor could explain why all four items did not cluster together and why inter-subscale correlations have deviated from the simplex structure. Fun, improvement and relationships consists of a mix of items based on intrinsic motivation from all three intrinsic subscales in addition to the extrinsic subscales of identification and introjection. The strongest correlation for this factor was with expectations, requirement and guilt, consisting of items based on external introjected regulation. Smith at al. (2012) also found a positive association between intrinsic motivation, external regulation, and identified regulation. This lends further support for the idea that the motivational subscales might not be mutually exclusive as proposed within SDT (Fairchild et al. 2005). Subsequent research is necessary to confirm the proposed factor structure of the questionnaire.

Results of the EFA and correlational analysis on the motivation section of the questionnaire depict SDT operating as a continuum whereby varying degrees of intrinsic and extrinsic motivation exist along it. The mix of regulatory styles seen in the factors could be a result of the way the items are written or worded or it could be a demonstration that motivation for teaching physical education exists along a continuum which does not divide extrinsic motivation into separate segments, but sees items or clusters of items positioned along the continuum based on the perception of the internalisation or

externalisation of the locus of causality. Cokley (2000), Fairchild et al. (2005), and Smith et al. (2012) also suggested that intrinsic and extrinsic motivation, as measured on the AMS, might not be constructs that are as distinct as suggested by SDT.

Mixed results were found when comparing the mean for each item between the participant groups on the motivation section of the questionnaire, with the non-specialist group scoring higher on some items and the specialist group scoring higher on others. For all items, the means of the total participant group fell between the non-specialist and specialist group item means. As the motivation section of the questionnaire was based on the AMS (Vallerand et al., 1992) and SMS (Pelletier et al., 1995), which makes use of the self-determination theoretical framework (Deci & Ryan, 1985), the differences in scores may represent different motivational orientations rather than higher or lower motivation. It is important to take into consideration the type of motivation the item was designed to measure when comparing the results for different groups.

The pattern of the differences between the groups did appear to be as expected when taking into account the type of motivation. For example, the specialist participant group reported higher mean scores for all the items designed to measure intrinsic motivation. As intrinsic motivation is displayed when an activity is undertaken out of interest, it would be expected that those who have chosen to become a physical education specialist would have greater levels of intrinsic motivation towards teaching physical education than those who did not specialise in the area. The non-specialist group reported higher means on the items designed to measure amotivation which is the least self-determined type of motivation and is associated with behaviour that lacks intention to act or as a result of no value being placed on the activity (Ryan & Deci, 2000a; Ryan & Deci, 2000b; Ryan, 1995). These students did not decide to become physical education specialists, so they may place a lower value on an activity such as physical education,

which would be reflected in higher amotivation. The non-specialist group also reported higher means on some of the items designed to measure extrinsic motivation. As extrinsic motivation is related to undertaking an activity for reasons other than inherent interest (Deci & Ryan, 1985; Vallerand & Ratelle, 2002), it is would again be expected that the non-specialist group would record higher means on some of these items. Similar to the confidence section of the questionnaire, these findings demonstrate the ability of the measure to discriminate between the participant groups according to the motivation constructs of the SDT framework.

Reliability of the factor structure.

Confidence. The confidence section of the questionnaire was reliable, with good internal consistency and test-retest reliability. Both confidence factors had Cronbach's alpha values greater than .70, which is the acceptable level suggested by Nunnally (1978) for internal consistency. The majority of research that has sought to examine the confidence or self-efficacy of teachers to teach physical education has not provided evidence of the psychometric properties of the measure used. It is difficult, therefore, to make comparisons, and the level of internal consistency of previously used measures remains unclear. Humphries et al. (2012) did report Cronbach's alpha values ranging between .77 and .94 for the PETES factors, which is fairly consistent with Callea et al. (2008) who also reported values ranging between .86 to .92 for each of the teaching standards in the TFMSSQ. Items in these measures would have been similar to some of the items used in the confidence section of the questionnaire as the PETES was based on the Physical Education Teacher Standards (NASPE, 2009) document and the TFMSSQ came from the same teaching standards document (VIT, 2010) as used in the development of the confidence section of the questionnaire in the current study.

The test-retest reliability was acceptable for both confidence factors, signifying consistency of factor scores over time. The PETES reported slighter higher test-retest reliability with the correlations ranging from .63 to .88 (Humphries et al., 2012). The test-retest period for the Humphries et al. (2012) study was significantly shorter (i.e., two or three-day period) than the current study (two weeks). The difference in time could account for the differences in these scores; the closer the test occasions are to each other, the greater chance of reproducing the same or similar responses on each testing occasion. With the exception of the Humphries et al. (2012), research studies that have examined confidence in physical education (e.g., Callea et al., 2008; Morgan & Bourke, 2005; Morgan & Bourke, 2008) have not reported on the temporal stability of measures used, meaning that there is little evidence of reliability of previous confidence measures. This is promising for further development of the confidence section of the questionnaire.

Motivation. Results of the reliability analysis found the Cronbach's alpha values displayed adequate internal consistency for all the five factors. These values are consistent with those reported for the AMS (Vallerand et al., 1992) and SMS (Pelletier et al., 1995) along with previous research that has examined the factor structure of these measures (Cokley et al., 2001; Fairchild et al., 2005; Pelletier et al., 2013; Smith et al., 2012).

The test-retest reliability was good for three of the subscales (personal satisfaction; fun, improvement, and relationships; and amotivation), indicating that these subscales provided consistent scores over time, supporting their temporal stability. Two of the factors displayed lower, but acceptable, test-retest reliability. This indicates less temporal stability, so scores may become less consistent over time. Further exploration of the reliability of these two factors is warranted to confirm temporal stability. It is conceivable that extrinsic motivation is less stable and may fluctuate more over time with experiences, because it is influenced by factors external to the person, which may be more transient than

internally driven motives. It is also possible that something influenced these scores for this particular sample group over the testing period, for example, positive or negative experiences in the course or on placement. It is important to recognise that motivation may also display some changes over time given that it is related to experiences and is situation specific (Ntoumanis & Mallett, 2014). The test-retest reliability results of the motivation section of the questionnaire appear slightly stronger than those of the WTMST which also had five subscales with r = <.70.

Confidence measures used in previous research. Although a number of measures have been developed to measure teaching self-efficacy, the development of measures of physical education teaching has been much less common (Humphries et al., 2012). Presently, very few physical education teacher self-efficacy instruments have been developed, and the focus of these measures (e.g., only examining the main content areas) is relatively narrow (Humphries et al., 2012; Martin & Kulinna, 2003). Teaching physical education requires knowledge and skills in a range of content areas; consequently, it is important to create an instrument that is capable of assessing confidence across a number of content areas and across a number of important tasks and activities involved in teaching physical education. This is also a criticism of teacher efficacy research in general, whereby, it has been treated as a global trait rather than task or situation specific (Bandura, 1997, Wheatley, 2005). This has led to a move towards the development of more multi-dimensional measures of teacher efficacy (e.g., Baker, 2005; Brouwers &Tomic, 2000; Duncan & Ricketts, 2008; Martin & Kulinna, 2003; Skaalvik & Skaalvik, 2007; Woolfolk-Hoy & Spero, 2005) which should probably be reflected in measures of physical education teacher efficacy. Previous measures of self-efficacy in physical education teaching have tended to focus on a limited number of areas or activities of teaching physical education. For example, the measure used by Morgan and Bourke (2005) only assessed self-perceived

levels of confidence across seven of the main content areas. Although content knowledge is a major part of teaching any curriculum area, physical education is often described as a specific environment that imposes unique demands on those who are more commonly practising within the classroom setting (Pickup, 2012). Accordingly, for this thesis a multi-dimensional measure was developed (the confidence section of the questionnaire) with the aim of reflecting the complex task of teaching physical education (e.g., classroom management strategies appropriate to physical education, plan curriculum, undertake meaningful assessment, and communicate with parents about their child's achievements in physical education). Humphries et al. (2012) also shared the view that to assess an individual's confidence to teach physical education, more than the content areas must be examined when developing the PETES measure. The confidence section of the questionnaire tested in the current study along with PETES (Humphries et al., 2012) were developed to examine confidence (efficacy) to teach physical education in a way that is more consistent with Bandura's theory, with both measures trying to encompass the specific subject content and specific components of the teaching process. To do this, both measures have been based on teaching standards so that all tasks relative to teaching physical education are covered as opposed to just focusing on specific content areas of the curriculum.

When comparing the number of items and the factor structure of the confidence section of the questionnaire to the PETES, differences can be distinguished. For example, the final PETES is comprised of 35 items, whereas the confidence section of the questionnaire only has 24. One of the aims of developing the confidence section of the questionnaire was to reduce the number of items as much as possible without comprising the reliability or validity of the measure. This was to aid in administration and completion of the questionnaire, which was critical because confidence is only one section of the

measure. The length/time to complete the measure was a significant consideration in the questionnaire design. The PETES has a seven-factor structure, which Humphries et al. (2012) confirmed aligned strongly with the ideas expressed in the NASPE standards. The confidence section of the questionnaire in this thesis has a two-factor structure. Having fewer factors may mean that some of the content areas are not covered in as much detail, for example, five questions on using technology compared to one. The questionnaire, however, does appear to encompass all of these areas in its two-factor structure. Thus, both measures appear to cover similar areas, although the PETES may cover some of these areas in more detail. When examining these items more closely it is questionable as to whether they are all necessary. For example items included in the 'efficacy for using technology' include 'I can use the internet to help plan lessons' and 'I often use email and the internet to find or share ideas about PE'. These items appear to reflect more generic competence and are not specific to the domain of physical education. It would be surprising for the effectiveness of a physical education lesson to be influenced by a teachers' ability or skill level with the use of email. It is important to acknowledge that the PETES has undergone CFA, while the confidence and motivation to teach primary school physical education measure has not, therefore, the confidence factor structure may still be further refined.

Measures of motivation to teach used in previous research. Similar to confidence, a number of measures have been used to assess motivation to teach (Fernet et al., 2008; Hein et al., 2012; Kauffman et al., 2011; Roth et al., 2007) with very few designed specifically for measuring motivation to teach physical education (Carson & Chase, 2009). The development of the motivation section of the questionnaire is comparable with the construction of other measures designed to assess motivation to teach. Similar to the measure designs of Carson and Chase, (2009), Fernet et al. (2008), Hein et al. (2012), and

Roth et al. (2007), the motivation section of the questionnaire was based on SDT. A notable difference between these measures and the motivation section of the measure being developed in this study is that three types of intrinsic motivation were identified to be measured. In the other studies, with the exception of Carson and Chase (2009) the measures only examined intrinsic motivation as a single construct. Despite all these motivational measures being based on SDT, a contrasting range of factor structures have been reported. The WTMST (Fernet et al., 2008), which aimed to assess the motivation of high school and elementary teachers towards specific tasks of teaching, produced a five-factor model in line with self-determination. Similarly, the perceived teacher motivation scale (Carson & Chase, 2009), a modified version SMS also produced a factor structure congruent with SDT, however, the factor structure was reported as not achieving acceptable levels of fit. The revised teacher motivational model (Hein et al., 2012), which has three subscales, and the motivation section of the current questionnaire, which has five, do not align perfectly with the SDT continuum as not all types of motivation were represented (Deci & Ryan, 1985; 2000). A possible reason for these inconsistencies in factor structure in their alignment with SDT could be the language or wording of items in the measures, which was identified as an issue in previous research (Fairchild at al., 2005; Smith et al., 2012). It is worth noting that the revised teacher motivational model (Hein et al., 2012) was completed by high school physical education teachers, whereas, the perceived teacher motivation scale (Carson & Chase, 2009) was completed by both elementary and high school teachers. The motivation section of the questionnaire of the current study was designed specifically to measure motivation to teach primary physical education and was completed by both generalist and specialist physical education pre-service teachers.

The revised teacher motivational model (Hein et al., 2012) and the motivation section of the current questionnaire were used to measure motivation to teach physical education. While both were reflective of the SDT continuum, neither produced a factor structure that was a perfect replication of the continuum. This could be because measurement in physical education confounds in intrinsic and extrinsic motivation. That is aspects of intrinsic and extrinsic motivation contribute to decisions rather than being separate constructs, so that intrinsic and extrinsic motivation and different types of intrinsic and extrinsic motivation are more difficult to separate. For example, one can derive pleasure from the activities enumerated in the intrinsic motivation scale 'For the enjoyment I have in seeing my students achieve their goals' irrespective of their feelings towards physical education. The differences seen between the factor structure of the revised teacher motivational model (Hein et al., 2012) and the factor structure of the motivation section of the questionnaire may also indicate that measures specific to primary physical education and specific to secondary physical education are needed. The development of multidimensional motivational measures that are specific to the tasks performed by a teacher is supported by previous research (Marsh, 1990; Fernet et al., 2008). As primary and secondary physical education involves the delivery of different content that is specific to that domain, motivational constructs may vary significantly between primary and secondary physical education. This can be seen in the AMS, which, is specifically designed to assess an individual's motivation to go to 'college' and not study at high school or primary school.

The revised teacher motivation model (Hein et al., 2012), which was used to measure the motivation of physical education teachers to teach, was not specifically designed to assess motivation for teaching physical education. The measure was originally developed by Roth et al. (2007) to assess motivation for teaching in general using SDT,

testing the hypothesis the teachers perceive motivation as distinct and falling along a continuum. To evaluate their instrument they used a specific population group in that the participants were all female teachers working in Jewish elementary schools. The factor structure of the teacher motivation model and the motivation section of the questionnaire did not have a simplex structure of self-regulation as described by Deci and Ryan (1999). This is consistent with previous research that has also been unable to substantiate a simplex pattern (Cookely, 2000; Fairchild et al., 2005; Hein et al., 2012; Smith et al., 2012).

Limitations

Despite confidence being an area of interest and one that has been investigated in physical education (e.g., Callea et al., 2008; Jarvis & Pell, 2004; Morgan & Bourke, 2005, 2008; Ross et al., 2001; De Vries, 2013) only a limited number of confidence measures exist in this domain. The confidence section of the current questionnaire, however, was found to display adequate levels of reliability and validity with an interpretable factor structure. The limited set of similar measures available for comparison should be considered problematic in fully determining the psychometric efficacy of the measure.

The sample used may be a limitation of this study. All participants in this study were pre-service teachers attending the same university. The results, therefore, may be specific to this sample group and not an accurate representation of how all pre-service teachers feel regarding their confidence and motivation to teach physical education. As such interpreting the results should be treated with some caution. To try and overcome this problem, future research should endeavour to incorporate a broader set of participant cohorts, for example a sample of pre-service teachers from multiple universities.

A further sampling limitation was due to the exclusive involvement of pre-service teachers. The intent of the questionnaire is to measure the confidence and motivation of

teachers to teach primary physical education. All participants were pre-service teachers, which restricts the generalisability of the results to pre-service teachers and not all teachers in general. Future research should consider including a sample that comprises both pre-service and in-service teachers to address this problem.

Future Research

This first study in this thesis provides preliminary supportive evidence of the psychometric qualities of the measure of confidence and motivation to teach primary school physical education. Further research is required to explore the confidence and motivation of teachers to teach physical education as well as continue to further develop and refine the questionnaire. Further development of the questionnaire should include examination of its factor structure to continue to refine the model. The examination of factor structure should incorporate confirmatory methods rather than exploratory techniques, as an existing basic model relating to confidence and motivation to teach primary physical education, suitable for model testing, now exists.

Criterion validity of the confidence and motivation to teach primary school physical education warrants examination by comparing the subscale scores of physical education specialists and generalists. This would provide an indication of the capability of the measure to discriminate between those who have more specialist training and interest in the area and those with less training and perceived interest. The differences in scores found on individual items between pre-service physical education specialists and generalists demonstrates that more comprehensive research should be undertaken in this area to identify specific tasks or areas of differences. For example, patterns related to particular content areas that specialists are more confident to teach, (e.g., gymnastics, athletics) or tasks related to teaching physical education (e.g., planning lessons, perform assessment) that one group is more confident in implementing could be contrasted. Results

of such research could be used to better inform both physical education specialist and generalist pre-service teacher education programs. The CMTPPEQ should also be examined for reliability and validity with different teaching groups such as pre-service and in-service teachers and comparisons made between the two. An examination of the different teaching groups would provide an insight into the importance of experience on confidence and motivation to teach primary physical education and would allow for further validation of the measure by comparing those with greater and lesser experience.

The factor structure presented from the current analysis of the CMTPPEQ, although suitable for model testing, also warrants further examination in relation to SDT. Construct inconsistency in the number of intrinsic motivation scales currently exists within the literature with Pelletier et al. (1995) and Vallerand et al. (1992) confirming the reliability and validity of a factor structure containing three intrinsic subscales with other research finding only one intrinsic motivation subscale (Fernet et al., 2008; Mallet et al., 2007; Smith et al., 2012). Only one pure intrinsic factor was found in the factor structure of the motivation section of questionnaire in the current study, with another factor believed to lie somewhere between intrinsic and extrinsic motivation. Further examination of intrinsic motivation is necessary to determine if more than one factor exists within this measure. The simplex pattern of the factor structure was not fully supported, thus the subsequent use of confirmatory factor analysis may be able to further clarify the factor structure and pattern.

All of the above recommendations would benefit from having larger data sets from which to perform the required analysis. If the psychometric merit of the CMTPPEQ was able to be established, researchers can then use it to generate further understanding and information on the characteristics that may impact on an individual's confidence and

motivation to teach primary school physical education. This should then help in developing approaches to assist those who are required to teach physical education.

Conclusion

The findings of this study provide preliminary support for the psychometric properties of the confidence and motivation to teach primary school physical education questionnaire. Specifically, EFA revealed the confidence section was composed of two factors and the motivation section composed of five factors. The confidence section of the questionnaire appears to represents a multi-dimensional construct that is capable of measuring subject content knowledge in addition to key components of teaching practice. The factors of the motivation section appear to represent different types of motivation along the SDT continuum, however, not all types of motivation are represented in their defined form (introjected regulation is not represented as a standalone factor). Along with the acceptable reliability and validity the findings generally suggest that the measure warrants on-going development and psychometric evaluation.

CHAPTER 4: REFINING THE MEASURE OF CONFIDENCE AND MOTIVATION TO TEACH PRIMARY PHYSICAL EDUCATION (STUDY 2)

Introduction

Confidence has been found to affect performance, impact on the decisions to engage in tasks and is an important factor in self-regulation and motivation (Humphries et al., 2012). Researchers have demonstrated that individuals charged with the task of delivering primary physical education often lack the confidence to actually deliver physical education (Callea et al., 2008; Morgan & Bourke, 2005, 2008; Xiang et al., 2002). As teaching physical education consists of many different tasks, it is important to identify which of these specific tasks individuals lack confidence to perform. Similarly it would also be beneficial to know what motivates individuals to teach physical education and how motivation differs between people. The availability of a psychometrically valid and reliable measure of confidence and motivation specific to the context of primary physical education would provide for greater understanding of the confidence and motivation to teach primary physical education.

Study 1 explored the development of the framework and questionnaire (CMTPPEQ) for measuring the confidence and motivation of primary teachers to teach physical education. The confidence section was developed using a range of teacher professional standards documents and the motivation section was an adaptation of the pre-existing framework of the AMS (Vallerand et al., 1992) and SMS (Pelletier et al., 1995). The use of EFA on the measure provided the data to guide the development of the initial structural framework of the confidence and motivation subscales of the CMTPPEQ.

The factor structure of the confidence section identified in Study 1 comprised two factors labelled as: management and planning (confidence in tasks associated with teaching practice [e.g., keep records, planning, developing learning goals]) and implementation

(confidence in the delivery of specific content areas [e.g., teaching fitness, games and sports]). This two-factor structure appeared to be logically valid, comprising two main areas of teaching practice in physical education, i.e., planning and implementing. The two factor structure also presented as reliable with acceptable internal consistency and test re-test reliability.

The factor structure of the motivation section produced five factors, which, appear to measure different types of motivation along the self-determination continuum. The structure was originally developed using the framework of the AMS (Vallerand et al., 1992) and SMS (Pelletier et al., 1995) (Pelletier et al., 1995; Vallerand et al., 1992), which consists of items designed to measure intrinsic motivation (intrinsic motivation to know, intrinsic motivation towards accomplishment and intrinsic motivation to experience stimulation), extrinsic motivation (identified regulation, introjected regulation and external regulation), and amotivation. The EFA, however, produced five factors listed in order of increasing self-regulation as per SDT labelled as: amotivation; expectations, requirements and guilt; learning and development; fun, improvement and relationships, and personal satisfaction. Despite being modelled on previous measures of motivation, the EFA produced this different structure in the context of teaching primary physical education. Previous research (Fernet et al., 2008; Hein et al., 2012; Roth et al., 2007) that has also used SDT as a theoretical model to develop a measure of motivation has revealed contrasting factor structures, and no studies have previously tested the factor structure in the primary physical education teaching domain. Although the factor structure produced in Study 1 is based on logical analysis and, as previously mentioned, is typically representative of different types of motivation along the SDT continuum, the minor variation in the current model structure reported in the SDT models in Study 1 and previous research warrants further investigation.

Study 2 extends the findings of Study 1 by refining the measure of confidence and motivation and exploring variables that may influence confidence and motivation in teaching primary physical education. To further refine the measure, CFA will be used to verify the factor structure of both the confidence and motivation sections of the questionnaire. As EFA was used in Study 1 to identify a factor structure for both confidence and motivation, CFA is necessary to test the hypothesised two and five factor structures (Kline, 1994). This will help to confirm the models for confidence and motivation. Study 2, therefore, provides for a more rigorous investigation of the psychometric properties and factor structure of the CMTPPEQ derived from the EFA of Study 1.

The confirmation of the confidence and motivation structures will allow the impact of individual characteristics on confidence and motivation to teach primary physical education to be explored. Experiences, personal backgrounds and the characteristics of individuals are believed to be important components affecting the learning and teaching process (Morgan & Bourke, 2008). As such, it is important to consider how these variables can impact upon an individual's confidence and motivation to teach primary physical education.

Confidence influences an individual's attitude towards their capabilities (Duda & Treasure, 2010). Bandura's (1977, 1997) conceptual model of self-efficacy, brings together concepts of confidence and expectations and outlines the main sources of information on which expectations are based (Weinberg & Gould, 2015). This infers that an individual's ability to cope with a situation is a result of their experiences. In the context of teaching primary school physical education, previous experiences such as the number of years an individual has been teaching for, if they have previously engaged in physical activity instruction, along with other characteristics such as the type of teacher they area (specialist

or non-specialist), what year of their degree they are in and their gender are likely to impact upon an individual's level of confidence. Based on theory, individuals will use their previous experiences to determine the level of efficacy they have towards the task of teaching physical education which will then affect their behaviour. These previous experiences include variables such as the knowledge they have gained from their training (undergraduate training), knowledge and skills gained from participating in or instructing activities or knowledge acquired from actually teaching a physical education lesson. Those with higher levels of self-efficacy are believed to be able to make a decision that they are capable of performing a task and have the knowledge and skills to do so effectively (Garvis & Pendergast, 2010). Consequently, high levels of self-efficacy within a teacher are desirable. The relevance of Bandura's (1977, 1997) conceptual model of self-efficacy and the influence of previous experience on behaviour highlights the need to explore previous experiences and characteristics of teachers, both pre-service and in-service, in teaching primary physical education.

Like confidence, motivation is also influenced by context, so that characteristics of the individual become important when examining this construct in relation to behaviours (Visser-Wijnveen et al., 2014). As a result, contextual perspective should be applied to exploring motivation to teach primary physical education. In an ideal world, teachers engage in their job, and all aspects of their role, because they find teaching enjoyable, however, other reasons can impact on a teachers' functioning. The relational perspective of motivation implies that the construct of motivation is changeable depending upon a context. This is highly applicable in a primary school setting as teachers are often required to teach across a range of subject areas, as a consequence the context of teaching changes. Different subject areas require different types of knowledge and are also taught using different teaching methods and in different environments. As such, it would be expected

that motivations for teaching different subject areas would vary. Those teachers who have chosen to work in a primary school environment may have differing levels of motivation towards teaching certain subject areas, including physical education, based on their personal characteristics and previous experience. Prior research demonstrated that teachers engage in teaching because they see the value of students learning new skills, because they want to prove to themselves that they are capable teachers, or because they feel pressure to perform from outside influences (Van den et al., 2014a). As those who are teaching physical education in a primary school have often chosen not to be a specialist physical education teacher it is valuable to know the types of motivation that drive their teaching behaviours.

A review of SDT research in physical education has highlighted that although there is substantial research on student motivation, investigations of the antecedents of teacher behaviour are scarce, so that student-related contextual factors were more frequently investigated than teacher-related contextual factors (Van de Berghe, et al., 2014). Examining the possible antecedents of teacher motivation and behaviour in primary physical education could underpin improved understanding of motivation to teach primary physical education. In addition to determining the types of motivation that control teaching behaviour in physical education, examining how personal experience and an individual's characteristics influence the different types of motivation identified in the measure would add to our understanding of motivation to teach primary physical education. Similar to confidence, previous experiences and other characteristics such as type of teacher (pre-service or in-service), gender, teaching experience, and experience in instructing physical activity could possibly impact on certain types of motivation in teaching primary physical education.

Aims

The purpose of this second study was to further evaluate the psychometric properties and factor structure of the CMTPPEQ. Evidence of the factor structure of the CMTPPEQ, derived from the EFA of Study 1 formed the framework for a more rigorous investigation of the construct framework of the CMTPPEQ through the use of CFA. Thus, the aim of Study 2 is to further refine the questionnaire (CMTPEEQ) developed in Study 1 using a Structural Equation Modelling (SEM) technique; CFA. This technique was adopted to help to verify the factor structures that were produced in Study 1.

Additionally, this study sought to gain an in-depth knowledge of the confidence and motivation of teachers to teach primary physical education and the associated variables (e.g., gender, years of teaching) that may influence these cognitive processes. An additional aim of Study 2 is to examine how types of confidence and motivation differ for various personal characteristics and experiences, such as gender, years of teaching, physical activity instructed, teaching specialisation (specialist or non-specialist physical education), and professional development and training.

Method

Participants

Participants were 318 pre-service (n = 211) and in-service teachers (n = 107), comprising 252 females and 66 males, ranging in age between 17 and 66 years (M = 30.37, SD = 11.98). Participants designated whether they were a physical education specialist or not, with 69 reporting they were a specialist and 249 reporting that they were not a physical education specialist. In-service teachers were asked to indicate the number of years they had been teaching, with 12 indicating they had taught for less than a year, 16 for 1-5 years, 20 for 5-10 years, 10 for 10-15 years, and 49 for more than 15 years. For the pre-service teacher cohort, there were 35 first year students, 22 second year students, 19

third year students, and 135 fourth year students. Participants also reported on whether they had taught any physical activity outside of teaching, with 178 reporting that they had instructed some sort of activity and 140 not instructing any activity.

Instrumentation

Two measures were used to collect the following information: basic demographic details for each group of participant (pre-service and in-service), and the confidence and motivation of both participant groups to teach primary physical education. There were two versions of the demographics information sheet created; one which was used to collect data from the pre-service participant group (Appendix J) and one which was used to collect data from the in-service participant group (Appendix K). The measures were presented in two ways; in hard copy (printed on paper) and electronically using a survey tool known as Qualtrics. Depending on the method that was used to present the questionnaire, participants circled answers and wrote short responses or checked boxes and typed short answers.

Demographics.

Pre-service demographics information sheet. This demographics information sheet contained thirteen questions and is presented in Appendix J. Participants were asked to indicate their gender, age, which University they are attending, the campus they are attending, the name of the degree they are completing, their year level, how many units of physical education they have completed, whether they are training to be a physical education specialist, the number of hours they have taught physical education on teaching rounds, if they have undertaken any additional professional development in physical education, if they have taught any physical activity outside of teaching rounds and if so what type of activity and how much they have taught it, and their previous and current involvement in physical activity.

In-service demographics information sheet. This demographics information sheet also contained thirteen questions and is presented in Appendix K. Participants were asked to indicate their gender, age, which University they had attended, the name of degree they had completed, how many years they had been teaching for, if they had trained to be a physical education specialist, if they had a physical education specialist working at the school, the number of hours they teach physical education per week, if they had undertaken any additional professional development in physical education, if they have taught any physical activity outside of teaching and if so what type of activity and how much, and their previous and current involvement in physical activity.

Confidence and motivation questionnaire to teach primary physical education questionnaire (CMTPPEQ). The questionnaire consisted of two sections; questions addressing confidence and questions addressing motivation. This questionnaire was developed in Study 1 and revised following data analysis.

Confidence. This section of the questionnaire measured confidence towards teaching primary school physical education. It consisted of 24 Likert scale style questions relating to two different themes of confidence that addressed the global question 'I am confident in my ability to ..'. Two factors were identified in Study 1 measuring confidence in relation to management and planning; and implementation in teaching primary physical education. The confidence section returned adequate internal consistency with management and planning at *a* .95 and implementation at *a* .89. Acceptable temporal stability was also displayed with an average test-retest correlation of $r = .65$ for management and planning and $r = .70$ for implementation during a period of two weeks.

Motivation. This section of the questionnaire measured motivation towards teaching primary school physical education. It consisted of 28 Likert scale style questions, which used the prompt WHY YOU WOULD TEACH PHYSICAL EDUCATION? Five

factors were identified in Study 1 that are believed to measure amotivation, intrinsic motivation, and three different types of extrinsic motivation. Adequate internal consistency was found with Cronbach's alpha values ranging from .60 to .91. Temporal stability of two of the factors were r =.53 (learning and development) and r = .54 (expectations, requirement and guilt) with the three other factors ranging between r = .75 and r = .84.

Procedures

Ethical approval for the project was granted by the AEHD HREC Victoria University. Data for this project was collected over a three year time period from 2011 to 2013. Each of the participant groups necessitated different testing procedures.

Pre-service teachers. Two groups of participants were needed for this project; individuals who were undertaking an education degree to become a generalist primary teacher and those who were undertaking an education degree to become a specialist primary physical education teacher. Individuals training to become a primary generalist were recruited as participants after they had completed their single unit of physical education. Individuals training to be specialist primary physical education teachers were recruited after they had completed their designated physical education curriculum unit.

Five Victorian Universities were approached by the student researcher to be participants in the research project. Units of study being studied by suitable participants were identified from each university's course outlines and the university staff member who was listed in charge of the unit was contacted to ask for permission to attempt to recruit some of the students completing the units as participants. Four of the universities responded and granted the student researcher permission to approach students to be participants in the project. Universities were given the option of the student researcher visiting the institution at a convenient time to recruit potential participants or for the student researcher to provide the person in charge of the unit with a written explanation of

the project and a link to the online survey tool to place on the unit site of the university's online learning management system. Three of the universities opted for the latter with only one requesting the student researcher attend a lecture at a designated time to explain the study and recruit potential participants. As data for this project was collected over a three year time period, some universities allowed participants to be recruited in the same unit in different years.

For recruitment at the university, the student researcher was invited to attend the last ten minutes of a lecture to explain the study to students who were potential participants. The researcher informed the potential participants both verbally and by their plain language statement that participation was voluntary, and that consent was implied by the return of a completed questionnaire. Those who wished to participate in the project were instructed to take a questionnaire from the box placed beside the lecture room door. Participants were to take the questionnaire away, complete it and bring it to their next tutorial. As for Study 1, participants were asked to fill out the questionnaire honestly without deliberating too long over any one item. At the next tutorial, a box was placed just outside the door of the tutorial room so that students who had chosen to participate in the project could place the questionnaire in the box either on the way in or on the way out of class.

For online recruitment, the online version of the questionnaire was completed by individuals clicking on a link they accessed through their unit site on their university's online learning management system. The link was accompanied by a small paragraph of text, which gave a brief description of the project. The link directed participants to the questionnaire. The first screen of the questionnaire contained the plain language information form. In addition to this information it stated that 'by completing this survey you are certifying that you are at least 18 years old and are voluntarily giving consent to

participate in the study. Any queries about your participation in this project may be directed to the researcher whose details can be found in the description accompanied by the link for this questionnaire'.

In-service teachers. Schools from the Government, independent and Catholic sector in Victoria that offer primary grades were contacted to participate in the project. Ethics approval for the research was granted by the Department of Education and Early Childhood Development (DEECD) as well as by each of the Dioceses (Diocese of Sale, Diocese of Ballarat, and Diocese of Melbourne) of the Catholic Education Office.

Between three to six government schools from each of the networks in each of the nine regions in Victoria were contacted by the student researcher. Schools were selected for contact based on their number of enrolments, as the student researcher considered that schools with fewer enrolments would be less likely to have a full time physical education specialist than a larger school. A letter addressed to the principal was sent to each of the selected schools outlining the research projecting and seeking permission to recruit staff as participants in the research project. Principals who were willing to allow their staff to be approached were asked to make contact with the student researcher via email. The student researcher then sent a reply email, which the principal then forwarded onto their staff outlining the research and inviting individuals to participate in the project. Teachers who were willing to participate clicked on the link contained in the email and were directed to the online version of the questionnaire.

Similarly to the online version of the questionnaire for the pre-service teachers, the plain language information was found on the opening screen for the in-service teachers. Once again, potential participants were informed that completion of the questionnaire implied their consent and any concerns could be addressed with the researcher whose details could be found in the email containing the link for the questionnaire.

