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Character Development through Physical Education: Measuring the Effectiveness of a Curriculum-Based Programme in Primary Schools

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A doctoral thesis submitted in partial fulfilment of the requirements for the Degree of Doctor of Clinical Psychology at The University of Auckland
Abstract

Character traits such as morality, self-esteem, self-efficacy and resilience have been associated with desirable life outcomes, including lower levels of stress, experiencing positive growth after stressful periods, fewer alcohol and drug related problems, academic achievement, being willing to set challenging life goals, and pro-social behaviour (Backer-Fulghum, Patock-Peckham, King, Roufa, & Hagen, 2011; Bandura, Barbaranelli, Caprara, & Pastorelli, 1996; Dolbier, Jaggars, & Steinhardt, 2010; Passini, 2012; Vieira & Grantham, 2011). It is natural therefore that attempts are made to promote these positive character qualities in young people. While well-structured and implemented programmes and interventions may positively influence elements of character, research in the area of physical education and character development remains scarce.

The purpose of this study was to determine if a curriculum-based physical education approach could influence elements of character in primary school children. The programme being investigated used a mastery-based approach and utilised game-play in combination with class presentations, discussions and exercises. Using a quasi-experimental design, participants from three programme schools (n=86) and one control school (n=84) completed a questionnaire before the programme was implemented, and after approximately 12 weeks of programme exposure. The questionnaire assessed participants’ moral character, self-efficacy, self-esteem, resilience, and their perceived ability and enjoyment in sport and physical activity.

When comparing the programme and control groups, and when comparing those who received zero, two or four hours of the programme a week, we found no evidence that this approach to physical education had any impact on the measures administered. However, interaction analyses suggested that on some measures the programme had a different impact on participants depending on their baseline scores. Significant interaction effects included: reductions in self-efficacy for formerly high scoring programme participants (if they were exposed to the programme for four hours per week), and increases in general self-esteem and enjoyment of sport and physical activity for initially low scoring programme participants.

While the self-efficacy finding was not endorsed by programme teachers’ short answer feedback, the self-esteem and enjoyment of physical activity results were. Some teachers noted improvements in some participants’ self-esteem, confidence, leadership, and enjoyment of physical education. All programme teachers reported finding this curriculum-based physical
education approach useful and said they would use it in future. Some measures suffered from poor reliability and findings are considered in light of this. Findings are discussed in relation to theory and previous research, research and programme strengths and limitations are outlined, and suggestions are made for future directions in this area.
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CHAPTER I: INTRODUCTION

What is Character?

Character has been a topic of interest for millennia (Peterson & Seligman, 2004). Many ancient works such as the Bible, the Tao Te Ching and the Bhagavad Gita discuss desirable human qualities and how they may be cultivated (Peterson & Seligman, 2004). These desirable qualities have been referred to as virtues (Fowers, 2008, p.631), and a culmination of different virtues is thought to create character (Power & Khmelkov, 1998). Plato believed there were four principal virtues; wisdom, courage, justice, and self-restraint, while Aristotle believed wit, truthfulness and generosity were also foundations for leading a happy life (Peterson & Seligman, 2004). In fact, Aristotle believed one would experience a deep sense of happiness, wellbeing (Griffin, 2007) and social and emotional flourishing (Fowers, 2008) in relation to one’s virtue (Griffin, 2007).

Religious systems throughout history have attempted to shape communities and foster the character qualities they believed to be important (Peterson & Seligman, 2004). Confucianism hoped to cultivate virtues such as humanity, justice, wisdom and truthfulness. The Bible contains the Ten Commandments, and proverbs and parables all speaking to different virtues, and Buddhism has many guidelines for living a good life, including details of the ‘Noble Eightfold Path’ (Peterson & Seligman, 2004). Lickona and Davidson (2005) have described a person with character as a moral, respectful, self-disciplined, emotionally intelligent and socially skilled individual, who contributes to their community. It is little wonder therefore that societies have valued good character, that systems of education and law have attempted to cultivate and enforce it, and that in recent years character has received increasing attention from policy makers and educators (Park & Peterson, 2006).

Character, Behaviour and Life Outcomes

The desire to encourage the development of positive character traits increased during the 20\textsuperscript{th} century, due, in part, to a perceived increase in problematic youth behaviours (Catalano, Berglund, Ryan, Lonczak, & Hawkins, 2004). Positive developmental assets including external forces (i.e. support from one’s surroundings), and internal characteristics (i.e. a positive sense of identity), have been associated with fewer problematic and risk behaviours. Benson, Leffert,
Scales and Blyth (1998) found that the more developmental assets students had, the fewer risk behaviours they engaged in. In their study of almost 100,000 sixth to twelfth grade students in the United States, Benson and colleagues (1998) administered a questionnaire that included assessment of students’ developmental assets. These included support, boundaries and expectations, empowerment, constructive use of time, commitment to learning, positive values, social competencies and positive identity (including self-efficacy, self-esteem, sense of purpose and having a positive view of one’s future). It also assessed risk factors and behaviours, such as drinking alcohol, smoking cigarettes, taking illicit drugs, engaging in sexual intercourse, depression, attempted suicide, anti-social behaviour, violence, school problems, drink driving, and gambling. It was found that as positive developmental assets increased, the number of risk behaviours students reported engaging in decreased.

The beneficial effects of positive assets for youth was also found in a later study of 6000 youth by Scales, Benson, Leffert and Blyth (2000). This study found positive youth assets contributed to higher levels of thriving outcomes such as physical health, school success and the ability to overcome adversity. Hemphill and colleagues (2009) conducted a longitudinal study of over 3000 12-16 year olds in Australia and the United States, and found that the ability to control one’s emotions was a protective factor against engaging in violent behaviour. These studies suggest that positive developmental assets may protect youth from behaviours that are potentially harmful to themselves and others, while also promoting positive outcomes. If character interventions can influence positive character elements such as self-regulatory skills and pro-social behaviour, young people may improve their life trajectory. There is some evidence that well-designed youth development programmes may do just this.

For example, Battistich, Schaps and Wilson (2004) examined 1246 middle school students who were part of the Child Development Project during primary school. The project, described as a resilience intervention, attempted to foster positive development and create a caring community of learners. It encompassed many aspects of school life through class-based programmes (including a focus on collaboration, building positive relationships, self-control, and responsibility), a school-wide intervention, and involving children’s families. Students in middle school who had received high levels of the intervention while in primary school showed better academic achievement and had more pro-social peers when compared to the no-intervention students. Those who received high or moderate exposure to the programme showed greater
levels of global self-esteem and self-efficacy, better relationships with teachers, a stronger sense of school community, and a better liking for school (Battistich et al., 2004). While the intervention had no significant impact on serious delinquent behaviour or drug use, intervention students were more involved in positive activities such as youth groups and sports teams, and showed fewer instances of misconduct (Battistich et al., 2004).

**Character Education and Positive Youth Development**

The nature of character, and its place in education, has been debated throughout history (Shepard Salls, 2007). Like character itself, character education has been conceived of in many ways, with each conception giving rise to different programme designs (Corrigan, Grove, Vincent, Chapman, & Walls, 2007). Character education is an extremely broad term covering a wide spectrum of educational approaches (Berkowitz & Bier, 2004, p.74), and many interventions that seek to influence elements of character are not labelled character education. Berkowitz and Bier (2004) suggest initiatives that intend to make positive social change and develop moral aspects of character may also be named Positive Youth Development (PYD). PYD is a theoretical framework that sees youth as a resource that can be developed rather than as problems that need to be fixed (Greenwood & Kanters, 2009).

There are many useful brief overviews of the development and history of the PYD approach (e.g. Catalano et al., 2004; Lerner, Almerigi, Theokas, & Lerner, 2005; Lerner, von Eye, Lerner, Lewin-Bizan, & Bowers, 2010). In short, during the 20th century there was increasing concern in the United States about troubled youth, higher rates of youth crime, and the apparent breakdown of societal structures (such as the nuclear family). As developmental research evolved, and youth workers saw the impact different environments can have on young people, the belief that young people have developmental flexibility grew, as did an interest in youth interventions (Catalano et al., 2004).

As theories developed, and longitudinal studies emerged that identified key risk factors, interventions evolved to become more multidimensional and strength-based. Rather than solely seeking to prevent negative outcomes by reducing risk factors, strength-based interventions seek to promote positive youth assets that prevent negative outcomes, while simultaneously promoting successful development (Catalano et al., 2004). From a PYD perspective, interventions should assist young people to develop assets including resilience, social, emotional,
cognitive, behavioural and moral competence, self-determination, spirituality, self-efficacy, a clear and positive self-identity and belief in the future (Catalano et al., 2004). This is a comprehensive list of character traits encompassing many factors that researchers must consider when they decide how to measure character and character-related interventions.

**Defining Character for Research**

Although character has been researched formally for decades, character is still not a well-defined or universally agreed upon construct (Corrigan et al., 2007). Corrigan and colleagues (2007) note that when 30 federally funded character research teams in the United States were asked to list their core character assessment tools, the teams amassed more than 60 distinct measures. This gives an indication of the diversity in this area, the difficulty of creating a universal operational definition of character, and the challenge of comparing disparate models of character education (Corrigan et al., 2007).

Character research measures many different aspects of human nature. However, amongst the many different conceptions of character there are common themes; the virtues detailed often relate to self-regulation and pro-social/moral behaviour (Berkowitz & Bier, 2004; Galloway, 2008; Lickona & Davidson, 2005; Peterson & Seligman, 2004; Shields & Bredemeier, 2005). An example of this comes from the New Zealand Foundation for Character Education (NZFCE), an organisation focused on character development in New Zealand schools (Galloway, 2008). Through school-based interventions the NZFCE seek to equip children and adolescents with eight *Cornerstone Values*: honesty and truthfulness, kindness, consideration, compassion, obedience (doing what one is asked for those who care), responsibility, respect, and duty (Galloway, 2008, p.18).

In the United States the Values in Action Classification of Strengths Project (VIA) (www.viacharacter.org) developed a character classification system which is detailed in Peterson and Seligman’s (2004) work. The authors sought to find an encompassing list of character traits; key human virtues that have been valued in societies throughout history. Their search included works from many disciplines and key texts from ancient societies and religions “recognised for their influential and enduring impact on human civilization” (p.34). The researchers found 24 character strengths and grouped them under six key headings: humanity (kindness, the capacity to love and be loved, and social intelligence), justice (fairness, leadership and teamwork),
wisdom and knowledge (creativity, curiosity, open mindedness, love of learning, and perspective), temperance (forgiveness, modesty, prudence, and self-regulation), transcendence (appreciation of beauty, gratitude, hope, humour, and spirituality/religiousness), and courage (honesty, authenticity, bravery, perseverance, and zest) (Peterson & Seligman, 2004). Of the six key headings, humanity and justice were most common throughout different cultures, time periods and disciplines (Peterson & Seligman, 2004).

Most often character education interventions, and the character research initiatives measuring them, focus on those psychological and behavioural traits that are beneficial for the individual and for those around them (Berkowitz & Bier, 2004; Galloway, 2008; Lickona & Davidson, 2005; Peterson & Seligman, 2004; Shields & Bredemeier, 2005). Such traits include morality, self-efficacy, self-esteem and resiliency; four developmental assets that contribute to a well-balanced character.

**Character and morality.** Character definitions are often closely linked with morality and ethical behaviour (Power & Khmelkov, 1998). According to Berkowitz and Bier (2004) character is a socio-moral competency; a “complex set of psychological characteristics that enable an individual to act as a moral agent” (p.73), while Greenwood and Kanters (2009) state that character symbolises an embodied morality. Moral virtues influence our motivations, desires and actions (Shepard Salls, 2007). Schulman (2002) stated that morality refers to the intention to create beneficial or fair outcomes for all those concerned, and that moral drivers are powerful and essential to human survival. Morality includes understanding another person’s perspective and their emotional experience, as well as pro-social and socially-responsible actions such as acting in a way that is fair for all (Mouratidou, Goutza, & Chatzopoulos, 2007). Moral behaviour is beneficial (or at least not harmful) to others. Meanwhile, behaviour that transgresses moral sanctions often has a negative impact on other people. For example, cheating, stealing, or acting aggressively through verbal or physical abuse.

With regard to moral development, Schulman (2002) stated that three factors help morality to flourish: empathy, principles and moral affiliations. In other words, our ability to put ourselves in others’ shoes, an internal sense of right and wrong and a connection with other people who model and encourage moral behaviour (Schulman, 2002). According to Berkowitz and Grych (1998, 2000) character development in children can be seen through six symptoms of psychological morality. These are 1) conscience (knowing when one has transgressed and
attempting to make amends), 2) moral reasoning (discerning right and wrong, and applying social rules skilfully), 3) empathy (being sensitive to, and aware of, the needs of others), 4) altruism (caring, sharing, helping and co-operating even when it may be costly to oneself), 5) social skills (perspective taking, and conflict resolution), and 6) honesty (telling the truth in the face of adverse personal consequences). Interventions that provide for children’s positive development in these areas may contribute to their overall character development. However, moral behaviour only results when moral drives and intentions turn into action.

While many character researchers and authors focus on morality, many also discuss the psychological characteristics that facilitate moral behaviour. Looking at moral development models, Berkowitz and Grych (1998) outlined four essential meta-moral characteristics required to turn psychological morality into moral action. These included: 1) self-control (controlling one’s behaviour), 2) compliance with external standards (complying with moral and social norms such as sharing, and internalizing these behavioural standards over time), 3) social orientation (valuing positive relationships), and 4) self-esteem (having a positive self-conception and optimism about one’s capabilities). These themes are echoed in the works of other authors (e.g. Lickona & Davidson, 2005; Shields & Bredemeier, 2005).

Shields and Bredemeier (2005) separated character into two aspects; one’s moral convictions, and the psychological attributes needed to turn them into action (including persistence and emotional regulation). In a similar vein, Lickona and Davidson (2005) discussed two elements of character; moral character and performance character. Moral character includes socio-moral attitudes and behaviours, including a commitment to ethical behaviour in relationships (Lickona & Davidson, 2005) and the drive to what is right and be a responsible member of different social groups (Khmelkov & Davidson, 2007, p.2). Performance character compliments this, and involves striving to perform well, and an orientation toward mastery and inner discipline (Khmelkov & Davidson, 2007; Lickona & Davidson, 2005). Meta-moral characteristics are those that facilitate ethical and moral behaviour. Whilst they facilitate moral action they are not moral in and of themselves, and without a moral component can equally assist immoral activity (Berkowitz & Grych, 1998). Two key attributes that may facilitate moral behaviour are self-efficacy and self-esteem.

**Character, self-efficacy and self-esteem.** A strong sense of self-esteem and self-efficacy characterise confident, capable, autonomous, socially successful youth (Scales et al., 2000). Self-
efficacy relates to one’s confidence to behave in a desired way, or achieve a desired outcome (Bandura et al., 1996), while self-esteem is one’s sense of self-worth; how one regards oneself in a general sense, or in specific areas of life (Hewitt, 2009). Not surprisingly, self-efficacy and self-esteem are closely linked in that if someone believes they can succeed in achieving their goals (self-efficacy), their sense of self-worth (self-esteem) is improved (Cockerill, Pyle, & Read, 1996). They are an integral part of character, and have been associated with many positive outcomes in youth and adolescents. These include cognitive and scholastic engagement, school success, coping skills, and improvement in peer-parental interactions (Deihl, Vicary, & Deike, 1997; Dowling, 2009; Fredricks et al., 2002; Karnes & McGinnis, 1996; Lee & Robbins, 1998; Linnenbrink & Pintrich, 2003; Lord, Eccles, & McCarthy, 1994; Pepi, Faria, & Alesi, 2006; Weist, Proescher, Freedman, & Paskewitz, 1995; Whitesell, Mitchell, & Spicer, 2009).

In a study of 279 Italian 11-14 year old students, Bandura and colleagues (1996) researched the varied ways in which self-efficacy influences academic achievement. The authors measured participants’ perceived self-efficacy, emotional and social behaviour, and moral disengagement. The authors found three factors of self-efficacy: academic, social and self-regulatory. Academic self-efficacy directly affected academic achievement, and helped academic success by increasing pro-social behaviour and scholastic aspiration. Social and self-regulatory self-efficacy also played an important role in scholastic success. Notably, self-regulation helped academic performance partly by helping students to maintain moral standards and avoid wayward behaviours that can derail scholastic success. Self-efficacy may also influence a willingness to set challenging life goals (Vieira & Grantham, 2011), including the types of careers young people aspire to (Bandura, Barbaranelli, Caprara, & Pastorelli, 2001).

Self-esteem is another important meta-moral character trait. Like self-efficacy, self-esteem can exist as a global evaluation, or be domain specific and relate to, for example, one’s academic ability or social skills (Carr, 2006). In a study of 634 New Zealand secondary school students, Dowling (2009) found self-esteem correlated positively with student engagement (extra-curricular activities, school connectedness and cognitive engagement), noting this finding echoed the findings of other studies (e.g. Fredricks et al., 2002; Lee & Robbins, 1998). In addition to its benefit for scholastic pursuits, self-esteem may be a protective factor for youth. Donnelly, Young, Pearson, Penhollow and Hernandez (2008) conducted a self-report questionnaire in which 700 adolescents detailed their use of various substances of abuse. Higher
school self-esteem and home self-esteem scores differentiated non-users from those who used or expected to use substances of abuse. Similarly, Backer-Fulghum and colleagues (2011) found that higher self-esteem was associated with lower levels of stress and alcohol related problems.

Self-efficacy and self-esteem are developmental assets that may help individuals to carve a positive path through life. They are part of a well-rounded and balanced character picture. They can facilitate moral behaviour, and are linked to favourable life outcomes. Therefore, programmes that can improve children’s self-esteem and self-efficacy may contribute to their future in a positive manner. Self-efficacy and self-esteem also contribute to an individual’s resilience, another element of character.

**Character and resilience.** Resilience is a broad construct (Cutuli & Masten, 2009) and while it is not often linked directly with character, the two constructs have close ties. Resilience is defined as one’s ability to adapt to change and stress in ways that are flexible and healthy (Catalano et al., 2004), and has been associated with greater levels of positive growth after stressful life events (Dolbier et al., 2010). A resilient person can adapt well during stressful experiences, recover well, and reach greater levels of positive functioning after hardship (Cutuli & Masten, 2009).

The relationship between resilience and character can be seen in studies by Sun and Stewart (2007) and Donnon and Hammond (2007). Sun and Stewart (2007) conducted a study with Australian primary school students in order to test the psychometric properties of a measure of resilience. Combining various pre-existing resilience scales, Sun and Stewart’s (2007) measure was found to assess 12 levels of resilience. Factors that contributed to resilience included certain personal attributes, and positive connections with other people and one’s community. Donnon and Hammond’s (2007) study of seven to ninth grade adolescents found 10 similar resilience factors. These related descriptions of resilience are listed in Figure 1.

The elements of resilience these groups highlight consist of internal personality traits (e.g. self-esteem, empowerment, self-control, commitment to learning), personal pro-social elements (e.g. cultural sensitivity, a sense of social justice), and developmental assets coming from outside the individual (e.g. family, school and community connection, peer relationships, community cohesiveness). There are many links between resilience and character including self-esteem and self-efficacy, and moral and pro-social elements such as empathy, communication and co-operation.
Interventions that help children to develop positive character traits may assist in the development of both personal and social resilience factors by helping them to feel more confident and competent, while also fostering pro-social behaviours in the wider student population. Interventions that seek to enhance elements of character may be delivered in educational settings where teachers have the opportunity to guide students. Physical education, by combining education with elements of play, sport, and physical activity, may be a useful format for character education.

Character Education through Play, Sport, and Physical Education

Social learning, structural developmental, and achievement goal theories. Character interventions using sport and physical education have advanced as sports psychologists
developed key theoretical perspectives to inform their work (Weiss, Smith, & Stuntz, 2008). Three key theoretical perspectives commonly used in these settings are social learning theory (Bandura, 1977; Rotter, 1954), structural developmental theory (Piaget, 1960), and achievement goal theory (Dweck & Leggett, 1988; Nicholls, 1989).

According to social learning theory, children learn pro-social or anti-social behaviour in two ways: by observing their surroundings and modelling behaviours they see in others (parents, sporting heroes, peers, teachers), and through receiving different reinforcement (or witnessing others receiving reinforcement) for the actions they take (Weiss et al., 2008). Moral development is thought to occur through observation of, and reinforcement for, moral behaviour. Teachers can take advantage of this by guiding students toward pro-social activities and through role-modeling and reinforcing pro-social actions (Gibbons & Ebbeck, 1997).

Structural developmental theory sees children’s framework of moral reasoning (the structure through which they perceive right and wrong) developing through an interactive process including two forces: cognitive development, and engagement in the social world (Weiss et al., 2008). From this perspective children learn through active problem solving in the world, whether the problems they grapple with are physical, logical, social or ethical (Kahn, 1997). As structural developmental approaches focus on the interaction between personal factors (such as one’s level of cognitive development) and social forces, a structural developmental approach to character development may include encouraging interaction with others and giving children the opportunity to discuss and solve moral problems (Gibbons & Ebbeck, 1997).

A third theory that can assist in the understanding and promotion of character development is achievement goal theory. This theory recognises that learning contexts can have a great impact on young people’s motivation (Urdan & Schoenfelder, 2006), and that teachers can influence the motivational climate of an environment and students’ achievement goals (Ames, 1992). Achievement goal theory identifies two major achievement goal orientations. These are task/mastery goal orientation and performance/outcome goal orientation (Papaioannou, 1994). When one has a mastery approach, one’s aim is to become increasingly competent at a given task (i.e. kicking a goal accurately, hitting the ball well or perfecting a golf swing), and one will compare oneself to one’s own standards (Papaioannou, 1994). When one is outcome-oriented, the aim is to appear competent compared to others (i.e. outperforming teammates or competitors), and to achieve or surpass an external normative standard (Papaioannou, 1994).
Outcome goal orientations have been linked to an extrinsic motivational style, and may lead to less enjoyment of an activity (B. C. Green, 2008), whereas mastery goal orientation may increase intrinsic motivation for a task (Shields & Bredemeier, 2005) and has been associated with greater self-esteem (Reinboth & Duda, 2004). In physical education settings, compared to outcome-orientation, mastery goal orientation has been associated with greater student persistence, effort and enjoyment (Barkoukis, Ntoumanis, & Thogersen-Ntoumani, 2010).

Motivational climates: climates of character. As well as being influenced by adult educators and role-models, an individual’s character is strongly influenced by groups they are a part of (Shields & Bredemeier, 2005). An understanding of motivational climate may assist teachers and coaches to better facilitate character development. Motivational climates refer to the type of motivation certain environments promote, and are influenced by the goals that groups focus on. In an outcome-oriented climate, group members feel encouraged to strive toward external outcomes such as winning or outperforming others (Papaioannou, 1994). In such settings mistakes are punished, coaches give recognition to the best athletes, and there is a sense of rivalry between team members (Reinboth & Duda, 2004). Alternatively, a mastery-oriented climate promotes increasing competence at any given task rather than focusing on external goals such as winning (Papaioannou, 1994). In mastery-oriented climates every player has a role in the team, emphasis is placed on the effort players expend and the improvements they make, and learning cooperation are encouraged (Reinboth & Duda, 2004). Barkoukis and colleagues (2010) found that when students felt that they were a part of a mastery-oriented physical education environment they were more likely to be mastery-orientated and experience greater intrinsic motivation and positive affect.

Moral and emotional development occurs in relation to cognitive development and involves children internalising standards of behaviour from the outside world (Carr, 2006). Shields and Bredemeier (2005) called the moral norms of a group its climate of character. Positive social and moral development depends largely on the nature of the environment in which one is engaged (B. C. Green, 2008). Typically, outcome-oriented environments are competitive and may not nurture pro-social sentiments and behaviours, whereas cooperative environments may assist in the development of pro-social action (Weiss et al., 2008). Ntoumanis, Taylor and Thogersen-Ntoumani (2012) found outcome-oriented climates in adolescent sport settings were associated with anti-social attitudes, while mastery-oriented
climates were associated with pro-social attitudes. In regard to morality, Mouratidou and colleagues (2007) summarised relevant studies and found that outcome-orientation was linked with the desire to outperform others, endorsing aggressive behaviours, intentional injurious acts, unsportspersonlike play, and lower moral judgement and moral intention. Meanwhile, mastery-orientation was associated with greater respect for sportspersonlike behaviours (including respecting the opponent, officials, and the rules) and moral development in general (Mouratidou et al., 2007).

Mastery climates may also enhance self-esteem. A study of 265 adolescent cricket and soccer players found self-esteem to be high in athletes who felt they were part of a mastery-oriented climate (Reinboth & Duda, 2004). In such climates self-esteem was not contingent on the players’ perceived competence; the players did not have to think they were particularly good at the sport in order to have healthy self-esteem. In addition, Reinboth and Duda (2004) found that participants in outcome oriented motivational environments reported more physical exhaustion and other negative physical symptoms.

Not all young people enjoy physical education (Spencer-Cavaliere & Rintoul, 2012), but mastery-oriented climates may influence one’s enjoyment of, and motivation toward, physical activity. Mastery-oriented physical education climates have been shown to improve satisfaction, effort, and to create desire for greater challenges (Treasure & Roberts, 1995). Cunningham and Xiang (2008) found that students’ perception of the motivational climate they were a part of influenced their goal orientation (mastery vs. outcome) and their subsequent levels of satisfaction with physical activity. Barkoukis and colleagues (2010) found students enjoyed physical education more when they felt they were part of a mastery-oriented environment.

Teachers and coaches play an important role in shaping students’ and players’ motivational environment focusing their goal orientations, and creating a situation that is conducive to character development. Focusing on the process of mastering a physical skill may generate more pro-social tendencies in a group, build self-esteem in many players (not only the best players), and increase students’ enjoyment of physical education. It may help to generate greater intrinsic motivation for physical activity, increasing the likelihood that young people will want to be physically active. This appears to be a good approach to teaching physical education, where the aim is to teach students to move, appreciate movement, relate to other people and show positive values and attitudes (Ministry of Education, 2007), and where children of all
levels of physical aptitude learn together. Teachers and coaches who understand the principles of social learning, structural developmental and achievement goal theories, and who understand how to create mastery-oriented motivational climates, may better guide students and team members in character development.

**Character development through play.** Play has been defined as a voluntary, spontaneous, and pleasurable activity that is engaging while having no direct instrumental purpose (Schriver, 2001). It has also been described as a self-directed activity led by intrinsic motivation (Trawick-Smith & Dziurgot, 2010). Trawick-Smith and Dziurgot (2010) note that Vygotsky (1976) believed autonomous play experiences were essential for children’s cognitive development, while Sommers-Flanagan and Sommers-Flanagan (2009) have called play “the stuff of life” (p.361). Play helps children learn verbal and communication skills, assists the development of interpersonal maturity (Schriver, 2001), and can lead to vital motor skill development, as well as experiences of success that contribute to self-esteem (Bunker, 1991).

While play can be beneficial to children’s development in and of itself, it may be better facilitated by adults when they use a guided scaffolding approach. Using a scaffolding approach (Wood, Bruner, & Ross, 1976), teachers direct children only as much as is needed for them to successfully complete any given task. This offers children experiences of autonomy while still providing them with monitoring and support when it is needed. Trawick-Smith and Dziurgot (2010) found that when teachers used a scaffolding approach successfully, guiding children enough but not too much, children played more independently the next time they engaged in that play activity.

Structuring children’s play well can lead to positive outcomes. For example, child-centred play therapy has been shown to build children’s self-esteem (E. J. Green & Kolos, 2010), and when co-operation and sharing are structured in children’s play activities and reinforced by adults, game-play can foster these pro-social behaviours (Orlick, 1981a, 1981b). Orlick (1981a) assessed the effects of a 16 week intervention in 28 four year old pre-school children. There were three conditions. In condition one the teacher used positive feedback to reinforce cooperative behaviours, while in condition two the teacher reinforced individual behaviours. Condition three was a free play group (where there was no guidance or instruction). After the intervention children in the cooperative group displayed a significant increase in cooperative play (working together toward a goal, helping someone up from the ground etc.) when playing outside. When
playing inside the free play group had a significant elevation in non-cooperative behaviours (refusing to take turns, obstructing others, hitting, tripping etc.). In another study with five year old children, Orlick (1981b) introduced an 18 week cooperative game play programme. Those in the experimental group significantly increased their sharing behaviours compared to control participants.

These results suggest that structuring children’s play, providing pro-social role modelling, and encouraging and reinforcing cooperative behaviour may have a positive impact. Meanwhile, letting children play without consciously considering how that play is structured or reinforced may lead to non-cooperative behaviours. As stated by Orlick, “…if one is concerned with the development of children’s capacity for cooperation, caring and sharing, then one must be prepared to implement play intervention programmes which have been designed for social ends.” (Orlick, 1981a, p.62). Care should be taken in how adults attempt to shape and mould the developmental process of children in play settings. Consideration should also be given to how adults structure and organise sporting environments and physical education settings when working with older children and adolescents.

**Character development through sport.** Sport has received much attention with regard to character development (B. C. Green, 2008; Shields & Bredemeier, 1995; Weiss et al., 2008). The terms moral development, character development, or sportspersonship are often used interchangeably (Weiss et al., 2008). In some cases sport and physical activity have been tasked with great social responsibilities, with governments investing large amounts of money in interventions attempting to create positive social change (Sandford, Armour, & Warmington, 2006). Pierre Coubertin (considered to be the founder of the modern Olympic games) believed the Olympics could promote personal growth, social change, and international understanding and peace (B. C. Green, 2008). The broad-ranging and beneficial role sport is believed to play is revealed further by the United Nations, who stated that sport can “help build a culture of peace and tolerance by bringing people together on common ground” (United Nations, 2004).

While participation in sport can have benefits, evidence suggests that it does not always lead to beneficial character outcomes (Holroyd & Armour, 2003; Shields & Bredemeier, 2005). Shields and Bredemeier’s (2005) review revealed there is little evidence that simply being involved in sport leads to any higher faculties of moral reasoning (including empathy, resolving conflict, and other moral skills), and that being engaged in sport can lead to undesirable
outcomes such as becoming involved in cultures of substance abuse and violence (B. C. Green, 2008). Similarly Greenwood and Kanters (2009) point out that while engagement in sport has been linked with improved mental and physical health, academic achievement, psychological adjustment and emotion regulation, it has also been associated with increased aggression, violence, alcohol abuse, negative interactions with peers and adults and a decline in moral reasoning. Sport has many different variables (i.e. the type of sport, characteristics of the coach etc.), therefore sporting involvement can lead to many different outcomes.

The nature of the environment (e.g. coach, teammates, parents, etc.) may determine whether or not involvement in sport leads to positive social and moral development (B. C. Green, 2008; Theokas, 2009). A study of 355 high school students found that, alongside gender and the type of athletic exercise engaged in, the school environment influenced students’ levels of self-reported sportspersonship (Proios, Doganis, & Proios, 2006). Therefore, like play, in order to optimize the positive influence of sport on a young person’s development, coaches and teachers must take note of how sport activities and participation are structured (Greenwood & Kanters, 2009). It is important to shape these environments consciously.

**Character development through physical education.** Physical education is a training ground for young people’s involvement in sport and physical activity (Boyle-Holmes et al., 2010), and enhancing students’ motivation towards exercise is one of the main objectives for physical education teachers (Barkoukis, Koidou, & Tsorbatzoudis, 2010). A potential benefit of physical education is that it has defined teaching goals that can be delivered through a structured teaching framework; the school’s physical education curriculum. Further to this, while many children participate in sports and physical activities, many more take part in compulsory physical education, making it a very significant context for moral development (Shields & Bredemeier, 1995).

As noted previously, participation in sport may improve character, but it can have varied outcomes depending on the nature of the activity and the social climate of different sport settings. In contrast to sporting environments, physical education has curriculum-based teaching goals, typically focused less on competition and the need to win, and teachers as trained educators can flexibly incorporate moral development training into the teaching context (Shields & Bredemeier, 1995). Further to this, physical education takes many forms (game-play, sports,
fitness, class-based teaching etc.) and can be used as a multidimensional approach to character development; especially as part of a wider school curriculum.

Holroyd and Armour (2003) detailed various physical education based interventions in Britain designed to build positive assets such as physical skill, organizational skill, fair-play attitudes, respect for others, self-responsibility and social-responsibility. However the authors concluded it was unclear what the exact impacts of such interventions were, largely due to the distinct lack of scientific evaluation in the area. Armed with a small number of research findings, the authors highlighted the potentially important role schools can play in re-engaging disaffected, disadvantaged, and disengaged youth through physical activity, sport and physical education, and promoting ongoing positive personal and pro-social development. The authors called for ongoing research in this area; however in subsequent years there appears to have been relatively little progress in the area of physical education and character development.

When it comes to positive youth development, most interventions involving physical activity are extracurricular sport activities, rather than physical education programmes incorporated into the school’s formal curriculum (Escarti, Gutierrez, Pascual, & Llopis, 2010). As observed by Holroyd and Armour (2003) ten years ago, more research detailing well-designed interventions and their efficacy is needed. Weiss and colleagues (2008) stated that although research in the area of sport and moral attitudes and behaviour has grown, it has been mostly correlational or cross-sectional in design. Meanwhile the evaluation of moral development intervention studies has remained relatively scarce. This is especially true of physical education interventions in primary school populations. At the time of writing of this thesis (late April 2013), a search in the databases PsycINFO and Google Scholar for the title words physical education, and the title or key words character, moral, morality, self-efficacy, self-esteem, resilience, and positive youth development, generated a small number of relevant research studies. For the purpose of evaluating physical education research relevant to the current study, empirical research articles with pre and post measures from physical education interventions with general populations in primary or high schools from 1995 on were selected, and are discussed below.
Physical Education Based Character Interventions

Physical education interventions to enhance morality. In response to growing levels of racism, gender inequality, violence, and competition in Greek schools, and in line with the moral development goals of physical education settings in Greece, Mouratidou and colleagues (2007) investigated the impact of an 18 lesson, six week physical education based moral development programme focused on the moral reasoning of 157 high school students. The intervention was based on the principles of both social learning theory and structural developmental theory, and also attempted to promote a mastery-oriented motivational climate. Students in the control and experimental schools were taught the same physical activities (track and field, dance, and volleyball); however those in the control group received a standard teaching approach, whereas in the experimental group the approach promoted a mastery-oriented motivational climate using a reciprocal teaching style. The reciprocal teaching style attempts to give students the opportunity to observe and model moral behaviour, while being reinforced such behaviours (Mouratidou et al., 2007). Experimental group students discussed problems and had rules such as taking turns and listening to others. Students were encouraged to cooperate and help others, and the focus on competition was reduced in favour of promoting a mastery-oriented climate, encouraging self-improvement and self-comparison. Experimental and control groups showed no difference on any measure at baseline. After the intervention, experimental group students reported significantly higher levels of moral reasoning. This study suggests that well-designed and implemented interventions that focus on mastering skills, modelling and reinforcing moral behaviour, and encouraging moral discussion may improve moral reasoning in student populations.

In another study of moral reasoning, Gibbons, Ebbeck and Weiss (1995) investigated the efficacy of the Fair Play for Kids programme; a manualised programme for teachers explicitly based on structural developmental and social learning theories (Fair Play for Kids, 1990) that was designed to foster ideals such as self-control, respect for others, respect for rules, and equality. It also included learning processes related to awareness and resolution of moral issues and perspective-taking (Gibbons et al., 1995). Participants were 452 students from grades four to six, and the programme lasted for seven months throughout a school year. The control group received no intervention, while one group received the Fair Play for Kids programme in physical education classes, and another received the programme’s curriculum in all school subjects. Both
programme groups showed significant improvements in moral reasoning and behaviour when compared to the control group, suggesting that manualised physical education programmes (as well as school-wide programmes that include physical education components) based on structural developmental and social learning theory have the potential to effect positive change (Gibbons et al., 1995).

Later Gibbons and Ebbeck (1997) compared the effectiveness of structural developmental and social learning teaching strategies (both chosen from the *Fair Play for Kids* teaching resource manual) in a physical education setting with primary school students from grades four to six over a seven month period (Gibbons & Ebbeck, 1997). Again the programme was delivered by the students’ usual physical education teachers as part of the standard physical education curriculum. Teaching strategies for the structural developmental classes included problem solving tasks related to moral conflict, and using games with inherent moral dilemmas to prompt discussions and resolution processes facilitated by teachers (Gibbons & Ebbeck, 1997). Alternatively, the social learning approach included the teacher role-modeling fair play and giving reinforcement for such behaviour. Control teachers had guidelines for appropriate behaviour but did not use *Fair Play for Kids* materials. There were three student measures (moral judgement, moral reasoning, and moral intention) and a teacher scale assessing students’ pro-social behaviour.

Results supported the use of both structural developmental and social learning approaches to enhance moral development through physical education. The structural developmental group showed significant improvements compared to controls on all four moral scales, while social learning participants showed significant improvements in all areas except moral reasoning. As control groups showed no significant improvement, Gibbons and Ebbeck (1997) suggested that physical education by itself may not create the positive development that well-designed programmes can offer.

In a study not immediately focused on morality, but which assessed self-regulation, classroom conduct, and pro-social behaviour, as well as self-esteem, Lakes and Hoyt (2004) examined the impact of a school-based martial arts class on students’ levels of self-regulation. Participants from kindergarten to fifth grade were randomly assigned to an experimental group receiving martial arts training, or a control group receiving ‘traditional physical education’. The authors noted the important outcomes that stem from self-regulation (including the ability to
delay gratification and refrain from destructive behaviours), and that martial arts systems often seek to foster such qualities. They conducted a three month martial arts intervention programme, including two to three martial arts sessions per week in normal physical education time. Here students bowed to the trainer, did breathing meditation, and engaged in physical training (stretching, punching, kicking, blocking, breaking boards). There was also a strong focus on awareness, as students were reminded to consider what they were doing, and what they should be doing, physically, mentally, and behaviourally. Overall Lakes and Hoyt (2004) described the teaching environment as being characterised by self-control, discipline and respect. Self-esteem was not different between experimental and control groups after the intervention, but the experimental group had greater improvement in cognitive and affective self-regulation, classroom conduct, and pro-social behaviour. Interestingly children appeared to benefit more the older they were, suggesting the intervention was more suited to older students.

It is important to note that this intervention was hosted by a black belt instructor (Lakes & Hoyt, 2004). This diverges from other studies discussed, where the usual physical education teacher lead the interventions. Programmes requiring highly skilled and specially trained individuals severely limit their widespread use in schools. In order to positively influence many children, physical education programmes must be easy for class teachers to roll out. They should also, as previously mentioned, attempt to promote moral discussions, model and reinforce pro-social behaviour, teach self-regulatory skills, create mastery-oriented environments, and be well implemented. The results of these intervention studies suggest that well-designed interventions can influence students’ moral development.

**Physical education interventions to enhance self-efficacy.** While various studies focus specifically on physical activity self-efficacy (e.g. Dishman et al., 2004), few focus on physical education and general self-efficacy. Two physical education intervention studies were however identified assessing self-efficacy in a broader sense. Escarti, Gutierrez, Pascual and Marin (2010), assessed the impact of an intervention designed to promote students’ personal and social responsibility and self-efficacy, using the Teaching Personal and Social Responsibility (TPSR) approach (Hellison, 1985; Hellison & Wright, 2003). TPSR is a physical activity-based approach using student strengths and focusing on skill mastery that aims to promote young people’s self-control, responsibility, effort, autonomy, empathy and respect for others (Escarti, Gutierrez, Pascual, & Marin, 2010). Participants included thirty Spanish 13 and 14 year old students from
two schools (one control group, one experimental), who had been identified as having adjustment problems, poor academic performance, and who were at risk of withdrawing from high school. The intervention included an intensive physical education teacher training (30 hours), and ongoing support (six hours) for the students’ classroom teachers. There was also a six hour training programme for students, introducing them to the intervention, and creating collaborative educational goals for the development of personal responsibility (Escarti, Gutierrez, Pascual, & Marin, 2010).

Throughout the eight month intervention, teachers helped students to create caring relationships, focused on positive behaviours and strengths, and allowed students’ decision making power and the chance to contribute to their community. This was thought to foster responsibility, empowerment and transference of responsibility from teacher to students, and the generalisation of responsible behaviour from the physical education class out into the wider world (Escarti, Gutierrez, Pascual, & Marin, 2010).

Interview findings suggested that students found the intervention beneficial and enjoyable. They believed they had more self-control and respect for others, and stated that others had commented on their positive changes. Class teachers reported finding the programme to be effective and backed the students’ claims that they had undergone positive change. Quantitative findings from four self-efficacy scales (enlisting social resources, self-regulated learning, self-regulatory self-efficacy, and social self-efficacy) found self-regulatory self-efficacy and perceived social self-efficacy improved for both control and experimental groups over the eight month intervention period. However, the intervention group (who had poorer self-efficacy for enlisting social resources and self-regulated learning than the control group at baseline), showed greater levels of self-efficacy for enlisting social resources and self-regulated learning at the end of the intervention, and maintained these gains at follow-up six months later (Escarti, Gutierrez, Pascual, & Marin, 2010). Although there was a relatively small sample size in this study (N=30), and the intervention was targeted to a specific subset of students (rather than a general programme for an entire school population), there are interesting conclusions to be drawn. Physical education interventions can influence different elements of self-efficacy and such improvements are linked to reported improvements in behaviour and social experiences for participants.
In another self-efficacy intervention using physical education and the TPSR approach, Escarti, Gutiérrez, Pascual and Llopis (2010), recruited 42 students (aged 11 and 12) from two schools (one experimental, one control). The study took place in a general physical education setting (rather than in alternative settings where the TPSR approach had been most used and evaluated). The intervention was run throughout a school year by the experimental class’s physical education teacher, who again received 30 hours of training with additional ongoing support. Each physical education class was structured in the following way: first the class discussed the purpose of the day’s lesson and the teacher’s expectations, participants then engaged in a physical activity (field and bat games, juggling, skating and acrogym) where they were expected to act with social and personal responsibility. Finally, the class discussed the lesson and completed self-evaluations. Student questionnaires revealed that while control and experimental group participants’ social and self-assertive self-efficacy increased throughout the measurement period, the intervention promoted TPSR group members’ self-regulatory self-efficacy.

It should be noted that in both of these studies (Escarti, Gutiérrez, Pascual, & Llopis, 2010; Escarti, Gutiérrez, Pascual, & Marin, 2010), control group participants improved as much as experimental group participants on some measures of self-efficacy. This is unusual in terms of other research on character development, and may relate to not controlling for baseline demographic differences, an important consideration in character research (Corrigan et al., 2007). It may also be caused by having small sample sizes. The small sample sizes in both studies increase the chance that an unaccounted for influence (e.g. the control teacher’s approach to teaching, or the control class culture), were particularly conducive to promoting self-efficacy.

**Physical education interventions to enhance self-esteem.** Noting the positive influence physical activity can have on psychosocial factors such as self-esteem, social skills, and academic performance, Marino (2011) found that an eight week aerobic dance programme with 64 experimental students (8-10 years old) showed no significant improvements in self-esteem, academic performance, social skills, or disruptive behaviour when intervention group members were compared to controls. This may be due to the fact that the classes were run in physical education time for only 40 minutes, once a week. Also, using just one approach (in this case dance) without other educational components may not be enough to lead to desired outcomes.
Boyd and Hrycaiko (1997) investigated a physical activity and education-based intervention for its effect on the self-esteem of pre-adolescent and adolescent girls. The sample included a control and experimental class in six different school grades. The grades were then grouped into three age brackets: fourth and fifth grade, seventh and eighth grade, and ninth and tenth grade students. The intervention included physical activities in the school gym for six weeks during the class’s usual physical education periods. Experimental group participants were taught by the investigator while control classes continued with their usual physical education teacher. The intervention attempted to achieve global self-esteem gains by providing successful experiences in different domains. Pre-adolescents focused on strength training and skill development, while adolescent groups did a weight circuit with a focus on fitness. Throughout, an education component focused on the benefits of physical activity and physical fitness and the older groups also had discussions about weight management, nutrition and beauty (Boyd & Hrycaiko, 1997). Findings showed that the pre-adolescent group had a significant improvement in global self-esteem. This was thought to be due to a shift in physical appearance self-concept. Overall the younger group had the most benefit from the intervention, while the older two groups experienced little change. The small sample size in each age group may have contributed to the lack of significant findings. Students complained that the intervention was not long enough and lacked intensity (Boyd & Hrycaiko, 1997). Also, the author describes the basis for the intervention to stem from sparse information in the literature and the expertise of the lead researcher (Boyd & Hrycaiko, 1997). Lessons from this study speak to the importance of having a large enough sample size, basing interventions and measurements on theoretical principles, delivering interventions that young people enjoy and find engaging, and delivering them long enough to have a desired effect.

**Summary of physical education based character interventions.** There is some evidence that physical education can be a useful agent for positive change, however more research is needed in this area. This is especially true of resilience, as no physical education intervention studies were found that specifically target that construct. In some studies control groups made similar improvements to experimental groups on some measures, while at times members of experimental groups (and control groups) made little change. These findings may be due to various factors. Particularly when sample sizes are small, baseline control group characteristics (such as cultural group membership or age) may lead to improvements in control
group character scores. Therefore baseline differences should be controlled for to allow for a true comparison (Corrigan et al., 2007). When there is a lack of findings it may be due to the intervention not being effective, or the research method not being able to detect changes.

Overall, positive changes appear to occur mostly through the concerted efforts and positive influence of intervention designers and teachers. Effective physical education programmes and interventions require good planning and execution, and should therefore take advantage of evolving best practice recommendations in the field.

**Best Practice Approaches: Recommendations for Effective Character Education using Physical Education**

There are a broad range of approaches when considering character education, and while sport and physical education based positive youth development interventions may have different participants, goals and contexts, and may use different activities, certain approaches may best facilitate character development. In recent decades research has allowed best practice principles to emerge and evolve. The following recommendations come from character education and positive youth development literature in different settings, including those from general education, sport, and physical education environments. Recommendations for best practice include:

- Taking a multifaceted, multidimensional approach, including some form of structured curricular intervention (Berkowitz & Bier, 2004; Catalano et al., 2004). Effective character initiatives are more than stand-alone programmes put out into the school market (Corrigan et al., 2007). They are often based on comprehensive reforms that occur at the school level, thereby shaping the culture of the school and its members (e.g. Berkowitz & Bier, 2004; Galloway, 2008). Programmes should, as much as possible, permeate the school’s culture by touching on different areas of school life.

- Effective character education is thought to stem from the nature of the relationships throughout the school. Successful programmes build social relationships and foster community, often through focusing on cooperation, positive social values and creating a caring environment (Berkowitz & Bier, 2004; Berkowitz & Bier, 2005; Corrigan et al., 2007; Green, 2008; Holroyd & Armour, 2003; Sandford et al., 2006).
- Professional development is a key component in sound programme design to ensure teachers are well trained and the programme is implemented as intended (Holroyd & Armour, 2003). Teachers should be given an underlying philosophy, and close guidelines for course content and delivery. Teachers have reported that having well-structured curriculum guide books, professional development and ongoing support are important factors in maintaining programme fidelity (Boyle-Holmes et al., 2010).
- Educators should adhere to the programme and deliver it completely, for a long enough duration (Berkowitz & Bier, 2004; Corrigan et al., 2007) (ideally for 10 weeks or longer, Catalano et al., 2004).
- Teachers and principals have an important influence on the school’s culture of character (Berkowitz & Bier, 2004; Corrigan et al., 2007). Programmes should promote positive leadership and role-modeling from adults, including teachers, principals (Corrigan et al., 2007). They should also engage with parents and the wider community (Berkowitz & Bier, 2004; Corrigan et al., 2007).
- Programmes should focus on encouraging multiple character elements (e.g. resilience, social competence, moral competence, self-efficacy, opportunities for pro-social involvement etc.) (Catalano et al., 2004).
- Teachers should encourage decision making and problem solving so that students have experiences of autonomy (Holroyd & Armour, 2003).
- Interventions should build sound structures for ongoing sustainability (Holroyd & Armour, 2003; Sandford et al., 2006).
- Interventions should ensure credible programme monitoring and evaluation (Holroyd & Armour, 2003).
- Taking into account social learning theory, interventions should include appropriate role modelling, mentoring, and social rewards (Weiss et al., 2008).
- From the perspective of structural development theory, interventions should highlight moral issues and involve moral problem solving in order to strengthen moral capacities (Weiss et al., 2008). Teachers should encourage self-reflection and reflection on moral and social issues through peer discussions (Berkowitz & Bier, 2004).
- With regard to achievement goal theory, teachers should promote a mastery-oriented motivational environment that encourages skill development, effort, involvement,
persistence and enjoyment, rather than emphasising competition and the need to win (Shields & Bredemeier, 2005).

- Successful programmes provide participants with a positive experience (Green, 2008). Physical education should include experiences where students feel happy through simply participating, meaning it is intrinsically valued rather than being seen as a means to an end (L. J. Wright, 2004). This may promote a natural attraction for physical activity, and nurture aspects of character such as self-esteem.

Wright and Li (2009) recommend using physical education as a part of a comprehensive school based positive youth development intervention designs. However, best practice requires careful planning and implementation (Sandford et al., 2006). Through a combination of these approaches educators may facilitate students’ character development.

**Character Education in New Zealand**

Schools are a highly suitable arena for preventative and early intervention programmes, offering a large captive audience, and allowing contact with a broad range of the population (Holroyd & Armour, 2003; Masia-Warner, Nangle, & Hansen, 2006). Knowing this, it is essential that considerations are made regarding how to best support children, and nurture their positive development throughout the schooling system. Accordingly, there is already some focus on character development in New Zealand schools as positive youth development is given a key place in the Youth Development Strategy Aotearoa (Ministry of Youth Affairs, 2002). This document states government practice and policy should be informed by sound research and have a positive youth development approach that helps to build protective factors in youth and focuses on youth participation and quality relationships (Ministry of Youth Affairs, 2002).

This positive youth development focus is manifest in the New Zealand Education Curriculum’s five key competencies (Ministry of Education, 2007): 1) managing self, 2) relating to others, 3) participating and contributing, 4) thinking, and 5) using language, symbols and text. In one study, New Zealand secondary school students reported that they believed physical education, more than any other school subject, assisted in the development of all of every key competency (Brudevold-Iversen, 2012). The New Zealand health and physical education curriculum specifies four broad educational goals as part of the five key competencies: personal
health and physical development, movement concepts and motor skills, relationships with other people, and healthy communities and environments. The health and physical education curriculum should build students’ resilience through improving self-worth, empathy, and social skills (Ministry of Education, 2007). Physical education focuses on how movement can help individuals and communities, and teachers are tasked with teaching students how to move and appreciate movement, display positive attitudes and values, and relate well to other people (Ministry of Education, 2007).

The Ministry of Education (2007) tasks primary school teachers with building children’s key competencies, yet often there is little guidance as to how teachers should approach teaching these competencies through their different subjects (Hipkins, 2010). In order to meet these goals it has been suggested that schools may have to use evidence-based methods that focus on particular character traits (Galloway, 2008). In New Zealand various methods are currently being used by different groups to foster character in the student population.

**The Foundation for Character Education.** According to Heenan (2009), The Foundation for Character Education (NZFCE) has produced teaching resources for hundreds of New Zealand schools, while also holding conferences and conducting research. The NZFCE approach is to provide teaching content focusing on eight *cornerstone values* of good character: 1) honesty and truthfulness, 2) kindness, 3) consideration, 4) compassion, 5) obedience, 6) responsibility, 7) respect, and 8) duty (Galloway, 2008). Foundational to their approach is the philosophy that character is learned through modeling; therefore they place importance on school culture and school relationships. The eight values are taught in class with a focus on one value per school term. It is intended that the values should be modelled throughout the school and its processes, with the goal to imbue school affairs with positive character values (The New Zealand Foundation for Character Education, 2010). There is some evidence to suggest that this approach has had a positive impact. The NZFCE assessed schools participating in its ‘Cornerstone values’ programme via questionnaire in 2004 (31 schools) and 2007 (34 schools) (McDonald, 2005, 2007). Almost 90% of the participating schools were primary schools. Findings showed improvements in student behaviour, a reduction in disciplinary activity (McDonald, 2005), a reduction in vandalism, an improvement in staff morale, improved quality of relationships (inter-student and student-staff) and an increase in the perception of the school as a caring community (McDonald, 2007).
Kiwi Can, Stars, and Project K. The Foundation for Youth Development created three projects designed to promote positive youth development: Kiwi Can, Stars, and Project K (Foundation for Youth Development, 2012a, 2012b, 2012c). Aligning with youth development strategy Aotearoa NZ, the programmes seek to build students’ strengths and protective factors, with the aim of promoting youth potential.

Kiwi Can is designed for primary and intermediate school children, with the aim of building confident children through instilling values and life skills including self-worth, self-confidence, a sense of responsibility and accountability, and a ‘can do’ attitude to life and its challenges (Foundation for Youth Development, 2012a). Kiwi Can is a co-curricular programme run by Kiwi Can staff in many New Zealand schools, delivering interactive lessons about relationships, resilience, integrity, health and the environment. Children attend one class a week where leaders facilitate interactive theme-based lessons with various creative mental and physical challenges. While research is currently being conducted on this programme, no findings were available at the time of writing.

Stars is a mentoring based programme, aiming to help young people through their transition to high school (Foundation for Youth Development, 2012c). Year nine students are mentored by year 12 and 13 students, and the programme focuses on communication, time management, goal setting, and building relationships. Alongside weekly mentoring sessions, students go on a week-long adventure camp with teachers (to help build the mentor-mentee relationship), plan a day of community service, and take part in a careers expo. There is some evidence that students may experience some benefit from participating in the Stars programme (Noonan, 2011).