As a result of a low initial take up rate from principals, a second mail out to government school was undertaken. Another three to six schools from each of the networks in each of the nine regions in Victoria were contacted. Unfortunately, the second mail out was no more successful than the first mail out.

Due to the low number of in-service teachers recruited through the first and second mail out, a third mail out was undertaken using a slightly different approach of sending a specific number of hardcopy questionnaires to the school. Using the DEECD website, the student researcher attempted to access the website of every government primary school in Victoria to gather information for the selection of schools for the third mail out. Schools were selected for this mail out based on a combination of criteria. Some of these criteria were (a) the school website listed its members of staff and no physical education specialist was listed, (b) the school had less than 100 enrolments and no staff were listed, and (c) less than 100 enrolments and no web page. The number of staff teaching at the school was then estimated using the number of students enrolled and this was used to determine the number of hard copy questionnaires to send. The hardcopy questionnaires were then sent in an envelope addressed to the principal along with a letter explaining the research project and seeking permission to recruit staff and to distribute the questionnaires to staff. The envelope sent to the school also contained a reply paid envelope addressed to the student researcher for the questionnaires to be returned.

Catholic primary schools (n=126) from each of the three diocese in Victoria were also contacted by the student researcher. The same initial process for mail out 1 and 2 as described above was used to contact schools and recruit participants. As with the government schools, the take up was almost non-existent with only one school contacting the researcher and one person completing the questionnaire.

A selection of independent schools in Victoria was also contacted using the same initial mail out process as mail out 1 and 2. Schools were selected on the basis that they offered primary grades and that if the school was a P-12 college, the primary grades were offered on a separate campus. The location of the campus and its enrolments were also influential in choosing schools to be approached for participation. The majority of schools were located outside of metropolitan Melbourne or were on the very outskirts and had lower enrolments. No independent schools chose to take up the invitation to participate in the project.

Design

A simple cross sectional single measure administration design was used to evaluate the psychometric properties of the confidence and motivation to teach primary physical education questionnaire with a cohort of pre-service and in-service teachers.

Data Analysis

The primary goals of the data analysis were the examination of the reliability, validity, and factor structure of the measure along with examining how the demographic variables impacted on confidence and motivation. The following statistical procedures were undertaken:

1. Descriptive statistics for specific subgroups (pre-service and in-service teachers) for each item in each section (confidence and motivation). This analysis included means and standard deviations.
2. CFA to examine the factor structure of each section of the questionnaire.
3. Descriptive statistics for each of latent variables in each section (confidence and motivation) included the assessment of internal consistency using Cronbach's alpha coefficients. Cronbach's alphas greater than .70 were considered acceptable (Nunnally, 1978).

4. One-way multivariate analyses of variance (MANOVAs) were conducted to determine differences based on demographic variables (pre-service or in-service, gender, year of degree, years of teaching, specialist physical education teacher vs non-specialist physical education teacher, and if physical activity has been instructed outside of teaching) on the confidence and motivation subscales. Individual univariate ANOVAs were conducted on each dependent variable as follow up tests on each significant MANOVA. Post hoc analyses to the univariate ANOVAs were conducted for ANOVAs with more than two dependent variables to compare each group to all other groups.
5. Relationships between confidence and motivation were explored using Pearson's correlations.

CFA, a form of structural equation modelling is a statistical technique used to verify the factor structure of a set of observed variables (Hu & Bentler, 1999). CFA analyses were undertaken using AMOS 20 software. CFA allows the testing of the hypothesis that a relationship between observed variables and their underlying latent constructs exists (Suhr, 2006). The maximum likelihood estimation procedure was selected as it is recommended for use with ordered categorical data of varying degrees of skewness (Conroy, Motl, & Hall, 2000) and is the standard method of testing a structural equation model (Kline, 2011). The sample was deemed adequate for CFA model testing as (a) the participants numbers were greater than 200, and (b) the ratio of participants to the number of variable in a model was greater than 10 (Myers, Ahn, & Jin, 2011).

Model solutions were evaluated using the chi-squared goodness-of-fit statistics and the fit indexes, which Hu and Bentler (1999) report as being the most popular ways of evaluating model fit. Chi-square is the original fit index for structural models, however, is

often criticised as not being a very reliable statistics to use as it can be affected by sample size, model size, the distribution of variables, and the omission of variables (Newsom, 2005). As such, model fit has also been assessed using a variety of fit indexes that have been offered to supplement chi-squared. Fit indexes have been classified into different categories by different researchers. For example, Hu and Bentler (1999) divided the fit indexes into absolute and incremental fit indexes as others have also done (Bollen, 1989; Gerbing & Anderson, 1993; Hu & Bentler, 1995; Marsh, Balla, & McDonald, 1998). Tabachnick and Fidell (2013) described different categories of fit indexes, such as comparative fit indices, absolute fit indices, degree of parsimony fit indices, and residual-based fit indices, whereas Tanaka (1993) and Maruyama (1998 as cited in Newsom, 2005) distinguished between several types of fit indices: absolute fit indices, relative fit indices, parsimony fit indices, and those based on noncentrality parameters.

Goodness of fit index (GFI) and adjusted goodness of fit index (AGFI) were selected from the absolute fit indices category (Newsom, 2005). These indices "assess the amount of increment in model fit, but an implicit or explicit comparison may be made to a saturated model that exactly reproduces the sample covariance matrix" (Hu & Bentler, 1999, p. 2). The normed fit index (NFI), the Tucker-Lewis index (TLI), and the comparative fit index (CFI) were chosen as incremental fit indices. The NFI demonstrates the degree of improvement in fit of a specified model compared to the independence model. The independence model, represents a model where the observed variables are assumed to be uncorrelated with each other, and the model is so severely constrained that a poor fit is expected from any reasonable set of data (Arbuckle & Wothke, 1999). The TLI indicates the improvement per degrees of freedom of the specified model over the independence model, and is less affected by the sample size than other indices (Hoe, 2008). CFI was also developed to overcome the limitations of sample size effect. Finally,

the root mean square error of approximation (RMSEA) is an indication of the specified model's lack of fit, taking into account degrees of freedom (Newsom, 2005). The above indices were selected on the basis of examination of the fit indices suggested within reputable multivariate analysis technique literature (e.g., Conroy et al., 2000; Hoe, 2008; Hu & Bentler, 1999; Myers et al., 2011; Newsom, 2005; Tabachnick & Fidell, 2013).

Results

Confidence

Descriptive statistics for the individual items. The means and standard deviations for each of the items in the confidence section of the questionnaire are presented in Table 4.1. The means of the total participants ranged from 3.18 to 5.24, with only one item recording a mean above 5 on the 6 point Likert scale. The in-service teachers scored higher than the pre-service teachers on all of the confidence items except for two items; item 5 and item 9.

Table 4.1

Means and Standard Deviations for the Items in the Confidence Section of the Questionnaire

	Total		Pre-Service		In-service		Specialists		Non-specialists	
	(*N* = 318)		(*N* = 211)		(*N* = 107)		(*N* = 69)		(N = 249)	
Item	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
1. Teach motor skills and complex movements	4.33	1.25	4.16	1.29	4.65	1.09	5.12	1.01	4.11	1.22
2. Demonstrate an understanding of assessment in physical education in relation to the curriculum	4.05	1.30	3.85	1.30	4.43	1.23	4.74	1.01	3.86	1.29
3. Teach outdoor experience activities (e.g., bushwalking and basic orienteering)	3.85	1.44	3.77	1.45	4.00	1.39	4.22	1.50	3.75	1.40
4. Plan a physical education program across a unit, term, and year to match the learning outcomes of the curriculum	4.14	1.43	3.82	1.46	4.79	1.12	4.88	1.28	3.94	1.41
5. Teach the movement skills of dance (e.g., responding to movement stimuli such as rhythm and beat and reproducing movement sequences)	3.90	1.47	3.92	1.51	3.86	1.40	4.12	1.24	3.84	1.52
6. Teach the skills and activities of team games and sports (e.g., tactics, sports-specific skills, rules and the roles of various positions)	4.61	1.24	4.43	1.29	4.96	1.05	5.35	0.89	4.41	1.24
7. Establish clear, challenging and achievable learning goals for students in physical education	4.48	1.21	4.34	1.21	4.77	1.15	5.19	0.99	4.29	1.19
8. Understand the relationship between physical activity and health	5.24	0.88	5.10	0.90	5.50	0.77	5.48	0.87	5.17	0.87
9. To use a range of technologies (e.g., ICT, heart rate monitors, movement analysis tools) to support and engage student learning in physical education	3.73	1.39	3.79	1.39	3.63	1.37	4.33	1.28	3.57	1.37
10. Identify the prior knowledge and the learning strengths and weaknesses of students in physical education	4.22	1.28	4.10	1.32	4.44	1.18	4.88	0.98	4.01	1.21
11. Use my knowledge of resources and organisations to assist with the development of the physical education curriculum	4.19	1.22	4.05	1.23	4.49	1.14	4.86	1.00	4.01	1.21
12. Effectively communicate information to students, teachers and parents about student achievement in physical education	4.44	1.25	4.30	1.24	4.71	1.21	5.20	1.04	4.23	1.22

(continued)

Table 4.1 (continued)

Means and Standard Deviations for the Items in the Confidence Section of the Questionnaire

	Total		Pre-Service		In-service		Specialists		Non-specialists	
	(*N* = 318)		(*N* = 211)		(*N* = 107)		(*N* = 69)		(N = 249)	
Item	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
13. Teach the movement skills of gymnastics	3.18	1.50	3.08	1.47	3.37	1.54	3.78	1.28	3.01	1.51
14. Use my knowledge of effective pedagogical approaches and learning styles to the areas of physical education	4.18	1.17	4.02	1.51	4.49	1.16	4.67	1.12	4.04	1.15
15. Understand the educational rationale for the inclusion of physical education in the school curriculum	4.87	1.09	4.64	1.10	5.34	0.90	5.25	1.06	4.77	1.08
16. Maintain accurate records of students learning in physical education	4.36	1.16	4.32	1.18	4.46	1.14	4.94	1.07	4.20	1.14
17. Teach the movement skills of athletics (e.g., javelin, discus, high jump, running events)	4.07	1.47	3.83	1.44	4.53	1.43	4.99	1.12	3.81	1.46
18. Create and maintain a learning environment which is student centered and maximises physical activity and participation	4.63	1.09	4.51	1.14	4.86	0.95	5.12	0.96	4.49	1.08
19. Teach the skills and knowledge of swimming and water safety	3.82	1.59	3.76	1.54	3.94	1.70	4.58	1.29	3.61	1.61
20. Teach fitness related skills and activities	4.57	1.19	4.49	1.18	4.74	1.20	5.26	0.89	4.38	1.20
21. To use a range of protocols to assist classroom management strategies that are unique to physical education (e.g., safety rules, putting away equipment, stop signal)	4.89	1.09	4.76	1.09	5.13	1.05	5.33	0.92	4.76	1.10
22. To self evaluate and revise the learning activities in physical education	4.58	1.18	4.51	1.18	4.71	1.18	5.13	1.06	4.41	1.17
23. Address the learning needs of all students in physical education including the gifted. Talented, disadvantaged or disabled	4.19	1.34	4.10	1.35	4.38	1.31	4.94	1.10	3.99	1.33
24. Demonstrate an understanding of the need for the mastery of fundamental motor skills as an important factor in children's participation in physical education	4.58	1.19	4.38	1.23	4.96	1.01	5.20	0.96	4.41	1.19

Confirmatory factor analyses. The initial analysis tested the fit of the model proposed by the EFA shown as Figure 4.1. This model incorporated each item of the confidence section of the questionnaire as observed variables. A reasonable degree of fit was found with the fit indices listed in Table 4.2. These results are labelled as Model 1. In an effort to improve the model fit, the modification indices were examined as the correlation of errors terms is one way in which fit can be improved. This practice is cautioned as it is believed this means there is some other issue that is not specified within the model that is causing the covariation (Hooper, Coughlan, & Mullen, 2008). Researchers believe a strong theoretical justification must exist for this correlation to take place (Joreskog, 1993). A correlation between error terms was added between two observed variables; question 5 (delivering the movement skills of dance) and question 13 (delivering the movement skills of gymnastics) and the results are labelled as Model 2 as shown as Figure 4.2. This correlation was data driven and logically driven. The modification index between these variable was large at 23.54.

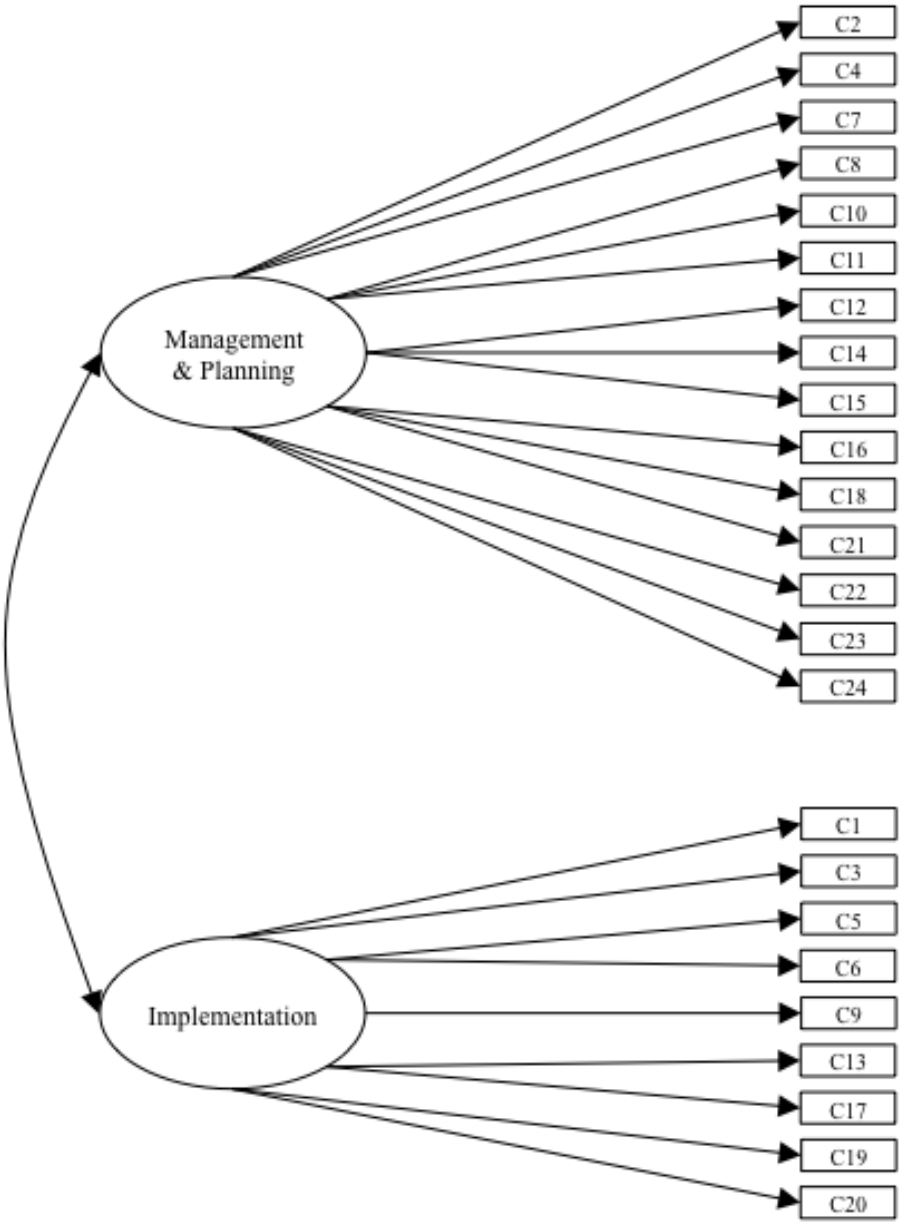

Figure 4.1

Model 1: Proposed Model Based on Exploratory Factor Analysis for the Confidence Section of the Questionnaire

Table 4.2

Goodness of Fit Indices for Confirmatory Factor Analysis Models of the Confidence Section of the Questionnaire

	χ^2 (df)	GFI	AGFI	Cmin/DF	TLI	RMSEA	CFI	NFI
Model 1	669.13 (251)	.838	.807	2.66	.922	.072	.929	.891
Model 2	644.35 (250)	.843	.812	2.58	.926	.071	.933	.895

Results of the CFA for the two models are shown in Table 4.2. Model 2 was found to have a better fit than Model 1, with the fit indices in Model 2 achieving values closer to the recommended cut offs for the respective fit indices. For both models a high chi-square and low p value (p<.001) was found; however, the χ^2 /d.f. ratios of both models were < 3. In both models, the TLI and CFI reached the recommended cut off of >.90, with the NFI value also very close. The RMSEA was also less than <.08 for both models, indicating a reasonable fit. The GFI and AGFI values were the lowest of the fit indices reported for the models. These fit indices did not reach the recommended cut off of >.90 in either model but the values were higher and closer to .90 in Model 2 than in Model 1. The resultant factors of the final CFA model will be considered the confidence factors. They will retain the labels they were given in Study 1: Factor 1 Management and Planning and Factor 2 Implementation. These factors will be used for descriptive and inferential analysis in this section.

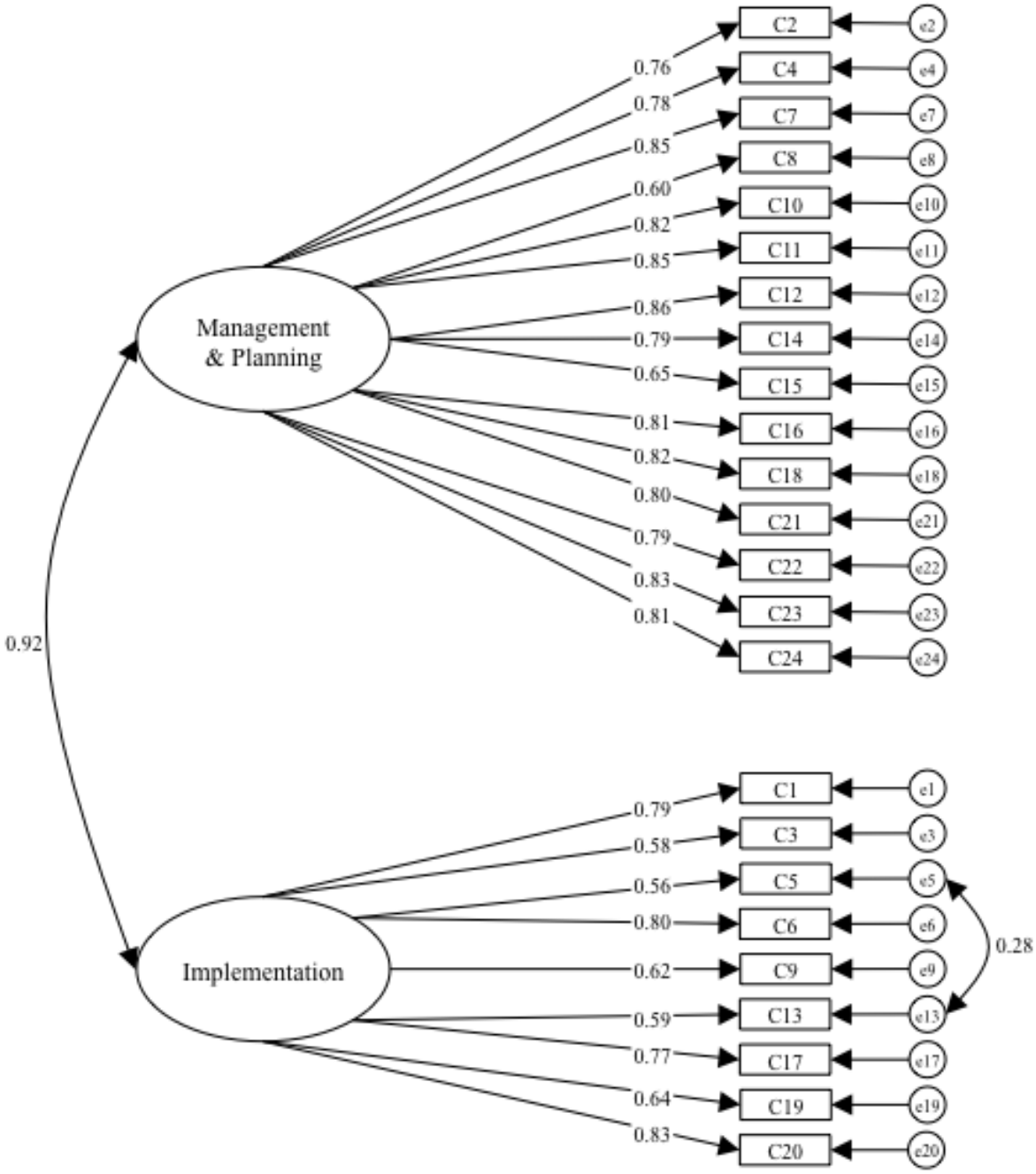

Figure 4.2

Model 2: Final Confirmatory Factor Analysis Model for the Confidence Section of the Questionnaire

Descriptive statistics and internal consistency for the confidence factors.

Descriptive statistics and internal consistency were computed for both the factors. The total scale score and average score per item for each latent variable are provided in Table 4.3. The average score per item for management and planning was 4.47 and for implementation was 4.01. Both returned adequate Cronbach's alpha values (Nunnally, 1978).

Table 4.3

Means, Standard Deviations and Internal Consistency for the Confidence Factors

	Total Scale Score		Average Score Per Item		Internal Consistency
	M	*SD*	*M*	*SD*	
Management and Planning	67.03	14.47	4.47	.96	.96
Implementation	36.05	9.11	4.01	1.01	.89

Confidence: Pre-service and in-service teachers. A one-way multivariate analysis of variance (MANOVA) was conducted to determine the difference between pre-service and in-service teachers on the two confidence dependent variables (management and planning and implementation). There was a significant difference between pre-service and in-service teachers on management and planning and implementation, Wilks Λ, $F(2, 315) = 19.45$, $p < .001$, $\eta p^2 = .06$. Follow up univariate ANOVAs on the dependent variables revealed a significant difference between pre-service and in-service teachers on management and planning, $F(1, 316) = 15.82$, $p < .001$, $\eta p^2 = .05$, and on implementation, $F(1, 316) = 5.28$, $p < .05$, $\eta p^2 = .02$. On both variables, in-service teachers were more confident than pre-service teachers (Table 4.4).

Table 4.4

Descriptive Statistics for Confidence Factors for Pre-Service and In-Service Teachers

	Total Scale Score				Average Score Per Item			
	Management and Planning		Implementation		Management and Planning		Implementation	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Pre-service	64.78	14.47	35.22	9.10	4.32	.96	3.91	1.01
In-service	70.33	14.12	39.08	8.56	4.76	.90	4.19	1.00

Confidence: Gender. The MANOVA for gender on the confidence dependent variables (management and planning and implementation) revealed a significant difference, Wilks Λ, $F(2, 315) = 7.33$, $p < .001$, $\eta p^2 = .04$. There was a significant difference between males and females on management and planning, $F(1, 316) = 14.26$, $p < .001$, $\eta p^2 = .04$, and on implementation, $F(1, 316) = 7.83$, $p < .01$, $\eta p^2 = .02$. On both variables, males were more confident than females (Table 4.5.)

Table 4.5

Descriptive Statistics for Confidence Factors for Gender

	Total Scale Score				Average Score Per Item			
	Management and Planning		Implementation		Management and Planning		Implementation	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Male	72.89	12.97	38.81	8.66	4.86	.86	4.31	.96
Female	65.49	14.47	35.33	9.10	4.37	.96	3.93	1.01

Confidence: Year of degree. There was no significant difference for year of degree on the confidence dependent variables (management and planning and implementation), *Wilks* Λ, $F(6, 412) = 0.54$, $p = .78$, $\eta p^2 = .01$ (Table 4.6).

Table 4.6

Descriptive Statistics for Confidence Factors for Year of Degree.

	Total Scale Score				Average Score Per Item			
	Management and Planning		Implementation		Management and Planning		Implementation	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Year 1	66.60	15.56	36.69	9.88	4.44	1.037	4.08	1.10
Year 2	65.10	12.94	36.32	8.82	4.34	.86	4.04	.98
Year 3	62.89	11.17	35.00	6.84	4.19	.74	3.89	.76
Year 1	64.53	14.91	34.70	9.24	4.30	.99	3.86	1.03

Confidence: Years of teaching. There was a significant difference on the confidence dependent variables (management and planning and implementation) for years of teaching, Wilks Λ, $F(10, 622) = 2.78$, $p < .01$, $\eta p^2 = .04$. There was a significant difference between year of teaching on management and planning, $F(5, 312) = 3.31$, $p < .01$, $\eta p^2 = .05$. Pot hoc tests revealed that 0 years teaching were significantly lower in confidence than those with more than 15 years teaching. No other years of teaching were different from one another (Table 4.7). There was no significant difference between years of teaching on implementation, $F(5, 312) = 1.18$, $p = .32$, $\eta p^2 = .02$.

Table 4.7

Descriptive Statistics for Confidence Factors for Years of Teaching

	Total Scale Score				Average Score Per Item			
	Management and Planning		Implementation		Management and Planning		Implementation	
Years	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
0	64.78	14.47	35.22	9.10	4.32	.96	3.91	1.01
<1	70.33	14.12	39.08	8.56	4.69	.94	4.34	.95
1 – 5	69.81	17.34	38.63	9.99	4.65	1.16	4.29	1.11
5 – 10	70.10	12.29	37.65	8.70	4.67	.82	4.18	.97
10 – 15	71.70	15.83	36.80	9.96	4.78	1.06	4.09	1.11
15+	72.78	12.26	37.24	8.93	4.85	.82	4.14	.99

Confidence: Specialist and non-specialist. There was a significant difference between specialist and non-specialist teachers on the confidence dependent variables (management and planning and implementation), Wilks Λ, $F(2, 315) = 20.398$, $p < .001$, $\eta p^2 = .12$. There was a significant difference for both management and planning, $F(1, 316) = 36.07$, $p < .001$, $\eta p^2 = .10$ and implementation, $F(1, 316) = 38.33$, $p < .001$, $\eta p^2 = .11$. Physical education specialists scored significantly higher on each subscale (Table 4.8).

Table 4.8

Descriptive Statistics for Confidence Factors for Specialist and Non-Specialist Teachers

	Total Scale Score				Average Score Per Item			
	Management and Planning		Implementation		Management and Planning		Implementation	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Specialist	75.81	12.89	41.74	7.68	5.05	.86	4.64	.85
Non-Specialist	64.59	13.95	34.48	8.86	4.31	.93	3.83	.98

Confidence: Activity instructed. There was a significant difference between those who reported instructing activity and those who reported not having instructed other activities on the confidence dependent variables (management and planning and implementation), Wilks Λ, $F(2, 315) = 33.75$, $p < .001$, $\eta p^2 = .18$. There was a significant difference for both management and planning, $F(1, 316) = 53.84$, $p < .001$, $\eta p^2 = .15$ and implementation, $F(1, 316) = 66.10$, $p < .001$, $\eta p^2 = .17$. Those who reported instructing activity scored significantly higher on both of the latent variables (Table 4.9).

Table 4.9

Descriptive Statistics for Confidence Factors for Activity Instruction.

	Total Scale Score				Average Score Per Item			
	Management and Planning		Implementation		Management and Planning		Implementation	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Activity	71.91	12.16	39.41	7.57	4.79	.81	4.38	.84
No Activity	60.81	14.81	31.79	9.15	4.05	.99	3.53	1.02

Correlational analysis. A Pearson's correlation between the confidence factors revealed a strong and statistically significant relationship (r=.84, p<.01) between the factors.

Motivation

Descriptive statistics for the individual items. The means and standard deviations for each of the items in the motivation section of the questionnaire are shown in Table 4.10. The total participant means ranged from 2.49 to 5.35 (this excludes items 5, 12, 20, 24, as a lower score on these items is desirable).

Table 4.10

Means and Standard Deviations of the Items in the Motivation Section

	Total (*N* = 318)		Pre-Service (*n* = 211)		In-service (*n* = 107)		Specialists (*N* = 69)		Non-specialists (N = 249)	
Item	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
1. For the excitement I feel when I am teaching physical education	4.13	1.40	4.05	1.45	4.30	1.27	5.13	0.94	3.86	1.38
2. Because it allows me to build a good reputation as a teacher	3.81	1.40	3.80	1.36	3.82	1.49	4.52	1.34	3.61	1.36
3. Because teaching physical education is fun	4.61	1.34	4.54	1.37	4.76	1.28	5.42	0.85	4.39	1.37
4. To prove to myself that I am capable of teaching physical education	3.66	1.48	3.93	1.38	3.11	1.51	3.96	1.68	3.57	1.40
5. It is unclear to me why I need to teach physical education	1.86	1.17	2.10	1.29	1.40	0.73	1.51	0.96	1.96	1.21
6. For the pleasure it gives me to learn more about the activities that I am teaching	4.10	1.31	4.15	1.33	4.00	1.27	4.64	1.28	3.95	1.28
7. Because other classroom teachers teach physical education	2.49	1.33	2.78	1.30	1.93	1.20	2.14	1.24	2.59	1.34
8. For the satisfaction I feel while improving my teaching within physical education	4.14	1.30	4.14	1.32	4.15	1.28	4.71	1.13	3.98	1.30
9. Because I would feel bad if I wasn't taking the time to teach physical education	3.39	1.56	3.31	1.51	3.55	1.66	3.43	1.79	3.38	1.50
10. Because physical education promotes positive relationships between teacher and student	4.82	1.22	4.67	1.25	5.11	1.11	5.35	0.94	4.67	1.25
11. For the enjoyment of discovering new teaching strategies	4.46	1.22	4.60	1.19	4.17	1.23	4.87	1.16	4.34	1.21
12. I am not sure of physical educations value within the curriculum	1.83	1.22	2.11	1.35	1.28	0.63	1.49	1.11	1.93	1.24
13. Because it is a learning area I am required to teach within the curriculum framework	3.53	1.54	3.53	1.49	3.53	1.64	2.86	1.64	3.71	1.47
14. Because I like the feeling of being involved in the activity that I am teaching	4.64	1.15	4.65	1.15	4.63	1.15	5.03	1.01	4.54	1.17
15. Because teaching physical education makes me feel like I am adequately fulfilling my role as a teacher	4.11	1.44	4.06	1.43	4.21	1.47	4.54	1.45	3.99	1.42

(continued)

Table 4.10 (continued)

Means and Standard Deviations of the Items in the Motivation Section

	Total (N = 318)		Pre-Service (n = 211)		In-service (n = 107)		Specialists (N = 69)		Non-specialists (N = 249)	
Item	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
16. For the satisfaction that I experience in broadening my knowledge about areas of physical education	4.25	1.30	4.27	1.31	4.21	1.30	4.65	1.41	4.14	1.25
17. For the enjoyment I have in seeing my students achieve their goals	4.49	1.24	4.41	1.21	4.64	1.28	4.83	1.31	4.40	1.20
18. Because what students learn in physical education is important	5.07	1.04	4.93	1.10	5.35	0.87	5.54	.80	4.94	1.07
19. For the satisfaction that I feel while teaching tasks I find difficult	3.93	1.32	4.01	1.30	3.76	1.36	4.10	1.50	3.87	1.27
20. I do not think I am capable of teaching physical education effectively	2.28	1.43	2.50	1.47	1.84	1.25	1.58	1.08	2.47	1.46
21.Because teaching physical education allows me to continue to learn about things that interest me	4.21	1.36	4.26	1.34	4.11	1.41	4.83	1.25	4.04	1.35
22. Because physical education is required to be taught in schools	3.98	1.48	4.03	1.41	3.90	1.61	3.55	1.69	4.10	1.39
23. For the satisfaction I experience when I am teaching physical education	4.25	1.33	4.20	1.37	4.36	1.25	4.81	1.30	4.10	1.31
24. I feel that I am wasting students time teaching physical education	1.61	1.07	1.75	1.15	1.35	0.85	1.35	0.87	1.69	1.11
25. Because physical education allows me to experience a personal satisfaction in my teaching career	4.03	1.38	4.01	1.36	4.07	1.42	4.70	1.36	3.85	1.32
26. Because my students expect to participate in physical education sessions	4.00	1.32	3.92	1.29	4.16	1.38	3.90	1.56	4.03	1.25
27. Because physical education is important in a child's development	5.35	1.01	5.24	1.07	5.55	0.83	5.54	0.95	5.29	1.02
28. Because I would feel guilty that I hadn't taught physical education to my students	3.62	1.61	3.55	1.56	3.75	1.72	3.49	1.74	3.65	1.58

Confirmatory factor analysis. The initial analysis tested the fit of the model proposed by the EFA shown as Figure 4.3. This model incorporated each item of the motivation section of the questionnaire as observed variables on one of five latent variables. The results listed in Table 4.11 indicated that the model shown in Figure 4.3 did not represent a good fit for the data and that substantial modifications would be required to facilitate improvement in the fit indices. After a review of the items in the questionnaire it was decided that item 7 'Because other classroom teachers teach physical education' was a potentially confusing item for participants to answer, so the item was removed. The removal of this item slightly improved the fit indices with the results labelled as Model 2 in Table 4.11. Following the removal of item 7, the latent factor labelled fun, improvement and relationships was split into two, with the items on the original factor appearing to be a mix of themes. Items 1, 3, 6, 8, and 11 all appeared to describe fun, excitement and satisfaction that an individual gains from teaching physical education, whereas the other three items (2, 4, and 10) appeared to be more about building relationships.