Finally, Project K is a 14 month intervention designed to help year 10 high school students with low self-efficacy to learn team building, self-reliance, perseverance, goal setting, life skills, good health, and self-confidence (Foundation for Youth Development, 2012b). The programme design includes mentoring, a community challenge, and a wilderness adventure. Zhang (2011) found that Project K participants developed healthier eating habits and were truant less than control group students a year after the intervention. Qiao and McNaught (2007) found that compared to controls, Project K participants showed greater self-efficacy improvement, which was maintained at a one year follow-up. The positive impact on self-efficacy was most
notable for low decile students and Maori students. Deane (2012) found that Project K positively influenced students social and academic self-efficacy when compared to control group students.

**Kids Rich in Character.** The health and physical education curriculum in New Zealand aims to guide children toward greater levels of personal and social wellbeing, ensuring they have what is needed to lead a good life and contribute to the lives of others in positive ways (Ministry of Education, 2007). Such goals align well with the aims of character education. To facilitate the incorporation of the principles of character education within school programmes, while at the same time meeting physical education curriculum requirements, a manualised curriculum-based physical education character development programme could be beneficial. Kids Rich in Character is an example of such a programme, and is the focus of the current research.

The Kids Rich in Character (KRIC) programme is a multi-modal approach to positive youth development which focuses on building competence, confidence and character in youth (Quantum Sport, 2010). It is a school-wide physical education based programme that meets Ministry of Education curriculum guidelines for teaching physical education and is currently being implemented in some New Zealand schools. KRIC was developed to promote values outlined in the New Zealand education curriculum, encouraging excellence, respect, diversity, integrity and community. The New Zealand curriculum asks schools to ensure these values are integrated into class teaching, and the KRIC programme provides teachers with curriculum-based class plans and content for physical education modules.

The KRIC programme is comprised of two main elements: 1) a game-play component on the sports field, and 2) in-class components such as class discussions, presentations and exercises. The game-play element includes a structured set of physical education game-play drills with a mastery approach. For example, students may focus on mastering the individual physical and tactical elements involved in being good at playing a game of tag. Class presentations include PowerPoint presentations related to the game-play elements, motivational video clips, and quotes from famous people focusing on motivation, socio-moral competencies and confidence building. There are also class activities and exercises where, for example, students are asked to detail the virtues of their sporting role-models, discuss where rules are helpful in life, describe their life goals, and consider the type of friend they wish to be.

The teacher in this programme is charged with creating a mood that is conducive to student participation, appreciation, voicing opinions, and contributing in general. As shown in
intervention studies mentioned earlier, and intervention research in other areas such as anxiety and depression, teacher-led programmes can be very effective (Lowry-Webster, Barrett, & Dadds, 2001; Neil & Christensen, 2009). Prior to implementation teachers are given two three hour professional development sessions with KRIC leaders, and then given curriculum material (including teaching guides, hand-outs, and multimedia presentations etc.) to guide their teaching both on the field and in the classroom. The teaching approach is to encourage children to focus on a progression of skill development, on many levels and in many areas (physical, interpersonal, educational etc.).

For students the KRIC programme begins with a launch where well-known New Zealand sports people (chosen by KRIC designers for their good character standing) come to the school to talk to the students. Then the KRIC programmes introductory ten week block begins where the fundamental approach and foundational concepts are introduced. The overarching theme of the first ten weeks is Being Better than Before. This theme is repeatedly highlighted through teachers’ presentation material. Within this theme three sub-themes are taught. The first is Winning at the Game of Life, where winning is considered to be doing one’s best and being better than before. Rather than beating others winning is seen as improving on one’s own past performance, a philosophy repeatedly presented to students. The second sub-theme is Rules and Boundaries. In this section students play games in which they must form their own rules. For example, they are asked to play a game, but are given no guidelines. This leads to discussion about the usefulness of rules and boundaries in life. The third sub-theme is Going for the Goal and explores the importance of focus in achieving one’s physical activity and life goals. Through class presentations, each of the three sub-themes is consistently linked back to the overriding concept; that winning is trying one’s best and being better than before.

The KRIC programme has a pro-social approach and encourages class interaction. With a multi-angled strategy (game-play and class presentations, discussions and exercises) attempts are made to reinforce students’ character development in various ways. Themes are introduced and tested during game play, then discussed later in class, in an attempt to teach character both implicitly (through physical activity and game-play experiences), and explicitly (through teaching and discussion). With a pro-social, mastery-based focus, KRIC may guide educators in fostering positive motivational climates that enhance students’ enjoyment of physical activity, as
well as stimulating the development of character faculties through experiences in physical education sessions both on and off the sports field.

**Assessing the Effectiveness of a Physical Education based Character Education Approach**

While many character development programmes and products have been created and introduced, few are assessed with vigour (Corrigan et al., 2007). There is much room for systematic assessment of character programmes and interventions (McDonald, 2007), and this is especially true of physical education settings. The Ministry of Education’s five key competencies align with the goals of character development initiatives, and well-designed physical education approaches may help teachers, especially if they feel unsure about how to teach the key competencies in a physical education setting.

The purpose of the present study was therefore to assess the impact of a curriculum-based physical education programme with a mastery-based approach, using game-play and in-class discussions, exercises and presentations. To the authors knowledge this is the first assessment of such a programme in New Zealand.

**Research Questions**

1. Can a curriculum-based physical education approach, using game play and in-class exercises and discussions, influence elements of character (morality, self-efficacy, self-esteem, and resilience) in primary school children?

2. Does this approach to teaching physical education influence students’ confidence in, and/or enjoyment of, sport and physical activity?
CHAPTER II: METHODS

Research Design

The current study used a quasi-experimental between and within subjects design to examine the effectiveness of a character development programme administered in physical education classes; Kids Rich in Character (KRIC). Researchers did not attempt to influence how the programme was taught, preferring to take a natural experiment (Bryman, 2008) approach, evaluating the programme as it may be applied in an everyday setting under real-world conditions.

Timeframe of Programme Evaluation

In KRIC’s introductory ten week block the programme is launched at the school and the foundational concepts are introduced (Being Better than Before: Winning at the Game of Life, Rules and Boundaries, and Going for the Goal). All schools using KRIC begin the programme with these standardised teaching materials before going on to select from a range of different teaching resources. To ensure we assessed KRIC’s most standardised components (and could therefore better generalise any findings made) the introductory ten week block was chosen as the time frame for the current research.

Ethics Approval

Ethical approval for the current study was granted for three years by The University of Auckland Human Participants Ethics Committee on September 8th 2010 (Reference Number 2010/249). Please refer to Appendix A for all ethics documents (including participant information sheets and consent forms).

Recruitment

As the programme was being taken up voluntarily by schools interested in the KRIC programme it was not possible to obtain a random sample of participants. Rather, schools already interested in implementing KRIC were invited to participate in the study. The principals of these schools were initially approached by KRIC developers and asked if they would like to be involved in the study. If principals were willing, the researcher then contacted them directly to discuss the research and their school’s potential participation. They were given principal
participant information forms, and copies of all teacher and student participant information forms and measures. After principals consented to their school participating in the study, schools about to implement KRIC were enrolled as programme schools, while schools planning to implement KRIC in the future were enrolled as control schools.

Classroom teachers were then approached by the principal for their consent. After teacher consent was given, teachers gave participant information sheets and consent forms to students to take home to their parents or guardians. These detailed the study and asked parents for signed permission to allow their child to take part. Children then brought the signed consent forms back to the school. Students also signed assent forms on the first day of data collection (a process detailed below in the data collection section). While the original research plan was to assess year six students only, due to the small number of schools available, and the fact that many New Zealand primary schools have mixed classes, year five students from mixed classes were also included if they were nine years old at the start of data collection.

Participants

Four schools in the greater Auckland area took part. All schools fell in the lowest of ten socio-economic decile bands (i.e. decile one). There were nine programme group classes in total (from three schools), and six control group classes (from one school). Only one control school was investigated due to the difficulty recruiting control schools. However, this school had a large number of students in mixed year five and six classes.

Overall 384 students in the 15 participating classes taking part in the study were approached and asked to participate through consent forms they took home to their parents. Of these students, 257 were given consent to take part (66.93%). Sixteen students could not take part as their parents denied consent (4.17%), and a further 111 consent forms were not returned (28.91%). Six students who were given parental consent were not yet nine years old on the day of first measurement; therefore they were not assessed (2.33% of those given parental consent). There were 21 students away on the first day of measurement (8.37% of students who had been given consent), meaning 230 were approached for their assent to participate at time one. All 230 students gave their assent and completed measure one. At the time of the second measure, 46 of these students (20.00%) were lost to follow up due to being absent or having left the school.
In total, 184 students completed both measure one and two (80.00% of those who had completed measure one, and 47.92% of all students). However, in one programme class the class teacher changed between measure one and measure two, therefore their data and the data from the 11 students in that class (who had completed time one and two measures) was removed. Also, the data for three students who had completed time one and time two measures were removed from the study as they had missed over half of the questionnaire at either time one, time two, or at both time points.

The final working data set included 170 participants, with 86 programme participants (50.6%) and 84 control participants (49.4%). The mean age for all participants at baseline was 10.07 years old (programme = 10.15 years; control = 9.98 years). Of these 170 participants there were 97 females (57.1%) and 73 males (42.9%).

Of the 170 participants, 108 identified as being Pacific Islander (63.53%), 21 identified as being Maori (12.35%), 15 identified as being Asian (8.82%), 11 identified as being Maori/Pacific Islander (6.47%), eight identified as Other (4.71%), five identified as being Pakeha/Pacific Islander (2.94%), one identified as Middle Eastern (0.59%), and one identified as being Pakeha/Maori (0.59%).

Fifteen teachers also took part, and all who were approached gave their consent. As noted, one programme teacher changed half way through the measurement period and their data was not used. This left data for fourteen classes and their teachers overall, with eight programme and six control teachers (11 female and three male).

**Measurement Timing**

Measurements were taken at two time points. In the programme schools baseline data was taken in normal class hours before they started KRIC. Each of these schools started KRIC within one month of each other. Control group time one measures were taken in a similar time period. We aimed to collect time two measures after ten weeks of KRIC implementation, as this matched the programmes’ introductory block structure. Between time one and time two measures there was a two week school holiday, therefore three weeks were added to the optimal measurement period to compensate for this break and to allow time for students to readjust to the programme after the holiday period. As we needed to measure at times that were suitable to each school, the times between measure one and measure two for each school were slightly different.
(school one = 14 weeks and two days, school two = 16 weeks and three days, school three = 15 weeks and four days, control school = 13 weeks and six days). Therefore, among the programme schools KRIC exposure ranged from 12 to 14 weeks.

Data Collection and Student Assent Process

For baseline data, the researcher went to schools to give the measures to the teacher and their students. To obtain the assent of students whose parents or guardians had given consent for them to participate in the study, the researcher first read the student participant information sheet aloud to the class, before giving participating students a copy of it. The researcher asked children to be as open as they could, saying the questionnaire was not a test, and all the students had to do was to answer as openly as possible. Students were told that they were under no obligation to do the questionnaire, they could leave out any questions they did not want to answer, and could stop any time they wanted without completing the questionnaire. They were also told to put their hand up if they had any difficulty answering any question, at which point the researcher would help them. Further to this, if they experienced any discomfort related to the questionnaire they were told they could talk to their teacher or the researcher about their concerns.

Students were then asked if they had any questions, before being given assent forms to sign. Once the assent forms were collected the researcher handed out the student questionnaire for students to complete. Students not taking part in the study were able to read silently while their classmates completed the questionnaire, which took approximately 15 minutes. Teachers completed the teacher questionnaire at the same time, which took them approximately 10 minutes. Control schools underwent the same procedure as programme schools.

Data was collected in the same way at time two (without the assent process). All measures remained the same; however the programme group’s teacher questionnaire contained additional questions about their experience with the KRIC programme (the additional questions took approximately 10 extra minutes to complete).

Measures

Student questionnaire. As noted, the 53 item student questionnaire took approximately 15 minutes to complete. The measure was pilot tested on six children to ensure it was appropriate and acceptable. These children reported finding the measure understandable in terms of its
wording (except for one item in the moral character measure, detailed below), and acceptable in terms of its duration. The student measure included demographic questions (gender, age, first language, and ethnicity), measures of four character domains (morality, self-efficacy, self-esteem, and resilience), one question asking about students’ perceived ability in sport and physical activity, and one question assessing their enjoyment of sport and physical activity (please refer to Appendix B for copies of all measures).

It was important the student measure was an acceptable length as judged by school principals and teachers, as they needed to give their consent for the study to proceed. It also needed to be an acceptable length for primary school students. Measures would be completed in class time and we did not want to interrupt student learning for too long. The measures chosen had proven reliability in students of different ages (ranging from 8 to 16 years old), however not all had proven reliability in the current age range (9-11 years). Despite this they were considered the most appropriate measures to use due to their brevity and ability to assess a broad range of character elements. Selected items were removed from three measures where there appeared to be some repetition. In these cases Cronbach’s alpha levels would show if these changes impacted negatively on the scale’s internal reliability. One measure (general self-esteem) was reduced to a single item. Single item measures may work best when the question asked is concrete in nature (Bergkvist & Rossiter, 2007), and the three single item measures (the modified general self-esteem scale, perceived ability in sport and physical activity, and enjoyment of sport and physical activity) each appeared to have strong face validity. However, reliability of these measures was assessed using test-retest correlation coefficient analyses. Where items were removed from scales it is highlighted below under the relevant measure description. The impact of this is discussed in the results and discussion chapters.

**Morality. Responsibility for Self: Moral Character.** The 11 item Moral Character scale from the Collective Responsibility for Excellence and Ethics survey (CREE) (Student Form) (Khmelkov & Davidson, 2007) was used to assess participants’ commitment to being ethical, responsible, and to doing the right thing in different situations. Khmelkov and Davidson (2008) reported acceptable alpha reliabilities ($\alpha=.76$) ($N=453$) in middle school samples. In a fourth grade sample in a primary school setting ($N=124$) Corrigan and colleagues (2007) reported questionable alpha reliability ($\alpha=.60$), however Corrigan, Klein and Isaacs (2010) reported an
acceptable alpha reliability (α=.77) in a combined sample of seventh grade and tenth grade students.

As pilot tested children reported being confused by the last question in the moral character measure (item 53 of the combined student scale), it was changed from “I consider different points of view when making a decision about a moral issue or dilemma” to “When I have to decide what is right or wrong, I think about what other people would do in that situation”. Other items in this scale include “When I see someone having a problem, I offer to help”, and “I speak up when someone is bullied”. Items were rated on a five point Likert scale from ‘Never’ (1) to ‘Always’ (5).

**Self-efficacy. Sense of Efficacy Scale.** The Developmental Studies Center’s (DSC) nine item Sense of Self-Efficacy scale was used in order to assess general self-efficacy in participants (Developmental Studies Center, 2005). All DSC measures used in the current study were the middle school versions (which had been tested on students in grades six to eight). The DSC (2005) report a good alpha reliability (α=.81) for the sense of efficacy scale in grade six to eight students. Questions in the sense of efficacy scale all start with the stem “How sure are you that things will work out well…”, and items include “…when you have to learn something new at school?”, “…when you are having trouble with your schoolwork?”, and “…when things are going wrong?”. Items were rated on a five point Likert scale from ‘Not at all sure’ (1) to ‘Very sure’ (5).

**Self-esteem. General Self-Esteem.** To measure general self-esteem, the DSC’s (2005) General Self-Esteem scale was used. However, it was reduced from three items to one, to ensure the questionnaire remained an acceptable length. The DSC (2005) report that the three item measure has shown a good alpha reliability (α=.80) in grade six to eight students. The two items that were removed for the current study were “I wish I were different from the way I am”, and “I like myself”. The item used was “I like myself just the way I am”, and was rated on a five point Likert scale from ‘Don’t agree’ (1) to ‘Agree a lot’ (5).

**Academic Self-Esteem.** To measure academic self-esteem, the DSC’s (2005) Academic Self-Esteem measure was used. The four item measure was reduced to two items. The DSC (2005) report that the four item measure has shown a good alpha reliability (α=.82) in grade six to eight students. Corrigan and colleagues (2007) report an acceptable alpha reliability (α=.70) in a primary school sample (124 fourth grade students), and an acceptable alpha reliability (α=.73)
in a middle and high school sample (grades seven and ten) (Corrigan et al., 2010). The two items that were removed for the current study were “I am doing a good job in school” and “I am not a very good student”. The items used in the current study were “I don’t do very well in school”, and “I think I’m a good student”. Items were rated on a five point Likert scale from ‘Don’t agree’ (1) to ‘Agree a lot’ (5).

**Resilience. Resiliency.** Five sub-scales of the Sun and Stewart (2007) Student Resiliency Scale were used: Communication, Self-Esteem, Empathy, Problem Solving, and Goals and Aspirations. There are 12 items in total in these five scales. In a pilot study, Sun and Stewart (2007) surveyed 189 students in four primary schools, and found their scale had an excellent alpha reliability (α=.92). Examples of the resiliency subscale items include “I enjoy working with other students”, “I feel bad when someone gets their feelings hurt”, “I know where to go for help when I have a problem”, and “I have goals and plans for the future”. Items were rated on a five point Likert scale from ‘Never’ (1) to ‘Always’ (5). The resiliency self-esteem subscale differed from the general self-esteem scale in that items focused on a perceived ability to do things rather than directly assessing a perception of self-worth. As an example, one item states “I can do most things if I try”.

**Responsibility for Self: Performance Character.** The 12 item Performance Character scale from the CREE (Khmelkov & Davidson, 2007) Student Form was used to assess participants’ commitment, self-discipline, and willingness to challenge themselves to improve their skills, knowledge or attitude in various life settings (Khmelkov & Davidson 2007). Khmelkov and Davidson (2008) reported acceptable alpha reliabilities (α=.71) in middle school samples (N=452). There is little data for this scale’s use in primary school settings. When used in a primary school setting with students in fourth grade (N=124) Corrigan and colleagues (2007) reported poor alpha reliability (α=.56). However, Corrigan and colleagues (2010) reported a good alpha reliability (α=.80) in a combined sample of seventh grade middle school students and tenth grade high school students. Items in this scale include “I think about my school work and consider whether I need to work harder”, and “I run out of time to do my assignments well”. Items were rated on a five point Likert scale from ‘Never’ (1) to ‘Always’ (5).

**Liking for School.** Three of the six items of the DSC (2005) Liking for School Scale were used. The DSC (2005) reported that the six item measure has shown a good alpha reliability (α=.83) in sixth to eight grade students. Corrigan and colleagues (2007) reported a good alpha
reliability (α=.86) in a primary school setting (124 fourth grade students). Items removed in the current study were “I’m bored in school”, “I hate being in school”, and “What we do in school is a waste of time”. Items used were “My school is a fun place to be”, “I enjoy what I do in school”, and “I like my school”. Items were rated on a five point Likert scale from ‘Don’t agree’(1) to ‘Agree a lot’(5).

**Perceived ability and enjoyment of sport and physical activity.** Two single item measures asked “How good are you at physical activity / sport?”, and “How much do you enjoy physical activity / sport?” The perceived ability item was rated on a five point Likert scale ranging from ‘Not good at all’ (1) to ‘Very good’ (5). The enjoyment item was rated on a five point Likert scale ranging from ‘Not at all’ (1) to ‘Very much’ (5).

**Teacher questionnaire.** Teachers completed questionnaires at time one and time two. Teacher questions included asking how many hours a week the class engaged in physical activity / physical education classes, how much their students enjoyed and engaged with physical activity and physical education classes, how much they believed physical activity and physical education has a role in personal development, social skills, confidence, self-esteem, character, and academic achievement, and how confident they were, and how much they enjoyed, teaching physical activity and physical education classes. Formal measures included:

**Assessment of student performance character.** The 12 item CREE Performance Character Teacher Form (Khmelkov & Davidson, 2007) was used to assess the teacher’s overall perception of the class’s performance character. The scale is a parallel version to the student Performance Character measure. Khmelkov and Davidson (2008) report an excellent alpha reliability (α=.91) (N=92). Items all start with the stem “I have noticed that students…”, and includes items such as “…try to get out of doing things that they see as difficult or boring”, and “…demonstrate persistence in the face of discouragement”. Items were answered on a five point Likert scale from ‘Never’ (1) to ‘Always’ (5).

**Assessment of student moral character.** The eight item CREE Moral Character Teacher Form (Khmelkov & Davidson, 2007) assesses the teacher’s overall perception of the class’s moral character. This measure parallels the student Moral Character scale. Khmelkov and Davidson (2008) reported the scale had good alpha reliability (α=.80) (N=86). Items all start with the stem “I have noticed that students…”, and includes items such as “…treat teachers and staff
with respect”, “...make fun of others”, and “...admit if they did something wrong”. Items were answered on a five point Likert scale from ‘Never’ (1) to ‘Always’ (5).

In addition to these measures, further questions were given to teachers in the programme group at time two to assess their experience of KRIC. Many used a yes/no answer format with spaces for additional written comments. We asked if teachers found the KRIC programme useful / beneficial, if the KRIC programme changed the children’s willingness to engage in physical activity / physical education classes, if they noticed changes in the children who participated in the KRIC programme, how many hours a week did they use the KRIC programme, whether this was enough, what percentage of the KRIC time did they spend doing physical activity/game-play versus in-class presentations, discussion and exercises, if they felt the two KRIC professional development sessions helped in their approach to teaching physical education, if they would want to use KRIC in the future, if they have any recommendations for how to improve the programme, if there anything about the programme they would like to share, if the programme had impacted upon them personally and how, and if they had any further comments.

All measures were given to the KRIC designers and coordinators to review. They reported that they were happy that the measures were assessing what the KRIC programme was designed to help students’ develop.

**Main Effects Analysis Approach: Multi-level Modelling**

Due to the nature of the research and subsequently the clustered structure of the data (students within classes within schools), multilevel modelling was used for the main effects analyses. Multilevel models are also known as hierarchical models, mixed models, mixed effects models, or random effects models. This approach is recommended in any research when there are hierarchical structures (such as class-rooms in schools) and when assumptions of independence are violated by participants being members of common groups such as class-rooms or sports teams (Field, 2009; Peugh, 2010). Multi-level approaches are highly recommended in the analysis of data from sport and physical education settings (Papaioannou, Marsh, & Theodorakis, 2004). By using multi-level analyses, researchers can account for the different variance components each level (i.e. school and class level groupings) contributes in the analysis.
CHAPTER III: RESULTS

This chapter discusses the results of all analyses and is divided into four parts. Analyses were decided upon a priori in order to minimise the chance of type one error. The analysis process was planned and conducted in collaboration with Jessica Thomas, a consultant from the Statistics Department at the University of Auckland.

Section one details preliminary analyses including data organisation procedures (input accuracy, missing data, organisation of demographic data), summary statistics (of continuous and categorical variables), measure correlations and alpha reliabilities. Section two details participants’ overall performance. Section three details main effects and interaction analyses. Section four reports on teacher data. Results are deemed to be statistically significant at the p<.05 level.

Section One: Preliminary Analysis

Data organising

Data input checking, missing data, and data means. The student sample included 84 control participants and 86 programme participants (N=170), while the teacher sample included eight programme and six control teachers (N=14). Ten percent of all student data was assessed for data entry accuracy. There were no mistakes and no data points outside of the 1-5 range. If a participant missed an item it was replaced with the overall sample mean score for that item. Reverse items in the student and teacher measures were then recalculated before means of scales and subscales for student and teacher data were computed using SPSS (version 18).

Recoding cultural group membership. The questionnaire had 10 culture options. No participants selected ‘NZ European’, ‘Latin American’, or ‘African’ while some participants identified with two groups. This created eight cultural groupings overall. To ensure cultural group could be used as a viable variable in the analysis, these eight groupings were re-categorised into four: Maori, Pacific Islander, Asian, and Other. In order to create these categories one person who reported being ‘Middle Eastern’ was re-categorised as ‘Other’, five ‘Pakeha/Pacific Islander’ participants were recoded as Pacific Islander, eleven participants who reported being ‘Maori/Pacific Islander’ were randomly assigned to Maori (6) or Pacific Islander (5) groupings (using Microsoft Excel’s random function where 0-0.5 led to a Maori grouping and
0.5-1.0 lead to a Pacific Islander grouping). One person reported belonging to ‘Pakeha/Maori’, and they were recoded into the Maori group.

**Student Characteristics**

*Categorical variables and demographic differences between groups at baseline.* Table 1 outlines student categorical data at baseline, including the demographic characteristics of gender, school year, language spoken at home, and cultural group. A Pearson’s Chi Square test assessed differences between control and programme groups. No significant difference between control and programme groups in terms of gender was found. However, there were significant differences in terms of the school year (years five vs. year six), language spoken most at home (English vs. Other), and cultural identification (Maori, Pacific Islander, Asian, Other). These baseline differences were controlled for in the main effects analysis (stage three) to prevent false programme findings or findings being masked.

Table 1

*Summary Statistics of Demographic Categorical Variables at Baseline*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>All (%)</th>
<th>Control</th>
<th>Programme</th>
<th>Chi Sq test p-value&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>73 (42.90)</td>
<td>40</td>
<td>33</td>
<td>0.223</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>97 (57.10)</td>
<td>44</td>
<td>53</td>
<td></td>
</tr>
<tr>
<td>Year at school</td>
<td>5</td>
<td>70 (41.20)</td>
<td>46</td>
<td>24</td>
<td>&lt;.001</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>100 (58.80)</td>
<td>38</td>
<td>62</td>
<td></td>
</tr>
<tr>
<td>Language spoken most at home</td>
<td>English</td>
<td>84 (49.40)</td>
<td>28</td>
<td>56</td>
<td>&lt;.001</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>82 (48.20)</td>
<td>54</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No-Answer</td>
<td>4 (2.40)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cultural group&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Maori</td>
<td>28 (16.50)</td>
<td>5</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pacific Islander</td>
<td>118 (60.00)</td>
<td>60</td>
<td>58</td>
<td>&lt;.001</td>
</tr>
<tr>
<td></td>
<td>Asian</td>
<td>15 (8.80)</td>
<td>14</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>9 (5.300</td>
<td>5</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup>The Chi-Square test tests the null hypothesis that there is no difference between control and programme groups.

<sup>b</sup>As some cells had fewer than five members, Fisher’s exact test (2-sided) was chosen.

*Summary statistics of continuous variables at baseline.* A summary of the baseline status of all participants on each measure can be found in Table 2. T-tests and Mann Whitney U non-parametric tests suggest there were no significant differences between programme and
control participants on any measure at baseline. Scores for enjoyment of physical education and sport, general self-esteem, and liking for school were high in both groups at baseline.

Table 2

Summary Statistics of Continuous Data at Baseline

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Two sample t-test p-value</th>
<th>Mann-Whitney U test p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All</td>
<td>Prog (n=86)</td>
<td>Control (n=84)</td>
<td></td>
</tr>
<tr>
<td>Moral Character</td>
<td>3.94</td>
<td>4.02</td>
<td>3.85</td>
<td>0.62</td>
</tr>
<tr>
<td>Sense of Efficacy</td>
<td>3.79</td>
<td>3.82</td>
<td>3.75</td>
<td>0.66</td>
</tr>
<tr>
<td>General Self-Esteem</td>
<td>4.66</td>
<td>4.66</td>
<td>4.65</td>
<td>0.75</td>
</tr>
<tr>
<td>Academic Self-Esteem</td>
<td>3.65</td>
<td>3.60</td>
<td>3.69</td>
<td>0.90</td>
</tr>
<tr>
<td>Resiliency</td>
<td>4.01</td>
<td>4.02</td>
<td>4.00</td>
<td>0.64</td>
</tr>
<tr>
<td>Resiliency Communication</td>
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<td>3.98</td>
<td>3.99</td>
<td>0.86</td>
</tr>
<tr>
<td>Resiliency Self-Esteem</td>
<td>4.03</td>
<td>4.09</td>
<td>3.98</td>
<td>0.82</td>
</tr>
<tr>
<td>Resiliency Empathy</td>
<td>3.95</td>
<td>3.98</td>
<td>3.91</td>
<td>1.01</td>
</tr>
<tr>
<td>Resiliency Problem Solving</td>
<td>3.91</td>
<td>3.91</td>
<td>3.91</td>
<td>0.85</td>
</tr>
<tr>
<td>Resiliency Goals / Aspirations</td>
<td>4.22</td>
<td>4.16</td>
<td>4.28</td>
<td>0.87</td>
</tr>
<tr>
<td>Performance Character</td>
<td>3.61</td>
<td>3.68</td>
<td>3.54</td>
<td>0.55</td>
</tr>
<tr>
<td>Liking for School</td>
<td>4.73</td>
<td>4.77</td>
<td>4.70</td>
<td>0.58</td>
</tr>
<tr>
<td>Perceived Ability in PA / Sport</td>
<td>4.04</td>
<td>4.12</td>
<td>3.95</td>
<td>0.85</td>
</tr>
<tr>
<td>Enjoyment of PA / Sport</td>
<td>4.71</td>
<td>4.67</td>
<td>4.74</td>
<td>0.77</td>
</tr>
</tbody>
</table>

*Equal variances not assumed

**Inter-scale correlation and student measure reliability.** As can be seen in Table 3, there were many significant inter-scale correlations. Moral character scores were most strongly correlated with performance character and resilience. Overall the close relationship the moral character measure had with almost every other scale (apart from enjoyment of sport and physical activity) supports the assertion that morality is an integral part of other traits associated with character. Participants’ sense of efficacy scores were most strongly correlated with their overall resilience scores. The close relationship sense of efficacy had with nearly all other scales indicates that, like morality, one’s self-efficacy is closely linked with other elements of character (as defined in the current research). General self-esteem was most strongly correlated with liking for school. It was also closely correlated with moral character, performance character, and enjoyment of physical activity and sport. General self-esteem was not correlated with resiliency
self-esteem. This may be as the resiliency self-esteem subscale asked questions about one’s perceived ability to do things rather than overall self-worth. Resiliency was correlated with all measures apart from academic self-esteem. Performance character was highly correlated with all other measures, most notably moral character (as previously noted), and resiliency. Liking for school was most correlated with performance character (a measure of commitment and self-discipline), moral character, sense of efficacy and resiliency. Perceived ability in physical activity and sport was most highly associated with enjoyment of physical activity, resiliency self-esteem, and sense of efficacy (the latter two measures appearing to assess one’s perceived ability to do things). Perceived ability in sport was not correlated with general self-esteem. Finally, enjoyment of physical activity and sport was most associated with performance character, resiliency self-esteem, overall resiliency, sense of efficacy and general self-esteem.

The Cronbach’s alpha coefficient tests a measure’s internal reliability (Gliem & Gliem, 2003) and allows a researcher to assess the pattern in which participants respond to a given measure, and how related this pattern is across the sample (Helms, Henze, Sass, & Mifsud, 2006). There are various benchmarks for acceptable alpha reliability levels (Helms et al., 2006). In this study the following guidelines are used: <.5 unacceptable, >.5 Poor, >.6 questionable, >.7 acceptable, >.8 good, >.9 excellent (George & Mallery, 2003, as cited in Gliem & Gliem, 2003, p.231).

The Cronbach’s alpha for each measure influences how we may interpret the study’s main effects findings. The moral character, sense of efficacy, resiliency, and modified liking for school scales all had internal reliability levels which suggested main effects analyses could be interpreted with some confidence. Performance character’s alpha reliability varied over time, so analyses had to be considered in light of this. The modified academic self-esteem scale’s alpha reliability was unacceptable and main effects analyses could not be interpreted with confidence.
Table 3

*Measure Correlations at Time One, and Alpha Reliabilities at Time One and Time Two.*

<table>
<thead>
<tr>
<th>Measure Correlations</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>T1</th>
<th>T2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.Moral Character</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.7</td>
<td>0.7</td>
</tr>
<tr>
<td>2.Sense of Efficacy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>0.74</td>
<td>0.78</td>
</tr>
<tr>
<td>3.General Self Esteem</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.20</td>
<td>0.43</td>
</tr>
<tr>
<td>4.Academic Self esteem</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.81</td>
<td>0.82</td>
</tr>
<tr>
<td>5.Resiliency</td>
<td>.594**</td>
<td>.564**</td>
<td>.142</td>
<td>.298**</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.57</td>
<td>0.53</td>
</tr>
<tr>
<td>6.Resiliency Comm.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.70</td>
<td>0.67</td>
</tr>
<tr>
<td>7.Resiliency Self-esteem</td>
<td>.439**</td>
<td>.508**</td>
<td>.106</td>
<td>.248**</td>
<td>.790**</td>
<td>.548**</td>
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<td></td>
<td></td>
<td></td>
<td>0.48</td>
<td>0.60</td>
</tr>
<tr>
<td>8.Resiliency Empathy</td>
<td>.403**</td>
<td>.455**</td>
<td>.099</td>
<td>.241**</td>
<td>.785**</td>
<td></td>
<td></td>
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<td></td>
<td>0.49</td>
<td>0.51</td>
</tr>
<tr>
<td>9.Resiliency Problem Solving</td>
<td>.412**</td>
<td>.385**</td>
<td>.101</td>
<td>.210**</td>
<td>.763**</td>
<td>.515**</td>
<td>.467**</td>
<td>.324**</td>
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<td></td>
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<td>0.72</td>
</tr>
<tr>
<td>10.Resiliency Goals / Aspirations</td>
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<td>.212**</td>
<td>.283**</td>
<td>.602**</td>
<td>.297**</td>
<td>.368**</td>
<td>.319**</td>
<td>.363**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.76</td>
<td>0.83</td>
</tr>
<tr>
<td>11.Performance Character</td>
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<td>.442**</td>
<td>.214**</td>
<td>.291**</td>
<td>.584**</td>
<td>.389**</td>
<td>.525**</td>
<td>.448**</td>
<td>.421**</td>
<td>.315**</td>
<td></td>
<td></td>
<td></td>
<td>0.66</td>
<td>0.70</td>
</tr>
<tr>
<td>12.Liking for School</td>
<td>.209**</td>
<td>.268**</td>
<td>.357**</td>
<td>.008</td>
<td>.180*</td>
<td>.097</td>
<td>.129</td>
<td>.084</td>
<td>.188*</td>
<td>.154*</td>
<td>.228**</td>
<td></td>
<td></td>
<td>0.47</td>
<td>0.53</td>
</tr>
<tr>
<td>13.Perceived Ability in PA / Sport</td>
<td>.169*</td>
<td>.349**</td>
<td>.074</td>
<td>.086</td>
<td>.398**</td>
<td>.284**</td>
<td>.575**</td>
<td>.137</td>
<td>.244**</td>
<td>.138</td>
<td>.297**</td>
<td>.090</td>
<td></td>
<td></td>
<td>0.76</td>
</tr>
<tr>
<td>14.Enjoyment of PA / Sport</td>
<td>.130</td>
<td>.222**</td>
<td>.224**</td>
<td>.153*</td>
<td>.228**</td>
<td>.131</td>
<td>.292**</td>
<td>.050</td>
<td>.183*</td>
<td>.150</td>
<td>.217**</td>
<td>.133</td>
<td>.507**</td>
<td>0.76</td>
<td>0.83</td>
</tr>
</tbody>
</table>

*Correlation is significant at the 0.05 level (2-tailed).*

**Correlation is significant at the 0.01 level (2-tailed).*
Cronbach’s alpha could not be tested on the three single item measures. Therefore test-retest reliability coefficients were calculated using the control school’s time one and time two data. Control group data was used because KRIC students had been exposed to the KRIC programme and therefore could be expected to change on the measures of interest. We used control participants’ data to provide a more accurate measure of the test-retest correlation coefficient.

Kline (2000) recommended a minimum correlation coefficient of 0.80 when assessing test-retest reliability. However, while also recommending a minimum time period of three months between testing points, Kline (2000) states this time period may be too long in children due to their rate of development. As a gap between measurement points this long may lead to a low correlation coefficient in child populations (Kline, 2000), and control group participants were assessed 13 weeks and six days apart, in the current research the minimum correlation coefficient was considered to be 0.70.

The Pearson test-retest reliability coefficient for control group participants’ general self-esteem was 0.60 (p<.001). This indicates that results based on this measure should be interpreted with some caution, as measurement error could have contributed more to the any finding than would be acceptable. The reliability coefficient for participants’ rating of perceived ability in physical activity and sport was 0.59 (p<001). Again, this indicates care is required when judging results based on this measure. Finally, the test-retest reliability for the single item measure of participants’ enjoyment of physical activity and sport was 0.71 (p<.001), suggesting interpretation of analyses using this measure may be interpreted with some confidence.

Section Two: Participants’ Overall Performance

Section two summarises mean scores at time one and time two for all participants, programme group members, and control group members (Table 4). It also shows the results of a test for the difference in time two means between the control and programme groups.

Means were similar on most measures between the control and programme groups at time one and time two. Both groups’ scores remained mostly stable over time, however the entire sample showed a significant increase in resiliency self-esteem from 4.03 to 4.15 (p=.02), and the control group reported a significant increase in resiliency self-esteem from 3.98 to 4.14 (p=.04).
Table 4

*Measure Means at Time One and Time Two, Including Difference Scores and Group Mean Comparisons at Time Two.*

<table>
<thead>
<tr>
<th>Variable</th>
<th>All (n=170)</th>
<th>Programme (n=86)</th>
<th>Control (n=84)</th>
<th>Two sample t-test p-value&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>T1</td>
<td>sd</td>
<td>T2</td>
<td>sd</td>
</tr>
<tr>
<td>Moral Character</td>
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<td></td>
</tr>
<tr>
<td>Sense of Efficacy</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>General Self-Esteem</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic Self-Esteem</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resiliency</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resiliency Communication</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resiliency Self-Esteem</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resiliency Empathy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resiliency Problem Solving</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resiliency Goals and Aspirations</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance Character</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liking for School</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Perceived Ability in PA / Sport</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enjoyment of PA / Sport</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup>Tests group difference at time two (equal variances not assumed)

*Indicates a significant within group difference between time one and time two scores: Paired samples t-test significant at the 0.05 level
The control group’s increase appears to have pushed up the overall mean, and their increase may be due to cultural group factors, independent of programme or control group membership. This will be discussed in the resiliency self-esteem main effects section below. Similar to baseline analyses, independent samples t-tests showed no significant difference between the control and programme groups at time two on any measure.

Section Three Part One: Main Effects Analysis Five Stage Method

Main effects analysis was conducted using multi-level modelling in order to assess significant differences in the change from time one to time two between the control and programme groups on all measures, taking into account time one scores and baseline demographic differences between the groups (year at school, language, and culture). Analysis was conducted in five stages for each of the 14 dependent variables. This section describes main effects analyses and interaction analyses for each variable.

Main effects analysis method: stage one

Testing normality and calculating change scores for the time two outcome variable. Prior to running the main effects analysis, normality of the time two outcome variables were tested. Normality was judged to be violated if the standard error of skewness or kurtosis was less than two times the skewness or kurtosis value (Tabachnick & Fidell, 2007). As many outcome variables were not normally distributed, change scores were calculated to normalize (see Table 5, Appendix C for details of outcome variable raw score and change score skewness and kurtosis Z scores). This was done for all variables to ensure analysis interpretation was consistent throughout. Change scores were calculated by subtracting each participant’s time one score from their time two score. While the variables were not all normally distributed after change scores were calculated, symmetry in the histograms improved greatly. These change scores were then used as dependent variables throughout the main effects analyses.

Independent Mann Whitney U non-parametric test on outcome variables. Non-parametric tests are used when one cannot assume the data set has any standard distribution (e.g. a normal distribution). While the independent Mann Whitney U non-parametric test only compared the control and programme groups at time two, not taking time one scores or potential
confounding variables into account, it provided a comparison for the results of the more in-depth multi-level analysis.

**Centring the time one variable.** As an interaction would be included in the model, baseline scores on each variable were centred to ensure the main effect output (related to the difference in change scores between the control and programme groups) remained meaningful. Centring was done by subtracting the mean time one score for each variable from each participant’s score on that time one measure. The centred baseline score for each variable was then used throughout the analysis.

**Variables in the statistical model at stage one.** In stage one the model included the outcome variable of interest (e.g. the change score for moral character). It also included fixed effects: the control versus programme grouping variable, the centered time one variable, and the interaction between the centered time one score and the control versus programme grouping variable. Finally the model included school and class groupings as random effects.

**Including time one scores in the model.** Time one scores were included in the model to control for baseline measure differences between participants. By doing this we can interpret other coefficient estimates as if the time one score were held constant across the sample. The final means predicted by the statistical model are mean change estimates for the control and programme groups at the mean of the time one variable. By controlling for the time one score (the idea of holding the time once score constant) it is easy to compare how much each group changed on a given measure over time.

**Including an interaction in the model.** The interaction between participants’ time one score and their group membership (control vs. programme) was included to identify differential response patterns to the KRIC programme. A significant interaction could indicate that the programme’s effect was different depending on what a participant’s time one score was on any measure. The interaction analysis could uncover differential programme effects which might otherwise be masked. It could also provide useful findings if there was a ceiling effect on any given measure (where the majority of participants scored highly at time one and therefore had little room for improvement when measured a second time).

**Running the model to test for random effects.** Running the model with school and class random intercepts allowed the variability from each of these sources to be estimated. If the
variance component from school or class levels were large enough for a standard deviation to be estimated, that level was retained in the final model.

**Building the stage one model.** After determining which random effects (school and class) would be included the model was run again. The variable with the highest p-value above .05 was removed, and the model was run again. This was done until all variables left in the model were less than .05. The group variable (control vs. programme) always remained in the model. The remaining variables advanced to stage three.

**Main effects analysis method: stage two.** As the control and programme groups were different in three areas at baseline (language spoken most at home, cultural group, and school year), these potential confounders were controlled for by including them in the overall model. Language and culture were tested for multicollinearity (Fisher’s exact test, $p<.001$). Due to their strong relationship they could not both be included in the model without testing each for its relationship to the outcome variable. The second stage of analysis tested language and culture and their relationship to each outcome variable to judge if they needed to be controlled for in the main effects model for any given outcome variable.

An independent sample t-test assessed the relationship between language and the outcome variable. A one-way ANOVA then assessed the relationship between culture and the outcome variable. If language or culture were not significantly related to the outcome variable neither were included in the model in stage three. If one was significant it was included in stage three. If both the language t-test and culture ANOVA were significant, a two-way ANOVA was run with both variables to test their relationship to the outcome variable together. If both were still significant, both moved to stage three. If one was significant it moved to stage three. If both became non-significant, one variable would go on to stage three based on comparing the p-values in the t-test, and one way and two-way ANOVAs. The variables were taken to stage three if their significance level was less than 0.10.

**Main effects analysis method: stage three**

**Running the model and testing for potential confounding variables.** For this analysis the model from stage one was used, and language or culture were added if indicated at stage two. School year was also added to the model.
**Backward Selection:** Running the stage three analysis repeatedly, non-significant (p<.05) variables were removed one by one (starting with those with the highest p-value), until all variables in the model (apart from the main grouping variable) were significant.

This generated the final model for each outcome variable, including the final main effect p-value signifying any difference in the programme’s influence on the outcome compared to that for the control group. If a variable had been removed from the model it meant that it was not significantly related to the outcome variable and therefore did not need to be included. If a variable remained in the model it meant it was significantly related to the outcome variable. It also meant the variable had been controlled for and the main effect could be interpreted without the confounding variable’s influence being unknown.

**Exploration of Interaction Findings:** In order to quantify the effect of the programme for people with different time one scores (i.e., the effect of the programme at different levels of the time one variable), the time one value was centred at different levels (1, 2, 3, 4, 5, and the overall mean score for that time one variable). The Wald significance test for the interactions can then be interpreted as testing the mean difference in change scores between control and programme groups at a given time one score. This significance test was only conducted when at least 20 participants reported the given time one value.

**Assumption Testing:** The model assumptions relate to the residuals, therefore the model needed to be fitted in order to have the residuals to test the assumptions. Normality and homogeneity of variance was checked for each variable. An overall diagnostic plot (fitted value vs. residual plot), and a normality histogram with skewness and kurtosis values were run in SPSS (version 20) for each variable that did not have random effects (school or class levels). When there were random school or class effects in the model, assumptions tests were run on scaled residuals in the Mixed Procedure in statistical software ‘SAS’ (version 9.3). Although these assumptions were checked, given the current sample size significance levels may only be slightly elevated if data is not normally distributed (Lumley et al 2002). Therefore violations of the assumption of normality are of concern when significance values are close to 0.05. When significance values are close to 0.001, such violations should not be of concern (Lumley et al 2002).
Using the outcome variable data (not residuals), homogeneity of variance Levene’s tests were run for all variables in the statistical software ‘R’ (version 2.14.1). This tested the homogeneity of variance of the outcome variable between the control and programme groups.

Main effects analysis method stage four: new grouping variable Hours KRIC. In order to explore whether different amounts of exposure to the programme led to different outcomes, stage four main effect analyses tested outcome variables against the group variable Hours KRIC. There were three groups: zero hours, two hours, and four hours. Six programme classes used KRIC for two hours per week while two classes used it for four hours. Control group participants were categorized as having been exposed to the programme for zero hours.

Baseline demographic differences were retested against the new grouping variable (see Table 6). Language, cultural group membership and school year were found again to be significantly different between the three groups; therefore these potential confounding variables were again controlled for in the analysis.

Stage one analysis was conducted again with the new grouping variable. Stage two did not need to be tested again as the relationship between language, culture, and the outcome variable had already been established. The new analyses were then run using the same method as the previously detailed stage three (control vs. programme analyses), this time revealing if there were significant differences between three groups (zero, two or four hours KRIC) on a given measure. If the main effects outcome differed from stage three findings for any outcome variable, or if there was a significant finding, or new interaction, assumptions were tested again.
Table 6
Summary Statistics by Group (Hours Exposure to the Programme) of Demographic Categorical Variables at Baseline

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>Zero Hours</th>
<th>Two Hours</th>
<th>Four Hours</th>
<th>Chi Sq test p-value&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>40</td>
<td>24</td>
<td>9</td>
<td>0.475</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>44</td>
<td>39</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Year at school</td>
<td>5</td>
<td>46</td>
<td>13</td>
<td>11</td>
<td>&lt;.001</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>38</td>
<td>50</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Language spoken most at home</td>
<td>English</td>
<td>28</td>
<td>42</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>54</td>
<td>19</td>
<td>9</td>
<td>&lt;.001</td>
</tr>
<tr>
<td></td>
<td>No-Answer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cultural group</td>
<td>Maori</td>
<td>5</td>
<td>16</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pacific Islander</td>
<td>60</td>
<td>43</td>
<td>15</td>
<td>&lt;.001</td>
</tr>
<tr>
<td></td>
<td>Asian</td>
<td>14</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>5</td>
<td>4</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup>The Chi-Square test tests the null hypothesis that there is no difference between control and programme groups*

<sup>b</sup>As some cells had fewer than five members, Fisher's exact test (2-sided) was chosen

Main effects analysis method stage five: main effects analysis with a new grouping variable Percentage KRIC. In order to explore whether different proportions of KRIC game-play activities versus class time led to different outcomes, in stage five, outcome variables were tested between KRIC participants (n=86) who had been exposed to different percentages of game play versus class activities. Seven of the eight programme teachers detailed this variable; therefore missing data for one class was replaced with the mean percentage (55.3%). There were six grouping categories overall: 20% game play (one class), 50% game play (three classes), 55.3% game play (one class), 60% game play (one class), 70% game play (one class), and 80% game play (one class). Analysis was similar to stages one to three previously outlined; however baseline demographic characteristics and interactions were not included in the model. School and class random effects were tested to see if they should be in each new model. Again, if main effect findings differed from stage three findings for any outcome, variable assumptions were re-tested.
Section Three Part Two: Main Effects Models

This section includes details of the main effects analysis for each of the 14 dependent variables, including analyses for each of the three grouping approaches; stage three compares the control and programme groups, stage four compares groups exposed to KRIC for different numbers of hours a week, and stage five compares programme participants with different gameplay versus in class exposure. Time one scores and demographic differences were controlled for in each model in order to analyse the main effect of the programme impartially.

Table 6 outlines the overall stage three analyses findings comparing control and programme groups. It also details which analyses were multi-level models (those with class or school random effects included) versus linear regression models (models run without class or school random effects), which outcome variables had confounding variables that were controlled for, and where interactions were found. Table 7 and 8 also outline overall stage four and five findings respectively. As can be seen in the tables, time one scores were significantly related to time two scores (p<.001) across the sample. This finding was the same for all analyses for all variables in stages three, four and five, and will therefore not be mentioned again.

As can be seen in Tables 6, 7 and 8, through both non-parametric and regression modelling we did not find that the KRIC programme had an impact on the overall means for any measure. There were also no main effect findings in stage four or five analyses. However, in stage three and four analyses interactions were found indicating the programme had different effects on people with different time one scores. These alongside other key results are detailed below. For more in-depth details of the analysis of each dependent variable, including details of the inclusion of random effects (school or class levels), p-values of excluded variables and excluded interactions, random effects variance components, residual error scores, tables to aid the interpretation of interactions, and assumption tests, please refer to Appendix D. Where there were significant findings with assumption violations, details are provided in the relevant variable’s write-up below.
### Table 7

**Stage Three Main Effects Findings, Including Non-Parametric and Multi-Level Regression Analyses.**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mann-Whitney U</th>
<th>Random Effects: School</th>
<th>Random Effects: Class</th>
<th>β estimate&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Confidence Interval</th>
<th>t</th>
<th>p</th>
<th>Time One Score&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Cultural Group&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Language&lt;sup&gt;b&lt;/sup&gt;</th>
<th>School Year&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Group by T1 Interaction&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moral Character</td>
<td>0.24</td>
<td>Yes</td>
<td>Yes</td>
<td>-0.09</td>
<td>-1.16 - 1.34</td>
<td>0.53</td>
<td>0.67</td>
<td>&lt;.001</td>
<td></td>
<td></td>
<td></td>
<td>0.033</td>
</tr>
<tr>
<td>Sense of Efficacy</td>
<td>0.17</td>
<td>Yes</td>
<td></td>
<td>-0.05</td>
<td>-0.18 - 0.37</td>
<td>0.75</td>
<td>0.47</td>
<td>&lt;.001</td>
<td></td>
<td></td>
<td></td>
<td>&lt;.001</td>
</tr>
<tr>
<td>General Self-Esteem</td>
<td>0.36</td>
<td></td>
<td></td>
<td>0.20</td>
<td>-0.42 - 0.02</td>
<td>-1.80</td>
<td>0.07</td>
<td>&lt;.001</td>
<td></td>
<td></td>
<td></td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Academic Self-Esteem</td>
<td>0.94</td>
<td></td>
<td></td>
<td>0.12</td>
<td>-0.41 - 0.16</td>
<td>-0.85</td>
<td>0.40</td>
<td>&lt;.001</td>
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<td>0.013</td>
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<tr>
<td>Resiliency</td>
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<td>Yes</td>
<td></td>
<td>0.05</td>
<td>-0.29 - 0.18</td>
<td>-0.60</td>
<td>0.62</td>
<td>&lt;.001</td>
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<td></td>
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<td>&lt;.001</td>
</tr>
<tr>
<td>Resiliency Communication</td>
<td>0.44</td>
<td></td>
<td></td>
<td>-0.08</td>
<td>-0.11 - 0.27</td>
<td>0.79</td>
<td>0.43</td>
<td>&lt;.001</td>
<td></td>
<td></td>
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<td>&lt;.001</td>
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<tr>
<td>Resiliency Self-Esteem</td>
<td>0.54</td>
<td>Yes</td>
<td></td>
<td>0.11</td>
<td>-0.37 - 0.14</td>
<td>-0.97</td>
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<td>&lt;.001</td>
<td></td>
<td></td>
<td></td>
<td>&lt;.001</td>
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<tr>
<td>Resiliency Empathy</td>
<td>0.38</td>
<td>Yes</td>
<td></td>
<td>-0.02</td>
<td>-0.40 - 0.45</td>
<td>0.12</td>
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<td>&lt;.001</td>
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<td>&lt;.001</td>
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<tr>
<td>Resiliency Problem Solving</td>
<td>0.28</td>
<td>Yes</td>
<td></td>
<td>-0.02</td>
<td>-0.36 - 0.40</td>
<td>0.10</td>
<td>0.93</td>
<td>&lt;.001</td>
<td></td>
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<td>0.01</td>
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<tr>
<td>Resiliency Goals / Aspirations</td>
<td>0.57</td>
<td>Yes</td>
<td></td>
<td>0.01</td>
<td>-7.89 - 7.88</td>
<td>-0.04</td>
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<td>0.001</td>
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<tr>
<td>Performance Character</td>
<td>0.22</td>
<td>Yes</td>
<td></td>
<td>-0.04</td>
<td>-1.42 - 1.50</td>
<td>0.14</td>
<td>0.90</td>
<td>&lt;.001</td>
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<td>Liking for School</td>
<td>0.81</td>
<td>Yes</td>
<td></td>
<td>0.03</td>
<td>-0.20 - 0.13</td>
<td>0.40</td>
<td>0.69</td>
<td>&lt;.001</td>
<td></td>
<td></td>
<td></td>
<td>0.001</td>
</tr>
<tr>
<td>Perceived Ability in PA / Sport</td>
<td>0.67</td>
<td>Yes</td>
<td></td>
<td>0.03</td>
<td>-0.29 - 0.22</td>
<td>-0.30</td>
<td>0.77</td>
<td>&lt;.001</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enjoyment of PA / Sport</td>
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<td></td>
<td></td>
<td>0.07</td>
<td>-0.23 - 0.09</td>
<td>-0.86</td>
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<td>&lt;.001</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

<sup>a</sup>Negative β estimate scores indicate the programme group’s change score was lower than the control group’s change score

<sup>b</sup>p-values
**Table 8**

*Stage Four Main Effects Findings*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Random Effects: School</th>
<th>Random Effects: Class</th>
<th>f</th>
<th>p</th>
<th>Time One Score(a)</th>
<th>Culture(a)</th>
<th>Language(a)</th>
<th>School Year(a)</th>
<th>Group by Time One Interaction(a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moral Character</td>
<td>Yes</td>
<td></td>
<td>0.49</td>
<td>0.62</td>
<td>&lt;.001</td>
<td></td>
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<td></td>
<td>0.045</td>
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<td>Sense of Efficacy</td>
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<td></td>
<td>0.35</td>
<td>0.71</td>
<td>&lt;.001</td>
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<td>General Self-Esteem</td>
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<td>&lt;.001</td>
<td></td>
<td></td>
<td></td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Academic Self-Esteem</td>
<td>Yes</td>
<td></td>
<td>0.48</td>
<td>0.62</td>
<td>&lt;.001</td>
<td></td>
<td></td>
<td>0.013</td>
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<tr>
<td>Resiliency</td>
<td>Yes</td>
<td></td>
<td>0.37</td>
<td>0.70</td>
<td>&lt;.001</td>
<td></td>
<td></td>
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<td>&lt;.001</td>
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<tr>
<td>Resiliency Communication</td>
<td></td>
<td>0.37</td>
<td>0.69</td>
<td></td>
<td>&lt;.001</td>
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<tr>
<td>Resiliency Self-Esteem</td>
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<td>&lt;.001</td>
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<td>&lt;.001</td>
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<tr>
<td>Resiliency Empathy</td>
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<td></td>
<td>0.27</td>
<td>0.77</td>
<td>&lt;.001</td>
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<tr>
<td>Resiliency Problem Solving</td>
<td>Yes</td>
<td></td>
<td>0.09</td>
<td>0.92</td>
<td>&lt;.001</td>
<td></td>
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<td>0.008</td>
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<td>Resiliency Goals / Aspirations</td>
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<td>Yes</td>
<td>0.09</td>
<td>0.92</td>
<td>&lt;.001</td>
<td></td>
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<td></td>
<td>0.004</td>
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<tr>
<td>Performance Character</td>
<td>Yes</td>
<td>Yes</td>
<td>0.02</td>
<td>0.98</td>
<td>&lt;.001</td>
<td></td>
<td>0.01</td>
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<td>0.02</td>
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<tr>
<td>Liking for School</td>
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<td></td>
<td>0.32</td>
<td>0.73</td>
<td>&lt;.001</td>
<td></td>
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<tr>
<td>Perceived Ability in PA / Sport</td>
<td>Yes</td>
<td>Yes</td>
<td>0.20</td>
<td>0.85</td>
<td>&lt;.001</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
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<td>0.61</td>
<td>&lt;.001</td>
<td></td>
<td></td>
<td></td>
<td>0.004</td>
</tr>
</tbody>
</table>

\(a\) *p*-values
Moral character

Stage Three Findings: There was some evidence that moral character scores changed at different rates depending on what school year participants were in (F=4.63, df1=1, df2 = 158.60, p=.03), however this change was not related to the KRIC programme as it was seen across the entire sample. After controlling for time one scores (as was done in every variables’ stage three, four and five models) and the influence of school year, we found no significant effect of the programme (95% C.I. = -1.16 to 1.34, t=.53, p=.67). The control group model-predicted change score at the mean value of the time one variable (the mean change score) was -0.04, while the programme group mean change score was -0.13. The control group’s drop in moral character was .09 less than the drop displayed by the programme group at time two. This difference was not significant.