The addition of another latent factor saw the overall model fit improve, with the results presented in Table 4.11 as Model 3. Adding this latent factor resulted in the model having three factors that appeared to characterise the affective motivations representative of the teaching process. Through logical analysis, items on these three latent factors; personal satisfaction, fun, improvement and relationships, and the recently added latent factor were then grouped together logically. This resulted in items 1, 3, and 8 being moved to personal satisfaction and items 15, 16, 21 and 25 being moved to fun, improvement and relationships. Items 10 and 17 were not moved to one of the three previously mentioned factors, instead it was believed they would logically fit better with other items on the factor labelled learning and development. This restructure saw the model fit improve; these results are presented in Table 4.11 as Model 4. Following the minor model restructure, the

modifications indices were examined to see if correlation errors could be added to improve the fit of the model. Correlation errors were added between the following items; items 15 and 16, 21 and 25, 18 and 27, 9 and 28, and 1 and 3 as the values were all >20. The results are presented as Model 5 in Table 4.11. The final step in attempting to improve the model fit was the examination of the standardised residual covariance matrix. Items 9 and 28 were found to have high values with a number of the other items, which resulted in them being removed. The removal of these items once again improved the model fit as can be seen in the results presented in Table 4.11 Model 6. The final model (Model 6) produced the best fit indices for the data. This model can be seen in Figure 4.4. The latent factors in this model were then renamed to provide a more accurate description of the items they include.

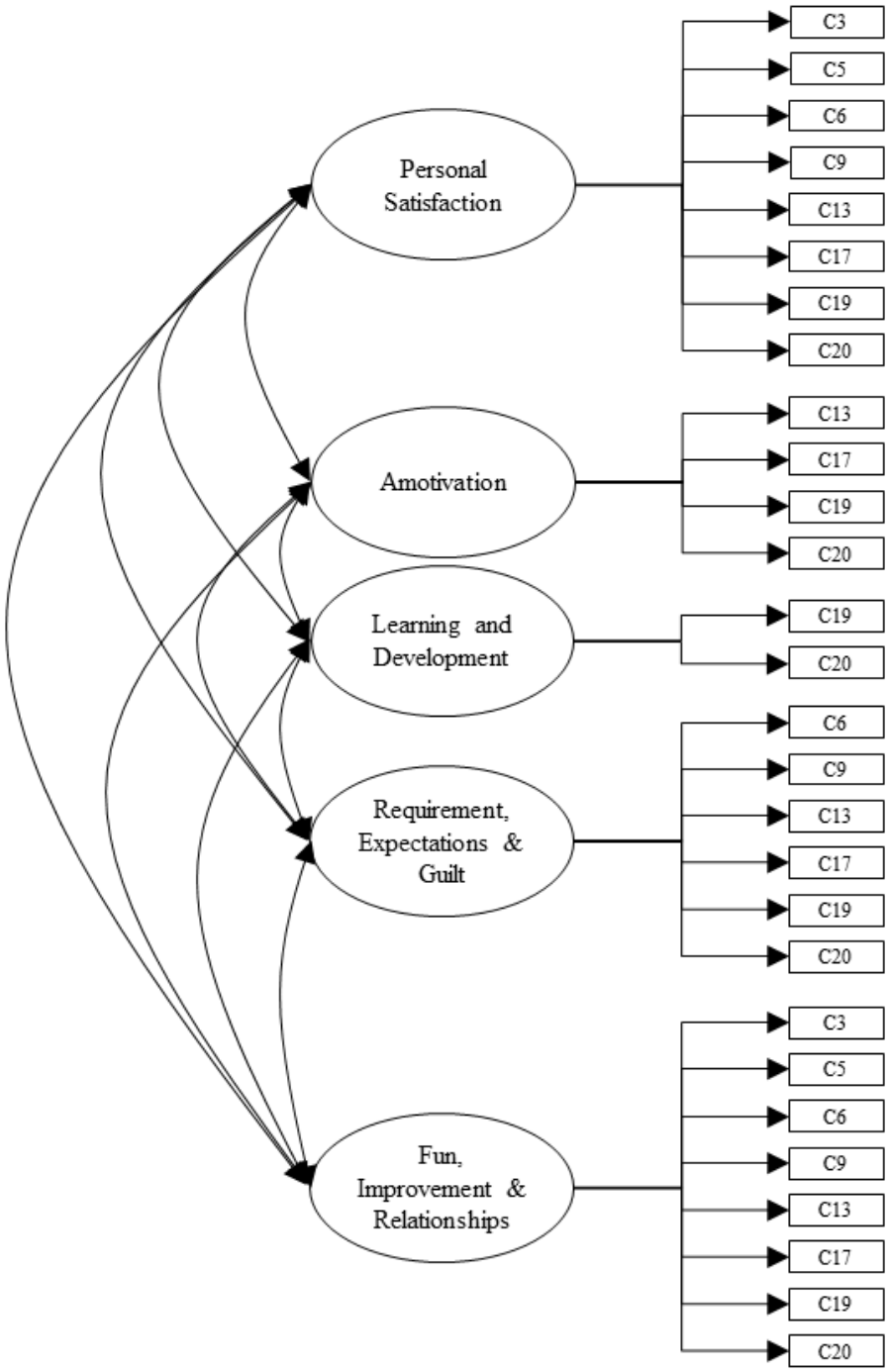

Figure 4.3

Model 1: Proposed Model Based on the Exploratory Factor Analysis Results for the Motivation Section of the Questionnaire

Table 4.11

Goodness of Fit Indices for Confirmatory Factor Analysis Models of the Motivation Section of the Questionnaire

	χ^2 (df)	GFI	AGFI	Cmin/DF	TLI	RMSEA	CFI	NFI
Model 1	1252.58 (340)	.762	.715	3.68	.823	.092	.841	.795
Model 2	1132.15 (314)	.778	.732	3.61	.836	.091	.853	.809
Model 3	1100.33 (309)	.784	.736	3.56	.839	.090	.858	.814
Model 4	1088.86 (309)	.790	.743	3.52	.841	.089	.860	.816
Model 5	895.37 (304)	.826	.784	2.95	.878	.078	.894	.849
Model 6	748.70 (256)	.839	.795	2.93	.891	.078	.907	.867

Results of the CFA for the models are shown in Table 4.11. Model 6 was found to be the model with the overall best fit as it achieved values closer to the recommended cut offs for the respective fit indices. With each modification that was made to the model the fit indices moved closer to their respective recommended cut off values. In the case of GFI, AGFI, TLI, CFI, and NFI, each of these values increased with the chi-square, χ^2 /d.f. and RMSEA decreasing. All of the models had high chi-square and low p values (p<.001) with the final two models achieving χ^2 /d.f. ratios of <.3. The only index that reached the recommended cut off of >.90 was CFI in Model 6. The other fit indices; TLI, NFI, GFI, and AGFI did not reach the recommended cut off values of >.90 in any of the models, however, the values were the highest and closest to .90 in Model 6. The RMSEA was less than <.08 in Model 5 and Model 6, indicating a reasonable fit. The six resultant factors as seen in Model 6 will be considered as the motivation factors and will be used for

descriptive and inferential analysis in this section. Each of the factors was labelled as can be seen in Figure 4.4. A shortened version of these labels will be used in this result section; Intrinsic – Affective (Knowledge) will be referred to as ‘knowledge’; Intrinsic – Affective (Practice) as ‘practice’; Extrinsic – Professional Expectations as ‘professional expectations’; Extrinsic – Student Outcomes as ‘student outcomes’; Amotivation Disengagement as ‘disengagement’ and Introjected Performance will be labelled as is.

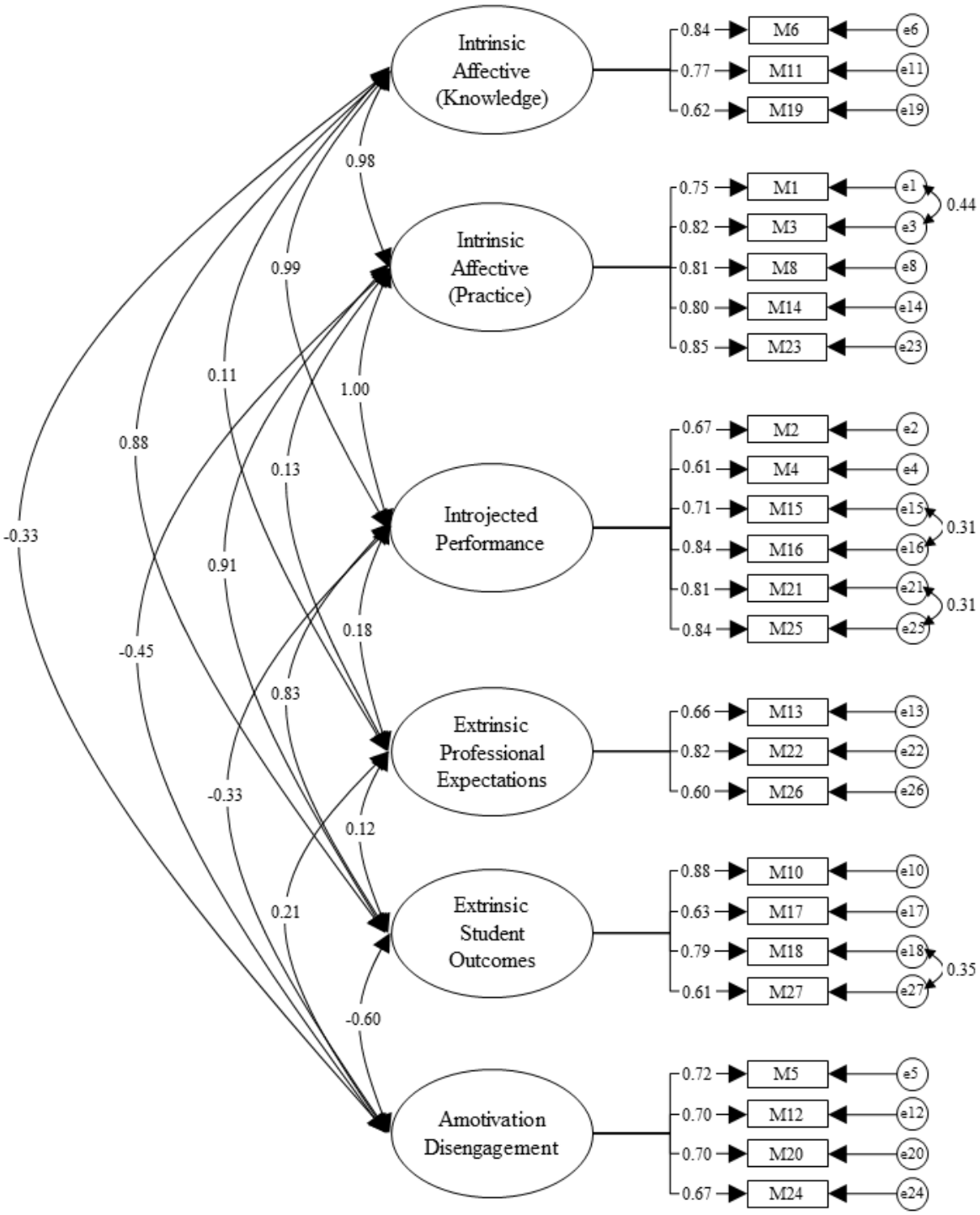

Figure 4.4

Model 6: Final Confirmatory Factor Analysis Model for the Motivation Section of the Questionnaire

Descriptive statistics and internal consistency for the motivation factors.

Descriptive statistics and internal consistency were computed for all of the motivation factors. The total scale score and average score per item for each scale are provided in Table 4.12. The average score per item for Student Outcomes was above 5, with Knowledge, Practice, and Performance, all above 4 and lower for Professional Expectations. Disengagement was lower than the other factors, which would be expected, as it is a negative motivational factor. All of the subscales returned adequate Cronbach's alpha values (Nunnally, 1978).

Table 4.12

Means, Standard Deviations and Internal Consistency for the Motivation Latent Variables

	Total Scale Score		Average Score Per Item		Internal Consistency
	M	*SD*	*M*	*SD*	
Knowledge	12.48	3.21	4.17	1.10	.78
Practice	21.78	5.61	4.35	1.17	.91
Introjected Performance	24.07	6.67	4.11	1.15	.89
Professional Expectations	11.51	3.50	3.85	1.19	.73
Student Outcomes	19.73	3.67	5.03	0.96	.83
Disengagement	7.59	3.86	1.97	1.02	.79

Motivation: Pre-service and in-service. A MANOVA conducted to determine the difference between pre-service and in-service teachers on the six motivation dependent variables (Knowledge, Practice, Performance, Professional Expectations, Student Outcomes, and Disengagement) indicated a significant difference between pre-service and in-service teachers, Wilks Λ, $F(6, 311) = 13.96$, $p < .001$, $\eta p^2 = .21$. Follow up univariate ANOVAs on the dependent variables revealed a significant difference between pre-service and in-service teachers on Knowledge, $F(1, 316) = 4.83$, $p = .03$, $\eta p^2 = .02$, Student

Outcomes, $F(1, 316) = 10.65$, $p = .001$, $\eta p^2 = .03$, and on Disengagement, $F(1, 316) = 35.51$, $p < .001$, $\eta p^2 = .10$. Pre-service teachers had higher Knowledge and Disengagement motivation that in-service teachers, whereas, in-service teachers had higher Student Outcomes motivation than pre-service teachers (Table 4.13). There were no other significant differences on the dependent variables.

Table 4.13

Descriptive Statistics for Motivation Factors for Pre-service and In-service Teachers

		Total Scale Score		Average Score Per Item	
		M	*SD*	*M*	*SD*
Knowledge	Pre-service	12.76	3.21	4.26	1.12
	In-service	11.93	3.16	3.99	1.06
Practice	Pre-service	21.57	5.78	4.34	1.20
	In-service	22.20	5.25	4.37	1.10
Introjected Performance	Pre-service	24.33	6.78	4.14	1.19
	In-service	23.54	6.44	4.04	1.08
Professional Expectations	Pre-service	11.47	3.44	3.85	1.16
	In-service	11.59	3.63	3.83	1.26
Student Outcomes	Pre-service	19.26	3.77	4.90	.98
	In-service	20.65	3.28	5.29	.85
Disengagement	Pre-service	8.46	4.17	2.19	1.08
	In-service	5.87	2.37	1.51	.68

Motivation: Gender. The MANOVA for gender on the motivation dependent variables (Knowledge, Practice, Performance, Professional Expectations, Student Outcomes, and Disengagement) revealed a significant difference for gender, Wilks Λ, $F(6, 311) = 3.66$, $p = .002$, $\eta p^2 = .07$. There was a significant difference between males and females on Practice, $F(1, 316) = 7.01$, $p = .01$, $\eta p^2 = .02$, Professional Expectations, $F(1, 316) = 6.63$, $p = .01$, $\eta p^2 = .02$, Student Outcomes, $F(1, 316) = 5.93$, $p = .015$, $\eta p^2 = .02$ and

Disengagement, $F(1, 316) = 6.75$, $p = .01$, $\eta p^2 = .02$. Males scored significantly higher on Practice and Student Outcomes, whereas females were significantly higher on Professional Expectations and Disengagement (Table 4.14).

Table 4.14

Descriptive Statistics for Motivation Factors for Gender

		Total Scale Score		Average Score Per Item	
		M	*SD*	*M*	*SD*
Knowledge	Male	12.86	2.82	4.27	.99
	Female	12.38	3.31	4.14	1.13
Practice	Male	23.39	4.57	4.65	.97
	Female	21.36	5.78	4.27	1.20
Introjected Performance	Male	24.88	5.94	4.21	1.03
	Female	23.85	6.84	4.08	1.18
Professional Expectations	Male	10.53	3.49	3.44	1.18
	Female	11.77	3.47	3.95	1.18
Student Outcomes	Male	20.70	3.04	5.26	.77
	Female	19.47	3.78	4.97	.99
Disengagement	Male	6.50	3.30	1.68	.86
	Female	7.87	3.95	2.04	1.04

Motivation: Year of degree. There was no significant difference for year of degree on the motivation dependent variables Knowledge, Practice, Performance, Professional Expectations, Student Outcomes, and Disengagement, Wilks Λ, $F(18, 571) = 1.53$, $p = .08$, $\eta p^2 = .04$ (Table 4.15).

Table 4.15

Descriptive Statistics for Motivation Factors for Year of Degree

		Total Scale Score		Average Score Per Item	
		M	*SD*	*M*	*SD*
Knowledge	Year 1	13.23	3.77	4.43	1.29
	Year 2	13.41	2.20	4.50	0.74
	Year 3	12.37	3.45	4.16	1.21
	Year 4	12.59	3.17	4.19	1.11
Practice	Year 1	23.63	6.25	4.71	1.30
	Year 2	22.50	4.34	4.68	0.84
	Year 3	20.47	5.36	4.16	1.07
	Year 4	21.04	5.82	4.21	1.22
Introjected Performance	Year 1	25.22	7.84	4.31	1.39
	Year 2	25.45	4.66	4.27	0.83
	Year 3	24.37	6.55	4.21	1.13
	Year 4	23.91	6.83	4.07	1.19
Professional Expectations	Year 1	11.37	3.35	3.86	1.19
	Year 2	12.05	3.43	3.95	1.13
	Year 3	12.11	3.41	4.11	1.20
	Year 4	11.31	3.48	3.80	1.16
Student Outcomes	Year 1	19.63	4.17	5.06	1.11
	Year 2	19.14	2.93	4.91	.75
	Year 3	19.11	3.13	4.84	.90
	Year 4	19.20	3.89	4.87	1.00
Disengagement	Year 1	7.74	4.23	1.94	1.06
	Year 2	9.41	4.46	2.45	1.18
	Year 3	9.68	4.89	2.42	1.30
	Year 4	8.32	3.98	2.19	1.04

Motivation: Years of teaching. The MANOVA for years of teaching on the motivation dependent variables (Knowledge, Practice, Performance, Professional Expectations, Student Outcomes, and Disengagement) revealed a significant difference for

years of teaching, Wilks Λ, $F(30, 1230) = 3.54$, $p < .001$, $\eta p^2 = .06$. There was a significant difference between year of teaching on Student Outcomes, $F(5, 312) = 2.89$, $p = .015$, $\eta p^2 = .04$, and Disengagement $F(5, 312) = 7.62$, $p < .001$, $\eta p^2 = .11$. Pot hoc tests revealed that participants with 0 years teaching were significantly lower in motivation related to Student Outcomes than those with more than 15 years teaching. For Disengagement, 0 years teaching were significantly higher than those who has taught for <1 year and those who had taught for more than 15 years. No other motivation subscales were significantly different from one another for years of teaching (Table 4.16).

Table 4.16

Descriptive Statistics for Motivation Factors for Years of Teaching

		Total Scale Score		Average Score Per Item	
		M	*SD*	*M*	*SD*
Knowledge	0	12.76	3.21	4.26	1.12
	<1	12.67	2.67	4.33	.89
	1 – 5	12.75	2.96	4.25	1.00
	5 – 10	11.10	3.86	3.65	1.31
	10 – 15	11.60	3.50	3.90	1.10
	15+	11.88	2.96	3.98	.99
Practice	0	21.57	5.78	4.33	1.20
	<1	23.25	5.81	4.58	1.24
	1 – 5	23.25	5.58	4.56	1.15
	5 – 10	20.40	7.00	4.00	1.45
	10 – 15	20.50	6.67	4.00	1.41
	15+	22.67	3.59	4.49	.77
Introjected Performance	0	24.33	6.78	4.14	1.19
	<1	25.42	5.28	4.33	.98
	1 – 5	25.44	6.48	4.31	1.14
	5 – 10	21.60	7.65	3.85	1.27
	10 – 15	22.90	8.31	3.90	1.45
	15+	23.39	5.69	3.98	.92
Professional Expectations	0	11.47	3.44	3.85	1.16
	<1	10.58	3.34	3.50	1.31
	1 – 5	11.19	3.04	3.69	1.08
	5 – 10	12.45	4.16	4.10	1.41
	10 – 15	11.90	3.28	4.00	1.05
	15+	11.55	3.77	3.82	1.29
Student Outcomes	0	19.26	3.77	4.90	.98
	<1	20.17	3.10	5.08	.79
	1 – 5	20.00	4.70	5.13	1.20
	5 – 10	19.70	4.43	5.05	1.10
	10 – 15	21.10	2.64	5.40	.70
	15+	21.29	2.13	5.47	.58
Disengagement	0	8.46	4.17	2.20	1.08
	<1	5.17	1.47	1.33	.49
	1 – 5	6.19	1.97	1.69	.60
	5 – 10	6.95	3.36	1.75	.91
	10 – 15	5.70	1.77	1.40	.52
	15+	5.53	2.20	1.43	.65

Motivation: Specialist and non-specialist. There was a significant difference between specialist and non-specialist teachers on the motivation factors, Wilks Λ, $F(6, 311) = 9.58$, $p < .001$, $\eta p^2 = .16$. There was a significant difference for all of the factors; Knowledge, $F(1, 316) = 11.26$, $p = .001$, $\eta p^2 = .03$, Practice, $F(1, 316) = 34.11$, $p < .001$, $\eta p^2 = .10$, Performance $F(1, 316) = 20.51$, $p < .001$, $\eta p^2 = .06$, Professional Expectations, $F(1, 316) = 10.76$, $p = .001$, $\eta p^2 = .03$, Student Outcomes, $F(1,316) = 15.86$, $p < .001$, $\eta p^2 = .05$, and Disengagement, $F(1, 316) = 17.16$, $p < .001$, $\eta p^2 = .05$. On Knowledge, Practice, Performance and Student Outcomes, physical education specialists reported higher motivation, whereas non- specialists had higher scores for Professional Expectations and Disengagement (Table 4.17).

Table 4.17

Descriptive Statistics for Motivation Factors for Specialist and Non-specialist Teachers

		Total Scale Score		Average Score Per Item	
		M	*SD*	*M*	*SD*
Knowledge	Specialist	13.61	3.13	4.55	1.06
	Non-specialist	12.16	3.17	4.06	1.09
Practice	Specialist	25.10	4.33	5.06	.92
	Non-specialist	20.86	5.58	4.15	1.15
Introjected Performance	Specialist	27.19	6.51	4.62	1.10
	Non-specialist	23.20	6.46	3.96	1.13
Professional Expectations	Specialist	10.30	3.70	3.41	1.25
	Non-specialist	11.84	3.38	3.97	1.15
Student Outcomes	Specialist	21.25	3.07	5.42	.79
	Non-specialist	19.31	3.71	4.92	.97
Disengagement	Specialist	5.93	2.84	1.52	.76
	Non-specialist	8.05	3.98	2.09	1.05

Motivation: Activity instructed. There was a significant difference between those who reported instructing activity and those who reported not having instructed other

activities on the motivation subscales, Wilks Λ, $F(6, 311) = 11.74$, $p < .001$, $\eta p^2 = .19$. There was a significant difference for Knowledge, $F(1, 316) = 23.36$, $p < .001$, $\eta p^2 = .07$, Practice, $F(1, 316) = 60.69$, $p < .001$, $\eta p^2 = .16$, Performance $F(1, 316) = 30.81$, $p < .001$, $\eta p^2 = .09$, Student Outcomes $F(1, 316) = 43.86$, $p < .001$, $\eta p^2 = .12$, and Disengagement, $F(1, 316) = 13.41$, $p < .001$, $\eta p^2 = .04$. On Knowledge, Practice, Performance and Student Outcomes, those who reported instructing activity reported higher motivation, whereas those who reported not having instructed activities had higher scores for Disengagement (Table 4.18). There was no significant difference for Professional Expectations.

Table 4.18

Descriptive Statistics for Motivation Factors for Activity Instruction

		Total Scale Score		Average Score Per Item	
		M	*SD*	*M*	*SD*
Knowledge	Activity	13.22	2.88	4.41	1.00
	No Activity	11.53	3.37	3.86	1.15
Practice	Activity	23.78	4.48	4.75	.96
	No Activity	19.25	5.88	3.84	1.20
Performance	Activity	25.83	5.90	4.39	1.04
	No Activity	21.83	6.93	3.74	1.18
Professional Expectations	Activity	11.58	3.44	3.87	1.16
	No Activity	11.41	3.58	3.82	1.24
Student Outcomes	Activity	20.86	2.61	5.30	.71
	No Activity	18.29	4.27	4.69	1.11
Disengagement	Activity	6.90	3.57	1.79	.94
	No Activity	8.46	4.04	2.19	1.07

Correlational analysis. Table 4.19 presents the Pearson's correlations among the motivation factors. The correlations suggest some evidence of a simplex like pattern with stronger positive correlations between adjacent variables than variables further apart on the continuum and appear to be somewhat consistent with the self-determination continuum.

Table 4.19

Correlations between Motivation Factors (N=318)

	1	2	3	4	5	6
1. Practice	1.00	.80**	.77**	.88**	.11	-.39**
2. Knowledge		1.00	.71**	.82**	.13*	-.24**
3. Student Outcomes			1.00	.69**	.15**	-.45**
4. Introjected Performance				1.00	.19**	-.27**
5. Professional Expectations					1.00	.16**
6. Disengagement						1.00

* $p<.05$, ** $p<.01$

Relationships between confidence and motivation. Table 4.20 presents the results of Pearson's correlations conducted to explore the relationships between the confidence and motivation factors. These results indicated that only implementation and Professional Expectations were not significantly related. Most correlations were between .4 and .62. Disengagement was negatively related to both the confidence subscales.

Table 4.20

Pearson's Correlations Between Confidence and Motivation Factors

	Management and Planning	Implementation
Knowledge	.46**	.48**
Practice	.62**	.62**
Performance	.51**	.51**
Professional Expectations	.12*	.09
Student Outcomes	.61**	.52**
Disengagement	-.35**	-.25**

*p<.05, **p<.01

Discussion

The purpose of this study was to further evaluate the psychometric properties and factor structure of the CMTPPEQ. Evidence of the factor structure of the CMTPPEQ, derived from the EFA of Study 1 underpinned a more rigorous investigation of the construct framework of the CMTPPEQ through the use of CFA. Additionally this study sought to gain knowledge of the confidence and motivation of teachers to teach primary physical education and the associated variables (e.g., gender, years of teaching) that may influence these cognitive processes. Demographic group scores were compared to determine differences between confidence and motivation to teach primary physical education for specific background characteristics. The contrasts included pre-service and in-service teachers, specialist and non-specialist physical education teachers, gender, year of degree, years of teaching, and previous instruction of physical activity outside of teaching.

Relationships with Research and Theory

Confidence factors. A CFA was used to confirm the two-factor structure solution for confidence produced through the EFA in Study 1. The two factors produced in Study 1

were management and planning and implementation. This model was found to have an acceptable structural fit, with indices approaching or above the accepted values, based on current interpretations. Based on this no 'structural' modifications were deemed necessary; all items from the original confidence section were retained and all individual items remained grouped on the same latent variable as they were in the model produced in Study 1.

In order to produce a model with a strong level of fit, the post hoc modification indices were examined to determine if there were any changes that could be made to the model to facilitate a better fit. The modification indices indicated that a correlation between the error terms of item 5 and item 13 may improve the model fit. Modification indices are based on statistical improvement (Mullin, 2013); the value of a modification index is the amount a chi-square value is expected to decrease if the corresponding parameter is freedom (Teo, Tsai, & Yang, 2013). The use of modification indices is cautioned as they will suggest all changes that will improve model fit but these changes may be nonsensical and not reflect the underlying theoretical model (Byrne, 1998, 2001). If changes are made it is important that theory and the professional context are also taken into consideration, rather than solely statistical values (Mullin, 2013). Item 5 'Teach the movement skills of dance' and item 13 'Teach the movement skills of gymnastics' would seem logical to correlate together as the areas of gymnastics and dance share a number of similarities. Both these areas are more artistically focused than other content areas such as fitness or athletics and often involve more individual based activities related to movement skills rather than team-based activities related to games and sports. These two content areas have also been found to be grouped together in some curriculum documents. For example, in the new Australian Curriculum, these two content areas are represented by the

one area of ‘Rhythmic and Expressive Movement’ (Australian Curriculum Assessment Reporting Authority [ACARA], 2015).

The addition of the correlation of error terms was found to marginally improve the model fit, with the modifications being labelled as Model 2 in the Results. Model 2 also observed the CFI and TLI values reach the >.90 criterion with the NFI achieving the .90 criterion when rounded to two decimal places. RMSEA did not change dramatically nor did the cmin/d.f. ratios. The GFI and AGFI values also increased but unfortunately did not reach the recommended cut off. The latent variables retained the same labels they were given in Study 1; Factor 1, Management and Planning and Factor 2Implementation.

The factor labelled as management and planning maintained the 15 item structure, which is believed to represent the common duties and responsibilities of a teacher. Although written specifically for physical education, the items in this factor represent tasks that are common practice in teaching. For example item 16 ‘maintain accurate records of student learning in physical education’, although written in the context of physical education, this is a task that is relevant to good teaching practice and a necessary practice irrespective of the content area.

The consistent factor structure of the confidence section demonstrates the continued perception that tasks in management and planning are different from those in implementation. Implementation also retained the nine-item structure and describes the delivery of content specific to physical education. The items in this factor are specific to teaching physical education and are not able to be assimilated to others tasks in teaching. Items in this section address the delivery of specific content such as fitness, athletics, and team games and sports. Freak and Miller (2015) reported that most pre-service generalist teachers surveyed felt prepared to plan and program (84.8%) and teach (84.5%) primary

physical education. These dimensions appear to be consistent with the two confidence factors that emerged in this study of management and planning and implementation.

A strong positive relationship was found between management and planning and implementation. This suggests confidence in management and planning is related to confidence in implementing primary physical education or vice versa. The confidence individuals have in one area (i.e., management and planning or implementation) may positively impact on confidence in the other area, for example planning activities and sessions would be expected to have some relationship to confidence in implementation of the planning.

Motivation factors. The motivation model produced from the EFA in Study 1 was found to have an unacceptable fit in the CFA in Study 2, with none of the fit indices used reaching their recommended cut-off values. To try and improve the model fit a number of structural modifications were made to the model, which included the deletion of some items, the addition of another latent variable, and the re-allocation of items loading onto these latent variables.

After making structural changes to the model further modifications were made based on the examination of model re-specification indicators (modifications indices and residual covariances). The final model was considered to demonstrate a tentative level of fit. As the measure is still under development, the results are supportive of continued refinement because some acceptable levels of fit were achieved; CFI >.90, RMSEA < .08 and χ^2/d.f. ratio <3. Scale development is regarded as a dynamic process that requires the ongoing examination of the psychometric properties of an instrument in association with the continued provision of evidence of reliability and validity (DeVellis, 2003). The standardised residual covariances indicated that the removal of more items may have improved the overall fit of the model, however, similar to the suggestion of Humphries et

al. (2012) the decision to retain these items in this study was based on "not sacrificing construct validity simply to obtain adequate GOF indices" (p.291). Humphries et al. (2012) and Marsh et al. (2004) concur that sound judgment based on the evaluation of the findings is a more appropriate alternative to using the goodness of fit indices as rigid decision rules during model re-specification.

The above mentioned approach of evaluation based on underlying theory and statistical information has been used to improve the model fit. This theoretical understanding and the re-specifications that have been made should enable further work and development to take place on this model with the aim of producing a model that demonstrates good statistical fit, logically coherence, and is supported by theoretical underpinnings.

Although the final model derived from the CFA is not an exact match of the continuum arrangement of the 'traditional' configurations of SDT as proposed by Deci and Ryan (1985) it still appears to measure representative states of the continuum. The diagram below shows the arrangement of the proposed factors with respect to the self-determination continuum. In order of increasing self-regulation per SDT these proposed factors are Amotivation (Disengagement), Extrinsic – Professional Expectations, Extrinsic - Introjected Performance, Extrinsic – Student Outcomes and Intrinsic motivation, which is represent by two proposed factors; Intrinsic – Affective (Knowledge) and Intrinsic – Affective (Practice).

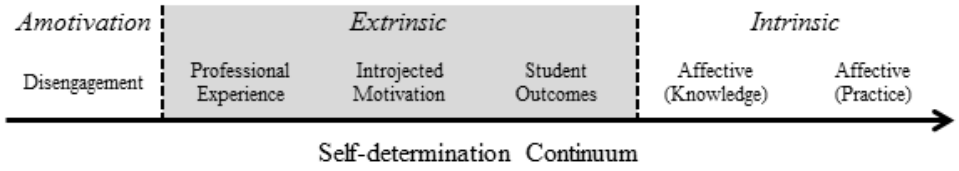

Figure 4.5

The Motivation Factors Related to the Self-Determination Continuum

The factor labelled Intrinsic - Affective (Knowledge) comprises three items; item 6, 11, and 19. These items appear to represent the knowledge an individual is able to gain from teaching physical education. As these items include language such as 'for the pleasure it gives me' and 'the enjoyment of discovery', it was considered that they represent intrinsic motivation. These items would imply that the activity of teaching physical education is pursued for the inherent satisfaction of knowing the professional content of the domain. These items were also originally written to measure the dimension of intrinsic motivation.