Stage Four: In stage four the main grouping variable was changed from control versus programme to hours using KRIC. School year (p=.045) was significantly related to the outcome.
variable. Controlling for time one scores and school year the overall type 3 test p-value for the main effect in this analysis was not significant (F=.49, p=.62), indicating that there was no significant difference in time two moral character change scores between the three groups.

Stage Five: In stage five the main grouping variable was changed from hours using the programme to percentage game-play versus class time. Controlling for time one scores there was no significant main effect finding (F=.90, p=.54), indicating that there was no difference in morality change scores between classes who spend different amounts of time in class-based programme activities versus game play based programme activities.

Summary: We found no evidence that the programme significantly impacted on participants’ moral character scores when compared to controls. There was also no significant difference between those who were exposed to the programme for longer than others. When assessing programme only participants, the amount of time spent in class versus game-play activities appeared to have no effect.

Sense of efficacy

Stage Three Findings: After controlling for time one scores we found no significant effect of the programme on sense of efficacy (95% C.I. = -0.23 to 0.32, t=0.37, p=.72). The control group’s mean change score was 0.06, while the programme group mean change score was 0.02. The control group’s mean resiliency self-esteem change score was 0.05 higher than the programme group’s mean change score, however this difference was not significant.

Stage Four: After controlling for time one scores we found no main effect of the programme (F=.35, p=.71) when comparing groups who had received zero, two, or four hours exposure to the KRIC programme. However, there was a significant interaction between time one scores and group membership (p=.03).

Interpreting the Stage Four Interaction: High scoring participants (time one = 5) who were then exposed to four hours of the KRIC programme appeared to score less at time two than those in the 0 or 2 hour groups with similarly high time one scores. In other words, greater exposure to the programme appears to have reduced high scorers’ sense of efficacy scores (see Table 10, Appendix D).

Stage Five: After controlling for time one scores we found no significant main effect finding (F=.25, p=.91).
Summary: We found no evidence that the programme impacted on most participants’ sense of efficacy scores. However, there was some evidence that more exposure to the programme may have reduced high scoring participants’ sense of efficacy ratings. This finding should be interpreted with caution as the p-value was not strong (.03) considering the number of main effects analyses run in the present study (42).

General self-esteem

Stage Three Findings: After controlling for time one scores we found no significant effect of the KRIC programme for general self-esteem (95% C.I. = -.42 to .02, t=-1.80, p=.074). The control group’s mean change score was -0.12, while the programme group’s mean change score was 0.07. The control group’s mean resiliency self-esteem change score was 0.20 lower than the programme group’s mean change score, a non-significant difference. There was also a significant interaction between time one scores and group membership (95% C.I. = .45 to 1.03, t=5.04, p<.001).

Interpreting the Interaction: Programme group members with time one scores lower than the mean (4.66) were found to have a greater increase in general self-esteem scores than control participants with the same time one scores. The overall interaction was significant, and of those whose baseline score was four (n=25), those in the programme group appeared to increase their general self-esteem scores by 0.68 more than control group members (p<.001) (see Table 11 Appendix D).

Assumption Testing: While the normality histogram showed most residuals were clustered around zero, it was left-skewed (skewness z=-14.048, kurtosis z=26.93). Violating the assumption of normality may make the confidence intervals and p-values unreliable in a sample size of 170. However, the interaction’s small p-value (p=<.001) points to evidence of a difference.

Stage Four: After controlling for time one scores there was no main effect of the programme (F=1.81, p=.17). However, again there was again a significant interaction between time one scores and group membership (p=<.001).

Interpreting the Stage Four Interaction: For those whose time one score was four (n=25) there was a significant difference between the three groups (0, 2, and 4 hours) (see Table 12 Appendix D). Programme group members exposed to two or four hours of KRIC improved more
than members of the control group with similar time one scores (p-values <.001 and .018, respectively) (see Table 13 Appendix D).

Assumption Testing of Stage Four: The normality histogram was left-skewed (skewness z=-14.00, kurtosis z=27.12), with the majority of residuals clustered around zero.

Stage Five: After controlling for time one scores we found no significant main effect finding (F=1.05, p=.46).

Summary: While overall we did not find that the programme had a significant impact on participants’ general self-esteem scores overall, members of the programme group with lower time one scores appear to have benefitted from the programme. The same could be said whether exposed to two or four hours of the KRIC programme per week. However, these findings should be interpreted with some caution as this modified single item measure’s test-retest reliability was below what is considered ideal.

Academic self-esteem

Stage Three Findings: There was some evidence that academic self-esteem scores changed at different rates depending on what language a participant spoke most at home (F=6.266, df1=1, df2 = 162, p=.013). After controlling for time one scores and the influence of language we found no significant effect of the KRIC programme (95% C.I. = -.41 to .16, t=-.85, p=.40). The control group’s mean change score was 0.05, while the programme group’s mean change score was 0.17. The control group’s mean academic self-esteem change score was 0.12 lower than the programme group’s mean change score. This difference was not significant.

Stage Four: After controlling for time one scores and the influence of language (again significantly related to the outcome variable, p=.01), comparing different hours of exposure to the KRIC programme we found no main effect of the programme (F=.48, p=.62)

Stage Five: Controlling for time one scores we found no significant main effect finding (F=.40, p=.85), meaning the percentage of game-play versus in class exercises participants were exposed to appeared to have no influence over academic self-esteem change scores.

Summary: We found no evidence that the programme had a significant effect on participants’ academic self-esteem scores. However, due to the unacceptable alpha reliability for this measure, any finding from it, whether significant or non-significant, could not be interpreted with confidence.
Resiliency full scale

Stage Three Findings: There was some evidence that resilience scores changed at different rates depending on what culture group participants belonged to (F=6.24, df1=3, df2 = 163.06, p<.001). After controlling for time one scores and cultural group differences there was no evidence that KRIC impacted on programme participants’ resilience scores (95% C.I. = -.29 to .18, t=-.50, p=.62). The control group’s mean change score was 0.01, while the programme group’s mean change score was 0.06. The control group’s mean resiliency change score was 0.05 lower than the programme group’s mean change score, again, a non-significant difference.

Stage Four: Change scores were again significantly different between cultural groups independent of hours KRIC group membership (p<.001). Controlling for this difference and time one scores there was no main effect of the programme (F=.37, p=.70).

Stage Five: Controlling for time one scores we found no significant main effect finding (F=1.57, p=.18).

Summary: We found no evidence that the KRIC programme had a significant impact on participants’ self-reported resiliency scores.

Resiliency communication subscale

Stage Three Findings: After controlling for time one scores we found no significant effect of the programme on the resilience communication subscale (95% C.I. = -.11 to .27, t=.79, p=.43). The control group’s mean change score was 0.15, while the programme group’s mean change score was 0.69. The control group’s mean resiliency communication change score was 0.08 greater than the programme group’s mean change score, which was not significantly different.

Stage Four: There was no main effect of the programme when comparing groups who had received zero, two, or four hours exposure to the programme (f=.37, p=.69).

Stage Five: There was no significant main effect finding (f=.46, p=.80).

Summary: We found no evidence that the KRIC programme had a significant effect on participants’ resilience communication scores.
Resiliency self-esteem

Stage Three Findings: There was some evidence that resilience self-esteem scores changed at different rates depending on what culture group participants belonged to (F=6.29, df1=3, df2 = 163.19, p<.001).

These demographic factors are likely to have contributed to the significant paired samples t-test score reported in stage two. In this t-test the control group had a significant increase in resiliency self-esteem scores (p=.04). However, there were more students in the Asian cultural group in the control group than in the programme group (see Table 2), and Asian participants’ resilience self-esteem scores rose by 0.63 (s.e.=.15) from time one to time two. This is likely to have elevated the overall control group’s resiliency self-esteem score. Therefore, the multi-level model analyses detailed here should be favoured when considering resiliency self-esteem outcomes, as demographic differences were controlled for in the model.

After controlling for these baseline differences and time one scores we found no significant effect of the programme (95% C.I.=-0.37 to .14, t=-.97, p=.35). The control group’s mean change score was 0.06, while the programme group’s mean change score was 0.18. The control group’s mean resiliency self-esteem change score was 0.11 lower than the programme group’s mean change score. This was not significant.

Stage Four: Change over time was significantly different between cultures, independent of exposure to the KRIC programme (p<.001). Controlling for this difference and time one scores there was no main effect of the programme (F=2.09, p=.17).

Stage Five: Overall there was no significant main effect finding (F=2.29, p=.054).

Summary: We found no evidence that the programme had a significant effect on student resilience self-esteem scores.

Resiliency empathy

Stage Three Findings: After controlling for time one scores we found no significant effect of the programme on the resiliency empathy scale (95% C.I.=-.40 to .45, t=.119, p=.91). The control group’s mean change score was -0.03, while the programme group’s mean change score was -0.05. The control group’s mean resiliency self-esteem change score decreased by 0.02 less than the programme group’s mean change score, which was not a significant difference.
Stage Four: After controlling for time one scores we found no main effect of the programme (F=.27, p=.77).

Stage Five: Controlling for time one scores there was no significant main effect finding (F=2.24, p=.06).

Summary: We found no evidence that the programme had a significant effect on participants’ resilience empathy scores.

Resiliency problem solving

Stage Three Findings: There was some evidence that resiliency problem solving scores changed at different rates depending on what culture group participants belonged to (F=4.07, df1=3, df2 = 162.86, p=.01). After controlling for time one scores and the effects of cultural differences between groups we found no significant effect of the programme (95% C.I.= -.36 to .40, t=.10, p=.93). The control group’s mean change score was -0.04, while the programme group’s mean change score was -0.06. This was not a significant difference. The control group’s mean resiliency self-esteem change score decreased by 0.02 less than the programme group.

Stage Four: Change over time was significantly different between cultures, independent of exposure to the programme (p=.01). Controlling for this difference and time one scores there was no main effect of the programme (F=.09, p=.92).

Stage Five: Controlling for time one scores there was no significant main effect finding (F=2.00, p=.09).

Summary: We found no evidence that the KRIC programme had a significant effect on participants’ resilience problem solving scores.

Resiliency goals and aspirations

Stage Three Findings: After controlling for time one scores we found no significant effect of the programme on resiliency goals and aspirations (95% C.I.= -7.89 to 7.88, t=-.04, p=.98). The control group’s mean change score was 0.04, while the programme group’s mean change score was 0.04, a non-significant difference. The control group’s mean resiliency self-esteem change score was 0.0067 lower than the programme group’s mean change score. There was a significant interaction between time one scores and group membership (95% C.I.= -.73 to -.19, t=-3.378, p=.001).
**Interpreting the Interaction:** Control group members appeared to improve more than programme group members when both scored below the mean at time one (4.22) (see Table 14 Appendix D). Due to the high time one mean there were not enough participants to test the significance of the difference between control and programme groups at scores lower than the mean.

**Assumption Testing:** The residuals histogram was clustered between zero and one and was left-skewed (skewness z=-7.05, kurtosis z=4.93). Violating the assumption of normality may make the confidence intervals and p-values unreliable in a sample size of 170. However, the interaction’s small p-value (p=.001) points to evidence of a difference.

**Stage Four:** There was no main effect of the programme (F=.09, p=.92). However, there was again a significant interaction between time one scores and group membership. (p=.004).

**Interpreting the Stage Four Interaction:** While again there were not enough participants with low time one scores to run significance tests of the difference between the three groups at scores below the mean, the interaction suggests (see Table 15 Appendix D) control group members with lower time one scores increased more than members of either the two or four hour programme groups with similar time one scores.

**Assumption Testing of Stage Four:** The residuals histogram was left skewed (skewness z=-6.95, kurtosis z=4.6862), however the majority of residuals were close to zero.

**Stage Five:** After controlling for time one scores there was no significant main effect finding (F=.46, p=.79).

**Summary:** While overall we did not find that KRIC had a significant impact on participants’ resiliency goals and aspirations scores, members of the control group with lower time one scores appear to have increased more than programme group members with similar time one scores. These findings need to be interpreted knowing the internal reliability of this measure was unacceptable.

**Performance character**

**Stage Three Findings:** Using multi-level analyses, there is some evidence that performance character scores changed at different rates depending on what culture group (F=3.93, df1=3, df2 = 160.20, p=.01) and school year (F=5.90, df1=1, df2 = 158.33, p=.02) participants belonged to. After controlling for time one scores, cultural group and school year we
found no significant effect of the programme (95% C.I. = -1.42 to 1.50, t=.14, p=.90). The control group’s mean change score was -0.048, while the programme group’s mean change score was -0.09. The control group’s mean resiliency self-esteem change score was 0.04 higher than the programme group’s mean change score, yet this difference was not significant.

Stage Four: Culture (p=.01) and school year (p=.02) were significantly related to the outcome variable. Controlling for these variables and the time one score we found no main effect of the programme (F=.02, p=.98).

Stage Five: There was no significant main effect finding (F=.12, p=.97).

Summary: There was no evidence that the programme had an impact on participants’ performance character scores.

Liking for school

Stage Three Findings: After controlling for time one scores we found no significant effect of the KRIC programme on participants’ liking for school (95% C.I. = -.20 to .13, t=-.40, p=.69). The control group’s mean change score was -0.045 while the programme group’s mean change score was -.010. The control group’s mean change score decreased 0.034 more than the programme group’s mean change score, however this difference was not statistically significant.

Stage Four: There was no significant main effect finding (F=.32, p=.73).

Stage Five: There was no significant main effect finding (F=.95, p=.46).

Summary: We found no evidence that the programme had a significant effect on participants’ liking for school scores.

How good are you at physical activity / sport?

Stage Three Findings: After controlling for time one scores we found no significant effect of the KRIC programme on participants’ rating of how good they were at physical activity/sport (95% C.I. = -.29 to .22, t=-.30, p=.77). The control group’s modelled mean change score was 0.001, while the programme group’s mean change score was 0.036. The control group’s mean change score was 0.034 lower than the programme group’s mean change score, however this difference was not significant.

Stage Four: After controlling for time one scores we found that the main effect was not significant (F=.20, p=.85).
Stage Five: After controlling for time one scores there was no main effect finding ($F=.80$, $p=.56$).

Summary: We did not find evidence that the programme had a significant impact on participants’ perceptions of how good they were at physical activity or sport.

How much do you enjoy physical activity / sport

Stage Three Findings: After controlling for time one scores we found no significant effect of the programme on participants’ enjoyment of physical activity/sport when the effect was averaged across the sample (95% C.I. = -.23 to .091, $t=-.86$, $p=.39$). The control group’s modelled mean change score was -0.01, while the programme group’s modelled mean change score was 0.06. Overall the control group’s modelled mean change score was 0.07 lower than the programme group’s modelled mean change score. Again, this difference was not significant. There was a significant interaction between time one scores and group membership (95% C.I. = .15 to .57, $t=3.33$, $p=.001$), indicating the effect of the programme was different for participants with different time one scores.

Interpreting the Interaction: In order to interpret the interaction the time one scores of enjoyment of physical activity / sport were centred at different time one score levels (refer to Table 16 Appendix D). The control group improved less than the programme group when their time one scores were below the mean (4.71). There were not enough participants to test the significance of the difference between the two groups at scores lower than the mean. However, the interaction indicates that participants in the programme group who reported enjoying physical activity and sport less may have improved more over time than control participants with similar time one scores.

Assumption Testing: The normality histogram of residuals did show some skewness and kurtosis (skewness $z=-8.84$, kurtosis $z=12.42$), however the majority of residuals were close to zero. Violating the assumption of normality may make the confidence intervals and $p$-values unreliable in a sample size of 170. However, the interaction’s small $p$-value ($p=.001$) points to evidence of a difference.

Stage Four: In the final model the overall type 3 test $p$-value for the main effect in this analysis was not significant ($F=.50$, $p=.61$). However, there was again a significant interaction between time one scores and group membership ($p=.004$).
Interpreting the Stage Four Interaction: Two or four hour programme group members with lower baseline scores appeared to report higher time two scores than control group members with similar baseline scores (see Table 17 Appendix D).

Assumption Testing of Stage Four: The normality histogram did show some skewness and kurtosis (skewness $z=-9.04$, kurtosis $z=12.82$), however the majority of residuals were close to zero.

Stage Five: There was no significant main effect finding ($F=.14$, $p=.98$).

Summary: We did not find that the programme had a significant impact on participants’ enjoyment of physical activity and sport in comparison to control participants. Nor was there a significant difference between those who were exposed to the programme for longer than others. When assessing programme only participants, the amount of time spent in class versus game play activities appeared to have no effect. Here it should be noted that the time one mean was very high, meaning participants had little room to move up on the measure provided.

Despite these findings, the significant interactions between group and the time one score (for both control vs. programme groupings and hours KRIC groupings) indicate that KRIC may have helped to increase enjoyment of physical activity and sport scores for participants who scored lower on the measure at time one.

Section Four: Teacher Data

Data was also gathered from the control ($n=6$) and programme ($n=8$) class teachers. Due to low teacher numbers means analyses were only run on the performance and moral character scales all teachers completed (measures corresponding to the student moral and performance character measures). Table 10 details teacher questionnaire mean ratings at time one and two for the control and programme groups.
Table 18

*Teacher Questionnaire Mean Scores at Time One and Time Two*

<table>
<thead>
<tr>
<th></th>
<th>Control Teacher Time One Mean (sd)</th>
<th>Programme Teacher Time One Mean (sd)</th>
<th>Control Teacher Time Two Mean (sd)</th>
<th>Programme Teacher Time Two Mean (sd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours a week class engages in physical education classes</td>
<td>7.00 (2.76)</td>
<td>4.50 (1.51)</td>
<td>7.00 (3.29)</td>
<td>4.50 (1.31)</td>
</tr>
<tr>
<td>How much students enjoy physical activity</td>
<td>4.83 (0.41)</td>
<td>4.63 (0.52)</td>
<td>4.83 (0.41)</td>
<td>4.63 (0.52)</td>
</tr>
<tr>
<td>How much students enjoy physical education classes</td>
<td>4.00 (0.89)</td>
<td>4.13 (0.64)</td>
<td>4.33 (0.52)</td>
<td>4.00 (0.76)</td>
</tr>
<tr>
<td>How much students engage with physical activity</td>
<td>4.67 (0.52)</td>
<td>4.00 (0.76)</td>
<td>4.83 (0.41)</td>
<td>4.38 (0.52)</td>
</tr>
<tr>
<td>How much students engage with physical education classes</td>
<td>4.00 (0.63)</td>
<td>4.00 (0.97)</td>
<td>4.50 (0.55)</td>
<td>4.00 (0.76)</td>
</tr>
<tr>
<td>Belief physical activity has a role in personal development</td>
<td>5.00 (0.00)</td>
<td>4.75 (0.46)</td>
<td>4.83 (0.41)</td>
<td>4.63 (0.52)</td>
</tr>
<tr>
<td>Belief physical activity has a role in social skills</td>
<td>5.00 (0.00)</td>
<td>4.88 (0.35)</td>
<td>5.00 (0.00)</td>
<td>4.63 (0.52)</td>
</tr>
<tr>
<td>Belief physical activity has a role in confidence</td>
<td>4.83 (0.41)</td>
<td>4.38 (0.74)</td>
<td>4.83 (0.41)</td>
<td>4.63 (0.52)</td>
</tr>
<tr>
<td>Belief physical activity has a role in self-esteem</td>
<td>4.83 (0.41)</td>
<td>4.38 (0.52)</td>
<td>5.00 (0.00)</td>
<td>4.63 (0.52)</td>
</tr>
<tr>
<td>Belief physical activity has a role in character</td>
<td>4.83 (0.41)</td>
<td>4.50 (0.54)</td>
<td>4.83 (0.41)</td>
<td>4.38 (0.52)</td>
</tr>
<tr>
<td>Belief physical activity has a role in academic achievement</td>
<td>4.67 (0.82)</td>
<td>3.88 (1.13)</td>
<td>4.67 (0.82)</td>
<td>3.88 (1.13)</td>
</tr>
<tr>
<td>Belief physical education has a role in personal development</td>
<td>4.83 (0.41)</td>
<td>4.50 (0.54)</td>
<td>4.83 (0.41)</td>
<td>4.63 (0.52)</td>
</tr>
<tr>
<td>Belief physical education activity has a role in social skills</td>
<td>4.83 (0.41)</td>
<td>4.75 (0.46)</td>
<td>5.00 (0.00)</td>
<td>4.63 (0.52)</td>
</tr>
<tr>
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<td>4.38 (0.74)</td>
<td>4.67 (0.82)</td>
<td>4.63 (0.52)</td>
</tr>
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<td>4.50 (0.54)</td>
<td>4.83 (0.41)</td>
<td>4.63 (0.52)</td>
</tr>
<tr>
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<td>4.38 (0.52)</td>
<td>4.67 (0.82)</td>
<td>4.50 (0.54)</td>
</tr>
<tr>
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<td>3.88 (1.13)</td>
<td>4.83 (0.41)</td>
<td>3.88 (1.13)</td>
</tr>
<tr>
<td>Confidence teaching physical activity</td>
<td>3.83 (0.75)</td>
<td>3.88 (0.84)</td>
<td>4.33 (0.52)</td>
<td>3.88 (0.64)</td>
</tr>
<tr>
<td>Confidence teaching physical education</td>
<td>3.83 (0.75)</td>
<td>3.88 (0.64)</td>
<td>4.00 (0.63)</td>
<td>3.88 (0.64)</td>
</tr>
<tr>
<td>Enjoyment teaching physical activity</td>
<td>4.33 (0.82)</td>
<td>4.13 (1.13)</td>
<td>4.50 (0.55)</td>
<td>4.00 (0.54)</td>
</tr>
<tr>
<td>Enjoyment teaching physical education</td>
<td>4.17 (0.75)</td>
<td>4.25 (0.89)</td>
<td>4.17 (0.75)</td>
<td>4.00 (0.54)</td>
</tr>
<tr>
<td>Performance Character</td>
<td>3.17 (0.36)</td>
<td>2.77 (0.59)</td>
<td>3.17 (0.75)</td>
<td>3.02 (0.40)</td>
</tr>
<tr>
<td>Moral Character</td>
<td>3.87 (0.39)</td>
<td>3.57 (0.39)</td>
<td>3.57 (0.43)</td>
<td>3.68 (0.35)</td>
</tr>
</tbody>
</table>

*Note.* Ratings for hours engaged in physical education a week had no upper limit. All other questions were rated 1-5.

**Hours a week the class engages in physical education classes.** As shown in Table 18, control classes engaged in more hours of physical education on average per week than programme classes at both time one and time two. Control group means were elevated by two teachers who reported teaching physical education for 10 hours at time one, and two teachers
reporting they taught physical education for 12 and 10 hours at time two. Hours of physical education were not controlled for in the main effects analysis as within the programme schools physical education and KRIC overlapped and thus it was not possible to separate these elements. As the control group were already being exposed to more physical education before the programme began, and exposure to physical education remained constant across the study period for both groups, it is unlikely that this difference influenced the outcome variables. However, it is possible this had an impact on student measures, and may indicate that the control group, when taken as a whole, valued physical education more than the programme group.

**General questions: attitudes and beliefs about physical activity and physical Education.** This series of questions revealed that teachers in both groups, before and after the measurement period, felt their students engaged well in physical activity and physical education classes, and believed physical education and physical activity were important factors in the development of young people’s personal development, social skills, confidence, self-esteem and character. Control and programme teachers appeared to differ slightly in their belief in the role physical activity and physical education played in academic achievement, with programme teachers having lower mean scores on these questions at both time points. Teachers in both groups seem to enjoy teaching physical activity and physical education.