The next factor includes 5 items; items 1, 3, 8, 14, and 23, and is labelled Intrinsic – Affective (Practice). These items appear to describe the fun and excitement that an individual experiences from teaching and being involved in physical education (e.g., 'For the excitement I feel when I am teaching physical education', 'Because I like the feeling of being involved in the activity that I am teaching', and 'Because teaching physical education is fun'). This proposed factor appears to also represent intrinsic motivation as these items would indicate that an individual was undertaking the activity of teaching physical education for interest and enjoyment of the professional practices associated with teaching in this domain. Similar to Intrinsic – Affective (Knowledge), all of the items on this proposed factor were originally labelled as intrinsic motivation items.

The largest factor in terms of observed variables contains 6 items; 2, 4, 15, 16, 21, and 25, and is labelled Introjected – Performance. These items appear to relate to feelings of professional performance and improving performance as a teacher (e.g., 'broadening my knowledge', 'to build a good reputation', 'to prove to myself that I am capable of teaching', and 'makes me feeling like I am adequately fulfilling me role as a teacher'). The items in this factor appear to be conceptually congruent with extrinsic motivation,

specifically introjected regulation, as they represent feelings associated with ego-involvement and internal rewards.

The factor labelled Extrinsic – Professional Expectations contains 3 items; 13, 22, and 26 representing feelings of obligation and requirement. All of these items were represented within the factor Requirement, Expectations and Guilt that resulted from the EFA in Study 1. These items were also all originally based on extrinsic motivation, specifically, the external regulation classification.

The final factor that is considered to represent extrinsic motivation is labelled Extrinsic – Student Outcomes and contains 4 items; items 10, 17, 18, and 27. This factor describes the importance of physical education in a child's learning and development. The EFA output from Study 1 revealed that items 18 and 27 load on the factor labelled as learning and development with these items being based on the extrinsic motivation category of identified regulation. Item 10 was also originally written to represent identified regulation 'because physical education promotes positive relationships between teacher and student', so it seems logical for it be grouped with items 18 and 27. Item 17 was originally constructed to represent intrinsic motivation; 'for the enjoyment in seeing my students achieve their goals', which could be interpreted to relate to the learning a child undertakes in physical education.

The factor labelled Amotivation (Disengagement) retained the same items that were produced as a result of the EFA in Study 1. This proposed subscale contains 4 items that all represent a lack of motivation towards teaching physical education. All these items were originally written as amotivation questions.

The final CFA model sees intrinsic motivation represented by two variables. This model is in contrast to the self-determination continuum developed by Deci and Ryan (1985) who viewed intrinsic motivation as a global construct. There have, however, been

other measures developed, i.e., the AMS (Vallerand et al., 1992), SMS (Pelletier et al., 1995), and IMI (McAuley, Duncan, & Tammen, 1989), that have shown intrinsic motivation to be separable into more specific motives. Vallerand et al. (1989) hypothesised an intrinsic motivation taxonomy that separated intrinsic motivation into three different types. Results from the validation of the AMS (Vallerand et al., 1992) and the SMS (Pelletier et al., 1995) along with subsequent studies that have used these measures support the possibility of multiple intrinsic subscales.

The Intrinsic Motivation Inventory (Ryan, 1982; Ryan, Mims, & Koestner, 1983; Plant & Ryan, 1985) also assesses motivation as multiple constructs. The IMI presents intrinsic motivation as an additive function of four factors; interest or enjoyment, perceived competence, effort or importance, and pressure or tension. The examination of the psychometric properties of the inventory has found it to be a valid and reliable instrument (e.g., McAuley et al., 1989; Whitehead & Corbin, 1991; Tsigilis & Theodosiou, 2003).

The two intrinsic motivation factors appear to be logically coherent, with one representing ‘knowledge’ and the other representing ‘practice’. When considering what might motivate teachers to teach it seems plausible that some individuals are motivated to teach for the satisfaction of learning new things and expanding their knowledge, whereas some are motivated for the fun of teaching and interacting with children. The two intrinsic motivation subscales appear to align with two of the three intrinsic motivation factors postulated by Vallerand et al. (1989). Vallerand’s tripartite taxonomy of intrinsic motivation identifies intrinsic motivation to know, to accomplish things, and to experience things, with both motivation to know and to experience things appearing to be represented in the motivation section of the questionnaire.

Intrinsic - Affective (Knowledge) appears to align with Vallerand’s intrinsic motivation to know. This factor describes an individual’s motivation for teaching physical

education as an activity that is undertaken for pleasure and satisfaction of learning new things. Intrinsic - Affective (Practice) appears to align with intrinsic motivation to experience, which describes experiencing stimulating sensations of fun and excitement as motives for teaching physical education.

The subscale that doesn't appear to be represented in the motivation section of the questionnaire is intrinsic motivation to accomplish things. Vallerand defines this subscale as the "act of engaging in an activity for pleasure and satisfaction experienced when one attempts to accomplish or create something" (1992, p.1005). Based on the definition, this aspect of intrinsic motivation appears to be more relevant within an academic or sporting field in which achievement is important and more easily measured. A large portion of the participants in this study were pre-service teachers with most of them having limited experience in teaching and more importantly in teaching physical education. As such, it is expected that at this point in their career the participants' focus is more about knowing what to do and actually doing it. An individual with very limited knowledge in the area of physical education is likely to be more concerned with the basics of just being able to teach a lesson successfully without trying to extend themselves by using teaching strategies or styles that are more complex. A different sample of teacher participants may have provided a contrasting set of results. For example, a cohort of teachers that has been teaching for several years and more secure with the content knowledge that has to be delivered may look to extend themselves by using different teaching strategies and teaching styles to see how these impact on student learning.

Three factors in the final CFA model represent extrinsic motivation. Extrinsic – Professional Expectations aligns with External Regulation, Introjected Performance aligns with Introjected Regulation and Extrinsic – Student Outcomes with Identified Regulation. These three factors are in line with how the AMS (Vallerand et al., 1992) and SMS

(Pelletier et al., 1995) extrinsic motivation subscales are expected to align according to SDT as hypothesised by Vallerand et al. (1993). Previous research validating the seven-factor structure of the AMS supports the existence of the three extrinsic motivation subscales (Cokley et al., 2001; Fairchild et al., 2005; Stover et al., 2012).

The correlations between the factors in the motivation section highlighted evidence of a simplex pattern that would support the SDT continuum. As outlined by Fairchild et al. (2005) the examination of the simplex pattern of an instrument based on the SDT to prove construct validity is not uncommon. The strongest negative correlation was seen between amotivation (Disengagement) and Extrinsic – Student Outcomes, which represents identified regulation. These results are coherent with Study 1, where the strongest correlation was between amotivation and the latent variable representing Identified Regulation. As discussed in Study 1, previous research has also found the strongest negative correlation between amotivation and Identified Regulation (Cokley, 2000; Fairchild et al., 2005; Smith et al., 2012; Vallerand et al., 1993). The strongest correlation was between Intrinsic – Affective (Practice), believed to represent intrinsic motivation to experience, and Introjected Performance, believed to represent introjected regulation. This result is consistent with Vallerand et al. (1993) who also found intrinsic motivation to experience to correlate more strongly with introjected regulation rather than identified regulation. These two factors are not positioned next to each other on the continuum of the final model. Congruent with Cokley (2000) the two intrinsic factors also correlated more strongly with Introjected Performance, which represents introjected regulation rather than identified regulation as represented by Extrinsic - Student Outcomes.

The relationship between the factor labelled Extrinsic - Professional Expectations, which was considered to represent external regulation, and the Intrinsic – Affective (Knowledge) factor, appears to support a simplex pattern. Extrinsic – Professional

Expectations had its highest correlations with the proposed factors positioned either side and exhibited lower correlations with the factors moving further away from it on the continuum. Extrinsic – Student Outcomes partially demonstrates a simplex pattern, with the exception of having a higher correlation with Intrinsic – Affective (Practice) rather than the adjacent factor Intrinsic – Affective (Knowledge). The relationships for Intrinsic – Affective (Practice), Introjected Performance, and amotivation (Disengagement) did not provide support for the simplex pattern, with higher correlations seen with factors that were not adjacent.

The first four factors (practice, knowledge, student outcomes, and introjected performance) correlate strongly together (r = .69 - .88), with the first two factors representing intrinsic motivation and the next two representing extrinsic motivation. Despite a simplex pattern not emerging perfectly, and although only one of the four factors in this group demonstrated a simplex pattern it does not completely contradict the continuum. As discussed in Study 1, a possible explanation for the deviation from the simplex pattern could be the language or wording of individual items. For example, all of the items in Intrinsic – Affective (Practice) were originally written based on intrinsic motivation to experience stimulation items, which this proposed subscale is now considered to represent. There is also an additional item in this factor, item 8, which was based on intrinsic motivation to accomplish. The item reads 'for the satisfaction I feel while improving my teaching within physical education'. The word 'satisfaction' is used at the beginning of the sentence and is also quite similar to item 23 'for the satisfaction I experience when I am teaching physical education' with which it is grouped. Introjected Performance, which is also one of the four factors that does not conform to the simplex pattern entirely, contains items that were originally based on several other intrinsic and extrinsic motivation subscale items. Item 2 was originally written to describe identified

regulation, items 16 and 21 intrinsic motivation to know and item 25 intrinsic motivation to accomplish. As described previously, these items appear to relate to professional performance and improving performance. As such, the wording of these items representing the theme of performance may have caused them to cluster together.

These strong correlations provide further support for the idea that the constructs of the SDT continuum are not distinct (Cokley, 2000; Fairchild et al., 2005; Smith et al., 2012). These results could also be a demonstration that factors representing identified regulation and introjected regulation are more 'self-determined' than is postulated in the SDT continuum. This structure may provide some indication of motivation for physical education teaching with motivation being separated by different themes specific to the role of being a physical education teacher.

Reliability of the CMTPPEQ.

Confidence. The confidence section of the questionnaire demonstrated adequate reliability with both of the proposed subscales displaying Cronbach's alpha values greater than .70 (Nunnally, 1978). These values are almost identical to those reported in Study 1 with management and planning at .95 in Study 1 and .96 in Study 2 and implementation at.89 in both. These results are once again consistent with the previous research described and discussed in Study 1; the PETES reported values ranging between .77 and .94 (Humphries et al., 2012) and the TFMSSQ between .86 to .92 (Callea et al., 2008). The results support the internal consistency of the measure and its subscales and provide a basis for its use in measuring confidence to teach primary physical education.

Motivation. Similar to the confidence section, the results of the reliability analysis for motivation showed that Cronbach's alpha values demonstrated adequate internal consistency for all six subscales. Due to the changes in model structure and configuration for the motivation section it is difficult to compare the results of Study 1 and Study 2. The

only proposed subscale that was consistent between the two studies is amotivation, which, reported a value of .77 in Study 1 and Disengagement (amotivation) with .79 in Study 2 (these subscales contained the same items, although named slightly differently between the studies). The values reported in Study 2 are consistent with previous research described in this section of the discussion in Study 1 of the thesis (Cokley et al., 2001; Fairchild et al., 2005; Pelletier et al., 1995, 2013; Smith et al., 2012; Stover et al., 2012; Vallerand et al., 1992). The results support the internal consistency of the motivational subscales and measure demonstrating that motivation specific to teaching primary physical education can be measured.

Characteristics of the individual. The confirmation of the factor structure of the confidence and motivation sections of the CMTPPEQ allows the impact of an individual's characteristics on their confidence and motivation to teach primary physical education to be explored. Previous research has identified an individual's characteristics, their background and previous experiences as being important components that can affect the learning and teaching process (Morgan & Bourke, 2008). As such, it is important to consider how these variables can impact upon an individual's confidence and motivation to teach primary physical education.

Confidence. The relevance of Bandura's (1977, 1997) conceptual model of self-efficacy to the influence of previous experiences on behaviour highlights the need to explore previous experiences and characteristics of teachers, both pre-service and in-service, in teaching primary physical education. In teaching primary school physical education, previous experience such as number of years an individual has been teaching for, if they have previously instructed activity, along with other characteristics such as the type of teacher they are (specialist or non-specialist), what year of their degree they are in, and their gender are likely to impact upon an individual's level of confidence.

Consistent with the findings of Study 1 and previous research in the area (e.g., Freak & Miller, 2015; Morgan & Bourke, 2005), the content areas with the lowest confidence were gymnastics and aquatics. Reasons for this, such as a limited amount of training in these areas, lack of knowledge, previous experience, technical skills required and safety, have been discussed in the previous chapter. The content areas with the highest mean score; fitness, team sports, and motor skills are also consistent with the findings of Study 1 and previous research (Freak & Miller, 2015; Morgan & Bourke, 2005). Possible explanations for individuals having higher levels of confidence to teach these areas were discussed in detail in Study 1 and include pre-conceived ideas individuals have about what is involved in teaching these areas as a consequence of participating more frequently in these types of activities, the availability of resources, and experience outside of teaching in participating, coaching, or instructing these activities.

Pre-service and in-service teachers. In-service teachers were more confident than pre-service teachers. These results are not surprising with performance accomplishments believed to be the most influential determinant of self-efficacy (Duda & Treasure, 2010). Those who are currently teaching are likely to have had greater opportunities for performance accomplishments in teaching physical education. If success has been experienced, it is likely to have a positive impact on an individual's level of self-efficacy. For example, Sodak and Podell (1997) found that after an initial drop in efficacy during the first year of teaching, there was an increase in efficacy as a result of experience for primary school teachers. De La Torre Cruz and Arios (2007) examined final year pre-service teachers and teachers who had been teaching for an average of fifteen years, and found that teachers with more experience had higher teacher efficacy than the pre-service teachers. Pre-service teachers, who may have had no or limited opportunities to teach physical education, haven't had the chance to build performance accomplishments in physical

education, or in teaching in general due to the lack of practical teaching experience. After teaching physical education, pre-service teachers may find that it is not as difficult as they first thought and if they have had a good experience while teaching their confidence is likely to increase.

The limited vicarious experience opportunities of pre-service teachers could also explain their lower levels of confidence when compared to the in-service teachers. Depending on what year an individual is in their degree they may not have had many opportunities to watch another teacher deliver physical education. Previous research (Callea et al., 2008; Cundiff, 1990; Hickey, 1992; Morgan & Bourke, 2005, 2008; Xiang et al., 2002) has found that generalist teachers often avoid teaching physical education because of their lack of confidence. This avoidance to teach would mean there are fewer opportunities for pre-service teachers to watch a lesson being taught. Vicarious experiences are believed to be most beneficial when the observer is able to identify with the performer and the performer is successful. This would mean a generalist teacher's efficacy may be impacted upon most when they observe another primary generalist teacher deliver physical education and do it well. Unfortunately, this is unable to happen if other primary generalists do not teach physical education. Armour and Dunscombe (2004) found vicarious experiences to be beneficial for newly qualified teachers.

The different levels of teacher confidence between the two pre-service and in-service groups highlighted by the measure scores in this study provides support for the validity of the measure by demonstrating an expected pattern of variation between pre-service and in-service teachers. Differences would be expected in their confidence to teach physical education based on the varying levels of experience they would each have with teaching physical education and teaching in general. This experience could be influenced

by the limited amount of preparation and training generalist teachers receive in the area of physical education (O'Sullivan & Oslin, 2012).

A further consideration when interpreting the differences found between pre-service and in-service teachers is the dropout rate of teachers, which could result in only the most confident remaining in the profession. Research shows that almost half of all new teachers leave the professional within the first five years (Hentges, 2012; Schacter & Thum, 2005), with reasons such as lack of support and pressure to perform at the same level as their more experienced peers being identified (Cherubini, 2007). Around three quarters of the participants in the current study had taught for 5 years of more, which could mean that those who are in the 5 years or more sample were the most confident, with the least confident in the profession dropping out, leaving only the most confident ones still teaching. This would account for some of the confidence differences between the pre-service teachers and in-service teachers, through some process of natural selection. In addition, the large number of participants in the sample who had been teaching for a number of years once again supports the earlier argument of opportunity to experience success influencing confidence and efficacy expectations; that is, the more opportunities to teach, the greater the chance to experience success. Personal achievements and feelings of satisfaction have been found to be a factor in determining whether beginning teachers remain or leave the profession (Lim-Teo et al., 2008). These in-service teachers have also had the opportunity to build their confidence up over time through exposure to teaching physical education, gathering resources and ideas, and potentially watching other people teach.

The higher confidence scores of the in-service teachers compared to the pre-service teachers on the confidence factors was also reflected on the individual items, with the in-service teachers recording higher scores on all items with the exception of items 5 and 9.

Higher confidence for pre-service than in-service teachers on item 5 ‘Teach the movement skills of dance’ could be attributed to pre-service teachers potentially receiving more recent training and exposure in dance than in-service teachers who may not have taught or trained in dance for years if ever. If pre-service teachers had been exposed to some type of dance in their undergraduate training they may have remembered this as it would be a relatively recent exposure, occurring within the last 4 years. Although the item that represents the content area of ‘dance’ in the questionnaire did not achieve the lowest mean when comparing specialist and non-specialist teachers, previous research has found that generalist teachers avoided teaching dance because of their lack of confidence, motivation, knowledge, resources and lesson ideas, and limited understanding of what teaching dance would actually involve (Russell-Bowie, 2013). For those currently teaching, many of this cohort may have been introduced to basic dance pedagogy in their undergraduate education, however, that could have been some years ago, with 49 of the 107 in-service teachers indicating they had taught for 15 years or more. This could be further impacted if they have never actually taught dance during their career, with research confirming that dance is not a regular area of instruction in primary schools, despite the confirmed benefits it provides to children (Russell-Bowie, 2013). For example, interviews of Canadian elementary school teachers found that none of them had ever taught dance but all acknowledged its importance in the curriculum (MacDonald, 1991). Although in-service teachers may have been exposed to dance and received basic skills and content knowledge in this area during their undergraduate training, if they have never applied the knowledge in practice, the knowledge may not be readily implementable and, therefore, adversely influenced confidence.

Secondary physical education specialists cite a lack of ongoing professional development (O’Sullivan, 2006), which may be exacerbated for non-specialist primary

teachers, who probably have less engagement with the content area. As a result of research in the area of teacher confidence, in particular the confidence of generalist teachers to teach physical education (Callea, et al. 2008; Cundiff 1990; Hickey, 1992; Morgan & Bourke, 2005, 2008; Xiang et al., 2002), it may be that tertiary institutions have taken this into consideration when preparing their graduates and concentrated on providing additional training in this content area. This could be reflected in higher confidence for the pre-service teachers when compared to the in-service teachers.

Pre-service teachers rated item 9 'To use a range of technologies (e.g., ICT, heart rate monitors, and movement analysis tools) to support and engage student learning in physical education' higher than in-service teachers. A potential explanation for this difference is 'generational differences'. In-service teachers on average were older than pre-service teachers, suggesting the possibility of age related influences. Over the years technology has become more prominent and easily accessible, so younger people may have more familiarity and confidence with using technology. Previous research on confidence in the use of ICT by pre-service teachers in general as opposed to specifically in physical education has found that older pre-service teachers were less confident than younger pre-service teachers (Yeung, Lim, Tay, Lam-Chiang, & Hui, 2012).

Another possibility for the difference in confidence of the pre-service and in-service to use technologies could be that in-service teachers are more aware of the level of accessibility of technology in a school environment. In-service teachers who are currently operating in a school have a more realistic view of what technologies are available. For pre-service teachers, they may have experienced technology in a university setting which was easy to access and as such have the expectation this technology will also be available in a school setting.

Gender. Males reported significantly higher confidence than females, which is consistent with some research in teacher education. For example, a longitudinal study that compared gender differences among teacher candidates found that females entered teacher education programs with lower levels of confidence than males (Kalaian & Donald, 1994). A similar pattern of confidence differences has been reported for generalist teachers teaching physical education. For example, Callea et al. (2008) found that male generalist primary school teachers were more interested in physical activity and also more confident to teach fundamental motor skills than their female counterparts.

Research has also found that teachers have greater confidence in activities in which they have had more experience (Bowles & O'Sullivan, 2012; O'Sullivan et al., 2009). Russell-Bowie (2013), when exploring pre-service teachers' confidence to teach dance in relation to the perceptions of their background, suggested that females had more confidence to teach dance because they had more experience in the area. In general, males participate more in sport and physical recreation activities than females (ABS, 2015) and, as such, we would expect males to perceive that they have more experience in the area. Morgan and Bourke (2008) found males tended to achieve higher scores on the construct 'perceived confidence teaching PE' than females did with factors such as their greater involvement in sport and more favourable memories of school physical education experiences believed to contribute. Experience is considered to be related to confidence, which may help to explain the differences seen for gender. Morgan and Bourke (2008) also developed a theoretical causal model to analyse confidence in teaching physical education and how other variables impact upon this. Results from this analysis produced a model, which demonstrated that gender influences confidence to teach physical education through commitment to sport and physical activity. It also illustrated that gender influences

commitment to sport and physical activity through primary physical education outcomes and secondary physical education experience.

Year of degree. Confidence to teach physical education did not differ across year level for the pre-service teachers. It was expected that more training, and potentially more exposure to teaching through practical placements and observations, would result in increased confidence across the year levels. Woodcock (2011) similarly, found no changes in efficacy in their examination of pre-service primary teacher efficacy during their training course. These results imply that pre-service teacher training programs have limited ability to impact on teacher efficacy levels.

The lack of significant differences between the year levels could be attributed to the limiting effects of professional socialisation in physical education teacher education. Well before they enter the classroom and undertake any teacher training, teachers form beliefs about teaching and the classroom based on their schooling experiences as a student (Hushman, 2013; Pajares, 1992). These pre-existing beliefs about teaching tend to remain static and are not easily changed during teacher training (Kim & Cho, 2014; O'Sullivan et al., 2009). Lawson (1983) describes the socialisation of teachers as a life-long process that begins at the commencement of schooling and continues on into their professional career as teachers. Wright, McNeil and Butler (2004) have further expanded this by identifying the physical education socialisation process into distinct phases. Crum (1990) provides a description of the teacher socialisation theory in relation to physical education:

> It is generally accepted that prospective physical educators do not bring tabula rasa to formal professional training programs, but their anticipatory professional conceptions are shaped by experience obtained in physical education classes and in participation in exercise, play, and sport outside the school context. (Crum, 1990, p. 287).

Green (2008) also explains how teachers tend to replicate what they have experienced in physical education and through participation in other physical activities. Essentially, as a result of the socialisation process, what is taught as part of a tertiary program aimed at preparing teachers to teach physical education may have minimal impact, as all their experiences may ultimately dictate what they are going to deliver. As discussed in the previous chapter, previous experiences appear to consist of curriculum that relates to sports (O'Donovan & Kirk 2008; Morgan & Bourke, 2008) which may mean that students perceive physical education to be all about sports (Green, 2008) so this is what they will then teach, which continues the cycle. The limited effects of professional socialisation in the process of becoming a teacher may help to explain why no significant difference in confidence was seen between the year levels.

Years of teaching. The only significant difference found on the management and planning scale for years of teaching was between the 0 years of teaching group and those teaching for 15 years or more. Based on this, similar arguments presented for the difference seen between the pre-service and in-service teachers would apply. Performance accomplishments could account for the differences seen, as those who have been teaching for more than 15 years have had more opportunities to experience success and, therefore, gain confidence to teach physical education than those in the 0 years teaching group. Morgan and Bourke (2008) outline performance accomplishments as one of the most important strategies to increase mastery experiences. They highlight the need for successful early teaching experiences in physical education that then progress onto more challenging and complex teaching tasks. Once again, more time spent in the teaching environment would provide teachers with greater opportunities to teach, and to teach physical education specifically, to allow confidence to increase as a result of mastery experiences. In addition, those who have been teaching for more than 15 years have made

it past the 5year drop out hurdle, indicating that they may have greater confidence in their teaching.

Specialist and non-specialist. The higher level of confidence displayed by the specialists is an expected result due to the varying levels of training the two groups would have received in the content area of physical education (O'Sullivan & Oslin, 2012). As discussed in Study 1, participants who have chosen to specialise in physical education would have undertaken more training in the area. A primary physical education specialisation for pre-service teachers is generally comprised of six units of study in the key learning areas (Freak & Miller, 2015), with generalist teachers most often only completing one unit. Non-specialist teachers describe their initial teacher training as being minimal and believe they need much more to be able to competently and confidently delivery physical education (Armour & Duncombe, 2004; DeCorby et al., 2005; Morgan & Bourke, 2005). Additional training within the area of physical education should provide the essential knowledge and practical experience necessary for delivering the wide range of content within this learning area.

Descriptive analysis of the scores for the items in the confidence section of the questionnaire for the total sample and specialist and non-specialist participant groups revealed a set of contrasting means between specialists and non-specialists. Wanting to be involved in sport and physical activity has been found to be one of the main reasons that individuals choose to specialise in primary physical education (O'Sullivan et al., 2009; Spittle & Spittle, 2014). This strong interest in sport and physical activity may mean specialists have often had extensive previous experience through participation or through other active engagement (e.g., coaching) or non-active engagement (e.g., watching sport). Research has found that pre-service classroom teachers feel their previous participation in sport was influential in their physical education teaching competence and attitude

(Morgan, Bourke, & Thompson, 2001; Webster, 2011). Newly qualified, and experienced teachers, have described a lack of confidence when teaching areas of the curriculum in which they have limited personal experience (Armour & Duncombe, 2004). Duda and Treasure (2010) suggest that one of the most influential determinants of perceived self-efficacy is vicarious experience. Therefore, theoretically, specialist teachers who participate in, and are interested in, sport and physical activity would have more actual participatory experience as well as vicarious experiences and, consequently, have more confidence and higher perceived self-efficacy. This idea has been supported by Russell-Bowie (2013) who found that experience in an area often leads to increased levels of confidence.

Physical activity instructed. Participants who reported they had previously instructed activity also reported higher levels of confidence. Research in which students rated themselves as competent to teach a particular content area of physical education attributed this to prior experience, for example if they held a coaching qualification or had coaching experience (Carney & Chedzoy, 1998). Findings in this study are similar to those of Parks et al. (2007) who also found that those with previous physical activity teaching experiences are more willing to engage in the delivery of physical activity curriculum projects. As previously discussed, the instruction of activity provides individuals with the opportunity for performance accomplishments to be achieved through mastery experiences. Bandura's (1977) theories would suggest that if an individual has achieved success when instructing an activity previously, it is likely to raise the levels of self-efficacy and confidence in their ability to delivery practical activities.

Motivation. Like confidence; environments, situations, setting and backgrounds can influence motivation and as such it is important to consider how these characteristics and previous experiences can influence behaviours when examining motivation to teach

primary physical education (Visser-Wijnveen et al., 2014). Primary school teachers often have the responsibility of teaching across all curriculum areas, including physical education (O'Sullivan, & Oslin, 2012; Petrie, 2010), thus the context of teaching changes. This change in context makes the consideration of characteristics and previous experiences even more relevant in the framework of exploring motivation to teach primary physical education. Research on possible antecedents of teacher motivation and behaviour in primary physical education would underpin understanding of motivation to teach primary physical education (Van de Berghe, et al., 2014). Examining how personal experience and an individual's characteristics influence the different types of motivation identified in the measure will add to our understanding of motivation to teach primary physical education. Similar to confidence, previous experiences and other personal characteristics, such as type of teacher (pre-service or in-service), gender, teaching experience, and experience in instructing physical activity are likely to impact on certain types of motivation in teaching primary physical education.

Pre-service and In-service teachers. In-service teachers were found to be significantly more motivated by student outcomes than pre-service teachers. The factor Extrinsic - Student Outcomes describes the importance of physical education to a child's learning and development. Student Outcomes, which represents identified regulation in SDT, is classified as a type of autonomous motivation. Deci and Ryan (2008) stated that individuals who are autonomously motivated "experience volition, or a self-endorsement of their actions" (p.182). Autonomous motivation can arise from the identification with the values and importance of a behaviour (Van den Berghe et al., 2014a). In 'identified regulation', which, in this study is represented by 'Student Outcomes', a teacher may value the importance of transferring movement skills and other knowledge delivered through physical education to their students. Those who are currently teaching are more likely to

have had the opportunity to see the benefits and positive impact participation in physical education can have on a child's learning, development, and overall wellbeing.

Research examining student teacher motivation to teach was reported to have increased as a result of reasons clustered under "interaction with significant people" (Lim-Teo et al., 2008, p. 48). Reasons that were grouped in this cluster included "being affected by interaction with pupils, being motivated by the needs of pupils, and being inspired by tutors, peers, or senior teachers" (Lim-Teo et al., 2008, p. 48). Spittle et al. (2009) found that confident interpersonal service was a strong motivator for students choosing to become a physical education teacher. "Students were likely to become physical education teachers as they enjoyed working in a school setting" (Spittle et al., 2009, p.195). This example could imply that motivation to teach increases over time.

Autonomous motivation, which also includes intrinsic motivation, can also arise from the pleasure and inherent satisfaction from engaging in the teaching of the activity itself. Pre-service teachers reported higher levels of motivation in the Intrinsic – Affective (Knowledge) subscale than in-service teachers. Pre-service teachers appear to have been motivated by the opportunity to enrich students with knowledge as well as the knowledge and experience they are able to gain by delivering a physical education session. Pre-service teachers also reported higher levels of amotivation (Disengagement) than in-service teachers. These results are interesting, as this seems somewhat contradictory, because autonomous motivation, which has been defined above, is described as intentional, whereas amotivation is the opposite and involves a lack of intention. A possible explanation for this combination of apparently different forms of motivation could be linked to idealistic feelings that pre-service teachers may have. In the early stages of study in their degree the pre-service teachers may be autonomously motivated by the idea on enriching students and making a difference in their lives by passing on knowledge and

seeing them achieve. Feelings of amotivation, however may accompany these intrinsic motives because they are not actually teaching yet and at this point have not had actually many or any opportunities to pass on their knowledge or see students achieve so have been unable to express this intrinsic motivation.

Gender. Males in this study were found to have higher levels of autonomous motivation towards teaching physical education compared to females, with females reporting higher levels of controlled motivation along with amotivation. Roth et al. (2007) considered that those with autonomous motivation for teaching possess expert knowledge in their specialist field and of the methods they use. With respect to this study, this would imply that those who have some knowledge or expertise in the area of physical education and/or have instructed activity are more likely to possess autonomous motivation for teaching physical education. As discussed above, male teachers were found to have greater levels of confidence than females to teach physical education with a possible explanation for this being their higher levels of participation in physical activity, which can lead to more experience in the area.

The higher levels of controlled motivation implies that females felt as though they have to teach physical education to avoid punishment, gain approval, or avoid shame. The factor Extrinsic - Professional Expectations was the one that was found to be significantly different between the genders this would suggest that these teachers would only teach physical education because the curriculum states that they must, because they have been told they have to, and to avoid punishment or shame for not teaching it.

These current findings are in contrast to previous research, which has found females to have stronger academic motivation than males, with males having higher amotivation. For example, research measuring academic motivation using the AMS (Vallerand et al., 1992) in College students found females to have significantly higher

motivation across all of the subscales with the exception of external regulation (Brouse, et al., 2010). Amotivation was also found to be significantly greater for males than females. Spittle and Spittle (2015) also found females to have higher levels of motivation than males in their exploration of pre-service physical education teachers' motivations to study. Perhaps the differences observed in the current study in comparison to previous research, was that males exhibited higher autonomous motivation, and females more controlled and amotivation. This pattern was possibly due to the expectations surrounding physical education for generalist teachers. In all the other studies on college students, students probably generally selected the area of study for their course and in the Spittle and Spittle (2014) study, they had selected physical education as a specialisation. In the current study, physical education was not necessarily the area of study that students had selected or were interested in and as a consequence, only those who had some knowledge or expertise in the area would be motivated autonomously. It appears that more male than female generalist teachers had an interest in the area of physical education. This may illustrate that motivation is specific to the content area, with the expectation that motivation may vary across content areas such as English, maths, ICT, and arts.

Year of degree. The lack of difference found for year of degree on any of the proposed motivation subscales is in contrast to previous research. Brouse et al. (2010) found there to be significant differences in both intrinsic and extrinsic motivation between freshman and seniors, with freshman having higher levels of motivation and a general decline in motivation with years in college. Ryan and Deci (2000) also stated that, in general, an individual's level of both intrinsic and extrinsic motivation decreases throughout their academic career and they become less and less self-determined. Spittle and Spittle (2015) also found differences in motivation of physical education specialists

between year levels, with students in the final year of their degree being more extrinsically motivated than first year students.

The lack of difference found between the year levels could be explained by the socialisation process associated with teaching physical education. The impact of the socialisation process on teacher training means that the beliefs teachers hold about physical education, which are developed prior to their training, are not easily changed and, as such, teacher training has relatively little influence on trainee teachers (Green, 1998). Research has also found the teacher training doesn't tend to contest trainee teachers' values and beliefs about physical education; rather teacher training tends to confirm as opposed to modifying their values and beliefs (Solomon & Ashy, 1995). That is, the motivation of pre-service teachers did not change across the degree years because of the limited influence of teacher training on their values, beliefs and expectations about teaching physical education.

Years of teaching. Significant differences in motivation related to Student Outcomes were found between those who had taught for 0 years and those with more than 15 years teaching experience. Those who have taught for 0 years are pre-service teachers. Similar arguments presented above with relation to the differences in motivation for pre-service and in-service teachers on the proposed factor of Student Outcomes would help to explain these results. Teachers who have had the opportunity to teach or see the positive impact that physical education can have may, therefore, be increasingly motivated in this area. When describing their feelings towards teaching physical education, teachers have cited that physical education gives those students who struggle in other areas of school a chance to shine (Morgan & Hansen, 2008).