**Performance and moral character measures.** The teacher form of the CREE Performance Character measure (12 items) and Moral Character measure (eight items) showed good or acceptable alpha reliability at time one (Performance Character 0.88, Moral Character 0.83) and time two (0.89, 0.77). KRIC teachers’ ratings of their students’ moral character increased slightly, whereas control group teachers’ ratings of their students’ moral character decreased. In terms of performance character, control group teachers’ reports remained the same, while programme group teachers’ ratings increased. As teacher numbers were small meaning statistical tests could not be relied on, and programme teachers may have responded in a biased manner, these results are not given great consideration.

**Yes/no answers.** At time two, after the repeat of time one measures, the eight programme teachers answered additional yes/no questions. 100% of the eight teachers reported finding the programme useful / beneficial, 75% agreed that the programme changed students’ willingness to engage in physical activity and physical education classes, 62.5% noticed changes in students who participated in the programme, 50% did not believe they had used the programme enough,
100% felt the professional development sessions had helped them in their approach to teaching physical education, and 100% said they would use the programme in the future.

**Short-answer themes.** The eight programme teachers also answered additional short-answer questions at time two. These answers were reviewed by the researcher and grouped into themes depending on their content. These themes are detailed below (the full teacher responses to each question are reported in Appendix E).

*The programme was useful to teachers and provided a new element to teaching physical education.* Many teachers commented that the programme had been helpful to them as teachers. Three teachers commented that the professional development sessions had helped them. Teacher one stated “It was practical”, while teacher two stated there was “Good modelling” and “Time to discuss ideas”. Teacher four commented on how the sessions helped to understand “…how to teach the programme”, and “…why the programme is an integral part of students’ wellbeing, self-worth and growth”.

Five teachers reported that the programme’s structure and resources were helpful. Teacher one highlighted that “Lesson plans, AOs (achievement objectives) and LIs (learning intentions) are provided”, while teacher two appreciated the “Sequential lesson plans”, “Good curriculum links”, and how the programme “Helped to reinforce good characteristics and dealing with life’s challenges”. Teacher four stated “The teacher work book is brilliant. As a teacher, I have not had to re-invent the wheel. The specific booklet is well structured, clearly outlined re learning intentions, outcomes. The activities are challenging yet fun and motivating”. Teacher seven stated the programme was helpful through “Setting up the backgrounds to games”, and through outlining different games to play. Teacher eight commented that the programme “Made things clearer and easy to follow”. Teacher five reported that due to the programme they were “More confident to take physical education and physical activity”.

In terms of the programme providing a new element to teaching physical education, Teacher eight reported that “It brings aspects of ‘thinking’ into the process. What makes a good team? Why do we need rules and boundaries?”, and “A lot of the children commented that it was cool to think of things in the classroom as they didn’t have time to think when playing”. Teacher seven wrote about changes in students’ expression, noting that “Children talked about their attitudes”, and were “Able to articulate feelings/attitudes/skills in games”.
There were boundaries to using the programme. While all teachers reported finding the programme helpful, some highlighted boundaries that prevented them from implementing the programme as well as they may have liked. Overall, teacher six stated they “Didn’t get as far with the programme as I would have liked due to a number of factors”. In terms of the teaching curriculum, teacher two stated the programme was “Difficult to incorporate more as we have such a crowded curriculum”. Teacher seven stated the “Curriculum [is] so tight”. Similarly, teacher eight reported “I would have liked more but curriculum constraints didn’t allow this”. Meanwhile, one said they had used the programme for long enough on average as they “Don’t want to exhaust a good thing”.

In terms of programme implementation issues, teacher one stated “... the projector was not available at the time”, and teacher two stated “Personally [I] found it difficult with slides as we do not have a projector in class and [the] comp[uter] suite [is] used every block”. They suggested “big posters” as alternatives to slides. Teacher four stated that the programme should “provide required resources to all classroom teachers”.

Teachers noted changes in students. Many responses detailed changes teachers had observed in students. Three teachers talked about students developing greater leadership skills. Teacher four stated the programme allowed “…students to step up and take leadership and initiative”... “I have students who have great leadership abilities, but prior to the programme these students struggled to use the abilities appropriately. Since the programme, I’ve noticed that these students have made progress to use these special leadership qualities appropriately”. Teacher five stated that students were “More focused”, that some students were now “Leading a group”, and that “Less confident children now more eager to participate willingly [and] prepared to lead groups”. Teacher three said “Children took charge of their own learning”.

Four teachers highlight changes in self-confidence and self-esteem. Teacher three wrote that “Confidence of the children has grown”. Teacher four stated “To be able to observe some of my students grow in self-esteem and confidence has been rewarding”. Teacher five reported that students had “More confidence to participate in a range of activities”. Finally teacher eight wrote that “A lot of the less confident children contributed more”.

A common theme from teachers was that students appeared to participate in and enjoy physical education more. Teacher three commented how “Reluctant participants of the past have disappeared and now fully engaged”. Teacher four said that the programme “... supports those
children who do have difficulty with physical education”, while teacher four wrote “I [had] students ... not engaging in physical activity ..... and now [their] attitude and confidence with physical education has changed - they are enjoying physical activity now because they feel more included, the support from their peers to “HAVE A GO”. Teacher four also reflected “To be able to see some of my students participate in physical activity willingly as a result of the programme is also very exciting”. Teacher six wrote that “Children who were reluctant to join in seemed more willing when they had input into what was happening”. Overall teacher eight commented “All of the class certainly looked forward to and enjoyed every session”

Two teachers wrote about team work and fair-play. Teacher four wrote how the programme had provided opportunities for students to “... be supportive of their team members, to work cooperatively and in a fair play environment”. This sentiment was echoed by teacher five who said “Teamwork improved”.

While these teachers reported noting changes in students, not all teachers did, and not all change was attributed to the programme. For instance, teacher two said “They have always been quite enthusiastic. This has remained the same”. Teacher eight, while reporting changes in students, also said “My class have always been willing to engage in physical activity”. Teacher two also stated “As teachers we are often reinforcing the skills and life lessons presented in the KRiC programme”. Teacher one commented that any lack of change may due to the fact that “They participate in physical activities quite often at school”. Teacher six also said they had seen changes in students, however commented that the class had “… just made a tentative beginning to the programme so might take a while to fully evaluate [it’s] impact”.

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CHAPTER IV: DISCUSSION

The purpose of this study was to evaluate the impact of a curriculum-based physical education programme being used in some New Zealand schools. The Kids Rich in Character programme (KRIC) uses a mastery-based approach, and includes game-play in combination with class presentations, discussions and exercises in order to promote character development. The research questions in the current study were: Can such a physical education approach influence elements of character in primary school children, and does it have an impact on students’ perceived ability or enjoyment of sport and physical activity?

Using a quasi-experimental design, students from three programme schools (n=86) and one control school (n=84) completed a questionnaire assessing moral character, self-efficacy, self-esteem, resilience, and their perceived ability and enjoyment in sport and physical activity. Measures were completed before the KRIC programme was introduced, and after approximately 12 weeks of programme exposure. Programme (n=8) and control (n=6) teachers completed brief measures at baseline and time two, including ratings of student character. Programme teachers also answered brief yes/no and short-answer questions.

After controlling for school and class level variations, time one scores, and baseline demographic differences between groups, findings indicated that the KRIC programme had no impact on any measure when programme participants were compared with control participants, or when those who received zero, two or four hours exposure to KRIC were compared with each other. However, interaction analyses suggested that on some measures the programme had a differential impact for participants with different time one scores.

Contrary to expectations, participants who were exposed to the programme for the longest (and who had also reported very high levels of self-efficacy at time one), reported lower self-efficacy scores than other participants with similarly high baseline scores. Meanwhile, compared to control group members, KRIC participants with lower general self-esteem and enjoyment of physical activity at time one appeared to benefit from the programme. While the general self-esteem result should be considered with some caution due to the measure’s poor test-retest reliability, this finding was supported by some teachers who noted improvements in some students’ self-esteem, confidence and leadership skills. Overall, KRIC teachers reported finding the programme useful and said they would use it in the future.
These findings are now discussed, limitations and strengths of the current research and KRIC programme are outlined, and suggestions are made for future research.

The KRIC Programme

Due to the non-prescriptive nature of the KRIC programme, differences in uptake and adherence levels were expected. The KRIC programme was a curriculum-based physical education teaching tool. Teachers were given material to apply in a structured but flexible manner, and could use the programme resources and teaching approach as much or as little as they chose or as time would allow. The programme was not as structured as some of the intervention studies with which the current results will be compared, and the researchers did not seek to influence how teachers applied any element of the programme. Notably, only half the teachers thought they had used the programme enough and some commented that KRIC was crowded out by an already busy curriculum. It is possible the programme was not implemented enough to significantly alter student character. Findings are considered in light of this.

Impact of the KRIC Programme

Morality. In the present study we found that the KRIC programme did not have a significant impact on participants’ moral character. We found no difference when comparing control and programme groups, when comparing groups exposed to different hours of KRIC per week, or when comparing the effect of how long each KRIC class spent in game-play versus class exercises and discussions. Mean baseline scores were above the midpoint for participants across the sample, suggesting many already believed they treated others with respect, followed class rules, helped other people, did the right thing (despite what others might think of them), spoke up against bullying, owned up to doing wrong, and thought about what other people might do when deciding what was right or wrong.

While the main effects analyses showed no change, KRIC teachers’ ratings of their students’ moral character increased slightly, whereas control group teachers’ ratings of their students’ moral character decreased. Although there were very few KRIC and control group teachers in the present study, these findings suggests there may have been at least some small change in the moral character of programme participants. There is some corroborating evidence of a small improvement in the moral character of KRIC students, as two teachers reported a
change in students’ pro-social behaviour, including an improvement in teamwork, cooperation and fair play.

The current study’s findings differ to other studies in which moral measure scores in experimental groups increased when compared to control groups (Gibbons & Ebbeck, 1997; Gibbons et al., 1995; Lakes & Hoyt, 2004; Mouratidou et al., 2007). This may have occurred due to programme design and execution differences between the KRIC programme and other character-based programmes. For example, while the KRIC programme was flexibly applied by classroom teachers, the interventions detailed by Mouratidou and colleagues (2007) and Lakes and Hoyt (2004) appeared to be applied in a more consistent manner, which may have generated more momentum in terms of their impact on moral development. Also, compared to Gibbon’s and colleagues (1995, 1997), where the measurement period was seven months, the current study’s measurement period was approximately 12 weeks. Overall therefore, the KRIC programme may not have been intense enough, and/or the measurement periods may not have been long enough, for there to be a notable difference in students’ moral character scores.

From a theoretical perspective, Mouratidou and colleagues (2007) and Gibbons and colleagues (1995, 1997) both used social learning and structural developmental approaches. In relation to achievement goal theory Mouratidou and colleagues (2007) also aimed to promote a mastery-oriented motivational climate. Teacher role modelling and reinforcement, the explicit discussion of moral issues and a mastery approach are key components of programmes based on these theories. While the KRIC programme does not explicitly draw on these theories, their key principles appear to be embodied in the KRIC material and teaching themes. To apply such principles teachers need adequate training and resources. Training issues are detailed in the next section, while issues with resources are now discussed.

Three of the eight KRIC class teachers stated there were issues with programme resources. Two reported not being able to deliver the multimedia presentations in class, which may have limited teaching and discussion opportunities. One teacher also stated that not all teachers had the required resources. While this information is scant, it is possible that due to a lack of teaching resources or the ability to present class-based material, teachers were not able to engage students in moral discussions enough to generate moral change.

To address this issue KRIC programme designers could ensure there is more ongoing support for, and dialog with, KRIC teachers. This connection could provide an opportunity for
teachers to explain issues they were having, and for these issues to be resolved. This should in turn help them to deliver the programme in a more effective manner.

**Self-efficacy.** We did not find any evidence that the KRIC programme had a significant impact on participants’ sense of self-efficacy. Despite finding no main effects of the programme, there was some evidence of an interaction effect. Of all the very high scoring participants at baseline, those who were exposed to four hours of the KRIC programme a week had lower sense of efficacy scores at time two. It is possible those exposed to the programme for longer were affected by a response shift bias. This can occur when participants’ understanding of a construct changes due to an intervention (Pratt, McGuigan, & Katzev, 2000; Sibthorp, Paisley, Gookin, & Ward, 2007). These participants may have rated their self-efficacy very highly at the start of the programme as they did not fully understand the concept being assessed. Upon being exposed to the KRIC programme for the longer period of time they may have experienced a shift in the way they understood self-efficacy, which may have influenced how they rated their sense of efficacy at time two.

It is interesting to compare the KRIC programme to interventions that have been shown to increase participants’ self-efficacy (Escarti, Gutierrez, Pascual, & Llopis, 2010; Escarti, Gutierrez, Pascual, & Marin, 2010). In these studies the interventions were substantially longer (run for one school year). Secondly, teachers delivering the intervention had more professional development than KRIC teacher received (30 hours vs. six hours). This may have contributed to the interventions being run more closely in line with the intended teaching philosophy and plan. Escarti, Gutierrez, Pascual, and Llopis (2010) also outline the regular structure every class period had, including teacher expectations, and class discussions and self-evaluations at the end of physical education periods. This combination of intervention duration, teacher training and support, and class structure may have led to self-efficacy improvements.

Finally, in these studies (Escarti, Gutierrez, Pascual, & Llopis, 2010; Escarti, Gutierrez, Pascual, & Marin, 2010), researchers used measures of self-efficacy focusing on multiple self-efficacy constructs. This may have helped researchers to pick up on shifts in specific self-efficacy domains. Measuring general self-efficacy assumes that a programme or intervention will be effective in helping children to believe they can succeed in a range of life situations. Meanwhile, focusing on one or more specific self-efficacy domains (such as self-regulatory self-efficacy) may increase the likelihood of a significant finding.
In contrast to the current study however, control group participants in both comparative studies (Escarti, Gutierrez, Pascual, & Llopis, 2010; Escarti, Gutierrez, Pascual, & Marin, 2010) showed improvement on some self-efficacy measures; improvements that were similar to that of the experimental group in some cases. This may be due to baseline differences that were not controlled for, or small sample sizes that allowed control group factors (e.g. a group teacher’s approach) to have a more powerful impact on the results. In the current study baseline demographic differences were controlled for and the sample was larger, meaning results could be interpreted with greater confidence.

**Self-esteem.** While we found no evidence that the KRIC programme had an impact on participants’ academic self-esteem, this measure had very low alpha-reliability levels in its modified form. It could not be relied on to assess any given construct at baseline or time two, or any potential change over time. It is possible that programme participants experienced some change in academic self-esteem, but this could not be measured accurately with the modified academic self-esteem scale. The limitations section discusses this measurement issue.

We found no evidence that the KRIC programme had an impact on participants’ general self-esteem when looking at the entire sample. Baseline scores of general self-esteem were very high across all participants. This indicates participants in both the control and programme group felt a high general sense of self-worth. However, it was also an example of the ceiling effect, where respondents rate themselves mostly in the top rating bracket (Vita et al., 2013). This meant that the measure may have struggled to discriminate change over time in high scoring participants. Therefore the interaction analysis between group membership and participants’ time one scores became all the more important.

While there was no significant effect of the programme, KRIC participants with baseline scores lower than the mean (which was very high) reported a greater increase in general self-esteem than control participants with the same baseline scores. This is evidence that the KRIC programme may have helped to increase general self-esteem in those with lower levels of self-esteem at baseline. While this general self-esteem result should be interpreted with some caution (due to the measure’s reliability coefficient being 0.60), teachers reported noticing improvements in some participants’ self-esteem and confidence levels, and stated that less confident students had begun to participate and contribute more, and take leadership roles. Self-esteem has been correlated with student engagement (Dowling, 2009), and in the current study it appears that as
self-esteem rose there may have been an associated increase in students’ contribution to the classroom.

In contrast to Morino (2011) where no change was found in student self-esteem, the current study was run for longer, had a larger sample size, and aligned with tested theory. Mastery-based motivational climates (Reinboth & Duda, 2004) and mastery goal orientations (M Kavussanu & Harnisch, 2000; Yoo, 1999) have been associated with higher levels of self-esteem. It is possible that KRIC’s mastery-based approach may have led to changes in the classroom’s motivational climate. While this possibility is speculative without goal orientation or motivational climate measures, it may explain how students who had lower self-esteem at baseline rated themselves higher after exposure to KRIC.

**Resilience.** We found no evidence that the KRIC programme had a significant impact on participants’ self-reported resiliency full scale scores, or any resiliency subscale. There was some evidence that control group members with low resiliency goals and aspirations scores increased more over time than their low scoring KRIC group counterparts, however, given the unacceptable reliability of this measure, these results will not be considered further.

There was no evidence to suggest that the programme had an impact on participants’ performance character or liking for school. The liking for school scale had the highest mean of all measures, indicating that participants liked going to school and felt connected with their school community. However, this high score at baseline created a ceiling effect, meaning the measure could not discriminate upward changes in the large proportion of very high scoring participants.

It is difficult to compare the current resiliency findings to previous studies of physical education as no physical education interventions were found that specifically targeted resilience. In saying this, resilience is a very broad construct and many of the studies that have already been discussed were in fact attempting to build elements of resilience. Therefore, many of the reasons previously discussed for a lack of findings (and those discussed in the limitations sections) can be applied to the current lack of resilience findings.

**Perceived ability and enjoyment of sport and physical activity.** While character was the main focus of the current study, asking brief questions about participants’ perceived ability and enjoyment of sport and physical activity was important as the KRIC programme is based in
physical education. We found no evidence that the KRIC programme increased how good participants thought they were at sports and physical activity.

In terms of enjoyment of sports and physical activity, there was a ceiling effect, as participants in both groups reported very high time one scores. This suggests participants already enjoyed physical education a great deal, and this is reflected in two teacher comments stating students had always liked and engaged well with physical activity. However, as in the liking for school and general self-esteem scales, the high time one mean score rendered the measure less able to detect upward changes in high scoring participants over time.

Despite this, there was evidence that KRIC helped those who did not enjoy physical activity and sport as much as many of their peers at baseline to enjoy it more (when compared to control group members with similar baseline scores). This was found comparing control participants with all programme members and when comparing controls with those exposed to KRIC for two or four hours a week. These findings are re-iterated in some of the teacher comments. A common theme from KRIC teachers was that students appeared to participate in and enjoy physical education more due to the KRIC programme. They said that students looked forward to KRIC sessions and that the programme’s approach appeared to support and engage reluctant participants who had previously had difficulty in physical education classes. These teacher observations are very telling, and indicate that the KRIC programme gives teachers guidance to teach physical education in a way that helps a range of students engage with, and enjoy, physical education.

Well-structured physical education can act as a training ground for students’ ongoing involvement in sport and physical activity, and enhance their enjoyment of physical activity (Shields & Bredemeier, 1995). In the light of growing health concerns exacerbated by sedentary habits, Stork and Sanders (2008) go so far as to suggest that high quality physical education interventions are a moral imperative. Some students do not enjoy physical education, and feel alienated during physical education classes (Spencer-Cavaliere & Rintoul, 2012), yet enjoyment plays a very important role in young people’s ongoing engagement in physical activity (Yli-Piipari, Barkoukis, Jaakkola, & Liukkonen, 2013).

Creating enjoyable experiences helps to foster students’ intrinsic motivation toward physical activity. It can help them to value physical activity for its own sake and for the satisfaction it brings (L. J. Wright, 2004). Because mastery-oriented physical education climates
have been linked with satisfaction with physical activity and enjoyment of physical education
(Barkoukis, Ntoumanis, et al., 2010; Cunningham & Xiang, 2008), it may be that KRIC’s
mastery-based approach contributed to some students enjoying physical activity and sport more.
Although again mastery orientation and motivational climate were not measured in the current
study, it is possible this was a mechanism for change. One teacher statement supports this theory,
as it suggests the class environment may have become less competitive and more pro-social: “I
had students ... not engaging in physical activity ... and now [their] attitude and confidence
with physical education has changed - they are enjoying physical activity now because they feel
more included, the support from their peers to ‘HAVE A GO’”.

Limitations of the Current Research

Limitations related to the measures used. There are various limitations of the current
study, including issues of measurement. A brief measure was needed for the current research so
that it would seem a feasible option for principals and would not overburden teachers and
students who already have a busy time table. We aimed to compile a range of reliable measures
to assess a broad range of character traits, while also ensuring the student measure was an
acceptable length. While character research measures for education settings are diverse, few are
validated (Corrigan et al., 2007), and brief, validated measures of character for primary school
populations could not be found. In lieu of this, a range of short measures were selected that had
been used and shown to be reliable in similar populations. Some items were then removed from
some scales (see Methods section). For the most part the unaltered measures proved to have
acceptable alpha reliabilities, and the liking for school scale, which was reduced by half (from
six to three items), also retained acceptable alpha reliability. However the academic self-esteem
measure, which had been reduced from four items to two items, had unacceptable alpha
reliability and so could not be interpreted with any confidence. The choice to reduce the items in
this scale was detrimental to the study as it meant results from analyses using the academic self-
esteeem measure, significant or not, could not be trusted. The self-esteem portion of the current
research was already small in comparison to the measurement of other constructs (e.g. morality
or resilience) and the failure of this measure contributed to this construct being further under-
represented.
The general self-esteem scale was modified from three items to one, and confidence and enjoyment of sport and physical activity were both assessed using single item measures created by the researchers. Single item measures have received positive and negative critiques (Bergkvist & Rossiter, 2007; Gliem & Gliem, 2003; Helms et al., 2006; West, Dyrbye, Sloan, & Shanafelt, 2009). They are limited in that they do not assess different parts of a given construct, they may be more susceptible to random measurement error, and internal consistency cannot be assessed (Hoeppner, Kelly, Urbanoski, & Slaymaker, 2011). However, they can be useful in assessing global constructs and in making survey questionnaires more acceptable to participants (Hoeppner et al., 2011). Studies have shown single-item measures have not been effective for use in observer ratings of classroom behaviour (Volpe & Briesch, 2012), or as a screening tool for depression in older adults (Pantilat, O'Riordan, Dibble, & Landefeld, 2012). However, they have been useful for various purposes including the measurement of self-efficacy in young adults seeking treatment for substance use (Hoeppner et al., 2011), burnout among medical physicians (West, Dyrbye, Satele, Sloan, & Shanafelt, 2012), and the assessment of medication adherence (Feldman et al., 2013).

While it has been said that single-item measures may work best when the question asked is concrete in nature (Bergkvist & Rossiter, 2007), researchers cannot rely on face validity as a test of any measure’s true reliability or validity. Test-retest reliability is a way of assessing a single-item measure’s reliability by testing the correlation between the same item at two different time points (Reber & Reber, 2001). The test-retest reliability of a measure represents the level to which we can be confident it will assess the same thing over time, and in the current research the confidence with which we can attribute change over time to the KRIC programme. The modified general self-esteem single item scale had somewhat questionable test-retest reliability, and while teacher reports support the measures finding that the KRIC programme did in fact assist those with lower self-esteem, in future the full general self-esteem scale could provide a more consistent measure of this construct. Also, a different measure of perceived ability in physical activity and sport could be used to ensure better test reliability.

In the present study, three scales suffered from a ceiling effect; general self-esteem, liking for school, and enjoyment of physical activity. It is possible that this was due in part to these measures being short, two being positively worded single-item measures, and the other having three positively worded items. Using the original versions of the general self-esteem and liking
for school measures may remedy this situation, while expanding the Likert scale (e.g. from 1-5 to 1-7), or altering Likert scale response options (e.g. Vita et al., 2013) may go some way to preventing a ceiling effect in the enjoyment of physical activity item in future.

To better understand the influence of the KRIC programme, there were some factors that could have been assessed. This includes the pre-existing level of character focus in the school; an important baseline variable (Corrigan et al., 2007). By not assessing this it is difficult to know if the results were affected by, for example, the control school having a much stronger character focus or mastery-based approach than the programme schools. However, baseline character scores were controlled for in the current study’s analyses, which controlled for differences up to the point of baseline measurement. Another factor that was not assessed was how far teachers got through the KRIC programme. Teachers were asked how many hours they used the programme a week, and the percentage of game-play versus class-based work they did, but not specifically how much of the programme they taught. Knowing this could have helped to better explain the current findings about why KRIC did or did not make a difference. More in-depth questions about the specific workbook components that teachers actually taught could have offered information about programme fidelity, and would have allowed for a clearer understanding of how the programme worked, or why it did not.

Mechanisms of action. The current research did not assess the mechanisms of action: how the KRIC programme effected change in some students. Therefore most interpretations about the cause and effect of the programme, while often based in theory, are speculative. Greenwood and Kanters (2009) suggest achievement goal theory may be a key link between the structure of sports environments and positive youth development, as research has linked mastery-oriented climates with positive outcomes (e.g. persistence, a strong work ethic, intrinsic motivation) (Greenwood & Kanters, 2009). It is possible that the KRIC approach prompted a shift in class motivational climates and student goal orientations. Therefore future research could measure these constructs. This may go some way toward understanding the mechanism of action in such programmes.

Sample related limitations. The sample size, while larger than some other physical education studies, was still small. When recruiting for the current study the rate of schools taking up the KRIC programme was slow. Only four schools were recruited overall: one control school and three programme schools. While the control school was large, and the student samples were
almost even \((n=86 \text{ vs. } n=84)\), having only one control school was not ideal. If their approach to teaching physical education, or schooling in general, was particularly effective at promoting character development this could mask programme findings. Ideally the sample size would have been bigger, including more schools, more teachers (allowing for teacher measures to be analysed with some confidence), and more students, from an equal number of control and programme schools.

Another sample-based limitation is that the study was a quasi-experimental design, whereby participating schools were not randomly selected but were approached after they showed interest in the KRIC programme. It is possible that these schools were more interested in physical education and character development than other schools in New Zealand. Therefore the sample may have been biased, limiting our ability to generalise findings. Another factor that could make it difficult to generalise the findings is that the demographic makeup of the student sample is not representative of the general population of New Zealand.

**Measurement period.** In terms of the length of the study, the KRIC programme had a standardised introductory block, and this time period was chosen to assess the character development of programme participants. It is possible however that this period (approximately 12 weeks) was not long enough to pick up significant changes in students’ character. In a naturalistic study, programmes may not be applied as rigorously as in planned research interventions; therefore longer measurement periods may be required. Highlighting this point, at the end of the study period one teacher commented that the class had only just begun the KRIC programme and that it could take some time to see its impact. The fact that the current study assessed the influence of the KRIC programme only after its introductory period may have contributed to a lack of findings.

**Strengths of the Current Research**

While the sample size of the current study has been described as a limitation, it was also strength in comparison to some other studies in the area. The study also adds to the small body of research in the area of character education through physical education where programmes are compared with a control group, and interventions are measured over time. The inclusion of a control group helps to provide a comparison to ensure any change in the programme group is related to programme related factors.
The current study also attempted to control for potentially confounding variables. As a natural experiment, without random selection, controlling for group differences was important. Even when groups are randomly selected, baseline differences should be controlled for as best as possible (Corrigan et al., 2007). In the current study we controlled for the influence of time one scores and demographic differences between groups. As we found, demographic differences such as cultural group, language, or school year were responsible for different rates of change on many of our variables of interest. These changes were independent of experimental or control group membership. If these had not been controlled for in the analyses they would have gone unnoticed and yet would have greatly influenced the study’s findings.

Boyle-Holmes and colleagues (2010) have noted the usefulness of naturalistic study designs. Such studies research outcomes in real life settings, where programme implementation levels vary widely. Measuring the KRIC programme as it was applied in schools by real teachers, without any researcher involvement, may be considered strength in that findings can be better generalised than if researchers had sought to control the way the programme was implemented.

Programme Strengths and Limitations

In relation to best practice recommendations, the programme under investigation appeared to have a number of strengths. There were also a number of areas where it could be improved.

Programme strengths

The KRIC programme had various strengths. These included the fact it was a curriculum-based physical education programme. As such it provided teachers with a framework for teaching physical education that was found to improve self-esteem and enjoyment of physical activity in some students. Various teachers commented that the programme resources were very useful. The programme was also implemented in physical education classes throughout the school. This allows for the teaching approach and influence to better permeate the entire school. The KRIC programme was multifaceted, including game-play and class-based presentations, discussions and activities with a mastery focus, which fits well with theoretical approaches including structural developmental, social learning and achievement goal theories.
Discussion of moral issues is a key component in a structural developmental approach to teaching moral development, and while it may have been that some of these discussions were limited by a lack of time, teaching resources, or presentation equipment, one teacher noted that the programme made the students think about broader issues, such as the need for rules and boundaries or what makes a good team. The designers have also made steps to assess their programme by way of the current research, which is important when some sport and physical activity interventions make untested claims about the potential benefits of their programmes (Holroyd & Armour, 2003).

Finally, the programme’s approach appeared to be endorsed by teachers. Six teachers agreed that the programme changed students’ willingness to engage in physical activity and physical education classes. Five stated they had noticed changes in students who participated in the programme. Meanwhile, all eight KRIC group teachers stated they found the programme useful and would choose to use it in future.

**Programme limitations**

A key limitation appeared to be a lack of professional development and ongoing planned teacher support. While teachers stated that the six hours of professional development had been helpful in their approach to teaching physical education, they were not asked if this was enough. When asked about recommendations for the programme, one teacher suggested “*More workshops for all staff and students*”.

In any school-based programme there is great reliance on the teacher to engage with the programme and deliver it with enthusiasm and skill. However, teachers will vary in their enthusiasm for, and self-efficacy when, delivering such programmes. Therefore, professional development and support is essential, as teachers’ self-efficacy is a key ingredient in programme success (Milson, 2003). Some KRIC teachers reported that they were too busy to use the KRIC programme as much as they would have liked. When asked if they had used the programme enough, half said no. More professional training may make it easier for teachers to pick up the programme and run with it.

In terms of ongoing support, KRIC teachers could ask for assistance, but this support was not planned into the programme. This could have helped when teachers did not have programme materials or could not present multi-media resources to their classes. Programme designers could implement processes to ensure they receive teacher feedback in a timely manner and make
changes as needed. They should also monitor and encourage programme fidelity (Kloeppel, Hodges Kulina, Stylianou, & van der Mars, 2013), including assessing how often the programme is being used, how closely teachers are following programme materials, how well teachers understand the underlying philosophy, and if they are teaching in accordance with the programme’s key principles. Processes like this would also offer the opportunity to offer advice and guidance where required.

These issues, if addressed, could go some way to ensuring teachers feel more able to incorporate character education materials into their daily teaching practice. This may ensure such programmes are not crowded out by other demands.

**Future Directions**

The various limitations and strengths of the current study offer insights for future research. Character is a latent construct that can be controversial to define (Fowers, 2008; Schwartz & Sharpe, 2006; Sundararajan, 2008), and difficult to measure (Shields & Bredemeier, 2005). Reflecting this, character education interventions and research initiatives are highly diverse, making them difficult to compare. Operational definitions of character, including definitions of its many components, have been developed (e.g. Peterson & Seligman, 2004), but there is some way to go before researchers in this area speak a common language. Research measures are diverse, and there is limited validation of character measurements (Corrigan et al., 2007).

Future directions for character research should include the development and validation of standardised measures of different elements of character to be used in primary school settings, including brief measures for use when long questionnaires are not feasible. This would not only improve evaluations in the area, but would also help to compare different character interventions and assist in the understanding of what approaches are most effective. Work is being done to create validated character measures for use with adolescents (e.g. Proios, 2010; VIA Institute on Character, 2013), and more are needed for use with children.

In terms of adapting measures, researchers should be cautious when removing scale items and altering measures in any way. If using single item measures, face validity should not be used as evidence of reliability or validity, and further testing should be done, including test-retest
reliability. It is possible that single item measures may benefit from a larger range of response options. For example, instead of 1-5, scales could extend from 1-10 (e.g. Hoeppner et al., 2011).

Other forms of measurement and evaluation should also be considered. There has been an increase in the measurement of moral behaviour in sport settings (Maria Kavussanu, 2012). Programme evaluations could include behavioural outcome measures (Was, Woltz, & Drew, 2006) and student observations (e.g. Gibbons & Ebbeck, 1997; Lakes et al 2004) to test whether or not these programmes contribute to concrete behavioural change. Research approaches could also include qualitative approaches including in-depth interviews or focus groups with teachers. This would allow for a depth of information not possible through quantitative measures, including how much they already worked toward teaching good character, how they did this, their experience of new programmes, and their perception of the influence of such programmes on students. Also, assessing the extent to which a manualised programme has been used would be advisable.

If possible, character education research should also attempt to answer the question “If this character education programme works, how does it work?”. Measuring programmes’ possible mechanisms of action ensures researchers are more able to comment on key factors that promote character development. Greenwood and Kanters (2009) suggest that achievement goal theory may be a key theoretical approach when investigating character development. This is reflected in the current research where achievement goal theory has been used to explain some findings. With the words Winning is being better than before woven throughout its teaching, and a mastery-based approach to game play activities, it is feasible that the KRIC programme may influence the motivational climate of a class and students’ goal orientations. It is also feasible that this may influence their self-esteem and enjoyment of sport. However, without measures of motivational climate and goal orientation these explanations can only ever remain speculative. Therefore, measures that allow for statements about possible mechanisms of action should be included in research where possible.

The current research found that demographic differences, including culture, language, and school year, influenced participants’ character scores. For example, we found that moral character changed at different rates depending on if a student was in year five or six, and that different elements of resilience changed at different rates over time depending on the cultural group a student belonged to. These findings lead to questions about why culture or school year
had an influence on character change. Future research could investigate what may have been occurring in these cases.

Finally, the effects of demographic factors on the current study findings emphasise the importance of controlling for baseline differences between participants. These factors can mask significant findings or create false results.

Conclusion

Interventions in childhood can improve children’s life skills and life trajectory (e.g. Battistich et al., 2004). The current research provides some evidence that a curriculum-based physical education programme, with a mastery approach, may make some difference to some students. There was also some evidence that teachers found the programme’s structure and approach useful, and that they would use it in future. However, there were many areas where the programme appeared to have little impact, and programme design issues such as a lack of professional development and ongoing teacher support may have contributed to this.

Character education has existed in one form or another for a long time. It is still developing, as are research methods and measurement tools that may help to understand more about character development through physical education. The way in which physical education is delivered is very important (Wright et al., 2004). As research suggests, we cannot expect young people to develop in optimal ways if we simply tell them to go outside and play. Nor can we hope for excellent character outcomes if we focus excessively on winning. Physical education is a part of the New Zealand school curriculum, and is tasked with helping students learn how to move, appreciate movement, relate to other people, and show positive values and attitudes (Ministry of Education, 2007). Physical education curriculum-based programmes that utilise best practice approaches and provide adequate support structures may help teachers to achieve these goals.
APPENDIX A

COPIES OF ETHICS DOCUMENTS

1. Participation information sheet (principal: control)
2. Participation information sheet (principal: programme)
3. Consent form (principal: control)
4. Consent form (principal: programme)
5. Information sheet for consent of a minor participant (parent/guardian)
6. Consent form (parent/guardian)
7. Participant information sheet (minor)
8. Assent form (minor)
PARTICIPATION INFORMATION SHEET (SCHOOL PRINCIPAL)

Assessing if game-play exercises can impact aspects of ‘character’ in primary school children

Dear Principal

As discussed with the KRIC team, we wish to invite your school to take part in this study which looks at how the physical education curriculum influences character development.

Lead Investigators

Dr Jane Magnusson (Senior Lecturer, Department of Sport and Exercise Science, the University of Auckland). Daniel Farrant (Doctoral student, Department of Psychology, the University of Auckland).

What is the purpose of this study?

The purpose of the study is to assess if game-play exercises and in-class discussions, exercises and presentations can be an effective tool for the development of character in primary school children. Another aim of the proposed study is to determine if we can accurately measure character in young children. Additionally, we want to better understand how teachers view character-related aspects of their students and character-oriented programmes such as KRIC in terms of influencing character development of their students.

How were you selected to be asked to be a part of the study?

The KRIC programme consists of exercises and activities that can have a positive influence on character development in students (e.g. confidence, belief in themselves, liking for school, behaviours towards others, behaviours in class etc). We would like to measure these aspects of character to see if the KRIC approach to the physical education curriculum has a positive effect on character in young children. As you will be introducing the KRIC programme into your curriculum, we would like measurements to be taken at the beginning and end of the school term prior to your school introducing the programme in your classes.

Who can take part in this study?

Year six students and their teachers. The participation or non-participation of students and staff at the school in this research will in no way affect their relationship with the school, or jeopardise their participation in the KRIC programme or any other aspect of school life.

What happens in this study?

Students in year six classes, and their teachers, will be asked to complete a questionnaire about aspects of character. The student questionnaires take approximately 15 minutes to complete and can be done as part of physical education sessions. Questionnaires will be completed at the start and end of the school term. The teacher questionnaire will take approximately 15 minutes at the beginning and end of the school term.

Should you consent to this study, teachers will be approached for their informed consent to participate in the proposed study. Parents will then be informed of the study by way of a detailed PIS and consent form taken home by students. They will be asked to sign the consent form and return it through their child taking it back to school. If a signed or blank consent form has not been received within a week another copy of the PIS/consent form will be sent out to
parents with a self-addressed stamped envelope to be returned to the researcher. We would require permission from the school to access students’ home addresses to be able to mail out these forms if necessary.

Before the questionnaires are handed to students, they will be read a student version of the PIS (they will also be given a copy of the PIS) and an assent form to sign.

Within the questionnaire we will ask students to rate themselves on general aspects of character. Questions will cover the following areas: enjoyment of sport and physical activity, self-perceived sporting ability, communication with others, ability to solve problems by talking with others, treatment of others, respect for others, bullying behaviour, behaviour when others are bullied, helpful behaviours, self-confidence, self-efficacy, self-esteem, optimism, resilience, empathy, having goals and plans for the future, confidence and belief in academic abilities, liking for school, team work, commitment to performing well, persistence, cheating at school, and honesty.

Students not participating in the questionnaire (due to personal or parental choice) can undertake an activity such as free reading while others complete the questionnaire.

**How is the privacy of the school and its students protected?**

Daniel Farrant will hand out and collect the questionnaires in class; therefore no staff member will be exposed to any individual’s answers (both student and teacher questionnaires). However, should any student questionnaire give rise to serious concerns, the researcher (Daniel Farrant) will notify the school counsellor who will liaise with the student and their parent/guardian to discuss their responses to items in the questionnaire.

All consent forms will be kept in a locked filing cabinet at the Department of Sport and Exercise at the University of Auckland for a period of six years before being destroyed. After completion, questionnaires will be coded so that all names are kept confidential. After coding and data input is complete all questionnaires will be kept in a locked filing cabinet at the Department of Sport and Exercise at the University of Auckland for a period of six years before being destroyed. All electronic data used for analysis purposes will use these codes so that no link can be made to either your school, or individual participants, by anyone other than the researchers.

Should you change your mind about your school’s participation you will have up to two weeks after the final data collection date to withdraw your school’s data.

Your school’s name, or specific location, will not be mentioned in any of the reports produced by this study. We will not state any participants’ names in any reports resulting from this study.

**What are the discomforts and risks?**

While no discomforts or risks are anticipated from completing the questionnaires, there is a possibility some of the questions may be sensitive to some students.

**How will these discomforts and risks be managed?**

Due to the possibility that some of the questions may be sensitive to some students, we would request that, in addition to the researcher (Daniel Farrant), the school’s counsellor be available to address any worries/concerns a student may have while completing the questionnaire. In class, students will be told that if they are not comfortable answering any questions they can leave them unanswered and they can stop the questionnaire any time. Students will also be informed that the questionnaire has no influence over any area of their school life. If a child indicates serious problems or concerns through their responses on the questionnaires the researcher (Daniel Farrant) will notify the school counsellor who will liaise with the student and their parent/guardian to discuss their responses to items in the questionnaire.

If you have concerns about possible consequences of students completing the questionnaire please feel free to discuss with the researcher Daniel Farrant or contact Dr Jane Magnusson (principal investigator).
What are the benefits?

The Ministry of Education calls for health and physical education to build resilience, self worth, and other beneficial character elements in children. This study will offer a better understanding about how to positively influence the development of children’s character through participation in school-based play/game activities. This is very important in terms of creating and implementing programmes aimed at positive youth development.

Research funding

The proposed research is funded by a University of Auckland Doctoral Scholarship.

For further questions regarding the study please contact Daniel Farrant: aucklandresearch@gmail.com. You may also contact the Primary Investigator or the Head of Department, Psychology:

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The Chair: The University of Auckland Human Participants Ethics Committee
Phone: 373-7999 extn 87830
Address: Level 3, Building 438, 76 Symonds Street, University of Auckland, Private Bag 92019, Auckland.

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 08/09/2010 for 3 years from 08/09/2010 to 08/09/2013 Reference Number 2010/249
PARTICIPATION INFORMATION SHEET (SCHOOL PRINCIPAL)

Assessing if game-play exercises can impact aspects of ‘character’ in primary school children

Dear Principal

As discussed with the KRIC team, we wish to invite your school to take part in this study which looks at how the physical education curriculum influences character development.

Lead Investigators

Dr Jane Magnusson (Senior Lecturer, Department of Sport and Exercise Science, the University of Auckland).
Daniel Farrant (Doctoral student, Department of Psychology, the University of Auckland).

What is the purpose of this study?

The purpose of the study is to assess if game-play exercises and in-class discussions, exercises and presentations can be an effective tool for the development of character in primary school children. Another aim of the proposed study is to determine if we can accurately measure character in young children. Additionally, we want to better understand how teachers view character-related aspects of their students and character-oriented programmes such as KRIC in terms of influencing character development of their students.

How were you selected to be asked to be a part of the study?

The KRIC programme being implemented within your school’s curriculum consists of exercises and activities that can have a positive influence on character development in students (e.g. confidence, belief in themselves, liking for school, behaviours towards others, behaviours in class etc). We would like to measure these aspects of character to see if the KRIC approach to the physical education curriculum has a positive effect on character in young children. As you are just about to introduce the KRIC programme, it allows for measurements to be taken at the beginning and completion of the first ten weeks of the programme.

Who can take part in this study?

Year six students and their teachers. The participation or non-participation of students and staff at the school in this research will in no way affect their relationship with the school, or jeopardise their participation in the Kids Rich in Character programme or any other aspect of school life.

What happens in this study?

Students in year six classes, and their teachers, will be asked to complete a questionnaire about aspects of character. The student questionnaires take approximately 15 minutes to complete and can be done as part of physical education sessions. Questionnaires will be completed at the start and end of the school term. The teacher questionnaire will take approximately 15 minutes at the beginning of the school term, and approximately 20 minutes at the end of the school term.

Should you consent to this study, teachers will be approached for their informed consent to participate in the proposed study. Parents will then be informed of the study by way of a detailed PIS and consent form taken home by students. They will be asked to sign the consent form and return it through their child taking it back to school. If a signed or blank consent form has not been received within a week another copy of the PIS/consent form will be sent.
out to parents with a self-addressed stamped envelope to be returned to the researcher. We would require permission from the school to access students’ home addresses to be able to mail out these forms if necessary.

Before the questionnaires are handed to students, they will be read a student version of the PIS (they will also be given a copy of the PIS) and an assent form to sign.

Within the questionnaire we will ask students to rate themselves on general aspects of character. Questions will cover the following areas: enjoyment of sport and physical activity, self-perceived sporting ability, communication with others, ability to solve problems by talking with others, treatment of others, respect for others, bullying behaviour, behaviour when others are bullied, helpful behaviours, self-confidence, self efficacy, self esteem, optimism, resilience, empathy, having goals and plans for the future, confidence and belief in academic abilities, liking for school, team work, commitment to performing well, persistence, cheating at school, and honesty.

Students not participating in the questionnaire (due to personal or parental choice) can undertake an activity such as free reading while others complete the questionnaire.

How is the privacy of the school and its students protected?

Daniel Farrant will hand out and collect the questionnaires in class; therefore no staff member will be exposed to any individual’s answers (both student and teacher questionnaires). However, should any student questionnaire give rise to serious concerns, the researcher (Daniel Farrant) will notify the school counsellor who will liaise with the student and their parent/guardian to discuss their responses to items in the questionnaire.

All consent forms will be kept in a locked filing cabinet at the Department of Sport and Exercise at the University of Auckland for a period of six years before being destroyed. After completion, questionnaires will be coded so that all names are kept confidential. After coding and data input is complete all questionnaires will be kept in a locked filing cabinet at the Department of Sport and Exercise at the University of Auckland for a period of six years before being destroyed. All electronic data used for analysis purposes will use these codes so that no link can be made to either your school, or individual participants, by anyone other than the researchers.

Should you change your mind about your school’s participation you will have up to two weeks after the final data collection date to withdraw your school’s data.

Your school’s name, or specific location, will not be mentioned in any of the reports produced by this study. We will not state any participants’ names in any reports resulting from this study.

What are the discomforts and risks?

While no discomforts or risks are anticipated from completing the questionnaires, there is a possibility some of the questions may be sensitive to some students.

How will these discomforts and risks be managed?

Due to the possibility that some of the questions may be sensitive to some students, we would request that, in addition to the researcher (Daniel Farrant), the school’s counsellor be available to address any worries/concerns a student may have while completing the questionnaire. In class, students will be told that if they are not comfortable answering any questions they can leave them unanswered and they can stop the questionnaire any time. Students will also be informed that the questionnaire has no influence over any area of their school life. If a child indicates serious problems or concerns through their responses on the questionnaires the researcher (Daniel Farrant) will notify the school counsellor who will liaise with the student and their parent/guardian to discuss their responses to items in the questionnaire.

If you have concerns about possible consequences of students completing the questionnaire please feel free to discuss with the researcher Daniel Farrant or contact Dr Jane Magnusson (principal investigator).
What are the benefits?

The Ministry of Education calls for health and physical education to build resilience, self worth, and other beneficial character elements in children. This study will offer a better understanding about how to positively influence the development of children’s character through participation in school-based play/game activities. This is very important in terms of creating and implementing programmes aimed at positive youth development.

Research funding

The proposed research is funded by a University of Auckland Doctoral Scholarship.

For further questions regarding the study please contact Daniel Farrant: aucklandresearch@gmail.com. You may also contact the Primary Investigator or the Head of Department, Psychology:

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ON 08/09/2010 for 3 years from 08/09/2010 to 08/09/2013 Reference Number 2010/249
CONSENT FORM (SCHOOL PRINCIPAL)

Assessing if game-play exercises can impact aspects of ‘character’ in primary school children

Researchers: Dr Jane Magnusson, Daniel Farrant.

This consent form will be kept for six years.

I have received a Participant Information Sheet (PIS) about this project. I have also received copies of the proposed questionnaires, and the PIS and consent forms for teachers and parents.

I understand that the research will involve a questionnaire being given to students and their teachers at the school who agree to participate. These questionnaires will be conducted at the beginning and end of the school term.

I understand that students will be asked to take home a PIS and consent form related to this study and that if signed or blank consent forms are not returned within a week mailing addresses of students will be provided to the researchers so that a copy of the PIS/consent forms can be mailed to parents/guardians.

I understand this research will take approximately 15 minutes of student time at the beginning and end of the school term. I also understand the questionnaire will take approximately 15 minutes of teacher time at the beginning and end of the school term. Additional time will be required from the teachers to coordinate data collection with the researchers.

I understand some of the questions may be personally sensitive to some students, and that the school counsellor will be asked to be available in case of any possible adverse impact the questionnaire may have on any student. I understand that if a child indicates serious problems or concerns through their responses on the questionnaires the researcher (Daniel Farrant) will notify the school counsellor who will liaise with the student and their parent/guardian to discuss their responses to items in the questionnaire. I understand that if I have concerns about this research and possible consequences of students completing the questionnaire I can contact Dr Jane Magnusson (principal investigator) or Daniel Farrant.

I understand that all non-identifiable electronic data will be stored on the researchers’ computers. After coding and data entry all original questionnaires will be stored in a locked filing cabinet at the Department of Sport and Exercise Science at the University of Auckland. I understand that I may withdraw the school’s participation at any time up to two weeks after the final measures are collected, and no further data will be collected.

I understand that I will receive a summary of results after the research is completed. I understand the participation or non-participation of students and staff at the school in this research will in no way affect their relationship with the school, or jeopardise their participation in the Kids Rich in Character programme or any other aspect of school life.

I agree that __________________________ can take part in this research.

(name of school)  Signed ________________

Date ________________

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE
ON 08/09/2010 for 3 years from 08/09/2010 to 08/09/2013 Reference Number 2010/249
CONSENT FORM (SCHOOL PRINCIPAL)

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Researchers: Dr Jane Magnusson, Daniel Farrant.

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I have received a Participant Information Sheet (PIS) about this project. I have also received copies of the proposed questionnaires, and the PIS and consent forms for teachers and parents. I understand that the research will involve a questionnaire being given to students and staff members at the school who agree to participate. These questionnaires will be conducted at the beginning and end of term. I understand that students will be asked to take home a PIS and consent form related to this study and that if signed or blank consent forms are not returned within a week mailing addresses of students will be provided to the researchers so that a copy of the PIS/consent forms can be mailed to parents/guardians.

I understand this research will take approximately 15 minutes of student time at the beginning and end of the school term. I also understand the questionnaire will take approximately 15 minutes of teacher time at the beginning of the school term and 20 minutes at the end of the school term. Additional time will be required from the teachers to coordinate data collection with the researchers. I understand some of the questions may be personally sensitive to some students, and that the school counsellor will be asked to be available in case of any possible adverse impact the questionnaire may have on any student. I understand that if a child indicates serious problems or concerns through their responses on the questionnaires the researcher (Daniel Farrant) will notify the school counsellor who will liaise with the student and their parent/guardian to discuss their responses to items in the questionnaire. I understand that if I have concerns about this research and possible consequences of students completing the questionnaire I can contact Dr Jane Magnusson (principal investigator) or Daniel Farrant.

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I understand the participation or non-participation of students and staff at the school in this research will in no way affect their relationship with the school, or jeopardise their participation in the Kids Rich in Character programme or any other aspect of school life.

I agree that ___________________________ can take part in this research.

(name of school)

Name ___________________________ Signed ___________________________

Date ___________________________

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 08/09/2010 for 3 years from 08/09/2010 to 08/09/2013 Reference Number 2010/249
PARENTAL/GUARDIAN INFORMATION SHEET FOR CONSENT OF A MINOR PARTICIPANT

Assessing if game-play exercises can impact aspects of ‘character’ in primary school children.

Dear Parent / Guardian

We wish to invite your son, daughter (or the child to whom you are guardian) to volunteer to take part in this study which looks at how the school’s physical education curriculum influences character development.

Lead Investigators

Dr Jane Magnusson (Senior Lecturer, Department of Sport and Exercise Science, the University of Auckland).
Daniel Farrant (Doctoral student, Department of Psychology, the University of Auckland).

What is the purpose of this study?

It has been proposed that sport participation can improve character. The purpose of the study is to assess if game-play exercises, and in-class discussions, exercises and presentations, can be an effective set of tools for the development of character in primary school children. Another aim of the study is to determine if we can accurately measure character in children.

How was your child selected to be asked to be a part of the study?

Activities within your school’s physical education curriculum may have a positive influence on character development (e.g. belief in themselves, behaviours towards others, etc). We would like to measure these aspects of character to see if the physical education curriculum has a positive effect on character development.

Who can take part in this study?

Year six students and their teachers.

What happens in this study?

Students in year six classes, and their teachers, will be asked to complete a questionnaire about aspects of character. The student questionnaires take about 15 minutes to complete and can be done as part of physical education sessions. Questionnaires will be completed at the start and end of the school term.

Before partaking in the study, students will be told about the study, then given a participant information sheet describing the study, and finally asked to sign an assent form if they would like to participate.

We will ask students to rate themselves on general aspects of character. Questions will cover the following areas: enjoyment of sport and physical activity, self-perceived sporting ability, communication with others, ability to solve problems by talking with others, treatment of others, respect for others, bullying behaviour, behaviour when others are bullied, helpful behaviours, self-confidence, self efficacy, self esteem, optimism, resilience, empathy, having goals and plans for the future, confidence and belief in academic abilities, liking for school, team work, commitment to performing well, persistence, cheating at school, and honesty.

Students not participating in the questionnaire (due to personal choice or your decision not to consent to their participation) can undertake an activity such as free reading while other students complete the questionnaire.
How is the privacy of my son / daughter protected?

This questionnaire will be collected from the students by Daniel Farrant, a University of Auckland doctoral student, therefore no member of the school staff will see your child’s answers.

All consent forms will be kept in a locked filing cabinet at the Department of Sport and Exercise at the University of Auckland for a period of six years before being destroyed. After completion, all questionnaires will be coded so that all names are kept confidential. After coding and data input is complete all questionnaires will be kept in a locked filing cabinet at the Department of Sport and Exercise at the University of Auckland for a period of six years before being destroyed. All electronic data used for analysis purposes will use these codes so that no link can be made to either the school, or individual participants, by anyone other than the researchers.

Your child’s school’s name, or specific location, will not be mentioned in any of the reports produced by this study. We will not state any participant’s name in any reports resulting from this study.

What are the discomforts and risks?

While no discomforts or risks are anticipated from completing the questionnaires, there is a possibility some of the questions may be sensitive to some students.

How will these discomforts and risks be managed?

Students will be told that if they are not comfortable answering any questions they can leave them unanswered and they can stop the questionnaire any time. Students will also be informed that the questionnaire has no influence over any area of their school life, and no one besides the researchers will ever know their answers.

Should any student feel distressed or concerned by the questions asked, the school counsellor will be on hand to address the student’s questions or concerns. If a child indicates serious problems or concerns through their responses on the questionnaires the researcher (Daniel Farrant) will notify the school counsellor who will liaise with the student and their parent/guardian to discuss their responses to items in the questionnaire.