Those who had taught for 0 years (i.e., pre-service teachers) were significantly more amotivated than those who had taught for less than 1 year and those who had taught for more than 15 years. The differences between those who had taught for 0 years and less

than 1 year and 15 years could be explained by a 'fear and the unknown' and a lack of understanding of the importance of the content area. The results could also represent a 'survival of the fittest' in the sense that only those who are motivated stay in the profession hence those who have taught for more than 15 years are less amotivated than those teaching for 0 years or less than 1 year. Those who have taught for 0 years may have had limited opportunity to watch physical education being taught or deliver it themselves in an environment in which they are supported by a more experienced teacher. This, along with the limited amount of training they receive in the area may mean they have a lack of knowledge and understanding about what physical education is and its purpose within the curriculum. Morgan and Bourke (2008) found that non-specialists teachers' perceptions of their ability to teach physical education was affected by their lack of understanding of what activities/skills are appropriate to deliver in a school environment. Many of the non-specialist teachers in the Morgan and Bourke study indicated they had not participated in any gymnastics at school and that they couldn't teach it because they couldn't perform or safely teach any of the high level skills seen in Olympic gymnastics. Once teachers enter into the school environment and begin teaching they may discover that they are capable of delivering physical education, realise its worth as a curriculum area, and its importance in a child's development.

Specialist and non-specialist teachers. The significantly higher levels of autonomous motivation reported by the specialists compared with the non-specialists is an expected result due to the presumed difference in interest levels between the groups in the curriculum area of physical education. Those who have chosen to become a physical education specialist would be expected to have an interest in the area of physical education and as such would be assumed to be more motivated to deliver it. O'Sullivan et al. (2009) found that for specialists their personal sporting success and leaderships roles in sport

promoted motivation to help others through teaching. Students who enrol in a physical education program are believed to have a strong attitude towards physical activities (Tuckman, 1999). Research has found that individuals that chose to become physical education teachers are motivated to enter the profession because of their experiences and success in sport (Al-Rawahi & Al-Yarabi, 2013; Stidder & Hayes, 2006). Spittle et al. (2009) identified sport and physical activity as a reason for choosing to become a physical education teacher. This could indicate that for those choosing to become a physical education teacher having sport and physical activity as part of their career is very important. If non-specialists do not have this interest or desire it could result in lower levels of motivation.

This was further supported by Spittle and Spittle (2014) when exploring reasons for pre-service teachers choosing to specialise in primary physical education and how these choices related to their motivation. They once again found the strongest predictors of intrinsic motivation were choosing the specialisation because of confident interpersonal service reasons, low perceived demand, and family reasons. Thus, intrinsic motives were related to confidence in the specialisation and wanting to help others. Consequently, specialists would be expected to be more confident and interested in the discipline area, so would be likely to experience higher levels of intrinsic motivation.

Along with the three factors representing autonomous motivation, significantly higher scores on Extrinsic – Introjected Performance were found for the specialists compared to the non-specialists. Introjected performance is classified as controlled motivation. The specialists' greater levels of introjected performance relate to their internal feelings and desire to increase their self-worth. Those who are specialists might want to prove to themselves and others that they are a good teacher and show off their skills.

It is anticipated that those who have not chosen to specialise in physical education may not have a strong interest in the area and, therefore, higher levels of Extrinsic – Professional Expectations and amotivation (disengagement). Professional expectations which, represents the regulatory style of external regulation would imply that non-specialist teachers feel they have to teach physical education as a form of compliance due to external pressure. The amotivation (disengagement) may also mean that non-specialists are unable to identify any good reasons in which they should teach physical education. Previous research has found that classroom teachers often view physical education as a 'time-out' from more important academic studies and a chance for students to burn off some energy (Morgan & Bourke, 2008). Tuckman (1999) argued that without positive attitudes no desired behaviour is expected. This means that if the non-specialists do not have positive attitudes towards physical education they wouldn't be expected to be intrinsically autonomously motivated towards teaching physical education (Al-Rawahi & Al-Yarabi, 2013).

Amotivation is the most concerning type of motivation, as this may lead teachers to not deliver physical education. If non-specialists do not place any value on physical education or recognise its importance within the curriculum they may decide they are not going to teach it (Morgan & Bourke, 2008). More time dedicated to physical education in pre-service training along with greater opportunities to observe lessons, teach, and engage in other professional development may help to increase non-specialists' awareness of the importance of physical education in the curriculum.

Activity instructed. Similar arguments used to explain motivational differences between the specialists and non-specialists apply to the difference found in motivation between those who have and have not instructed activity. Those who have previously delivered activity would be expected to have higher levels of autonomous motivation as

they have chosen to deliver an activity so could be expected to have interest in some type of physical activity. The choice to deliver activity would also imply that these individuals are able to identify some benefits of participation. In contrast those who have not delivered any activity before may not have interest in physical activity at all and may not see the benefits of participation. Interest in sport and physical activity (Spittle at al., 2009) has also been found to be a predictor of motivation with regard to choosing to become a physical education teacher highlighting interest in these areas as an important motivator towards teaching physical education.

Limitations

The sample used is this study consisted of an uneven number of pre-service to in-service teachers. These results, therefore, may be more reflective of feelings of pre-service teachers towards teaching primary physical education than in-service. Although there were more pre-service to in-service teachers, the sample size was still quite large. All participants were also from the one state in Australia, which may limit the generalisability of the findings. The sample did however include pre-service teachers from four different universities along with teachers from across Victoria.

Future Research

Further research may explore the possible relationships that exist between confidence and motivation. Specifically, the development of a path model that examines the influence of certain characteristics and experiences associated with an individual's confidence and motivation to teach primary physical education. This could also be further extended to examine the influences of confidence and motivation on teaching outcomes and effectiveness.

Supportive evidence for the psychometric properties of the CMTPPEQ was found in this study. As instrument development is an ongoing process, continued evaluation of

the psychometric properties of the questionnaire is encouraged. Although the factor structure of the confidence section of the questionnaire was found to display acceptable structural fit, not all of the fit indices used reached their recommended cut offs. A possible modification that could be made to this section includes the addition of items to provide a more accurate picture of all the tasks involved in teaching physical education (e.g., performing assessment). The addition of items may also help to more evenly distribute the items across the two proposed factors and the addition of a third factor may even result.

Further refinement of the motivation section of the questionnaire could also be explored due to the tentative level of fit achieved by the model. Inconsistencies still exist between the number of intrinsic subscales found in the factor structure of the motivation model compared to the number of intrinsic subscales found in other research (Fernet et al., 2008; Mallet et al., 2007; Pelletier et al. 1995; Smith et al., 2012; Vallerand et al., 1992). The simplex pattern of factor structure was also not fully supported. The wording of items needs could be reviewed and amendments made to make the items clearer in their meaning and more characteristic of the regulatory style they are meant to represent. These on-going revisions of the CMTPPEQ may then warrant re-examination using CFA to test both the existing and any newly proposed models of confidence and motivation to teach primary physical education. Continued evaluation of the model will strengthen its ability to measure confidence and motivation to teaching primary school physical education.

Additionally, specific teaching tasks and content areas that pre-service and in-service teachers have identified as having high and low levels of confidence in could also be examined in more detail to try and determine why the differences in confidence exist. This type of study may benefit from a qualitative methodology so that responses are not restricted and there is a greater chance of discovering all factors that teachers believe impact on their confidence to teach primary physical education.

Conclusion

This study aimed to further evaluate the factor structure of the CMTPPEQ and explore whether other variables such as gender impact on individual's confidence and motivation to teach primary physical education. The proposed two-factor structure of the confidence section of the questionnaire (comprising management and planning and implementation) was confirmed and these two factors do seem representative of the requirements of the professional context of physical education comprising management and planning and implementation activities. The original motivation model tested did not achieve an acceptable level of fit, so a number of structural changes were made. These changes resulted in a model composed of six factors: Intrinsic – Affective (Practice), Intrinsic – Affective (Knowledge), Extrinsic – Student Outcomes, Introjected Performance, Extrinsic – Professional Expectations, amotivation (Disengagement), however, an acceptable level of fit was still not obtained on all fit indices. The factors of the motivation section appear to represent different types of motivation along the SDT continuum ranging from more self-determined to less self-determined motives for teaching physical education, with most areas of intrinsic and extrinsic motivation continuum represented on the SDT continuum present. The motivation factors also appear to be logically coherent when applied to the profession of teaching when considering what may motivate individuals to teach comprising areas such as practice, knowledge, student outcomes, professional performance, professional expectations, and disengagement. Continued refinement of the measure will support further investigation of confidence and motivation. The CMTPPEQ represents a valuable source of information regarding the characteristics associated with confidence and motivation to teach primary physical education. The measure is worthy of continued use by itself or in conjunction with other assessment techniques, and is capable of generating information that will make a significant contribution to the knowledge base

in the area of confidence and motivation in teaching primary physical education. The psychometric analysis supports the use the CMTPPEQ, which should be promoted as a suitable device for investigations examining confidence and motivation in relation to teaching physical education in primary schools.

Specific demographic variables (e.g., gender, years of teaching, activity instructed) exhibited differences on confidence and motivation, which appear to represent expected or predictable patterns. For example, males were more confident in both management and planning, and implementation, they were also more motivated for practice and student outcomes than females. Females reported higher professional expectations and disengagement. In-service teachers were more confident for both management and planning and implementation and more motivated in relation to student outcomes, whereas pre-service teachers were more motivated for knowledge and disengagement. Teachers with 0 years of teaching were generally less confident and motivated than other years of teaching, with less confidence on management and planning and lower motivation on student outcomes and higher amotivation. Specialists were more confident on both management and planning, and implementation, and were more motivated on knowledge, practice, integrated performance and student outcomes than non and is capable of generating information that will make a significant contribution to and is capable of generating information that will make a significant contribution to the knowledge base in the area of confidence and motivation in teaching primary physical education. Non-specialists reported higher motivation on professional expectations and disengagement. Previous experience in instructing physical activity also influenced motivation and confidence with those with previous instructional experience more confident on management and planning and implementation and higher motivation for knowledge, practice, performance and student outcomes and those with no previous instructional

experience higher on disengagement. These initial findings suggest that confidence to teach physical education may be a significant influence on the delivery of physical education in primary schools, which could reflect lower subsequent motivation to teach physical education. Additional theoretical and model development for confidence and motivation factors would make a significant contribution to the knowledge base in relation to teaching primary physical education.

CHAPTER 5: DEVELOPMENT OF A MODEL OF CONFIDENCE AND MOTIVATION TO TEACH PRIMARY PHYSICAL EDUCATION (STUDY 3)

Introduction

Research on teacher education in physical education has increased over recent decades (Graber, 2001; Siedentop, 2009; Tsangaridou, 2012), however, research on physical education in primary schools remains an under researched area (Hunter, 2006; Kirk, 2005; Tsangaridou, 2012). Primary school physical education is critical as an area of enquiry as it contributes to the development of fundamental movement skills and competencies, as well as social, cognitive, and affective skills to support lifelong physical activity patterns of children (Graber et al., 2008; Hunter, 2006; Pangrazi, 2004; Rink & Hall, 2008). In Australia, as in much of the world, physical education in primary schools is predominantly the responsibility of generalist primary teachers (Hardman, 2008; Morgan & Hansen, 2007; O'Sullivan, & Oslin, 2012; Petrie, 2010). The requirement to teach primary physical education provides a challenge to pre-service teacher education programs to equip generalist teachers to be prepared, confident, and motivated to teach physical education (Freak & Miller, 2015). Low levels of confidence (Callea et al., 2008; Faucette et al., 2002; Morgan & Burke, 2005; 2008 Telford et al., 2005; Xiang et al., 2002) to teach physical education appears to be a significant barrier to delivery of physical education in primary schools, which could reflect lower subsequent motivation to teach physical education. The current study will build on the results of Study 1 and Study 2 of this thesis and extend previous research on confidence and motivation to teach primary school physical education by developing a model of relationships that influence confidence and motivation to teach primary physical education.

Study 1 explored the development of a questionnaire (CMTPPEQ) for measuring the confidence and motivation of primary teachers to teach physical education. Study 2

aimed to further evaluate the psychometric properties and factor structure of questionnaire. The analysis resulted in a two-factor confidence section of the questionnaire (comprising management and planning and implementation), which had acceptable structural fit. The motivation section of the questionnaire required a number of structural changes which resulted in a six factor model of motivation to teach primary physical education: Intrinsic – Affective (Practice), Intrinsic – Affective (Knowledge), Extrinsic – Student Outcomes, Introjected Performance, Extrinsic – Professional Expectations, and amotivation (Disengagement). The factor structure of the motivation section provided a tentative fit. The initial development and confirmation of these measures provides an opportunity to further explore the relationships of confidence and motivation to teach primary physical education in this third study of the thesis. In addition, in Study 2 differences were found on confidence and motivation to teach primary physical education for several demographic variables (e.g., specialisation, years of teaching, activity instructed). This suggests that these variables may be important to explore in models of how confidence and motivation operate in relation to teaching physical education in primary schools..

The exploration of the relationship between confidence and motivation is valuable as confidence (self-efficacy) is often identified as an important mediator of motivation (Feltz & Oncu, 2014). It is also acknowledged as a relevant motivating factor in academic settings (Diseth, Danielsen, & Samdal, 2012). This would suggest that a teacher's type or level of confidence to teach physical education can influence their motivation to teach physical education. Studies have shown that a perceived high confidence (self-efficacy) towards a given task strengthens the tendency to choose to attempt that task, to persevere in carrying it out despite difficulties, to perform well, and even to evaluate the task as important and enjoyable (Schunk, 1990; Weiss & Ferrer-Caja, 2002). The use of path analysis will serve to evaluate the influence of a range of characteristics on the interaction

of confidence and motivation relative to the context of teaching primary physical education.

Path analysis, rather than testing for linear relationships, explores relationships between variables and the strength of these relationships (Olobatuyi, 2006). An assessment quality of path analysis in exploring these relationships is that it explicitly considers cause (Eshima, Tabata, Borroni, & Kano, 2015), and, therefore, allows the examination of causal processes of relationships and their relative importance (Karadag, 2012). It also enables for direct and indirect effects of variables on one another to be determined (Olobatuyi, 2006). Using path analysis to develop a model of confidence and motivation to teach primary physical education should allow for the exploration of relationships between a range of mediating variables, to determine the effect of specific variables on the overall model, and assess the strength of the relationships between variables. Thus, it will allow the examination of the influence of confidence in particular areas of teaching physical education on different types of motivation for teaching primary physical education.

The model, in highlighting the influence of a range of personal and experience variables on confidence and motivation, could provide for greater understanding of how these psycho-social variables shape teaching in primary physical education. This model could provide supporting practice and process knowledge in preparing pre-service teachers and in providing appropriate PD for in-service teachers to teach primary school physical education. The feelings of confidence and motivation of generalist primary teachers towards teaching physical education are potentially key drivers in the delivery of quality physical education programs in primary schools and exploring how these factors interact should support understanding of the delivery of physical education in primary schools.

Aims

Study 3 aims to develop models that depict the interaction of personal characteristics and previous experience, confidence, and motivation. Using a Structural Equation Modelling technique; Path Analysis also aims to establish causal links in these relationships which affect both confidence and motivation to teach primary physical education. Two models were developed, one for teachers in general (including both specialist physical education and generalist teachers) and one for generalist (non-specialist physical education) teachers.

Method

The data collected as part of Study 2 was used in the evaluation of the hypothesised path models developed in this study. As such, the participants and measures used in Study 3 represent those used previously. Not all measures and data collected for Study 2 were utilised in the models for this study and the analytical framework in which the data are used is different as it aims to explore the relationship between the variables and not a factor structure.

Participants

The description of the participants highlights the characteristics that are specific to this analysis. Participants were 318 physical education specialists (n = 69) and non-specialists (n = 249). Participants were asked to indicate the number of years they had been teaching, with 211 indicating 0 years (pre-service teachers), 12 for less than a year, 16 for 1-5 years, 20 for 5-10 years, 10 for 10-15 years, and 49 for more than 15 years. Participants also reported on whether they had instructed any physical activity (e.g. team games and sports, athletics, gymnastics, etc) outside of teaching, with 178 reporting that they had instructed some sort of activity and 140 not instructing any activity.

Measure

Demographics.

Pre-service demographics information sheet. The demographics information sheet used is the same as that detailed in Study 2. The questions from the demographics information sheet that are relevant for this study are; whether the participant was training to be a physical education specialist, and whether they had taught any physical activity outside of teaching rounds.

In-service demographic information sheet. As stated above, the demographics information sheet was the same as the one used in the previous study, Study 2. The questions on the information sheet relevant for this study were; how many years the participant had been teaching for, if the participant had trained to be a physical education specialist, and if the participant had taught any physical activity outside of teaching.

Listed below are the demographic variables that have been hypothesised to have an influence on confidence and motivation to teach primary physical education. The variables were selected based on the considerations of existing theory (i.e., self-efficacy model; Bandura, 1977, 1997); research which has suggested that variables such as being a specialist or non-specialist physical education teacher (e.g., Faucette et al., 2002; Morgan & Burke, 2005; 2008), physical activity experience (e.g., Faulkner et al., 2004; McKenzie & Kahan, 2008; McKenzie, LaMaster, Sallis, & Marshall, 1999; O'Sullivan et al., 2009), and years teaching (O'Sullivan et al., 1989) will influence confidence and potentially motivation to teach physical education; and the findings of Study 2 which also found differences in confidence and motivation for several variables including specialisation, years of teaching, and activity instructed.

Specialist/Non-specialist. A specialist is a teacher who has undertaken specific training to teach the curriculum area of physical education. A non-specialist is a teacher

that has chosen not to become a physical education teacher. Non-specialist teachers are likely to have varying levels of training and expertise in the area of physical education.

Years of teaching. This refers to the number of years a teacher has been teaching for. Pre-service teachers were recorded as having '0' years of teaching experience while in-service teachers answered on a scale: less than a year, 1 – 5 years, 5 – 10 years, 10 – 15 or more than 15.

Activity instructed. This represents whether the participant has previously instructed any physical activity outside of teaching physical education.

Confidence and Motivation to Teach Primary Physical Education Questionnaire (CMTPPEQ). This questionnaire consists of questions that address confidence and questions that address motivation and is separated into sections accordingly. The questionnaire was developed and revised in Study 1 and then further revised in Study 2 of this thesis.

Confidence. The confidence section of the questionnaire consists of 24 questions. These questions are represented by two factors; management and planning consisting of 15 questions and implementation consisting of 9 questions. These factors are described in detail below and represent 'confidence' to teach in the path diagram.

Management and Planning. This represents the common roles or duties that a teacher would be expected to perform when teaching physical education. Examples of these tasks include planning a physical education program, establishing learning goals, communicating student's achievements, maintain recordings and self-evaluating learning activities.

Implementation. This represents the delivering of content areas specific to physical education. For example teaching motor skills and complex movements, outdoor experience activities, dance, team games and sports, athletics and fitness.

Motivation. The confidence section of the questionnaire consists of 25 questions. The latent variables are described below and represent 'motivation' to teach in the path diagram.

Intrinsic. This represents both of the factors that were identified in Study 2 as being intrinsic. All of the observed variables that are in the Affective – Practice and Affective – Knowledge factors are represented here.

Extrinsic. This represents the three factors that were identified in Study 2 as being extrinsic. All of the items that are in Extrinsic – Student Outcomes, Introjected Performance, and Extrinsic – Professional Expectations are represented.

Amotivation (Disengagement). This represents a lack of motivation towards teaching physical education.

Hypothesised Model of Confidence and Motivation to Teach Primary School Physical Education

Model 1 (General Model). The findings from Study 2 revealed that there were differences in confidence and motivation of participants based on their personal characteristics and previous experience. Significant relationships between the confidence and motivation factors were also found through Pearson's correlations, ranging from medium to large. Using these results, a path diagram was constructed depicting a possible model of how the demographic variables affect the confidence factors and how these then affect the motivation factors.

The demographic variables hypothesised to have the greatest influence on an individual's confidence and motivation to teach primary physical education were the number of years they had been teaching, if they had taught or instructed any physical activity outside of teaching physical education, and whether they were trained as a physical education specialist. These variables were selected based on the consideration of existing

theories (e.g., self-efficacy) along with the findings presented in Study 2. The conceptual model of self-efficacy (Bandura, 1977, 1997) details that performance accomplishments are an important influential mediator of self-efficacy. Therefore, the demographic variables of years of teaching; the instruction of physical activity; and the type of teacher (physical education specialist or non-specialist) were selected as probable influences of an individual's confidence and motivation to teach primary physical education.

The hypothesised path model shows the order of effect moving from left to right with variables to the left of the confidence factors considered to have an effect on confidence to teach primary physical and the confidence factors believed to have an effect on an individual's motivation to teach primary school physical education. The confidence variables are positioned in the middle of this model as self-efficacy is believed to be a cognitive mechanism that mediates between sources of an individual's self-appraisal and their motivation (Feltz & Oncu, 2014). The demographic variables in this model represent an individual's self-appraisal, which affect confidence and an individual's confidence effects their motivation.

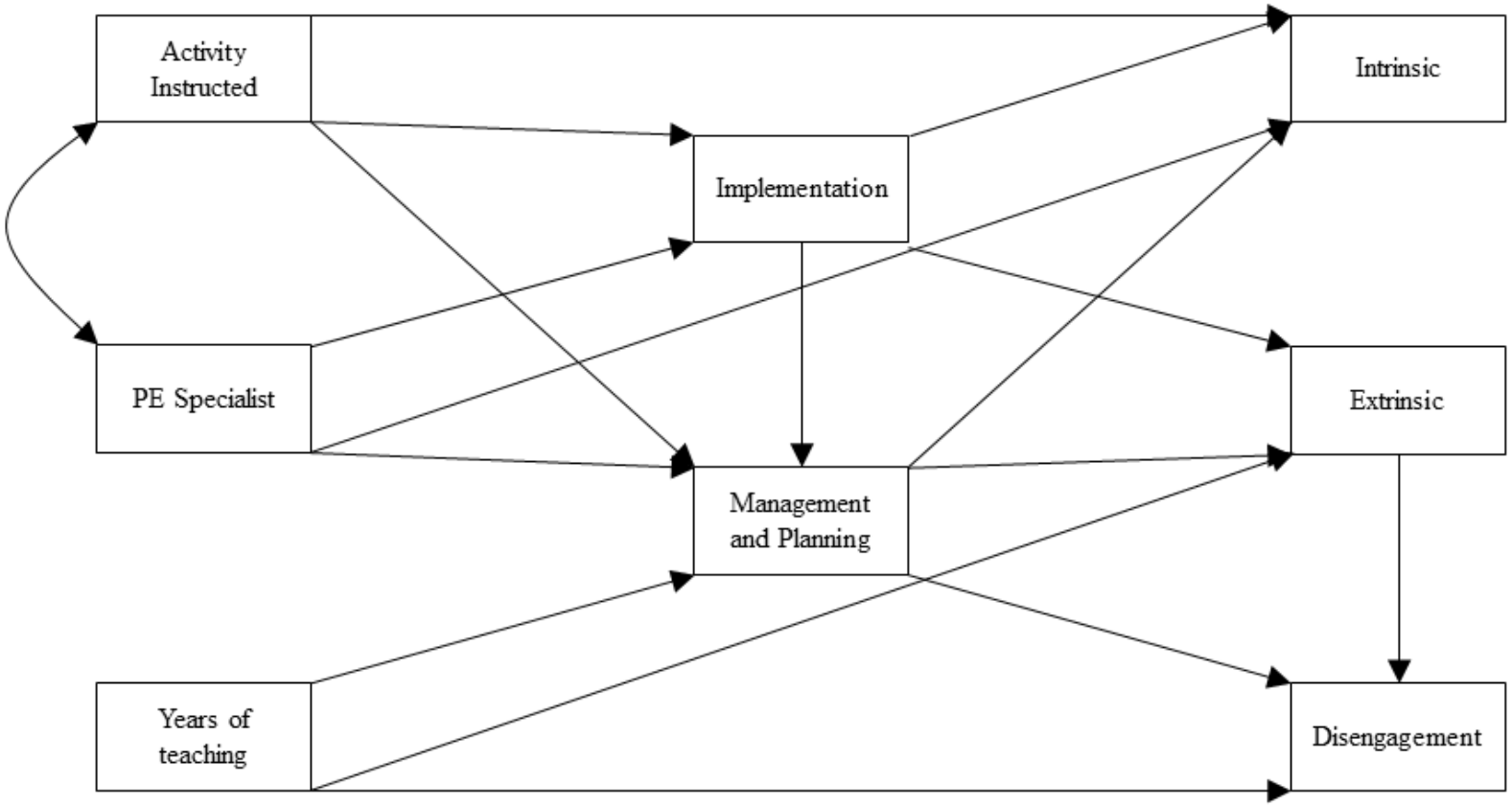

Figure 5.1

Hypothesised Model of Confidence and Motivation to Teach Primary Physical Education: Model 1

Model 2 (Non-Specialist Model). Research has previously identified that individuals who are charged with the task of delivering primary physical education, which in Australia is predominately the classroom teacher), who often lack the confidence to actually delver physical education (Callea et al., 2008; Morgan & Bourke, 2005; 2008; Xiang et al., 2002). As such, a model (Model 2) that is specific to non-specialist teachers rather than all teachers was proposed that illustrates confidence and motivation towards teaching primary physical education for non-specialists.

Years teaching and activity instructed were the demographic variables proposed to have the strongest effect on a non-specialist teacher confidence to teach primary physical education for the same reasons as detailed above in Model 1. The model shows the order of effect moving from left to right with the previously identified demographic variables believed to affect the confidence and motivation factors and the confidence factors affecting the motivation factors. This model differs to the overall model (Model 1) with reference to the number of observed variables and the pathways. This model has been designed to demonstrate the relationship of a non-specialist teacher's previous experience, and confidence and motivation to teach primary physical education. As such the observed variable representing type of teacher; specialist or non-specialist, was not included in the model.

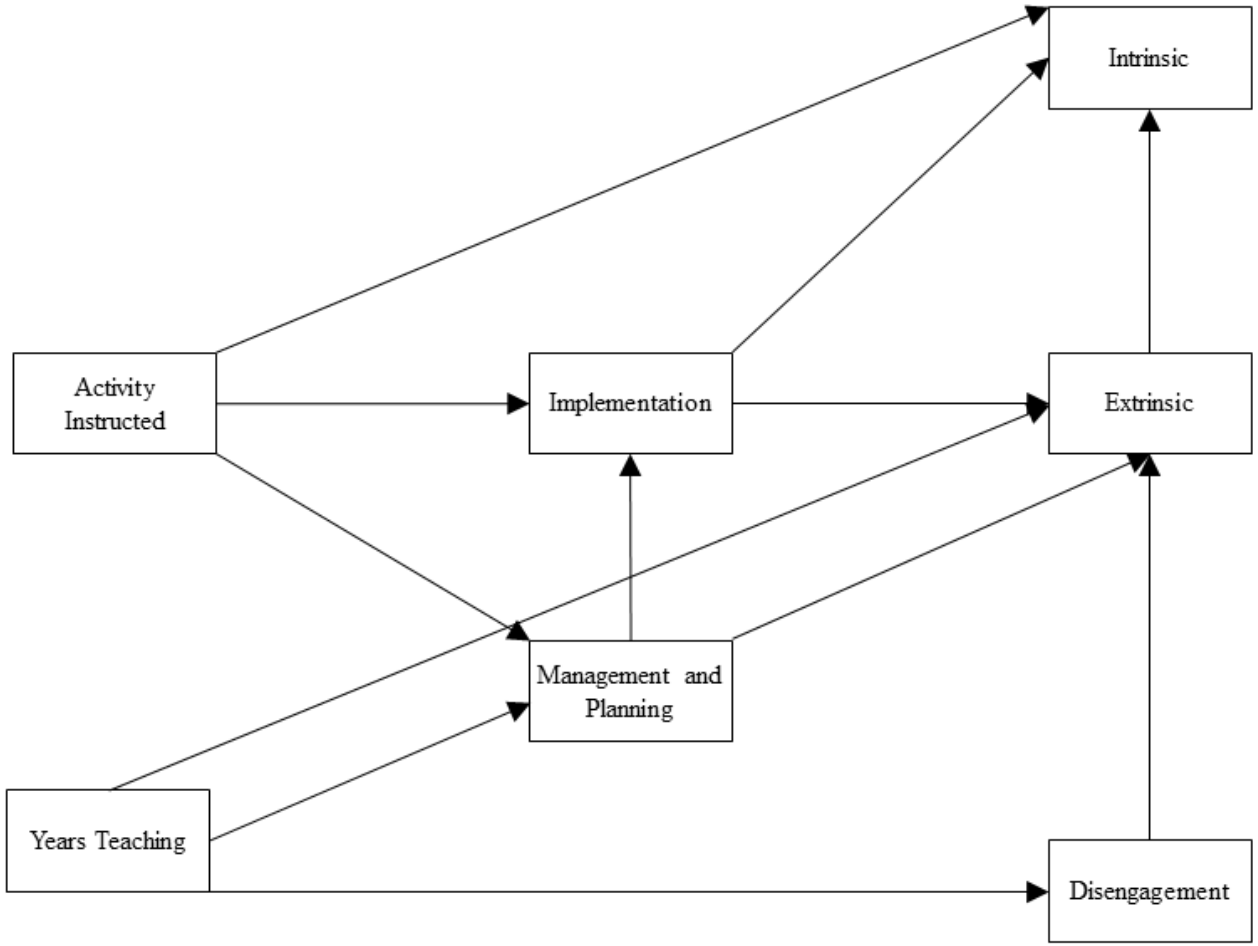

Figure 5.2.

Hypothesised Model of Confidence and Motivation to Teach Primary Physical Education: Model 2

Procedure

The data used in this study was collected as part of Study 2 using the CMTPPEQ. Participants completed a demographics information form that was specific to the type of teacher they are; 'pre-service' or 'in-service' along with the CMTPPEQ. Participants either completed an online version of the questionnaire or a paper based copy. The pre-service participant group was sourced from four Universities located in Victoria that offered Bachelor of Education courses with the in-service group being teachers currently working in schools also in Victoria.

Data Analysis

Data analysis was undertaken with the goal of developing two different path models that can be used to demonstrate confidence and motivation to teach primary school physical education. Statistical analysis to facilitate the development of this model involved the following procedure:

1. Pearson's correlations to explore the relationships between the identified constructs to be used in the path models. This analysis was based on existing means and standard deviations.
2. Path analysis is used to evaluate the relationships that exists between the latent variables

Path analysis is a method of structural equation modelling that allows for the observation of casual links making up complex systems (Karadag, 2012). Path analysis helps determine the conditions under which the variables in the causal links are the cause of the effect, and explaining this causal connection in mathematical terms is an important step in understanding relationships between variables of interest so that a model can be created (Karadag, 2012). Path analysis enables the researcher to measure the direct and indirect effects that one variable has upon another (Olobatuyi, 2006). A path analysis was

tested in a structural equation modelling programme (AMOS 20) using the maximum-likelihood method of parameter estimation. This method allows for examination of both direct and indirect pathways simultaneously providing an indication of fit using indices between the theoretical model and data (Olobatuyi, 2006).

As different fit indices evaluate model fit from different perspectives, more than one fit index is used to evaluate the model (Kline, 1998). The traditional Chi-square (χ^2), χ^2/df ratio, GFI, CFI, NFI, AGFI, TLI, RMSEA were calculated.

The Chi-square value is the most basic fit measure (Lee & Scott, 2006), where the χ^2 should be small (near zero) and the *p* value should be .05 or greater (Hooper et al., 2008). This statistics is sensitive to sample size and normality of the data. The χ^2/df ratio was also considered for assessment of model fit rather than χ^2 alone (Byrne, 2001). "There is no consensus regarding an acceptable ratio for this statistic, recommendations range from as high as 5.0 (Wheaton et al. 1997) to as low as 2.0 (Tabachnick & Fidell, 2007)" (Hooper et al., 2008, p. 54).

The GFI assesses the differences between the sample covariance matrix and the covariance matrix implied by the fitted model (Tabachnick & Fidell, 2013). The AGFI is the GFI adjusted for degrees of freedom of the model. The NFI assesses the model by comparing the χ^2 value of the model to the χ^2 of the null model (Hooper et al., 2008). CFI, a comparison of a hypothesised model with the independence model (Byrne, 2001), has been described as the index of choice in SEM (Hu & Bentler, 1999) and is believed to be one of the measures least effected by sample size (Tabachnick & Fidell, 2013). A value of >.90 for GFI, AGFI, NFI, and CFI has been suggested as an indicator of good fit (Hooper et al., 2008). Researchers consider RMSEA to be an important fit index as it takes into account the number of parameters in the hypothesis models and selects the most parsimonious model to analyse (Hooper et al., 2008). RMSEA values of less than .05 is

believed to correspond to a "good" fit, less than .08 as an "acceptable" fit, and above .10 are a "poor" fit (McDonald & Ho, 2002).

Results

Relationships between Confidence and Motivation Variables

Table 5.1 presents the results of Pearson's correlations conducted to explore the relationships between the confidence and motivation factors. The results indicate that all of the factors were significantly related, ranging from -.28 (moderate) to .85 (large). Amotivation (Disengagement) was negatively related to all other factors.

Table 5.1

Pearson's Correlations Between Confidence and Motivation Subscales

Variables	1.	2.	3.	4.	Average score per item	
					M	*SD*
1. Management and Planning	-				4.47	0.96
2. Implementation	.83**	-			4.01	1.01
3. Intrinsic	.56**	.57**	-		4.28	1.05
4. Extrinsic	51**	.49**	.85**	-	4.25	0.83
5. Amotivation	-.38**	-.28**	-.39**	-.33**	1.97	1.02

**$p<.01$

Path Analysis

Model 1(General Model). The model is shown in Figure 5.1 and the Path Analysis fit indices are listed in Table 5.2. The results indicated that the model did not represent a good fit for the data with none of the indices reaching their recommended values. In order to simplify the model, and improve model fit, a number of paths that were demonstrated to be non-significant were removed. Non-significant paths were removed on the condition that they did not threaten the theoretical integrity of the model. The following paths were

removed: activity instructed to intrinsic, activity instructed to management and planning, physical education specialist to intrinsic, physical education specialist to management and planning, and years of teaching to extrinsic. The removal of these pathways led to an improvement in model fit, with the results of the fit indices listed in the Table as Model 2.1. Although fit improved, the fit indices still failed to reach the recommended cut off values. The modification indices were then examined to see if the correlation of error terms may improve the model fit. The errors terms were allowed to correlate between the Intrinsic and Extrinsic factors. The results are presented in Table 5.2 as Model 2.2. This model produced the best fit indices for the data. This model can be seen in Figure 5.3.

Table 5.2

Goodness of Fit Indices for the Path Model

	χ^2 (df)	GFI	AGFI	Cmin/DF	TLI	RMSEA	CFI	NFI
Model 2	348.495 (11)	.852	.517	31.681	.255	.313	.707	.705
Model 2.1	356.757 (15)	.846	.630	23.784	.447	.270	.703	.698
Model 2.2	54.66 (15)	.957	.898	3.644	.936	.092	.966	.954

The results of the path analysis are shown in Table 5.2. Model 2.2 achieved an acceptable level of fit with the majority of the fit indices within the acceptable range. GFI, CFI and NFI were all above >.95 with TLI also reaching the recommended cut off of >.90 and AGFI just below. Cmin/d.f. ratio was slightly below the .3 value, and RMSEA also <.80.

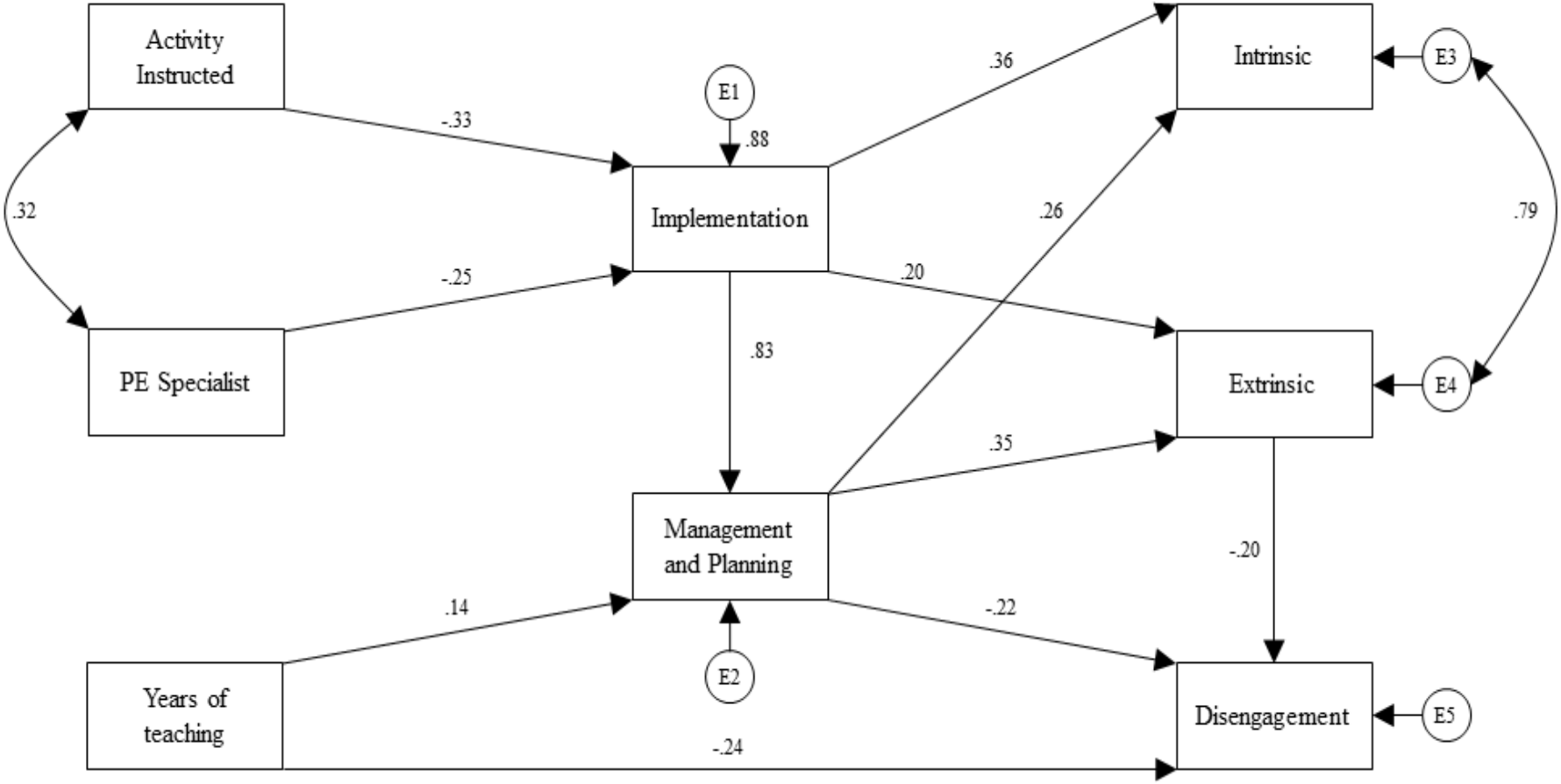

Figure 5.3

Path Analysis of Model 1 (General Model) of Confidence and Motivation to Teach Primary Physical Education using Standardised Coefficients

Model 2 (Non-specialist Model). A second confidence and motivation to teach primary physical education model was proposed, that would be specific to non-specialist (generalist) teachers. The hypothesised model is shown in Figure 5.4 and the fit indices that resulted from the Path Analysis are displayed in Table 5.3 The model displayed acceptable fit with a number of the fit indices (i.e., GFI, CFI and NFI) reaching their recommended cut offs. The results of the analysis are displayed in the table as Model 2.1. As a procedure to simplify the model and improve model fit, paths believed to be non-significant were removed. The removal of a path between activity instructed and intrinsic resulted in alteration to the model fit. These results are displayed in Table 5.3 and labelled as Model 2.2.

Table 5.3

Goodness of Fit Indices for the Path Model

	χ^2 (df)	GFI	AGFI	Cmin/DF	TLI	RMSEA	CFI	NFI
Model 2.1	45.914 (9)	.951	.848	5.102	.894	.129	.955	.945
Model 2.2	48.045 (10)	.949	.857	4.804	.902	.125	.953	.942

A path analysis was performed in accordance with the hypothesised relations; the results are shown in Table 5.3. The model produced some fit indices that reached the recommended cut off values with the GFI and CFI at .95 and the NFI and TLI >.90. AGFI did not reach the .90 threshold, RMSEA was above .10, and the Cmin/DF was also above 3.

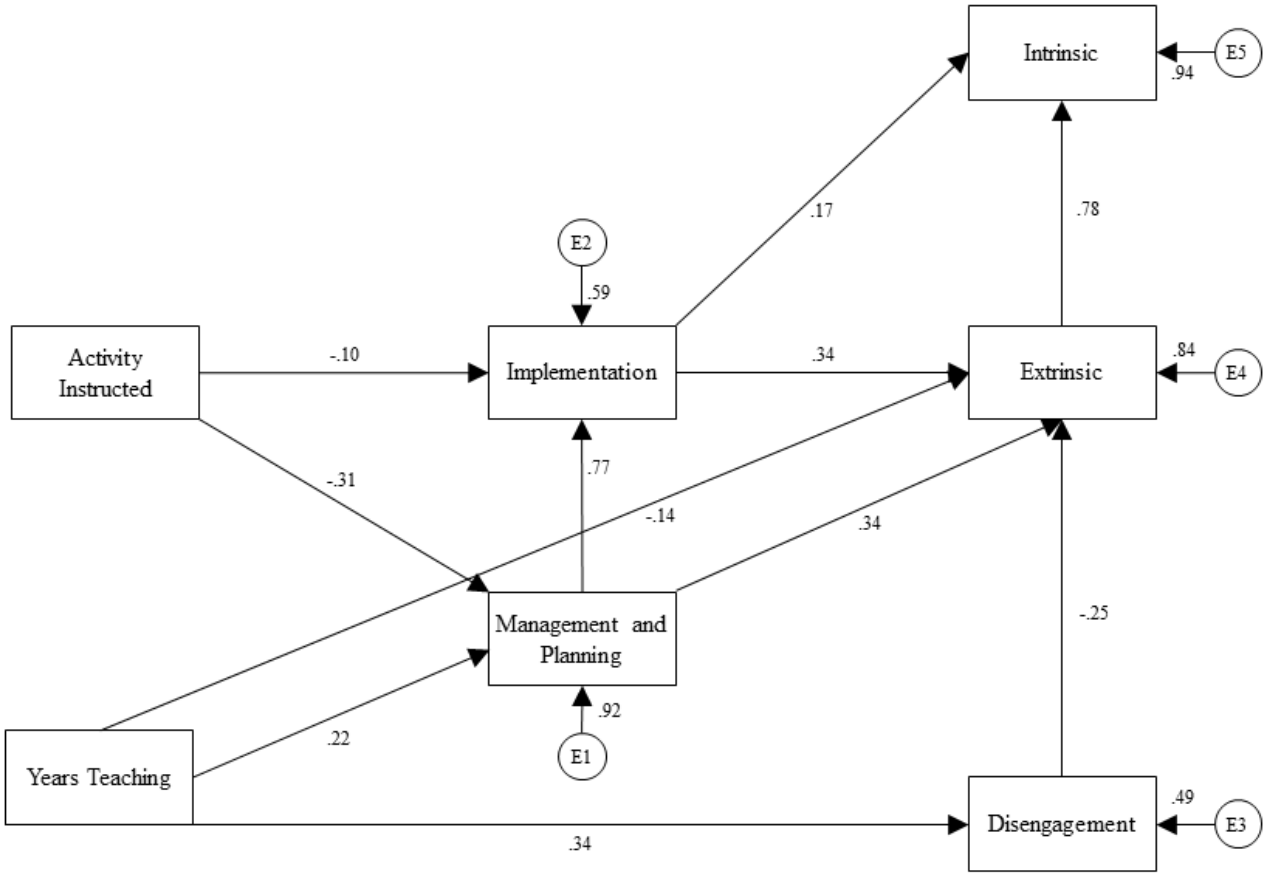

Figure 5.4.

Path analysis of Model 2 (Non-specialist Model) of Confidence and Motivation to Teach Primary Physical Education using Standardised Coefficients

Discussion

The aim of this study was to develop a model of the relationships between confidence and motivation for teaching primary school physical education. To achieve this aim, the connections between personal characteristics, previous experiences, confidence and motivation to teach primary school physical education were explored using causal modelling (path analysis). A general model was produced that explained the associations for teachers who may be responsible for teaching physical education at a primary level, including both physical education specialists and non-specialists (generalists). A second model was also developed that was specific to non-specialist teachers required to teach primary physical education. Different models might be expected due to the differences in training, experience, and motivation to teach physical education for those who are generalist teachers and those who have chosen to specialise in physical education. These models provide a basis for understanding how personal characteristics and experiences as well as confidence and motivation interact to influence motivation to teach primary physical education.

General Model of Confidence and Motivation

Model 1 was developed to explore the relationships for teaching physical education which included both specialist and non-specialist physical education teachers. The model included personal characteristics, experiences, and confidence and motivation to teach primary physical education. Based on previous research, theories of confidence and motivation, and the results of Study 2, a hypothesised model was developed that placed personal characteristics and experiences as influential factors on confidence and motivation and confidence as an influence on motivation. This model was generally supported, with experience and personal characteristics influencing confidence in

management and planning and confidence in implementation, and confidence influencing intrinsic, extrinsic, and amotivation.

To develop this model, a path analysis was performed in accordance with the hypothesised model. Years teaching, activity instructed, and type of teacher (physical education specialist or non-specialist) were set as predictors of both confidence (implementation and management and planning) and motivation (Intrinsic, Extrinsic, and amotivation). Furthermore confidence was set as a predictor of motivation and other parameters were added based on theory (self-efficacy model; Bandura, 1977, 1997), previous research, and the findings of Study 2.

The personal characteristics of activity instructed, type of teacher (specialist or non-specialist), and years of teaching all influenced confidence. Activity instructed and type of teacher were associated with confidence in implementation, whereas years of teaching influenced confidence in management and planning. Implementation relates to delivering content specific to physical education (e.g.,, outdoor experience activities, gymnastics, and athletics). It appears that confidence to implement physical education programs is influenced by being a physical education specialist, which involves receiving specific training in physical education, as well as previous experience in instructing physical activity. This experience and training could equip teachers for implementation, whereas, the implementation or delivery of physical education curriculum could be confronting for those with limited experience, training, or content knowledge. For specialist teachers, implementing new pedagogical approaches in physical education can be challenging and can force teachers to confront their personal beliefs and assumptions about physical education (Pope & O'Sullivan, 1998), this is also true for the generalist who is confronted with a new curriculum area such as teaching primary physical education. Those who have chosen to specialise in physical education have an interest and because

they have chosen the specialisation, probably have confidence that they can successfully teach physical education. Furthermore, because they have undertaken a specialisation, they will have engaged in additional training in physical education (DeCorby et al., 2005; Freak & Miller, 2015; Rink & Hall, 2008) in comparison to non-specialist/generalist teachers. It would be expected that this interest in the area, knowledge and skills acquired during pre-service teacher education, and increased opportunity to teach the curriculum area would result in higher levels of confidence towards physical education delivery. There is a significant relatedness between curriculum and instruction (O'Sullivan, 2013), so that both knowledge of the content area and pedagogy within the content area can influence decisions in primary physical education about what is taught, how it is taught, and even whether it is taught. Limited content and instructional knowledge may lead to decisions that limit the quantity and quality of physical education delivered by non-specialist teachers. A lack of confidence or motivation may develop from this limited content knowledge, so that implementation of physical education is also limited.

Lack of physical education content knowledge has been postulated to contribute to uncertainty and lack of confidence to implement physical education (DeCorby et al., 2005; Hart, 2005; Siedentop, 2007). For example, primary teachers feel less competent and confident teaching physical education when they believe that they lack the movement skills themselves and perceive that they do not have knowledge of rules, tactics and techniques of the sporting activities in the curriculum (Carney & Chedzoy, 1998; Morgan, 2008; Morgan & Burke, 2008; Xiang et al., 2002). In contrast, those who perceived they had better movement skills and who participated in the activities themselves were more effective at developing student management (Capel, 2007). Previous experience and activity instruction appears to be important to confidence to teach physical education. In addition, previous negative experience in sport and physical education is likely to diminish

confidence and motivation to teach physical education (Faucette et al., 2002; Morgan & Burke, 2005, Morgan et al., 2001)

Those with previous physical activity instruction experience have been found to have higher levels of confidence to teach particular areas of physical education and are more willing to engage in delivering physical activity related projects (Carney & Chedzoy, 1998; Park et al., 2007). Teachers who participate in more physical activity, aside from instruction, also have stronger intentions to deliver physical education (Faulkner et al., 2004) and deliver higher quality physical education lessons (McKenzie & Kahan, 2008; McKenzie et al., 1999). Engagement in physical activity and experience of instructing, in particular, appear to be important predictors of confidence to teach primary physical education. The effect the personal characteristics of activity instructed, type of teacher, and years of teaching on confidence, is consistent with expectations. It also highlights the importance of previous experience on confidence, which is consistent with self-efficacy models (Bandura, 1977, 1997). This is a valuable finding for those who deliver physical education units to pre-service generalist teachers, with the provision of more teaching opportunities being a potential approach to increasing confidence to teach physical education. A strategy to do this could be to ensure that pre-service teachers are delivering physical education sessions while on teaching rounds to ensure they have sufficient experience in this area. Recent research has highlighted that opportunities to teach physical education during practicum for pre-service generalist primary teachers may be limited, with some pre-service teachers (21%) reporting that they did not teach a physical education lesson at all during their 9 week placement in the school (Nathan, Wolfenden, & Morgan, 2013). Other pre-service teachers (35%) reported that physical education occurred only one day per week or less at the school. Another approach to develop more instructional experience could be to utilise more activities and assessments within the designated

physical education unit that involve the delivery of practical activity content outside of their practical placement; for example assisting with after school activity programs or other coaching activities.

The variables representing previous instruction of activity and type of teacher (physical education specialist or non-specialist) were also found to correlate with one another, demonstrating a relationship between the variables. It is important to note that the relationship between these variables is correlational and is not one of causation. Research has found that an interest in sports and physical activity along with a desire to be involved is one of the main reasons individuals choose to specialise in primary physical education teaching (O'Sullivan et al., 2009; Spittle & Spittle, 2014) and physical education teaching in general (Al-Rawahi & Al-Yarrabi, 2013; O'Sullivan et al., 2009). This implies that an interest in the activities perceived to be associated with physical education is connected to a choice of that specialisation.

Years of teaching influenced confidence in management and planning, with pre-service and in-service teachers with more experience reporting higher confidence. This supports earlier findings from Study 2 in this dissertation and previous research (Morgan & Bourke, 2008; O'Sullivan et al., 1989; Zach et al., 2012), where experience is an important factor in management and planning. For example, Benz, Bradley, Alderman, and Flower (1992) found experienced teachers had high efficacy beliefs on planning and evaluating lessons compared to their pre-service counterparts.

Management and planning represents the common roles or duties that a teacher would be required to perform in teaching physical education. As management and planning is common practice to teachers regardless of the content area, those with teaching experience may feel they are able to transfer this knowledge and skills to a physical education environment. The notion of a teacher being able to transfer their knowledge and

skills in management and planning across a range of content areas is supported by Russell-Bowie (2010). Petrie (2010) found that when generalist teachers were encouraged to use general pedagogical strategies rather than physical education focused teacher-directed approaches it had a positive effect on teacher perceptions of teaching physical education and their confidence and motivation. This meant that their teaching in other curriculum areas could transfer to teaching physical education. Limited physical education content knowledge hindered generalist teachers from fully incorporating their general pedagogical knowledge and skills to physical education. Petrie (2010) suggested that physical education content knowledge is important to delivering physical education, however, generalist teachers can feel confident and motivated without extensive physical education content knowledge if they can utilise their general pedagogical knowledge. Further research on the influence of general pedagogical knowledge and transferring this to teaching in primary physical education would help clarify if strategies could be adopted to support generalist teachers in transferring this knowledge to physical education. General management and planning activities might transfer to physical education teaching, whereas, implementation may rely upon more specific content knowledge. Utilising general pedagogies may enhance confidence to teaching physical education (Hickson & Fishburne, 2005; Petrie, 2010).

Activity instructed and type of teacher may have less influence on confidence in management and planning than they have on confidence in implementation because these are experiences that are more specific to the instruction of physical activities, which is a core task in teaching physical education (Buck, Lund, Harrison, & Blakemore, 2007). Consequently, they influence the specific task of implementing physical education rather than the task of managing and planning.

The only personal characteristic or experience variable that directly influenced motivation was years of teaching. More years of teaching was associated with lower levels of disengagement. Teachers with a number of years of teaching experience may have formed strong beliefs of the importance of physical education as a learning area and its significance to a child's development. Hills, Dengel, and Lubans (2015) reported that teachers with less experience had limited understanding of the importance of physical education as a learning area and its significance to a child's development. This could explain higher disengagement in those with fewer years of teaching experience. The direct relationship supports the proposition that experience in teaching is related to lower disengagement. Disengagement (amotivation) refers to a lack of intention; individuals see no good reasons for engaging in the activity anymore. These findings highlight the need to reinforce the importance of physical education to teachers especially pre-service and those in the early career phases. As motivation is about the intention to act, a lack of motivation is likely to result in a lack of action in the curriculum area, meaning that engaging early career teachers with the curriculum area is important if we want to encourage them to teach physical education in primary schools.

As only one of the personal characteristic or experience variables directly related to a motivation factor in the model (years of teaching and disengagement), it appears that these factors indirectly influence motivation through the confidence variables of management and planning and implementation. This pattern of association infers that personal characteristics such as experience and training influence an individuals' confidence to teach primary physical education, which in turn influences their motivation to teach primary physical education. This relationship between confidence and motivation to teach primary physical education demonstrates how efficacy beliefs affect the psychological process of human functioning (Feltz & Oncu, 2014). This relationship is

described by Visser-Winjveen et al. (2014) specifically in the context of teaching, with teachers' motivations being impacted upon by how important they feel the activity is and their expectations of how effectively they will perform the functions of a teacher. Petrie (2010) also reported that a one-year physical education professional development program for generalist primary school teachers improved confidence, which appeared to result in teachers feeling more motivated to deliver physical education on a more regular basis. Again, this reinforces the importance of confidence to motivation and the need to measure both constructs in exploring processes around teaching primary physical education.

The confidence variables of implementation and management and planning influence one another along with the motivation variables of intrinsic motivation, extrinsic motivation, and disengagement. Implementation strongly affects confidence in management and planning, so that higher confidence in implementing a physical education program resulted in higher confidence to plan and manage a program. Confidence in implementation was influenced by experience factors specific to physical education (being a physical education specialist and instructing physical activity). These experience factors seem to be related to confidence to deliver and implement physical education programs, which in turn can influence confidence to manage and plan. This could indicate that teachers in general focus on implementation factors in assessing their confidence to deliver physical education programs, with higher confidence in implementation resulting in higher confidence to manage and plan in physical education. The importance of implementation to a teacher's confidence is supported by research on teacher self-evaluation, which has identified the application of physical education content as an important factor for lesson success (Collier & Hebert, 2004; Kyrgiridis, Derri, Emmanouilidou, Chlapoutaki, & Kioumourtzoglou, 2014). Both knowledge of the content area and pedagogy within the content area can influence decisions in primary physical education about what is taught,

how it is taught, and even whether it is taught (O'Sullivan, 2013). Limited content and instructional knowledge may lead to decisions that limit the quantity and quality of physical education that is delivered. As implementation represents the various practical content areas that teachers are required to teach as part of physical education, it highlights the need for undergraduate units in physical education to focus on the practical aspects of delivering physical education and for the provision of continuing professional development of practical content for in-service teachers.

Confidence in implementation also affects intrinsic and extrinsic motivation, but not amotivation. Confidence to implement and deliver physical education has a positive influence on intrinsic and extrinsic motivation to teach physical education. This highlights the importance of confidence as a mediating variable in motivation to deliver programs. In general, individuals with higher motivation are driven to act when they feel they will be able to complete the task at hand successfully (Lim-Teo et al., 2008). As motivation influences the choices people make and the effort they invest (Deci & Ryan, 1985; Gredler et al., 2004; Visser-Winjveen et al., 2014), it is crucial that teachers have confidence in implementing physical education if they are to be motivated to deliver physical education. Lack of confidence and disengagement may even lead to teachers avoiding teaching physical education altogether in primary schools, which Morgan and Burke (2008) characterised as a non-teaching ideology. This could add to primary school teachers and schools not prioritising the teaching of physical education (Nathan et al., 2013)

Similar to the findings for implementation, management and planning was found to influence intrinsic and extrinsic motivation, and disengagement. The effect from management and planning to intrinsic motivation was smaller than that from implementation to intrinsic motivation, suggesting confidence in implementation is more important to intrinsic motivation. This is an expected result, as confidence in

implementation is influenced by the previous instruction of activity and type of teacher (specialist or non-specialist). An individual who enjoys instructing activity and has chosen to be a physical education teacher would be expected to engage in these activities for reasons associated with intrinsic motivation, which include participation in an activity for personal satisfaction and enjoyment (O'Sullivan et al., 2009; Spittle & Spittle, 2014; Weinberg & Gould, 2015). The effect from management and planning to extrinsic motivation was greater than that from implementation, which suggests that confidence in management and planning is associated with extrinsic motivation.

Extrinsic motivation influenced disengagement, so that extrinsic motivation to teach physical education was related to lower disengagement. Extrinsic motivation is intentional (Gagne & Deci, 2005). Tasks driven by extrinsic motivation indicate an individual places value on the activity, they are completing the activity for external rewards, to stop feelings of guilt or anxiety, or because they see it as being worthwhile (Ryan & Deci, 2000a; Petrie & Govern, 2013). Thus, extrinsic motives may be important in minimising disengagement in teaching physical education. Disengagement was most associated with fewer years teaching and lower levels of confidence in management and planning, than to activity instruction, being a physical education specialist, or confidence in implementation. Those who have chosen to be a physical education specialist or who engage in the instruction of activity place value on the importance of physical education (Green, 2008); as such these results are expected.

In the model for teachers in general, prior experience relevant to physical education (activity instructed and type of teacher) influenced confidence in implementation, which in turn influenced confidence in management and planning and intrinsic and extrinsic motivation. Years of teaching influenced confidence in management and planning, which influenced intrinsic motivation, extrinsic motivation, and disengagement. The findings

suggest that experience specific to physical education is important to confidence to implement physical education. Subsequently, confidence to implement is valuable to confidence to manage and plan and to intrinsic and extrinsic motivation to teach physical education. Experience in teaching appears to be critical to confidence to manage and plan in physical education, which is related to lower disengagement and higher intrinsic and extrinsic motivation.

Specific Model for Non-Specialist (Generalist) Teachers

A specific model was developed for non-specialist (generalist) teachers who may be required to teach primary physical education. This model was developed as it was expected that there could be specific patterns in the relationships of variables for those who have not specialised in primary physical education. These patterns may be different from the patterns observed for all teachers, including specialists. Differences in the models are likely due to the contrasting levels of training, experience, and interests of these teachers (O'Sullivan & Oslin, 2012). The findings from Studies 1 and 2 of this thesis have also found lower levels of confidence and different forms of motivation for specialists and non-specialists. Similar to the general model, the specific model included personal characteristics, experiences, and confidence and motivation to teach primary physical education. A path analysis was performed in accordance with the hypothesised model, which placed personal characteristics and experiences as predictors of confidence and motivation and then confidence as a predictor of motivation. Activity instructed and years teaching were set to predict confidence (management and planning and implementation) and motivation (Extrinsic and Disengagement). Confidence was also set as a predictor of motivation (Intrinsic and Extrinsic) with several other parameters added. Type of teacher (specialist or non-specialist) was obviously removed, as the model was specific to non-specialist teachers.

Personal characteristics of activity instructed and experience of years of teaching both influenced confidence but in contrasting ways. Activity instructed affected both confidence in implementation and confidence in management and planning, whereas, years of teaching only had an effect on confidence in management and planning in the model. Consequently, having previous activity instruction was related to confidence to manage and plan and to implement primary physical education. Previous research has found coaching experiences and the instruction of physical activity contributed to confidence in teaching particular content areas of physical education (Carney & Chedzoy, 1998; Parks et al., 2007). Years of teaching, however, was only influential in confidence to manage and plan. This is consistent with the general model, where specific activity experiences were important to confidence in implementation and to management and planning; whereas more general teaching experience, (years teaching) was related to management and planning, but not actual implementation. This again could be because management and planning is a more general and transferable activity of teaching, whereas actual implementation of physical education requires more specific knowledge and skills. In addition, beginning teachers in physical education spend a lot of time and effort in planning lessons, organising students, and managing their classes, whereas physical education teachers with more experience expand their scope of activities (O'Sullivan et al., 1989), as a consequence, confidence in management and planning may be more important for those with fewer years of teaching experience and for those who are not accustomed to teaching physical education.

Activity instructed did not directly relate to any of the motivation factors, indicating it influenced motivation through confidence. Previous activity instruction may have been more important to confidence as it may be viewed by teachers as a way of assessing their confidence to teach primary physical education. This causal chain of

activity instructed to confidence and motivation further demonstrates the relationship that exists between confidence and motivation. Performance accomplishments and vicarious experiences can both be obtained through the instruction of activity. Both are believed to be influential determinants of an individual's self-efficacy (Duda & Tressure, 2010), with efficacy then thought to affect the motivational processes concerned with human functioning (Bandura, 2004). For the non-specialist teachers, previous activity instruction was most important for assessing their confidence in physical education. This previous activity instruction then could indirectly influence their motivation to teach primary physical education through confidence.

In contrast to previous activity instruction, years teaching directly related to extrinsic motivation and disengagement. A direct relationship between years teaching and disengagement was also apparent in the general model, however, a different relationship between these variables was found in this model. For the non-specialists, the positive path coefficient indicated that with more years of teaching, amotivation towards teaching primary physical education increased. That is, the longer a generalist had been teaching, the higher their levels of disengagement with primary physical education. In the general model, which included physical education specialists, more years of teaching experience was associated with lower levels of disengagement. Non-existent professional development and in-service training in physical education (O'Sullivan, 2006) may be a significant problem for non-specialists who have not engaged with the curriculum area. Those who have more years of teaching may have had limited recent exposure to in-service training or professional development over several years (O'Sullivan, 2006), and this may explain higher levels of disengagement. For beginning teachers, they may have had more recent exposure to training in physical education (albeit limited), which may have moderated their disengagement with physical education.

Disengagement with physical education of generalist teachers could also be a result of accumulated negative feelings and emotions they have towards the curriculum area. Interests in curriculum and content often vary for students and as such there may be times when they lack motivation or do not see any good reason for participation. Negative feelings or emotions toward the subject or activity, while being made to participate, can result in diminished effort or persistence during the lesson or complete non-attendance (Van den Berghe, Tallir, Cardon, Aelterman, & Haerens, 2015). This may manifest in generalist teachers exhibiting disengagement with the curriculum area if they have experienced adverse situations while teaching physical education and felt external pressure to continue to teach the curriculum area over a number of years.

Years teaching directly related to extrinsic motivation, but with a negative path coefficient, indicating that more years of teaching for the non-specialist were related to lower extrinsic motivation towards teaching physical education. This direct relationship was not apparent in the general model, so indicates a more direct influence of years of teaching on extrinsic motivation to teach primary physical education for the non-specialist. There are general developmental and age related changes in motivation that occur that could explain differences in motivation based on years of teaching (Pintrich, 2003). The general developmental changes that occur over the course of a teacher's career, however, are not well understood (Kaplan, 2014). Initial research highlights that there are some adjustments that occur in motivational profiles (Richardson & Watt, 2014). For example, pre-service teachers who were initially more positive and idealistic displayed a decrease in self-efficacy, motivation, and career satisfaction as their teaching career progressed. This implies that adjustments in motivation may be needed for adaptive coping (Richardson & Watt, 2014), and may explain differences in motivation for years of teaching.

Teachers who had more years of teaching experience may display higher confidence in teaching in general. This confidence may cause them to feel that they can make choices such as not teaching physical education. These feelings could be a result of more experienced teachers perceiving there are no consequences if they do not teach physical education. A concern of low confidence is a trend for some generalist teachers avoiding physical education and not teaching it in primary schools (Morgan & Burke, 2008), which could occur if they experienced lower extrinsic motives regulating their behaviour in relation to teaching physical education. In-service teachers with fewer years teaching experience and pre-service teachers may feel more pressure to comply with curriculum requirements and potential expectations of the school to teach physical education, which may result in them being more extrinsically motivated and displaying autonomous motivation (Roth, 2014).

As for the general model, the confidence variables of implementation and management and planning related to one another and to the motivation variables of intrinsic motivation, extrinsic motivation, and disengagement. The nature of the relationships, however, was quite different. This indicates that confidence factors may operate differently in relation to one another and towards motivation for the non-specialist teachers in comparison to the broader group of teachers, which included specialists. For the general model, confidence in implementation strongly influenced confidence in management and planning, so that higher confidence in implementing physical education related to higher confidence to plan and manage the program. This could be due to teachers in general focusing on implementation factors in assessing their confidence to deliver physical education programs. For the non-specialist teachers, however, the model indicated the opposite effect, that confidence in management and planning influenced confidence in implementation. This finding implies that the focus for confidence beliefs for non-

specialists was centred more on management and planning, which in turn influenced confidence to implement. A review study by Kyrgiridis, Derri, and Kioumourtzoglou (2006) identified effective teaching to be a result of things such as teacher preparation, lesson planning, content application, classroom organisation and management, teaching strategies, positive learning environment, class control and discipline, teacher flexibility, communication skills, teacher feedback, and assessment with many of these being represented by the management and planning variable. Using general pedagogical knowledge around management and planning could be a useful approach for teacher educators to develop the confidence of generalist teachers to teach physical education who may not have extensive physical education content knowledge (Petrie, 2010).

The confidence factors did influence motivation, but differently from the general model presented earlier. Again, this highlights the importance of confidence as a mediating variable in motivation to deliver programs, but also illustrates that the relationships between confidence and motivation are different for non-specialist teachers. Confidence in implementation influenced both intrinsic and extrinsic motivation and did not influence disengagement, which was the same as for the general model. Management and planning, however, only related to extrinsic motivation, whereas for the general model it related to intrinsic motivation, extrinsic motivation, and disengagement. Hence, for the non-specialists, management and planning was an influential factor on their extrinsic motivation. This could be because management and planning represents the common roles or duties that a teacher would be required to perform such as planning units of work, performing assessment, and establishing learning goals (Buck et al., 2007). These management and planning activities could be perceived by the non-specialists as extrinsically driven as they are the required elements of preparing to teach physical education. As a consequence, these activities are perceived to be more externally regulated.

In teacher motivation, not specific to physical education, it has been suggested that external regulation can facilitate behaviour as long as the individual feels competent (Roth, 2014). Consequently, it appears that confidence may be important to extrinsic motivation and regulation of behaviour to teach physical education in primary schools, especially for the generalist teacher. Implementation, which related to both intrinsic and extrinsic motivation, may be more connected to intrinsic motivation than management and planning as it involves engagement with the actual activity of delivering physical education.

There were no significant relationships between the confidence factors and disengagement. In the general model, higher confidence in management and planning was related to lower disengagement. That is, feeling more confident to plan and manage physical education programs related to being less disengaged with physical education. This is logical, as this planning and management would likely lead to greater perceptions of control over behaviour, which should lead to more self-determined beliefs about behaviour. For the non-specialists, however, confidence did not appear to predict disengagement in teaching primary physical education. This implies that confidence was not the most important factor in disengagement. Perhaps other variables such as interest or "liking" physical education and associated areas were critical in mediating disengagement for non-specialists. Future research should continue to explore other potential mediators of the disengagement of non-specialists in primary physical education. Disengagement (amotivation) is the lack of intention to engage in the activity, which would severely limit the teaching of primary physical education by a non-specialist. Finding the causes of disengagement is essential in encouraging generalist primary teachers to engage with physical education and to improve the quality and effectiveness of the physical education provided by generalist teachers (Bailey, 2006; Bailey et al., 2009; Graber et al., 2008; Hardman, 2008; Hunter, 2006; O'Sullivan, & Oslin, 2012; Rink & Hall, 2008).

Interestingly, the motivation factors related to one another, which was not the case for the general model. In the general model, extrinsic motivation influenced disengagement, but intrinsic and extrinsic motivation were not related. In the non-specialist model, there was a different relationship between disengagement and extrinsic motivation, whereby a lower level of disengagement was associated with a higher level of extrinsic motivation. In addition, extrinsic motivation was strongly related to intrinsic motivation, so that higher levels of extrinsic motivation were related to higher levels of intrinsic motivation. For the non-specialists, therefore, extrinsic motivation was an important motivational factor as it mediated the relationship between personal and experience variables and confidence to intrinsic motivation. This infers that extrinsic sources of motivation may be especially important to the motivation of non-specialists and that externally regulated behaviours may be important to motivating non-specialists in teaching physical education. It is also possible that confidence was important in encouraging this extrinsic motivation. For this model, extrinsic motives appear to assume more importance and fulfil a central role. There are a number of externally driven beliefs about the reasons for delivering physical education and school sport perceived by generalists, such as to maintain discipline, social cohesion, and opportunities for social development (Bowles & O'Sullivan, 2012). This could drive extrinsic motivation to deliver primary physical education for the generalist teachers. Future research should be undertaken that investigates the role of extrinsic motives in engaging non-specialist teachers in primary physical education because of the high level of importance these motivators contribute to the model.

In summary, the model highlighted that for non-specialist teachers, activity instructed influenced confidence in implementation and management and planning. Years teaching influenced confidence in management and planning, but also directly influenced

extrinsic motivation and engagement. The model, therefore, illustrates that experience in activity instruction is important to confidence in teaching primary physical education, whereas years of teaching was more related to the motivational factors of extrinsic motivation and disengagement. Confidence in management and planning influenced confidence in implementation, so being confident to plan and manage was important to confidence in delivering primary physical education. Confidence in management and planning was also related more to extrinsic motivation, whereas implementation was related to both intrinsic and extrinsic motivation. In the general model, confidence in implementation appeared to be particularly important because of its influence on confidence in management and planning and intrinsic and extrinsic motivation. The non-specialist model, in contrast, displays that confidence in management and planning and extrinsic motivation were particularly important to the non-specialists teachers through their mediating effects on confidence in implementation and intrinsic motivation. A focus on management and planning activities and extrinsic motives for physical education delivery may be important mediators to improving the confidence of generalist primary teachers to implement and become more intrinsically motivated to deliver primary physical education.

Limitations

A number of limitations in Study 3 should be acknowledged. In relation to structural equation modelling, models can be developed that have a good fit to the data but it is not assured that the model is the only or even the best representation of the relationships between the variables (Ham, 2005). Considering this, each of the models characterises a version of the relationships that exists between the variables denoting the selected personal characteristics and pervious experiences measured in this study with the confidence and motivation variables. Alternative configurations for each of the models

may be possible and there may be other variables that are not part of the models that influence both confidence and motivation to teach primary physical education that were not explored in this study.

Another limitation could be the uneven sample of specialist and non-specialist teachers. The uneven sample may have distorted the results of the general model as non-specialist teachers had a greater representation and, as such, interpreting the results should be treated with some caution. Future research in model development could try and overcome this problem by endeavouring to recruit a sample of participants with an even representation of both specialist and non-specialist teachers, or by developing models that are specific only to each population group.

The consolidation of the motivation factors into intrinsic, extrinsic, and amotivation rather than using the six-factor structure identified in Study 2 could be also be a limitation. The psychometric properties of the three factor structure for the motivation section had not been examined. The reduced factor structure used to represent motivation inhibited the identification of relationships between confidence and more specific types of motivation being identified. The decision to consolidate the motivation factors from the six identified in Study 2 into three: intrinsic, extrinsic and disengagement (amotivation) was to create a simpler model. The goal to create a 'simple' model was considered to contribute toward facilitating improved application of the model concepts in supporting the practices of teachers within primary physical education. The personal characteristics and experiences investigated were also linked to activity instructed, type of teacher (specialist or non-specialist). Other personal characteristics and experiences variables that could be important to confidence and motivation may have been excluded from the model.

Future Research

The models developed in this study can support opportunities for further research to explore the relationship between confidence and motivation in teaching primary physical education. Further research could help clarify some of the relationships identified, and support the establishment of a clearer model of how confidence and motivation operate in primary physical education teaching. For example, investigations could be undertaken to explore the relationship of other personal characteristics and experiences on confidence and motivation. The current study was limited to personal characteristics of activity instructed, type of teacher (specialist or non-specialist) and years of teaching but there are other variables that could potentially influence both confidence and motivation. In Study 2, for example, confidence and motivation were different for gender, age, and year of degree. Further investigation into previous experiences, such as more detailed investigation of specific instruction in physical activity could be undertaken, as previous experience is seen as important in fostering self-efficacy beliefs (Bandura, 1977; Carney & Chedzoy, 1998; Hoy, 2000; Parks et al., 2007). Instruction in activity was found to influence implementation in the general model and both implementation and management and planning in the specific model for generalist teachers. It, therefore, does appear to be central to confidence. Perhaps the nature of these experiences is also critical in influencing confidence beliefs.

Differences in the relationships of years of teaching with disengagement in the general and specific model warrant further investigation. For the general model, having taught for more years was related to lower disengagement, however, for the non-specialists, worryingly, there seemed to be more disengagement the longer a teacher had taught. The causes of this disengagement of non-specialists with teaching experience is important to determine as it implies a lack of intention to engage with physical education

the longer someone has been teaching. Finding ways of targeting teachers who have become disengaged with physical education over time are important for teacher educators.

A more complex model could be examined in future research. The model could include additional personal characteristics and experiences and utilise the six-factor structure of motivation to create a framework that provides supplementary detail and explanation of how confidence and motivation operate in teaching primary physical education. The model could also incorporate teaching behaviours, to determine the influence of this confidence and motivation upon action. For example, do confidence and motivation predict activities associated with teaching such as planning lessons, instructional models adopted, the number of physical education classes taught a week, and the type of activities taught within lessons.

Conclusion

This study focused on investigating the relationship between confidence and motivation with regard to teaching primary physical education. Variables identified in the literature and personal characteristics and previous experiences explored in Study 2 were hypothesised to influence confidence and motivation to teach primary physical education. Two different models were created that could be used for different population groups; a general model which could be used by the wider teaching population responsible for delivery physical education in a primary school and one for non-specialist (generalist) teachers who are often required to deliver physical education in a primary school. The relationships identified between the variables provides important information about factors that influence an individual's confidence and motivation to teach primary physical education and demonstrate how efficacy beliefs influence the psychological process of human functioning.

CHAPTER 6: GENERAL DISCUSSION

This discussion integrates the findings of the three studies that were undertaken as the research framework for this thesis, with an emphasis on the psychometric evaluation of the CMTPPEQ and the examination of confidence and motivation to teach primary physical education. The initial study constituted the development of a questionnaire designed to measure an individual's confidence and motivation to teach primary physical education with subsequent quantitative studies generating evidence towards the measure's validity and reliability. Investigations involved both in-service and pre-service teachers who were either non-specialist or specialist physical education teachers with varied backgrounds in teaching and previous experiences (years teaching and activity instructed). Subsequently, the confidence and motivation of these participants to teach primary physical education was examined, coupled with the development of a model of the relationships between a set of variables proposed to link with confidence and motivation to teach primary physical education. This discussion centres on the possible contributions of the CMTPPEQ as an instrument to be utilised in future research examining confidence and motivation to teach primary physical education. This chapter summarises the important outcomes of each study that best reflect the value of the CMTPPEQ in furthering the knowledge base underlying confidence and motivation to teach primary physical education. Specific content includes sections discussing the development of the questionnaire, the relationship of the findings to theory, and future research directions incorporating the CMTPPEQ.

Development of the Measure

The original CMTPPEQ contained 52 items and was separated into two sections; confidence (24 items) and motivation (28 items). Each section of the questionnaire was constructed independently. The confidence section required the development of an item

pool specific to teaching primary physical education. These confidence items were generated through the examination of teaching standards and curriculum documents. A total of 43 confidence items were created, with this number being reduced to 24 following a review of content similarity. The motivation section of the questionnaire was developed based on existing motivation measures that utilise the self-determination theory as a framework (AMS; Vallerand et al., 1992; SMS; Pelletier, et al. 1995)**,** but was designed specifically for teaching primary physical education. Each of the seven motivation subscales were represented by four questions. To make the items specific to primary physical education, some items simply required the substitution of a word, whereas other items required re-writing. The complete measure, comprising both confidence and motivation, was then reviewed for comprehensibility by five undergraduate students. Following minor revisions, five expert practitioners and researchers in physical education assessed face and content validity. Suggestions and modifications made by the experts were then incorporated into the final draft of the questionnaire for psychometric evaluation.

The questionnaire was then administered to a sample of 161 pre-service teachers who were completing an education degree. The confidence section of the questionnaire was a newly developed measure and the motivation section had undergone significant changes from the measure it was based on. Consequently, EFA and reliability analysis techniques were used to determine the factor structure of the confidence and motivation sections and to examine the measure's psychometric properties. The confidence section of the questionnaire comprised a two-factor structure, with the factors consequently labelled Management and Planning, and Implementation. This section of the measure displayed adequate internal consistency, with both factors having values greater than .70 (Nunnally, 1978), and acceptable test-retest scores. Five factors were found in the motivation section

of the questionnaire: Amotivation; Expectations, Requirement and Guilt; Learning and Development; Fun, Improving and Relationships; and Personal Satisfaction (listed in order of increasing self-determination). All five factors of the motivation section had adequate internal consistency, however, only three out of the five displayed adequate temporal stability. The validity of the CMTPPEQ was further supported by successfully differentiating between participants who reported specialising in the area of physical education and those who had no specialisation in the area.

CFA was then utilised to evaluate data collected from a larger sample of 318 pre-service and in-service teachers to verify the factor structure for each section of the CMTPPEQ formulated in the initial study. Preliminary analysis of the confidence section tested the model proposed by the EFA, which suggested unacceptable levels of fit. The addition of a correlation between the error terms of two items improved the overall fit of the model. The model fit indices suggested that the χ^2/d.f ratios, TLI and CFI met their recommended cut offs, and the NFI approached the criterion level, with the RMSEA also within an acceptable range. The confidence factors, Management and Planning, and Implementation, exhibited adequate internal consistency and retained the labels they were given in Study 1.

For the motivation section of the questionnaire, the preliminary model produced by the EFA was tested by CFA. The confidence section of the model did not initially represent a good fit, however, unlike the minor modifications required in the confidence section, the motivation section required more substantial adjustments to the model. These modifications to the motivation model included: the removal of a number of items, splitting a factor into two, the addition of some items to factors, removal of some items from factors, and the correlation of error terms. The model fit indices indicted an acceptable fit based on the χ^2/d.f. ratio <3 and CFI>.90, however, other fit indices used to

evaluate the model approached criterion levels but did not quite reach the recommended cut off values. The CFA produced six factors, all the factors appeared to have adequate internal consistency and were representative of different types of motivation comprising the self-determination continuum. These six factors were relabelled to accurately reflect the differing states of motivation considered to be representative of teaching physical education: Amotivation (Disengagement), Extrinsic – Professional Expectations, Extrinsic – Introjected Performance, Extrinsic – Student Outcomes, Intrinsic - Affective (Knowledge), and Intrinsic – Affective (Practice) (listed in order of increasing self-determination).

The results of the psychometric analysis of the CMTPPEQ provide preliminary support for its use as an instrument in measuring confidence and motivation to teach primary physical education. The construction of the confidence section of the questionnaire, including the factor analyses, has assisted in demonstrating the content validity and construct validity of the measure, in addition to establishing internal consistency. The results of the CFA of the motivation section, however, indicated that the motivation section required further psychometric testing and evaluation to confirm its ability to accurately measure the different types of motivation specific to teaching primary physical education. The removal of items, addition of a factor, and moving of items onto different factors saw the overall fit of the model improve, with a tentative level of acceptable fit almost being attained across all indices. Continued examination of the motivation section of the questionnaire will be necessary and additional modifications may be required. This ongoing modification of subjective affective measures is a normal component of instrument development, incorporating a continuous process of evaluation of the psychometric properties of measures (Humphries et al., 2012).

Despite a clear level of model fit not being established across all of the fit indices for both sections of the questionnaire, support for the measure is still strong. Internal consistency of all factors in the questionnaire was acceptable and the measure has demonstrated its ability to distinguish between groups throughout all phases of data analysis within the thesis, with those trained in physical education displaying higher levels of confidence and motivation towards teaching the curriculum area. These findings provide support for the CMTPPEQ as a measure of confidence and motivation to teach primary physical education.

Development of the Path Model

Following the creation of the CMTPPEQ, the connection between confidence and motivation to teach primary physical education was explored using a path analysis. Additional evaluation of the data collected in Study 2 within the framework of a path model was used demonstrate the strength of causal links in the relationship between confidence and motivation and how specific variables interact to affect confidence and motivation to teach primary physical education. Two models were developed; the first to consider the relationship for all teachers as it differentiates between non-specialist and specialist physical education teachers (known as Model 1) and the second to specifically consider the experience of non-specialist physical education (generalist) teachers (known as Model 2).

Model 1: General Model. The initial model tested had poor levels of fit and, as such, modifications were made. The removal of a number paths and the correlation of error terms saw the model fit improve with the majority of the modification indices reaching their recommended cut off values. Variables influencing confidence were the previous instruction of activity, type of teacher (non-specialist or specialist) and number of years teaching. Years of teaching was also found to have a direct effect on motivation, with

confidence also influencing motivation. Moderate relationships between confidence and motivation were also found.

Model 2: Non-Specialist Model. The fit of this initial model was considerably better than that of Model 1. Not all of the fit indices, however, reached their recommended cut off values. Similar to Model 1, removal of paths believed to be negligible in effect subsequently improved the model fit. Type of teacher as a variable was removed from this model. Previous instruction of activity and years of teaching were found to influence confidence with years of teaching also found to have a direct effect on motivation with confidence also affecting motivation.

Despite both models not achieving acceptable fit for all fit indices, both models appear to adequately highlight the casual relationships that exist between the personal characteristics and experience variables, and confidence and motivation in teaching primary physical education. The models also demonstrate the influence of confidence on motivation, which will be discussed in more detail later in this chapter.

Contextualising Personal Characteristics and Experiences within Confidence and Motivation Theory

Results from this thesis have demonstrated the influence that the characteristics (specialist or non-specialist) of an individual along with their previous experiences (years teaching and activity instructed) can have on confidence and motivation to teach primary physical education. Study 2 examined differences in these demographic variables (years of teaching, specialist or non-specialist and activity instructed), while Study 3 examined how these variables influenced confidence and motivation. Both these studies provide an understanding of the influence on confidence and motivation, and how confidence can influence an individual's motivation.

In Study 2, differences in confidence were found for pre-service and in-service teachers, years of teaching, and the previous instruction of activity. The results from Study 2 were in line with perspectives proposed within Bandura's social cognitive theory. These findings highlight the importance of performance accomplishments on confidence to teach primary physical education, which is consistent with the conceptual model of self-efficacy, where performance accomplishments are believed to be the most influential determinants of self-efficacy (Duda & Treasure, 2010) and are based on mastery experience (Weinberg & Gould, 2015; Feltz & Oncu, 2014). This supports the critical nature of performance accomplishments in physical education, such as in the form of training, specialisation, years of teaching, and previous instruction of physical activity, on an individual's confidence to teach primary physical education.

Differences in confidence between specialist and non-specialist teachers found in Study 2 could be attributed to by the varying levels of training the groups receive (O'Sullivan & Oslin, 2012), with the possibility that performance accomplishments could also have an impact. Those who are trained to teach physical education are more likely to have developed a deeper knowledge base in the curriculum domain and have experienced additional opportunities to teach in the area, and, therefore, more chances to accumulate performance accomplishments supporting their confidence. Most primary generalist teachers have extremely limited training or exposure to teaching physical education within initial teacher education (O'Sullivan, & Oslin, 2012) and limited continuing professional development (Hardman & Marshall, 2006). As a result of limited training and ongoing professional development, generalist teachers may have difficulties in providing the depth and breadth of the primary physical education curriculum (O'Sullivan, & Oslin, 2012). Lack of physical education content knowledge has been postulated to contribute to

uncertainty and a lack of confidence to teach physical education (DeCorby et al., 2005; Hart, 2005; Siedentop, 2007).

The difference in confidence and motivation for the personal characteristics and experience variables (type of teacher [specialist or non-specialist], years teaching and previous instruction of physical activity) in Study 2 were consistent with the expectations of social cognitive theory (Bandura, 1977; 1997) and, as a consequence, also supported their use in the model of confidence and motivation developed in Study 3. Being a specialist, previously instructing activity, and the more years teaching experience an individual has is likely to contribute to a change to an individual's confidence. The models developed in Study 3 further substantiated the influence of these variables on confidence (and subsequent motivation), lending further support to the application of social cognitive theory in relation to teaching primary physical education. Previous experience in the instruction of movement based activities along with general prior teaching experiences appear to be fundamental in facilitating increased confidence (self-efficacy) in teaching primary physical education (Capel, 2007). The importance of teaching opportunities on an individual's confidence is highlighted within key aspects of the current findings.

Self-efficacy represents a critical in teaching, as perceived self-efficacy has been shown to influence goals, challenges, persistence, and behaviours (Feltz & Oncu, 2104). High levels of self-efficacy are considered to assist teachers in remaining on task when faced with unexpected situations, failures, or setbacks (Bandura, 2004). The development of confidence (self-efficacy) is important for generalist teachers because of their lower confidence in teaching primary physical education. Generalist teachers are predominantly responsible for delivering physical education in primary schools (Morgan & Hansen, 2007, 2008; Petrie, 2010). This low confidence however, may serve as a barrier to the delivery of physical education in primary schools (Faucette et al., 2002; Morgan & Burke, 2005;

2008), so much so that there may be a trend for some generalist teachers avoiding teaching physical education in primary schools. Low levels of confidence can also influence the quality and quantity of physical education that is provided by generalist teachers (Bailey, 2006; Bailey et al., 2009; Graber et al., 2008; Hardman, 2008; Hunter, 2006; Rink & Hall, 2008). For generalist teachers, this signifies that strategies to improve self-efficacy are important, as those with higher levels of self-efficacy towards their ability to teach physical education will be more likely to actually attempt to deliver physical education sessions. Based on the results of this thesis, which are in line with social cognitive theory, these strategies should include the opportunities for teachers to gain practical experience in the instruction of physical education.

Previous experiences in instruction are vital to enhance confidence to deliver primary physical education through performance accomplishments. These experiences can also be supported by vicarious experiences, based on social cognitive theory. Increasing the opportunities for teachers to engage in instructional experiences where they are supported by fellow teachers with expertise in physical education, as well as observational experiences, will provide teachers with a range of knowledge and skills that will assist them in dealing with any adverse situations (Morgan & Bourke, 2008; Nathan et al., 2013). The knowledge and skills gained from these supported (performance accomplishments) and observational (vicarious experiences) experiences will contribute to increasing levels of self-efficacy in teachers.

According to social cognitive theory, an individual's self-efficacy is believed to be affected by four psychological processes of human functioning; cognitive processes, motivational processes, affective processes, and selection processes. Individuals often anticipate the likely outcomes of actions based on their own beliefs, and as a result, this acts as motivation to succeed at a particular task (Bandura, 1997). These beliefs will be

influenced by an individual's self-efficacy, demonstrating the vital contribution self-efficacy or confidence makes to motivation. The relationship between confidence and motivation was substantiated in the current research with confidence found to have an effect on motivation. That is, changes to a person's confidence to teach primary physical education can affect their motivation to teach primary physical education.

Motivation underpins what curriculum and practice a teacher chooses to implement, how much effort they choose to put into a task, and how long they will persist in the face of difficulty (Carson & Chase, 2009). As such, an individual's motivation is likely to affect their decision to teach physical education. Findings from Study 1 and Study 2 support the existence of different states of motivation in the context of teaching primary physical education. The types of motivation identified appear to be representative of SDT. The recognition of varying types of motivation support the idea that there are various reasons that individuals choose to teach primary physical education (e.g., because they see the value of students learning skills, to prove to themselves they can do it, or because they feel pressure from both internal and external sources). The relationships found between confidence and motivation highlight that choices to teach primary physical education can be affected by personal characteristics, previous experience, and confidence.

Future Research Involving the CMTPPEQ

The first two studies of this thesis encompassed the development of a questionnaire to measure confidence and motivation to teach primary physical education. Only a limited number of psychometrically evaluated instruments specific to physical education have been available to assess confidence and motivation. The CMTPPEQ represents an instrument that has both conceptual integrity and psychometric merit and, therefore, should prove valuable in the assessment of confidence and motivation.

A major aspect in maintaining and improving the quality of any psychological measure is the developer's commitment to the process of refinement and re-evaluation. As discussed earlier, adequate model fit was not found for all of the fit indices in each section of the questionnaire and as such modifications and improvements to the questionnaire are recommended, in particular, to the motivation section. As the CMTPPEQ is in the early stages of development, continued investigation of the factor structure, reliability, and validity of the measure will be beneficial.

Revision and Psychometric Evaluation of the Confidence Section. Although the confidence section of the questionnaire did not achieve acceptable fit across all of the fit indices, based on logic, substantive changes do not appear to be warranted. From a statistical perspective the individual factor loadings of all items in the confidence section ranged from .56 to .85, therefore achieving the criteria proposed by Hair, Black, Babin, Anderson, and Tatham (2006) of item loadings being greater than .40. Furthermore, the internal consistency of each of these factors was also demonstrated. The fit indices that did not meet their recommended cut off values were GFI, AGFI, and NFI. All of these indices are reported as being sensitive to sample size and their use as independent indices to evaluate a model is cautioned (Hooper et al., 2008). Some authors have even suggested that GFI should not be used in the evaluation of a model because of this sensitivity to sample size and a range of problems associated with this (e.g., Sharma, Mukherjee, Kumar, & Dillon, 2005). Overall, the achievement of recommended cut off values for all other indices supports the conclusion of acceptable structural fit for the current model.

The two factors that resulted from the CFA of the confidence model were postulated to represent tasks pertaining to management and planning, and implementation and were labelled accordingly. The loading of specific items onto these two factors was logical and representative of tasks a teacher would be required to complete. Items in

management and planning relate to tasks involved in common teaching practice (e.g., planning lesson and units, understanding assessment, and establish learning goals) but are applied to the area of physical education. Items concerning implementation relate to the delivery of practical content areas of physical education (e.g., fitness skills, fundamental motor skills, and athletics). These two factors allow the confidence section of the questionnaire to assess an individual's feelings of capability towards management and planning tasks in the area of physical education and their feelings of confidence to implement and/teach practical skills and activities in physical education. A further strength of the confidence section is that it comprises 24 items, a sufficient number to promote factorial uniqueness and support simple administration and completion.

The items comprising each of the confidence factors support the assessment of confidence specific to teaching primary physical education. Items assessing self-efficacy beliefs need to be specific enough to the target task or behaviour to give meaning to a context, but not so specific that the results are not generalisable (Bandura, 1977). For example, the items in management and planning factor relate to planning lessons and units of work in physical education, thus they are specific to physical education, but are not directly targeting identifiable content areas within physical education. This should enable a particular focus on physical education, but not be so specific that results are not able to be applied to the general curriculum area of physical education. Similarly, the confidence in implementation factor refers to teaching certain content areas, such as gymnastics or athletics, but not explicit skills within the content area, such as throwing a javelin.

Both confidence factors are important as they provide a holistic perspective of teaching physical education representative of planning, managing, and implementing the content. Previous approaches to measure confidence or self-efficacy to teach physical education have tended to either focus on the 'management and planning' tasks associated

with being a teacher (e.g., PETES; Humphries et al., 2012), without a focus on specific content knowledge across all areas, or they have focused on the delivery of the practical areas of physical education (e.g., gymnastics, athletics, and fitness) (Morgan & Bourke, 2005) without assessing confidence to complete any management or planning activities.

The confidence section of the questionnaire and the two factors contained within it constitute a progression in the assessment of confidence to teach physical education. The confidence section of the CMTPPEQ can be used to assess an individual's feelings of capability towards the tasks involved in planning physical education and managing physical education environments, and teaching a range of practical skills and activities. Data derived from items representing management and planning are able to provide important information on an individual's views towards completing these tasks and their beliefs concerning implementation and delivery. Overall, the confidence section of the questionnaire is able to assess an individual's judgements of confidence towards teaching physical education from a holistic view that encapsulates two major components of teaching physical education.

Revision and Psychometric Evaluation of the Motivation Section. Similar to the confidence section, all of the fit indices for the motivation section of the CMTPPEQ did not reach recommended cut off values. The individual factor loadings of the items ranged from .60 to .88, meeting criteria described above (Hair et al., 2006), and indicating removal of items is not required. Like the confidence section GFI, AGFI, and NFI indices did not reach recommended cut off values. As discussed previously, these indices are not recommended for use based on their sensitivity to sample size. The TLI also did not reach its recommended cut off value for the motivation section. Sharma et al. (2005) describe TLI as one of the best performing indices as long as the size of the factor loadings is >.5 and the sample size is at least 200. They further proposed that sample size and the number

of indicators can have a significant impact on indices, suggesting that in some cases more liberal cut offs are required. For example, they reported that "86.2% of true models were accepted when TLI was used for assessing model fit with a cutoff value of 0.90, a sample size of 200, and eight indicators. To achieve the same 86.2% acceptance rate for a sample size of 200 and 32 indicators would require a cutoff value of 0.82" (Sharma et al., 2005, p. 942). Based on the above example, the TLI of .89 achieved in the motivation section of the questionnaire, which had 25 items and 318 participants, may actually be an acceptable cut off value for this index. All of the motivation factors demonstrated acceptable internal consistency.

The final model for the motivation section of the questionnaire contained six factors, which appear to represent different motivation states along the self-determination continuum. The loading of the items onto these six factors and justification for the labels given to each factor and the type of motivation they are believed to represent has been explained in the discussion section of Study 2. There are some modifications that could be considered to improve the motivation section in relation to both factors and items. Currently, the motivation section consists of 25 items, unevenly distributed across the six factors. Possible modifications could include the reduction or addition of items on certain factors so there is an even distribution. Similar to the AMS (Vallerand et al., 1992) and SMS (Pelletier, et al. 1995), the current questionnaire was based on having four items per factor; modifications could be made to replicate this structure, which would result in a 24 item section for motivation, and also match the 24 item design of the confidence section. Another option could be to reduce the number of items in each of the factors to three resulting in a total of 18 questions, which has been previously observed as a refinement procedure in the continuing development of the SMS-II (Pelletier et al., 2013). For administration purposes a reduction in the number of items may be favourable as there are

already 24 items in the confidence section of the questionnaire, therefore making the complete confidence and motivation questionnaire relatively long. A reduction in the number of items could potentially make the CMTPPEQ more manageable for individuals to complete. As outlined in Studies 1 and 2, some motivation items did not load with other items as expected, so that they were originally conceived to represent one type of motivation, but ended up loading on another type of motivation. This may have been due to the wording of these items, which were based on existing scales but modified to primary physical education. Consequently, the wording of some items could be revisited to confirm each factor is representative of the type of motivation it was intended to measure.

A process of modifications and refinement similar to those implemented in regards to the SMS (Pelletier et al., 2013) could be explored for the motivation section of the questionnaire. Revisions included the removal of problematic items, reduction in the number of items in each scale, intrinsic motivation being represented by more than one factor, and the addition of an integrated regulation factor. The SMS-II has a confirmed six-factor structure, which is similar to the motivation section of the CMTPPEQ, however, there are differences in structure. The motivation section of the CMTPPEQ has two intrinsic motivation factors, whereas the SMS-II only has one intrinsic motivation factor and includes integrated regulation. As the motivation section of CMTPPEQ already contains six factors, modifications could mean the rewriting of items in one of the intrinsic scales to reflect integrated regulation. The similarities between the base factor structure of the CMTPPEQ and the SMS-II is promising, as it indicates that the development of the motivation section of the CMTPPEQ is aligned with reputable existing measures. Despite requiring some ongoing modification, the final structure of the CMTPPEQ appears capable of measuring representative states of motivation along the self-determination continuum, with each state of motivation being logically coherent and relevant in the context of

teaching primary physical education. The motivation section of the model demonstrates the capacity to be used to assess the relevant strengths in each type of motivation a person has towards the task of teaching primary physical education.

Qausi Experimental Investigations

For the overall CMTPPEQ, including both the confidence and motivation sections, modifications have been suggested to the factor models produced through CFA, so future research analysing the factor structure of the questionnaire is recommended. In addition to confirming the factor structure of CMTPPEQ, exploring and collating additional evidence regarding the reliability of the measure will be important. Predictive validity was not evaluated in the current thesis and could be beneficial to investigate. Predictive validity aims to explore the ability of a measure to predict a subsequent event and is a form of criterion related validity (Field, 2013). A measure of confidence and motivation to teach physical education should be predictive of behaviours associated with teaching physical education, such as whether a teacher plans to teach physical education, how many physical education lessons a generalist teacher delivers, and the type of physical education activities they teach.

The general recommendation is that the questionnaire can be used to measure the confidence and motivation of teachers to teach primary school physical education. It is possible to administer the section of this questionnaire separately as each has been developed as separate models. The confidence section could be used independently to examine an individual's confidence in teaching primary physical education or the motivation section could be used to assess motivation towards teaching primary physical education. It is recommended, however, that where researchers are interested in choices and behaviours related to teaching primary physical education, it would be desirable to

measure both confidence and motivation, given the relationship between these measures as identified in Study 3.

Practical Implications

Results from the questionnaire will provide researchers with an understanding of an individual's confidence and motivation towards teaching physical education. For in-service teachers, information could be used to provide professional development opportunities for teachers in particular areas, or identify areas or tasks of physical education in which a teacher may require extra support. This information could also be used to inform those involved in initial teacher education and assist in identifying problematic areas within their unit and course programs. As discussed earlier in the thesis, pre-service teachers who do not specialise in primary physical education often have minimal exposure to the content area and the time they do have is very limited (O'Sullivan & Oslin, 2012; Petrie, 2010). Although it would be advantageous to devote more time to this key learning area to develop confidence and motivation for delivering physical education lessons, it is acknowledged that this change in practice within many institutions and teacher training programs is logistically not possible (Morgan & Hansen, 2008; Petrie, 2010). Other suggestions include extending access to resources, information, and professional development opportunities that are available to teach physical education. Equipping generalist teachers to teach physical education provides a challenge to pre-service teacher education programs (Freak & Miller, 2015). The practical content areas of physical education which are included in implementation may not be covered in sufficient detail within the one unit dedicated to the physical education curriculum that most generalist teachers undertake at university. With this is mind, a greater focus should perhaps be placed on one content area such as FMS, as they are the essential skills for successful

physical activity participation opposed to providing a brief sample of each of the content areas.

Based on the current findings, confidence in implementation is an important factor in confidence and motivation to teach primary physical education with content knowledge and the instruction of activities also shown to be influential. Undergraduate opportunities to instruct physical education appear crucial to the successful delivery of physical education in a primary school. A requirement that physical education lessons must be taught on teaching rounds could be introduced to support an increase in the number of teaching experiences a pre-service teacher has in the content area. These teaching experiences would ideally be undertaken in an environment where mentor support is able to be provided. Increased teaching opportunities for the pre-service teacher should support their success in teaching the content area, which in turn will stimulate confidence towards teaching physical education.

For in-service teachers more opportunities for professional development that focus on the content areas of physical education are recommended to help to increase their confidence in implementation. Schools could provide their teachers with membership to professional organisations such as ACHPER, which provide professional development opportunities on a regular basis across a year and access to conferences and resources relevant to physical education. Teachers should be encouraged to attend professional development activities, and provisions should be made to facilitate opportunities. The chance for teachers to work in teams and, collaborate and share their issues and concerns about teaching in physical education may also have a positive impact. This type of professional learning could foster engagement in extended experiences in teaching physical education within supportive environments that build feelings of personal accomplishment. In line with self-efficacy models, these peer-based approaches may

provide for vicarious experience by observing peers, and verbal persuasion through encouragement of peers (Bandura, 1986).

Although confidence in implementation was central to confidence and motivation, especially for non-specialists, physical education teacher educators could also utilise existing knowledge of teaching in general, in the form of management and planning, to support generalist teachers in teaching primary physical education. General management and planning activities may transfer capability to physical education teaching as a pedagogical knowledge factor, whereas, implementation may be reliant on specific content knowledge and pedagogical content knowledge. As management and planning is core practice for teachers regardless of the content area, those with teaching experience may feel they are able to transfer this knowledge and skills to a physical education environment (Petrie, 2010). Limited physical education content knowledge may inhibit the teaching of physical education for generalists (DeCorby et al., 2005; Hart, 2005; Siedentop, 2007), however, it is possible that generalist teachers could feel more confident and motivated if they could adapt their general pedagogical knowledge (Petrie, 2010). Developing strategies to transfer general pedagogical knowledge to teaching in primary physical education could support enhancing the confidence of primary generalist teachers.

Limitations

The use of questionnaire data that was collected from volunteer participants may mean that the responses received are not generalisable to all members of the population of individuals involved in the delivery of primary school physical education. Self-report data is potentially subject to the participants providing socially desirable responses or "the tendency to give answers that make the respondent look good" (Paulhus, 1991, p. 17). Likewise, according to Podsakoff, MacKenzie, Lee, and Podsakoff (2003), self-report data can be subject to common method variance, not only including social desirability, but also

item demand (e.g., items may convey hidden cues as to how to answer them), common scale formats (e.g., Likert scales), and consistency motifs (e.g., propensity for participants to maintain consistency in their responses).

The sample of participant has been identified as a limitation consistently throughout this thesis. In Study 1 the sample consisted of only pre-service teachers from the one university. In Study 2 this limitation was addressed with both in-service and pre-service and specialists and non-specialist teachers being recruited from across Victoria. Despite a wider range of participants being recruited in Study 2, the sample was still unevenly distributed between specialist and non-specialist teachers. As discussed in Study 3, this uneven distribution may have influenced the current results. The sample used in this thesis has also only come from the one state in Australia making the results specific to teaching primary physical education in Victoria. As some of the documents used to create the confidence questionnaire were also specific to Victoria (curriculum and teaching standards) the results may not be generalisable across other states of Australia or into other parts of the world.

Another limitation in this thesis is the use of structural equation modelling techniques; specifically the CFA in Study 2 and path analysis in Study 3. As mentioned in Study 3, models can be developed that are found to have a good fit, however, there is no guarantee that that model is the only or best representation (Ham, 2005). Different factor structures of both the confidence and motivation sections of the questionnaire could be available which may then alter the relationships in the path model. Future research should continue to examine and possibly refine the factor structure and psychometric properties of the questionnaire.

Conclusion

This thesis aimed to examine the development of a measure of confidence and motivation to teach primary physical education and to use this measure to examine both pre-service and in-service teachers' feelings of confidence and motivation to deliver primary physical education. Study 1 focused on the development of the measure through EFA and provided preliminary support for the psychometric properties of the CMTPPEQ. Study 2 further refined the measure and verified the factor structure through CFA.

The measure developed consisted of two confidence factors: confidence in Management and Planning and confidence in Implementation. The measure comprised six motivation factors: Intrinsic – Affective (Practice), Intrinsic – Affective (Knowledge), Extrinsic – Student Outcomes, Introjected Performance, Extrinsic – Professional Expectations, and Amotivation (Disengagement). The confidence section of the questionnaire appears to represents a multi-dimensional construct that is capable of measuring subject content knowledge in addition to key components of teaching practice. The factors identified for the motivation section appear to represent different types of motivation along the SDT continuum ranging from more self-determined to less self-determined motives for teaching physical education, with most areas of intrinsic and extrinsic motivation represented on the SDT continuum. The motivation factors appear to be logically coherent when applied to teaching physical education comprising areas such as practice, knowledge, student outcomes, professional performance, professional expectations, and disengagement. Further to the acceptable reliability and validity results, the findings generally highlight that the measure would benefit from on-going development and psychometric evaluation. The CMTPPEQ represents a valuable source of information regarding the characteristics associated with confidence and motivation to teach primary physical education. The measure is worthy of continued use by itself or in

conjunction with other assessment techniques, and is capable of generating information that will make a substantive contribution to the knowledge base in the area of confidence and motivation in teaching primary physical education.

The responses to the questionnaire allowed for the exploration of how different variables may influence confidence and motivation to teach primary school physical education. Analysis of the relationships within and between the demographic variables in Study 3 indicated that there were differences in confidence and motivation variables for a number of personal and experiential characteristics. Differences in confidence and motivation to teach primary physical education were found for pre-service and in-service teachers, gender, years of teaching, specialist and non-specialist, and activity instructed. For example, in-service teachers were more confident for both management and planning and implementation and more motivated in relation to student outcomes, whereas pre-service teachers were more motivated in relation to knowledge and had higher disengagement. Specialists were more confident on both management and planning, and implementation, and were more motivated on knowledge, practice, integrated performance, and student outcomes than non-specialists. Non-specialists reported higher motivation on professional expectations and higher levels of disengagement.

Study 3 built upon the results of Study 2 by producing a path analysis model to analyse casual links between confidence and motivation for teaching primary school physical education. Two models of confidence and motivation to teach primary school physical education were examined; Model 1 was a general model that distinguishes between specialist and non-specialist physical education teachers while Model 2 is specific to non-specialist teachers. The models showed that demographic variables predicted both confidence and motivation with confidence factors also predicting motivation factors. The model demonstrates the importance of confidence as an influence on motivational factors

towards teaching primary physical education. An important finding from the model analysis was that confidence in implementation was a critical variable in confidence and motivation to teach primary physical education. This highlighted the importance of opportunities to experience instruction of physical education in developing confidence and subsequent motivation to deliver physical education in primary schools, particularly for the non-specialist teachers.

Overall, the outcomes of the thesis should encourage the continued refinement and development of the measure, and as a consequence, its use to explore confidence and motivation in teaching primary physical education. The findings related to confidence and motivation reinforce the importance of confidence to motivation, and the centrality of confidence in implementation to teachers' overall confidence and motivation to deliver physical education programs, especially for non-specialist teachers. This dissertation has substantially contributed to our ability to evaluate confidence and motivation in teaching primary physical education and enhanced knowledge of the factors that influence confidence and motivation in teaching primary physical education. It is hoped that other researchers will be stimulated to engage in the future research that considers the methodological and pedagogical concepts examined and discussed in this research.

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APPENDICES

Appendix A-Human Research Ethics Committee Approval

VICTORIA UNIVERSITY | A NEW SCHOOL OF THOUGHT

MEMO

TO Dr Tony Watt
School of Education
Footscray Park Campus

DATE 29/09/2010

FROM Prof. Mark Andersen
Acting Chair
Arts, Education & Human Development Human Research Ethics Subcommittee

SUBJECT Ethics Application – HRETH 10/151

Dear Dr Watt,

Thank you for submitting your application for ethical approval of the project entitled:

HRETH 10/151 An examination of teacher confidence and motivation to teach primary school physical education

The proposed research project has been accepted and deemed to meet the requirements of the National Health and Medical Research Council (NHMRC) 'National Statement on Ethical Conduct in Human Research (2007)', by the Acting Chair, Faculty of Arts, Education & Human Development Human Research Ethics Committee. Approval has been granted from 29/09/2010 to 19/11/2011.

Continued approval of this research project by the Victoria University Human Research Ethics Committee (VUHREC) is conditional upon the provision of a report within 12 months of the above approval date (by **29/09/2011**) or upon the completion of the project (if earlier). A report proforma may be downloaded from the VUHREC web site at: http://research.vu.edu.au/hrec.php

Please note that the Human Research Ethics Committee must be informed of the following: any changes to the approved research protocol, project timelines, any serious events or adverse and/or unforeseen events that may affect continued ethical acceptability of the project. In these unlikely events, researchers must immediately cease all data collection until the Committee has approved the changes. Researchers are also reminded of the need to notify the approving HREC of changes to personnel in research projects via a request for a minor amendment.

If you have any further queries please do not hesitate to contact me on 9919 5413.

On behalf of the Committee, I wish you all the best for the conduct of the project.

Kind regards,

Prof Mark Andersen
Acting Chair
Faculty of Arts, Education & Human Development Human Research Ethics Subcommittee

Appendix B-Human Research Ethics Committee Approval (Amendment)

Amendment Request - Approved

Quest NoReply
Sent: Tuesday, April 09, 2013 5:02 PM
To: Anthony Watt
Cc: Robyn Broadbent; Sharna Spittle

Dear DR ANTHONY WATT,

Your amendment request for the following ethics application has been formally reviewed.

Application ID: HRE13-049
Application Title: Exploring teachers confidence and motivation in the learning area of physical education.

The amendment request for this ethics application has been accepted and deemed to meet the requirements of the National Health and Medical Research Council (NHMRC) 'National Statement on Ethical Conduct in Human Research (2007)' by the Victoria University Human Research Ethics Committee. Approval has been granted for two (2) years from the original approval date; .

Continued approval of this research project by the Victoria University Human Research Ethics Committee (VUHREC) is conditional upon the provision of a report within 12 months of the above approval date or upon the completion of the project (if earlier). A report proforma may be downloaded from the Office for Research website at: http://research.vu.edu.au/hrec.php.

Please note that the Human Research Ethics Committee must be informed of the following: any changes to the approved research protocol, project timelines, any serious events or adverse and/or unforeseen events that may affect continued ethical acceptability of the project. In these unlikely events, researchers must immediately cease all data collection until the Committee has approved the changes. Researchers are also reminded of the need to notify the approving HREC of changes to personnel in research projects via a request for a minor amendment. It should also be noted that it is the Chief Investigators' responsibility to ensure the research project is conducted in line with the recommendations outlined in the National Health and Medical Research Council (NHMRC) 'National Statement on Ethical Conduct in Human Research (2007).'

On behalf of the Committee, I wish you all the best for the conduct of the project.

Secretary, Human Research Ethics Committee
Office for Research
Email: researchethics@vu.edu.au

This is an automated email from an unattended email address. Do not reply to this address.

Appendix C-Department of Education and Early Childhood Development Research Approval

Department of Education and Early Childhood Development

Office for Policy, Research and Innovation

2 Treasury Place
East Melbourne, Victoria 3002
Telephone: +61 3 9637 2000
DX 210083
GPO Box 4367
Melbourne, Victoria 3001

2011_000976

Mrs Sharna Spittle
Victoria University
PO Box 14428
MELBOURNE 8001

Dear Mrs Spittle

Thank you for your application of 18 January 2011 in which you request permission to conduct research in Victorian government schools and/or early childhood settings titled *An examination of teacher confidence and motivation to teach primary school physical education.*

I am pleased to advise that on the basis of the information you have provided your research proposal is approved in principle subject to the conditions detailed below.

1. The research is conducted in accordance with the final documentation you provided to the Department of Education and Early Childhood Development.

2. Separate approval for the research needs to be sought from school principals and/or centre directors and this is to be supported by the DEECD approved documentation and the letter of approval from a relevant and formally constituted Human Research Ethics Committee.

3. The project is commenced within 12 months of this approval letter and any extensions or variations to your study, including those requested by an ethics committee must be submitted to the Department of Education and Early Childhood Development for its consideration before you proceed.

4. As a matter of courtesy, you advise the relevant Regional Director of the schools or early childhood settings that you intend to approach. An outline of your research and a copy of this letter should be provided to the Regional Director.

5. You acknowledge the support of the Department of Education and Early Childhood Development in any publications arising from the research.

6. The Research Agreement conditions, which include the reporting requirements at the conclusion of your study, are upheld. A reminder will be sent for reports not submitted by the study's indicative completion date.

I wish you well with your research study. Should you have further enquiries on this matter, please contact Kathleen Nolan, Research Officer, Education Policy and Research, by telephone on (03) 9637 3244 or by email at nolan.kathleen.j@edumail.vic.gov.au.

Yours sincerely

[redacted]

Dr Elizabeth Hartnell-Young
Group Manager
Education Policy and Research

10/06/2011

enc

Appendix D-Catholic Education Office Research Approval (Archdiocese of Melbourne)

Catholic Education Office
Archdiocese of Melbourne

In reply please quote:

GE11/0009
1720

27 June 2011

Mrs S Spittle
Victoria University
PO Box 14428
MELBOURNE VIC 8001

Dear Mrs Spittle

I am writing with regard to your research application received on 22 June 2011 concerning your forthcoming project titled *An examination of teacher confidence and motivation to teach primary school physical education.* You have asked approval to approach Catholic primary schools in the Archdiocese of Melbourne, as you wish to involve teachers.

I am pleased to advise that your research proposal is approved in principle subject to the nine standard conditions outlined below.

1. The decision as to whether or not research can proceed in a school rests with the school's principal, so you will need to obtain approval directly from the principal of each school that you wish to involve.

2. You should provide each principal with an outline of your research proposal and indicate what will be asked of the school. A copy of this letter of approval, and a copy of notification of approval from the university's Ethics Committee, should also be provided.

3. A *Working with Children* (WWC) check – or registration with the Victorian Institute of Teaching (VIT) – is necessary for all researchers visiting schools. Appropriate documentation must be shown to the principal before starting the research in each school.

4. No student is to participate in the research study unless s/he is willing to do so and informed consent is given in writing by a parent/guardian.

5. You should provide the names of schools which agree to participate in the research project to the Knowledge Management Unit of this Office.

6. Any substantial modifications to the research proposal, or additional research involving use of the data collected, will require a further research approval submission to this Office.

7. Data relating to individuals or schools are to remain confidential.

James Goold House, 228 Victoria Parade, East Melbourne VIC 8002 Tel: (+61 3) 9267 0228 Fax: (+61 3) 9415 9325
Correspondence: PO Box 3, East Melbourne VIC 8002 Email: director@ceomelb.catholic.edu.au www.ceomelb.catholic.edu.au
ABN 85 176 448 204

8. Since participating schools have an interest in research findings, you should consider ways in which the results of the study could be made available for the benefit of the school communities.

9. At the conclusion of the study, a copy or summary of the research findings should be forwarded to this Office. It would be appreciated if you could submit your report in an ***electronic format*** using the email address provided below.

I wish you well with your research study. If you have any queries concerning this matter, please contact Mr Martin Smith of this Office.

The email address is <km@ceomelb.catholic.edu.au>.

Yours sincerely

[redacted]

Nancy Bicchieri
DEPUTY DIRECTOR

Appendix E-Catholic Diocese of Ballarat Education Research Approval

CATHOLIC DIOCESE of BALLARAT Education

PO Box 576 Ballarat Victoria 3353
Telephone: (03) 5337 7135
Facsimile: (03) 5331 5166
www.ceoballarat.catholic.edu.au
ABN: 45 121 091 506

22 July 2011

Ms Sharna Spittle
Victoria University
PO Box 1442
MELBOURNE 8001

Dear Sharna

I am in receipt of your application requesting the participation of Catholic schools in the Diocese of Ballarat in your Research Project: ***An examination of teacher confidence and motivation to teach primary school physical education***

I am pleased to advise that on the basis of information you have provided I grant permission for you to approach the Principals of our schools seeking their involvement in the project. You will understand that many requests are made to our schools and I am conscious of the time commitment required by participants. With this in mind I stress that the decision as to whether or not to participate rests with the individual Principals.

The following **general conditions** apply to all persons/institutions conducting research in schools in the Diocese of Ballarat:

1) The decision as to whether or not your research can proceed in a school rests with the School Principal. For each school in which you wish to do the research, you must obtain approval directly from the School Principal.

2) You are requested to provide the Principal with an outline of your research proposal and the likely time that participation in the research project will demand. A copy of notification of approval from the appropriate Ethics Committee should also be provided to the participating school.

3) A Criminal Record check is necessary for all researchers visiting schools and should be shown to the Principal before starting research in each school.

4) No student is to participate in your research study unless s/he is willing to do so and permission is given by a parent/guardian. Sufficient information must be provided to enable a parent/guardian to make an informed decision. Permission to participate would generally be indicated by means of a consent form, signed by a parent/guardian and returned to the school. You are requested to liaise with the School Principal to assist in the writing of a letter to parents/guardians regarding information about the research project.

5) You are requested to forward a list of schools/participants to this office.

6) Any substantive modifications to the research proposal or additional research involving use of the data collected will require a further research approval submission to this office.

7) Data relating to individual students or schools is to remain confidential.

8) I will look forward to receiving a copy of the research findings and would expect that you offer such results to participating schools.

I take this opportunity to wish you success with your research project.

Yours sincerely

[redacted]

Larry Burn
DIRECTOR

Appendix F-Catholic Education Office Research Approval (Diocese of Sale)

CATHOLIC EDUCATION OFFICE
DIOCESE OF SALE

9 August, 2011

Mrs Sharna Spittle
Victoria University
PO Box 14428
MELBOURNE VIC 8801

Dear Mrs Spittle

Thank you for your emailed application dated 8 August, 2011 in which you have requested permission to conduct research entitled "an examination of teacher confidence and motivation to teach primary school physical education" in schools in the Diocese of Sale.

I am happy for you to approach the schools in this diocese. It is important that you understand that the final permission for you to undertake this work rests with the Principal.

This approval in principle is subject to the attached *Research - Standard Conditions*. Should you require further information please contact Mr Peter Ryan at this Office, email pryan@ceosale.catholic.edu.au or phone 5622 6603.

With best wishes

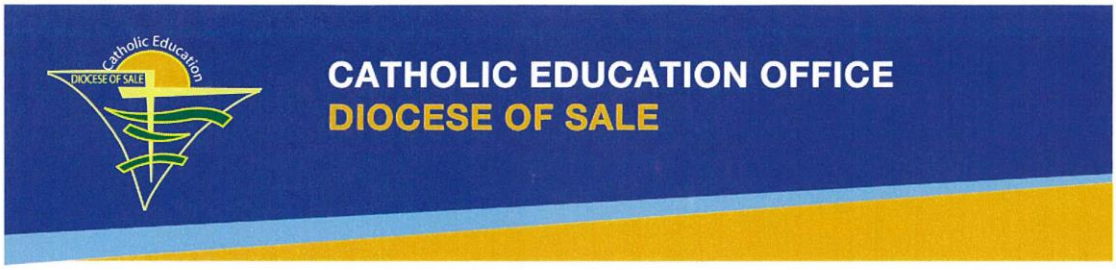
Yours sincerely

[redacted]

Peter Ryan
DIRECTOR OF CATHOLIC EDUCATION
DICOESE OF SALE

Faith ... Learning ... Growth

6 Witton Street Warragul VIC 3820 - PO Box 322 Warragul 3820 - Phone: (03) 5622 6600 - Fax: (03) 5623 4258 - Email: director@ceosale.catholic.edu.au



RESEARCH – STANDARD CONDITIONS

This approval in principle is subject to certain standard conditions:

1. The decision as to whether or not a project can proceed in a school rests with the school principal. You will need to obtain approval directly from the principal of each school that you wish to involve.

2. You should provide the principal with an outline of your proposal and indicate what will be asked of the school. A copy of this letter of approval should be included.

3. If your study involves one-to-one contact with a child, you are required to provide the principal with a certified copy of your registration with the Victorian Institute of Teaching or a current "Working with Children" check.

4. You should provide to the Director of this Office, a list of schools which have agreed to participate in the research project.

5. Any substantive modifications to the research proposal or additional research involving use of the data collected will require a further research approval submission to this Office.

6. Data relating to individuals or schools is to remain confidential.

7. The collection and use of information from schools must conform with the Privacy Amendment (Private Sector) Act 2000 as indicated in the School's Privacy Policy.

8. Since participating schools have an interest in the findings, you should discuss with each principal ways in which the results of the study could be made available for the benefit of the school community.

9. At the conclusion of the study, a copy of the summary of the findings should be forwarded to the Director of this Office.

Appendix G-Demographics Information Sheet (Study 1)

Code:

DEMOGRAPHICS INFORMATION

Teacher
Please provide information on aspects of yourself, your education/training, and sporting participation/experience. Please CIRCLE or WRITE CLEARLY where appropriate.

1. Gender Male Female

2. Age _____

3. Which university did you attend?

_____

4. What degree did you complete?

_____

5. How many years have you been teaching for?

0 – 2 2 – 5 5 – 10 10 – 15 15+

6. How many units of physical education have you completed at university?

_____

7. Are you a physical education specialist?

Yes No

8. Within your school setting, approximately how many hours of physical education do you teach per week?

<1 1 – 2 2 – 3 3 – 4 4 – 5 5+

9. Have you undertaken any additional professional development in physical education to your degree?

Yes No

10.Have you taught/instructed any type of physical activity outside of your teaching?

Yes No

10. If yes;
10a. Type of Activity _____

10b. Length of time (years)

<1 1 – 2 2 – 3 3 – 4 4 – 5 5+

10c. Hours per week

<1 1 – 2 2 – 3 3 – 4 4 – 5 5+

11. Are you currently involved in any sort of organised recreation or sporting club?

Yes No

11a. If yes, Types of Activities

_____

12. Have you previously been involved in any sort of organised recreation or sporting club?

Yes No

12a. If yes, Types of Activities

_____

Appendix H-Confidence and Motivation to Teach Primary Physical Education Questionnaire

Code:

Confidence and Motivation to Teach Primary Physical Education Questionnaire

Section 1

INSTRUCTIONS: Questions in this section relate to your confidence to teach primary school physical education. Please indicate your level of confidence to each statement by circling the appropriate response.

Strongly Disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly Agree
1	2	3	4	5	6

I am confident in my ability to:

1.	Teach motor skills and complex movements	1	2	3	4	5	6
2.	Demonstrate an understanding of assessment in physical education in relation to the curriculum	1	2	3	4	5	6
3.	Teach outdoor experience activities (e.g., bushwalking and basic orienteering)	1	2	3	4	5	6
4.	Plan a physical education program across a unit, term, and year to match the learning outcomes of the curriculum	1	2	3	4	5	6
5.	Teach the movement skills of dance (e.g., responding to movement stimuli such as rhythm and beat and reproducing movement sequences)	1	2	3	4	5	6
6.	Teach the skills and activities of team games and sports (e.g., tactics, sports-specific skills, rules and the roles of various positions)	1	2	3	4	5	6
7.	Establish clear, challenging and achievable learning goals for students in physical education	1	2	3	4	5	6
8.	Understand the relationship between physical activity and health	1	2	3	4	5	6

9.	To use a range of technologies (e.g., ICT, heart rate monitors, movement analysis tools) to support and engage student learning in physical education	1	2	3	4	5	6
10.	Identify the prior knowledge and the learning strengths and weaknesses of students in physical education	1	2	3	4	5	6
11.	Use my knowledge of resources and organisations to assist with the development of the physical education curriculum	1	2	3	4	5	6
12.	Effectively communicate information to students, teachers and parents about student achievement in physical education	1	2	3	4	5	6
13.	Teach the movement skills of gymnastics	1	2	3	4	5	6
14.	Use my knowledge of effective pedagogical approaches and learning styles to the areas of physical education	1	2	3	4	5	6
15.	Understand the educational rationale for the inclusion of physical education in the school curriculum	1	2	3	4	5	6
16.	Maintain accurate records of students learning in physical education	1	2	3	4	5	6
17.	Teach the movement skills of athletics (e.g., javelin, discus, high jump, running events)	1	2	3	4	5	6
18.	Create and maintain a learning environment which is student centered and maximises physical activity and participation	1	2	3	4	5	6
19.	Teach the skills and knowledge of swimming and water safety	1	2	3	4	5	6
20.	Teach fitness related skills and activities	1	2	3	4	5	6
21.	To use a range of protocols to assist classroom management strategies that are unique to physical education (e.g., safety rules, putting away equipment, stop signal)	1	2	3	4	5	6
22.	To self evaluate and revise learning activities in physical education	1	2	3	4	5	6
23.	Address the learning needs of all students in physical education including the gifted, talented, disadvantaged or disabled	1	2	3	4	5	6
24.	Demonstrate an understanding of the need for the mastery of fundamental motor skills as a important factor in children's participation in physical education	1	2	3	4	5	6

PLEASE CONTINUE ONTO NEXT PAGE

Section 2

INSTRUCTIONS: Questions in this section relate to your motivation to teach primary school physical education. Using the scale below, please indicate by circling, to what extent each item corresponds to
WHY YOU WOULD TEACH PHYSICAL EDUCATION.

Strongly Disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly Agree
1	2	3	4	5	6

1.	For the excitement I feel when I am teaching physical education	1	2	3	4	5	6
2.	Because it allows me to build a good reputation as a teacher	1	2	3	4	5	6
3.	Because teaching physical education is fun	1	2	3	4	5	6
4.	To prove to myself that I am capable of teaching physical education	1	2	3	4	5	6
5.	It is unclear to me why I need to teach physical education	1	2	3	4	5	6
6.	For the pleasure it gives me to learn more about the activities that I am teaching	1	2	3	4	5	6
7.	Because other classroom teachers teach physical education	1	2	3	4	5	6
8.	For the satisfaction I feel while improving my teaching within physical education	1	2	3	4	5	6
9.	Because I would feel bad if I wasn't taking the time to teach physical education	1	2	3	4	5	6
10.	Because physical education promotes positive relationships between teacher and student	1	2	3	4	5	6
11.	For the enjoyment of discovering new teaching strategies	1	2	3	4	5	6
12.	I am not sure of physical educations value within the curriculum	1	2	3	4	5	6

PLEASE CONTINUE ONTO NEXT PAGE

13.	Because it is a learning area I am required to teach within the curriculum framework	1	2	3	4	5	6
14.	Because I like the feeling of being involved in the activity that I am teaching	1	2	3	4	5	6
15.	Because teaching physical education makes me feel like I am adequately fulfilling my role as a teacher	1	2	3	4	5	6
16.	For the satisfaction that I experience in broadening my knowledge about areas of physical education	1	2	3	4	5	6
17.	For the enjoyment I have in seeing my students achieve their goals	1	2	3	4	5	6
18.	Because what students learn in physical education is important	1	2	3	4	5	6
19.	For the satisfaction that I feel while teaching tasks I find difficult	1	2	3	4	5	6
20.	I do not think I am capable of teaching physical education effectively	1	2	3	4	5	6
21.	Because teaching physical education allows me to continue to learn about things that interest me	1	2	3	4	5	6
22.	Because physical education is required to be taught in schools	1	2	3	4	5	6
23.	For the satisfaction I experience when I am teaching physical education	1	2	3	4	5	6
24.	I feel that I am wasting students time teaching physical education	1	2	3	4	5	6
25.	Because physical education allows me to experience a personal satisfaction in my teaching career	1	2	3	4	5	6
26.	Because my students expect to participate in physical education sessions	1	2	3	4	5	6
27.	Because physical education is important in a child's development	1	2	3	4	5	6
28.	Because I would feel guilty that I hadn't taught physical education to my students	1	2	3	4	5	6

Appendix I-Consent Form (Study 1)

Code:

CONSENT FORM FOR PARTICIPANTS INVOLVED IN RESEARCH

INFORMATION TO PARTICIPANTS:
We would like to invite you to be a part of a study examining teacher confidence and motivation to teach primary school physical education.

Research has found that generalist primary school teachers receive limited training in the curriculum area of physical education. This project aims to explore the impact this can have on teacher's levels of confidence and motivation towards teaching the subject.

Participation in this study will involve the completion of a questionnaire taking approximately 10 minutes to complete.

All collected data will be kept and stored securely by the researchers and treated in a strictly confidential manner. Data from this study will be used in a student thesis, and may be presented at professional conferences, and/or published in professional journals. Individuals will not be identified in any of these presentations.

CERTIFICATION BY SUBJECT

I, _____
(name)
of _____
(address)
certify that I am at least 18 years old and that I am voluntarily giving my consent to participate in the study 'An examination of teacher confidence and motivation to teach primary school physical education' being conducted at Victoria University by Dr Anthony Watt, Dr Robyn Broadbent and Sharna Spittle.

I certify that the objectives of the study, together with any risks and safeguards associated with the procedures listed hereunder to be carried out in the research, have been fully explained to me by Sharna Spittle and that I freely consent to participation involving the below mentioned procedures:

- Completion of both a demographics form and a confidence and motivation questionnaire

I certify that I have had the opportunity to have any questions answered and that I understand that I can withdraw from this study at any time and that this withdrawal will not jeopardise me in any way.

I have been informed that the information I provide will be kept confidential.

Signed:_____ Date: _____

Any queries about your participation in this project may be directed to the researcher

Principal Investigator
Dr Anthony Watt
anthony.watt@vu.edu.au
(03) 9199 4119

Student Researcher
Sharna Spittle
sharna.spittle@vu.edu.au

If you have any queries or complaints about the way you have been treated, you may contact the Ethics & Biosafety Coordinator, Victoria University Human Research Ethics Committee, Victoria University, PO Box 14428, Melbourne, VIC, 8001 phone (03) 9919 4148.

Further Research

☐Yes I would like to take part in further research associated with this study and can be contacted in the following way:

Email:_____ Phone Number: _____

Appendix J-Demographics Information Sheet Pre-service Teachers (Study 2)

Code:

VICTORIA UNIVERSITY | A NEW SCHOOL OF THOUGHT

DEMOGRAPHICS INFORMATION

Please provide information on aspects of yourself, your education/training, and sporting participation/experience. Please CIRCLE or WRITE CLEARLY where appropriate.

1. Gender Male Female

2. Age _____

3. Which university are you attending?

---

4. Which campus are you attending?

---

5. What is the name of the degree are you completing at university?

_____

6. In what year of your degree are you?

1st 2nd 3rd 4th

7. How many units of physical education have you completed at university?

0 1 2 3 4 4+

8. Are you training to be a physical education specialist?

Yes No

9. During your teaching rounds approximately how many hours of physical education have you taught?

<1 1 – 5 5 – 10 10 – 151 5+

10. Have you undertaken any additional professional development in the area of physical education during your degree?

Yes No

11. Have you taught/instructed any type of physical activity outside of university/teaching rounds?

Yes No

11. If yes;
11a. Type of Activity (please only CIRCLE one)

Gymnastics Swimming & Water Safety Outdoor experience activities

Dance Fitness related skills and activities Team Games & Sports

Athletics Other:_____

11b. Length of time (years)

<1 1 – 2 2 – 3 3 – 4 4 – 5 5+

11c. Hours per week

<1 1 – 2 2 – 3 3 – 4 4 – 5 5+

12. Are you currently involved in any sort of organised recreation or sporting club?

Yes No

12a. If yes, Type of activity (If more than 1 please list the activity you enjoy the most)

_____

13. Have you previously been involved in any sort of organised recreation or sporting club?

Yes No

13a. If yes, Type of activity (If more than 1 please list the activity you enjoyed the most)

_____

Appendix K-Demographics Information Sheet for In-service Teachers (Study 2)

Code:

DEMOGRAPHICS INFORMATION

Teacher
Please provide information on aspects of yourself, your education/training, and sporting participation/experience. Please CIRCLE or WRITE CLEARLY where appropriate.

1. Gender Male Female

2. Age _____

3. Which university did you attend?

_____

4. What is the name of the degree you completed?

_____

5. How many years have you been teaching for?

0 – 2 2 – 5 5 – 10 10 – 15 15+

6. How many units of physical education did you complete at university?

_____

7. Are you a physical education specialist?

Yes No

8. Do you have a physical education specialist working at your school?

Yes No

9. Within your school setting, approximately how many hours of physical education do you teach per week?

<1 1 – 2 2 – 3 3 – 4 4 – 5 5+

10. Have you undertaken any professional development in physical education to your degree?

Yes No

11.Have you taught/instructed any type of physical activity outside of your teaching?

Yes No

11. If yes;
11a. Type of Activity (please only CIRCLE one)

Gymnastics	Swimming & Water Safety	Outdoor experience activities
Dance	Fitness related skills and activities	Team games and sports
Athletics	Other:_____	

11b. Length of time (years)

<1 1 – 2 2 – 3 3 – 4 4 – 5 5+

11c. Hours per week

<1 1 – 2 2 – 3 3 – 4 4 – 5 5+

12. Are you currently involved in any sort of organised recreation or sporting club?

Yes No

12a. If yes, Type of activity (If more than 1 please write the activity you enjoy the most)

_____

13. Have you previously been involved in any sort of organised recreation or sporting club?

Yes No

13a. If yes, Type of Activity (If more than 1 please write the activity you enjoyed the most)

_____