What are the benefits?

The Ministry of Education calls for health and physical education to build resilience, self worth, and other beneficial character elements in children. This study will offer a better understanding about how to positively influence the development of children’s character through participation in school-based play/game activities. This is very important in terms of creating and implementing programmes aimed at positive youth development.

Are there any costs for participating?

There are no costs to participants for taking part in this study.

What do I do if I do not my child to take part in this study?

Your child’s participation in this study is voluntary. If you do not want your child to take part in this research, simply throw away the attached consent form. We will be mailing a second copy of this participant information sheet, and consent form, home to those who do not respond to the first. If you do not want your child to participate, and you do not want to receive the second copy, please give the first unsigned consent form to your child to return to the school.

Your child’s participation, or non-participation, will in no way affect any aspect of their school life.

Participants may drop out of the study (i.e. not complete questionnaires) at any time without giving a reason. Participants may also withdraw the data they have supplied at any time up to two weeks after the data collection period.
Students not participating in the study will undertake an activity such as free reading while other students complete the questionnaire.

**Research funding**

The proposed research is funded by a University of Auckland Doctoral Scholarship.

**Support groups**

**WHATSUP:** is a free, professional telephone counselling service for anyone in Aotearoa New Zealand aged between 5 and 18 years.
0800 WHATSUP (0800 942 8787)

**YOUTHLINE:** provides a whole range of services designed for young people.
Helpline: 0800 37 66 33
Free TXT: 234
Email/MSN: talk@youthline.co.nz

**Where can you get more information about this study?**

If you would like more information on the study please feel free to contact Daniel Farrant at aucklandresearch@gmail.com

If you have any concerns about participant rights in this study you can contact the Health Advocates Trust, freephone 0800 555 050.

For further questions regarding the study please contact the Primary Investigator or the Head of Department, Psychology:

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CONSENT FORM (PARENT/GUARDIAN)

Assessing if game-play exercises can impact aspects of ‘character’ in primary school children

Researchers: Dr Jane Magnusson, Daniel Farrant.

This consent form will be kept for six years.

I have received a Participant Information Sheet (PIS) about this project.

I understand that the research will involve a 15 minute questionnaire being given to my child at two times (the beginning and end of a school term).

I understand some of the questions may be personally sensitive to some students.

I understand that no staff member will have access to my child’s answers at any point in time, except in the case of my child giving answers to the multi choice questions which give rise to serious concerns about their level of self-esteem, aversion to school etc. I understand that if a child indicates serious problems or concerns through their responses on the questionnaires the researcher (Daniel Farrant) will notify the school counsellor who will liaise with the student and their parent/guardian to discuss their responses to items in the questionnaire.

I understand that all non-identifiable electronic data will be stored on the researchers’ computers. After coding and data entry all original questionnaires will be stored in a locked filing cabinet at the Department of Sport and Exercise Science at the University of Auckland.

I understand that I may withdraw my child’s data at any time up to two weeks after the final measures are collected, and no further data will be collected.

I understand the participation or non-participation of students in this research will in no way affect their relationship with the school, or jeopardise any aspect of their school life.

I agree that ___________________________ can take part in this research.

(name of child)

Name ______________________________

Signed ______________________________

Date ______________________________

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 08/09/2010 for 3 years from 08/09/2010 to 08/09/2013 Reference Number 2010/249
PARTICIPANT INFORMATION SHEET (MINOR)

Assessing if game-play exercises can impact aspects of ‘character’ in primary school children.

Dear Student,

We would like to invite you to take part in this study, but before you accept this invitation please read the following outline of the study, the reasons for it, and your role in it.

Lead Investigators

Dr Jane Magnusson (Senior Lecturer, Department of Sport and Exercise Science, the University of Auckland).
Daniel Farrant (Doctoral student, Department of Psychology, the University of Auckland).

What is the purpose of this study?

To see if taking part in game-play exercises, and in-class discussions, exercises and presentations can influence aspects of your development such as character (e.g. belief in yourself, behaviours towards others, behaviour at school, etc).

Who can take part in this study?

If you are a year six student you can take part in this study.

What happens in this study?

You will fill in a questionnaire at the start and end of the school term. The questionnaire takes about 15 minutes to complete. You will be asked to rate yourself on things that relate to your character. Questions will ask how you feel about: enjoyment of sport and physical activity, your sporting ability, communication with others, ability to solve problems by talking with others, treatment of others, respect for others, bullying behaviour, behaviour when others are bullied, helpful behaviours, self-confidence, concern for others, having goals and plans for the future, confidence and belief in your school abilities, liking for school, team work, commitment to performing well, persistence, cheating at school, and honesty.

If you do not want to take part in this study you can do another activity such as free reading while other students complete the questionnaire.

How is my privacy protected?

Your name and personal details will be kept confidential (only the researchers will know them and they will not be made public).

After this study is completed all information will be kept in a locked filing cabinet at the Department of Sport and Exercise at the University of Auckland for a period of six years before being destroyed.

What are the discomforts and risks?

While no discomforts or risks are anticipated from completing the questionnaires, you may find some of the questions are sensitive and challenging to answer. If you are not comfortable answering any questions you can leave
them unanswered and you can stop the questionnaire any time. Should you feel distressed or concerned by the questions asked, you can speak with the researcher (Daniel) or your teacher about your questions or concerns.

The questionnaire has no influence over any area of your school life.

What are the benefits?

You will be helping us learn more about the benefits of physical activity/exercise programmes in schools and their impact on student development.

Are there any costs for participating?

There are no costs for taking part in this study.

Where can you get more information about this study?

If you would like more information on the study please feel free to contact Daniel Farrant at aucklandresearch@gmail.com

If you have any concerns about participant rights in this study you can contact the Health Advocates Trust, freephone 0800 555 050.

For further questions regarding the study please contact the Primary Investigator or the Head of Department, Psychology:

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| Private Bag 92019 | Private Bag 92019 |
| Auckland | Auckland 1142. |
| Phone: 373-7599 ext 88278 | Ph 3737599 ext 88414 |
| Email: j.magnusson@auckland.ac.nz | Email: f.seymour@auckland.ac.nz |

For any queries regarding ethical concerns please contact:
The Chair: The University of Auckland Human Participants Ethics Committee
Phone: 373-7999 extn 87830
Address: Level 3, Building 438, 76 Symonds Street, University of Auckland, Private Bag 92019, Auckland.

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 08/09/2010 for 3 years from 08/09/2010 to 08/09/2013 Reference Number 2010/249
ASSENT FORM (MINOR)

This consent form will be held for a period of six years.

Assessing if game-play exercises can impact aspects of ‘character’ in primary school children

Researchers: Dr Jane Magnusson, Daniel Farrant.

I have had the study explained to me by the researcher (Daniel Farrant).
I have been given a copy of the Participant Information Sheet (PIS) that explains what the study is about.
I have understood what the study is about and I have had the chance to ask questions about the study.
I understand that taking part in this study is my choice and that I can decide to not do the study at any time.

I _______________________ hereby consent to take part in this study.
(your name)
Date of birth: ___________________

Signature: _______________________  Today’s Date: _________________

Project explained and consent obtained by:
Name: Daniel Farrant  Signature: _______________________
Date: _________________

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 08/09/2010 for three years from 08/09/2010, Reference Number 2010/249
APPENDIX B

COPIES OF ALL STUDY MEASURES

1. Student Questionnaire
2. Teacher Questionnaire at time one
3. Teacher Questionnaire at time two (extra questions for programme teachers)
Hello

Please take a few minutes to answer the following questions. There are no right or wrong answers, so just circle the answer that best suits you!!

Thanks!!

What is your name? __________________________

Are you a .... Boy  Girl

What year are you in at school?  5  6

When were you born?

Jan  Feb  Mar  Apr  May  Jun  Jul  Aug  Sep  Oct  Nov  Dec

1999  2000  2001  2002  2003

What language do you speak most?
At home  English  Other _____________
Elsewhere (e.g. at school)  English  Other _____________

What cultural group do you belong to? (You can circle more than one)
NZ European (Pakeha)  Maori  Pacific Islander  Asian
Middle Eastern  Latin American  African  Other ........

1. How much do you enjoy physical activity / sport?
   Not at all  Mostly not  Sort of  Mostly  Very much

2. How good are you at physical activity / sport?
   Not good at all  Mostly not good  Average  Mostly good  Very good

3. I enjoy working with other students
   Never  Sometimes  Often  Nearly always  Always

4. I help other people
   Never  Sometimes  Often  Nearly always  Always
<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>5</td>
<td>I stand up for myself</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Never</td>
<td>Sometimes</td>
<td>Often</td>
<td>Nearly always</td>
<td>Always</td>
</tr>
<tr>
<td>6</td>
<td>I can work out my problems</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Never</td>
<td>Sometimes</td>
<td>Often</td>
<td>Nearly always</td>
<td>Always</td>
</tr>
<tr>
<td>7</td>
<td>I can do most things if I try</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Never</td>
<td>Sometimes</td>
<td>Often</td>
<td>Nearly always</td>
<td>Always</td>
</tr>
<tr>
<td>8</td>
<td>There are many things that I do well</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Never</td>
<td>Sometimes</td>
<td>Often</td>
<td>Nearly always</td>
<td>Always</td>
</tr>
<tr>
<td>9</td>
<td>I feel bad when someone gets their feelings hurt</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Never</td>
<td>Sometimes</td>
<td>Often</td>
<td>Nearly always</td>
<td>Always</td>
</tr>
<tr>
<td>10</td>
<td>I try to understand what other people feel</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Never</td>
<td>Sometimes</td>
<td>Often</td>
<td>Nearly always</td>
<td>Always</td>
</tr>
<tr>
<td>11</td>
<td>When I need help, I find someone to talk to</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Never</td>
<td>Sometimes</td>
<td>Often</td>
<td>Nearly always</td>
<td>Always</td>
</tr>
<tr>
<td>12</td>
<td>I know where to go for help when I have a problem</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Never</td>
<td>Sometimes</td>
<td>Often</td>
<td>Nearly always</td>
<td>Always</td>
</tr>
<tr>
<td>13</td>
<td>I try to work out problems by talking about them</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Never</td>
<td>Sometimes</td>
<td>Often</td>
<td>Nearly always</td>
<td>Always</td>
</tr>
<tr>
<td>14</td>
<td>I have goals and plans for the future</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Never</td>
<td>Sometimes</td>
<td>Often</td>
<td>Nearly always</td>
<td>Always</td>
</tr>
<tr>
<td>15</td>
<td>I think I will be successful when I grow up</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Never</td>
<td>Sometimes</td>
<td>Often</td>
<td>Nearly always</td>
<td>Always</td>
</tr>
<tr>
<td>16</td>
<td>I like myself just the way I am</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Don’t agree</td>
<td>Don’t agree a little</td>
<td>Don’t know</td>
<td>Agree a little</td>
<td>Agree a lot</td>
</tr>
<tr>
<td>17</td>
<td>I don’t do very well in school</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Don’t agree</td>
<td>Don’t agree a little</td>
<td>Don’t know</td>
<td>Agree a little</td>
<td>Agree a lot</td>
</tr>
</tbody>
</table>
18. I think I'm a good student
   Don’t agree     Don’t agree a little     Don’t know     Agree a little     Agree a lot

19. My school is a fun place to be
   Don’t agree     Don’t agree a little     Don’t know     Agree a little     Agree a lot

20. I enjoy what I do in school
   Don’t agree     Don’t agree a little     Don’t know     Agree a little     Agree a lot

21. I like my school
   Don’t agree     Don’t agree a little     Don’t know     Agree a little     Agree a lot

How sure are you that things will work out well...........

22. .....when you have to learn something new at school?
   Not at all sure     Mostly not sure     Sort of sure     Mostly sure     Very sure

23. .....when you have to give a talk in class?
   Not at all sure     Mostly not sure     Sort of sure     Mostly sure     Very sure

24. .....when you have to do an activity for the first time?
   Not at all sure     Mostly not sure     Sort of sure     Mostly sure     Very sure

25. .....when you are having trouble with your schoolwork?
   Not at all sure     Mostly not sure     Sort of sure     Mostly sure     Very sure

26. .....when you feel very unhappy?
   Not at all sure     Mostly not sure     Sort of sure     Mostly sure     Very sure

27. .....when you have to figure out something by yourself?
   Not at all sure     Mostly not sure     Sort of sure     Mostly sure     Very sure

28. .....when you have to make an important decision?
   Not at all sure     Mostly not sure     Sort of sure     Mostly sure     Very sure

29. .....when someone is counting on you to do something?
   Not at all sure     Mostly not sure     Sort of sure     Mostly sure     Very sure
30. .....when things are going wrong?
Not at all sure  Mostly not sure  Sort of sure  Mostly sure  Very sure

31. I can be counted on to do my part for the team/group.
Never  Sometimes  Often  Nearly always  Always

32. I try to get out of doing things that are difficult or boring.
Never  Sometimes  Often  Nearly always  Always

33. I spend extra time working to improve my weaknesses.
Never  Sometimes  Often  Nearly always  Always

34. I continue trying hard, even when things are not going well.
Never  Sometimes  Often  Nearly always  Always

35. I forget to bring what is needed for class.
Never  Sometimes  Often  Nearly always  Always

36. I work with another student to help him or her do better on an assignment, without letting them copy my work.
Never  Sometimes  Often  Nearly always  Always

37. I forget to do my homework.
Never  Sometimes  Often  Nearly always  Always

38. I think about my school work and consider whether I need to work harder.
Never  Sometimes  Often  Nearly always  Always

39. I talk to a teacher to find out if I'm doing well in my school work.
Never  Sometimes  Often  Nearly always  Always

40. I run out of time to do my assignments well.
Never  Sometimes  Often  Nearly always  Always

41. I give up watching TV or hanging out with friends to study for a test or do an assignment for school.
Never  Sometimes  Often  Nearly always  Always

42. I am willing to redo a school assignment to make it better.
Never  Sometimes  Often  Nearly always  Always
43. I treat teachers and staff with respect, even if I disagree with them.
   Never   Sometimes   Often   Nearly always   Always

44. I break classroom or school rules.
   Never   Sometimes   Often   Nearly always   Always

45. When I see someone having a problem, I offer to help.
   Never   Sometimes   Often   Nearly always   Always

46. I do the right thing no matter what others might think.
   Never   Sometimes   Often   Nearly always   Always

47. I help another student choose between doing what is right and what is wrong.
   Never   Sometimes   Often   Nearly always   Always

48. I make fun of someone.
   Never   Sometimes   Often   Nearly always   Always

49. I speak up when someone is bullied.
   Never   Sometimes   Often   Nearly always   Always

50. I cheat on a test or an assignment.
   Never   Sometimes   Often   Nearly always   Always

51. I think about how my parent, teacher, or coach would act before making an important decision.
   Never   Sometimes   Often   Nearly always   Always

52. I admit if I do something wrong.
   Never   Sometimes   Often   Nearly always   Always

53. When I have to decide what is right or wrong, I think about what other people would do in that situation.
   Never   Sometimes   Often   Nearly always   Always
Teacher Questionnaire

Please take a few minutes to complete this survey.
Simply circle the answer that seems most appropriate to you.

Please note this information will not be used to assess you as a teacher.

Thank you for your time.

Name: ______________________________________

1. **How many hours a week does your class engage in physical activity/physical education classes?**
   
<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>10+</th>
</tr>
</thead>
</table>

2. **How much do your students enjoy…..**
   
   a. Physical activity (e.g. fitness, lunchtime sporting activities, school team trainings)?
      
      | Not at all | A little | Moderately | A good deal | A great deal |
   
   b. Physical education classes (e.g. a lesson with learning intentions and success criteria)?
      
      | Not at all | A little | Moderately | A good deal | A great deal |

3. **How much do your students engage with...**
   
   a. Physical activity (e.g. fitness, lunchtime sporting activities, school team trainings)?
      
      | Not at all | A little | Moderately | A good deal | A great deal |
   
   b. Physical education classes (e.g. a lesson with learning intentions and success criteria)?
      
      | Not at all | A little | Moderately | A good deal | A great deal |

4. **Do you believe physical activity has a role in......**
   
   a. *Personal development?*
      
      | Not at all | A little | Moderately | A good deal | A great deal |
   
   b. *Social skills?*
      
      | Not at all | A little | Moderately | A good deal | A great deal |
   
   c. *Confidence?*
      
      | Not at all | A little | Moderately | A good deal | A great deal |
   
   d. *Self-esteem?*
      
      | Not at all | A little | Moderately | A good deal | A great deal |
5. Do you believe physical education has a role in......

a. **Personal development?**
   Not at all  A little  Moderately  A good deal  A great deal

b. **Social skills?**
   Not at all  A little  Moderately  A good deal  A great deal

c. **Confidence?**
   Not at all  A little  Moderately  A good deal  A great deal

d. **Self-esteem?**
   Not at all  A little  Moderately  A good deal  A great deal

e. **Character?**
   Not at all  A little  Moderately  A good deal  A great deal

f. **Academic achievement?**
   Not at all  A little  Moderately  A good deal  A great deal

6. How confident are you teaching ...

a. Physical activity (e.g. fitness, lunchtime sporting activities, school team trainings)?
   Not at all  A little  Moderately  A good deal  A great deal

b. Physical education classes (e.g. a lesson with learning intentions and success criteria)?
   Not at all  A little  Moderately  A good deal  A great deal

7. How much do you enjoy teaching ...

a. Physical activity (e.g. fitness, lunchtime sporting activities, school team trainings)?
   Not at all  A little  Moderately  A good deal  A great deal

b. Physical education classes (e.g. a lesson with learning intentions and success criteria)?
   Not at all  A little  Moderately  A good deal  A great deal

8 I have noticed that students:

a. Demonstrate dependability, including the ability to do their part on a project.
   Never  Sometimes  Often  Nearly always  Always
b. Try to get out of doing things that they see as difficult or boring
   Never  Sometimes  Often  Nearly always  Always

c. Spend extra time working to improve their weaknesses.
   Never  Sometimes  Often  Nearly always  Always

d. Demonstrate persistence in the face of discouragement.
   Never  Sometimes  Often  Nearly always  Always

e. Take responsibility for having the required school supplies/materials.
   Never  Sometimes  Often  Nearly always  Always

f. Work together to help one another do their best academic work.
   Never  Sometimes  Often  Nearly always  Always

g. Take responsibility for preparing their homework.
   Never  Sometimes  Often  Nearly always  Always

h. Are involved in goal setting and self-evaluation toward the realization of their goals.
   Never  Sometimes  Often  Nearly always  Always

i. Show initiative in monitoring their progress.
   Never  Sometimes  Often  Nearly always  Always

j. Demonstrate organizational skills and responsible time management.
   Never  Sometimes  Often  Nearly always  Always

k. Demonstrate self-discipline, including the ability to delay gratification in order to pursue future goals.
   Never  Sometimes  Often  Nearly always  Always

l. Demonstrate diligence, including a personal concern to do a job or assignment well.
   Never  Sometimes  Often  Nearly always  Always

m. Treat teachers and staff with respect.
   Never  Sometimes  Often  Nearly always  Always

n. Break classroom or school rules.
   Never  Sometimes  Often  Nearly always  Always

o. Offer to help when they see someone having a problem.
   Never  Sometimes  Often  Nearly always  Always
p. Do the right thing no matter what their peers might think.
   Never  Sometimes  Often  Nearly always  Always

q. Make fun of others.
   Never  Sometimes  Often  Nearly always  Always

r. Speak up when someone is bullied.
   Never  Sometimes  Often  Nearly always  Always

s. Cheat on tests or assignments.
   Never  Sometimes  Often  Nearly always  Always

t. Admit if they did something wrong.
   Never  Sometimes  Often  Nearly always  Always

   Thank you very much for your time
OPEN ENDED QUESTIONS FOR PROGRAMME TEACHERS

In the section below please answer yes or no to each question. Feel free to comment in the boxes provided if you would like to.

1. As a teacher, did you find the KRIC programme useful / beneficial?
   Yes    No
   How/why?

2. Did the KRIC programme change the children’s willingness to engage in physical activity / physical education class?
   Yes    No
   How/why?

3. Did you notice changes in the children who participated in the KRIC programme?
   Yes    No
   Comments
4. How many hours a week did you use the KRIC programme?

0 1 2 3 4 5 6 7 8 9 10 10+

5. Was that enough?
   Yes  No

Comments

6. What percentage of the K.R.I.C. time did you spent doing physical activity/game-play, versus in-class presentations, discussion and exercises?

   Physical activity  %

   Class based activities  %

7. Do you feel the two KRIC professional development sessions (given by the KRIC team to staff) helped you in your approach to teaching physical education?

   Yes  No

Comments
8. Having done the introductory part of the KRIC programme, would you want to use it in the future?
   Yes    No

Comments

9. Do you have any recommendations for how to improve the programme?

10. Is there anything about the programme you would like to share? (e.g. how the programme helped change a child’s behaviour, and/or the general mood of the classroom?).
11. Has this programme impacted upon you personally, and if so, how?

12. Any other comments?

Thank you very much for your time.
APPENDIX C

Skewness and Kurtosis Z Scores for Raw Outcome Scores and Change Scores

Table 9

<table>
<thead>
<tr>
<th>Variable</th>
<th>Raw Scores</th>
<th>Change Scores</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Skewness Score</td>
<td>Kurtosis Score</td>
<td>Skewness Score</td>
<td>Kurtosis Score</td>
</tr>
<tr>
<td>Moral Character</td>
<td>-1.47</td>
<td>-1.62</td>
<td>0.01</td>
<td>-0.09</td>
</tr>
<tr>
<td>Sense of Efficacy</td>
<td>-1.62</td>
<td>-1.62</td>
<td>-1.72</td>
<td>-0.29</td>
</tr>
<tr>
<td>General Self-Esteem</td>
<td>-14.18</td>
<td>18.75</td>
<td>-1.39</td>
<td>20.65</td>
</tr>
<tr>
<td>Academic Self-Esteem</td>
<td>-1.42</td>
<td>-1.41</td>
<td>-1.03</td>
<td>1.81</td>
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<tr>
<td>Resiliency</td>
<td>-3.90</td>
<td>-0.20</td>
<td>-0.87</td>
<td>3.13</td>
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<tr>
<td>Resiliency Communication</td>
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<td>-0.29</td>
<td>-2.06</td>
<td>5.00</td>
</tr>
<tr>
<td>Resiliency Self-Esteem</td>
<td>-6.05</td>
<td>2.45</td>
<td>0.74</td>
<td>1.91</td>
</tr>
<tr>
<td>Resiliency Empathy</td>
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<td>-0.02</td>
<td>-0.10</td>
<td>4.41</td>
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<tr>
<td>Resiliency Problem Solving</td>
<td>-3.91</td>
<td>-0.59</td>
<td>-2.13</td>
<td>1.25</td>
</tr>
<tr>
<td>Resiliency Goals / Aspirations</td>
<td>-7.03</td>
<td>3.00</td>
<td>-0.98</td>
<td>5.61</td>
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<tr>
<td>Performance Character</td>
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<td>-0.97</td>
<td>0.63</td>
<td>1.26</td>
</tr>
<tr>
<td>Liking for School</td>
<td>-14.82</td>
<td>23.38</td>
<td>0.73</td>
<td>23.62</td>
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<tr>
<td>Perceived Ability in PA / Sport</td>
<td>-4.73</td>
<td>2.42</td>
<td>1.22</td>
<td>2.34</td>
</tr>
<tr>
<td>Enjoyment of PA / Sport</td>
<td>-15.97</td>
<td>27.05</td>
<td>7.79</td>
<td>22.95</td>
</tr>
</tbody>
</table>
Moral Character

*Stage One, Two and Three Analyses:* School and class levels were included in the model. The interaction was not significant ($p=.62$). In stage two, language ($p=.81$) and culture ($p=.65$) were not significantly related to the outcome variable. In stage three school year was significant ($p=.03$).

*Stage Three Findings:* The final estimate of the variance in school group effects was 0.02 (s.e.=.03), while the variance in class group effects had become non-existent at 0.00 (s.e.=.00), and the overall residual error variance estimate was 0.29 (s.e.=.03).

*Assumption Testing:* The diagnostic plot showed nothing of concern. The normality histogram showed the residuals were in accord with a normal distribution (skewness $z=-1.28$, kurtosis $z=-.37$). The Levene’s test was not significant ($F=.91$, $p=.44$), therefore there was no evidence of differing variances between the groups in terms of the outcome variable.

*Stage Four:* Class was included in the multi-level model.

*Stage Five:* Stage Five included school level random effects.

Sense of Efficacy

*Stage One, Two and Three Analyses:* Class level random effects were included in the model (variance estimate=.02, s.e.= .02). The interaction was not significant ($p=.08$). In stage two language ($p=.52$) and culture ($p=.66$) were not significantly related to the outcome variable. In stage three school year was not significant ($p=.08$).

*Stage Three Findings:* The final estimate of the variance in school group effects was 0.02 (s.e.= .02), while the overall residual error variance estimate was 0.39 (s.e.= .04).

*Assumption Testing:* The diagnostic plot showed a random spread around zero. The residuals histogram was close to normal (skewness $z=-2.44$, kurtosis $z=-.43$). The Levene’s test was not significant ($F=2.86$, $p=.09$).

*Stage Four:* Class was included in the multi-level model.

*Interpreting the Stage Four Interaction:*
Table 10

*Mean Change in Sense of Efficacy scale from Time One to Time Two as Estimated from the Model for Different Levels of the Time One for Three Hours Groups*

<table>
<thead>
<tr>
<th>T1 value</th>
<th>n**</th>
<th>Estimated Change from T1 to T2</th>
<th>Type 3 test p-value for any Pairwise Differences Between the Hours Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Control (0 Hours)</td>
<td>Programme (2 Hours)</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>2.05</td>
<td>1.12</td>
</tr>
<tr>
<td>2</td>
<td>7</td>
<td>1.34</td>
<td>0.74</td>
</tr>
<tr>
<td>3</td>
<td>49</td>
<td>0.62</td>
<td>0.35</td>
</tr>
<tr>
<td>3.79*</td>
<td>NA</td>
<td>0.06</td>
<td>0.05</td>
</tr>
<tr>
<td>4</td>
<td>90</td>
<td>-0.09</td>
<td>-0.03</td>
</tr>
<tr>
<td>5</td>
<td>24</td>
<td>-0.81</td>
<td>-0.41</td>
</tr>
</tbody>
</table>

*Mean of the T1 value of Sense of Efficacy scale
**Based on rounding the composite scale score

Assumption Testing of Stage Four (Given Interaction Finding): As there was an interaction finding, assumptions were retested. The diagnostic plot again showed nothing of concern. The residuals histogram was close to normal (skewness z=-2.40, kurtosis z=-.39) with the majority of residuals clustered around zero. Levene’s testing revealed no significant difference between the control and programme groups in their variance on the outcome variable (F=.04, p=.84).

Stage Five: Stage Five included class level random effects.

General Self-Esteem

Stage One, Two and Three Analyses: School and class random effects had no standard error and so were not included in the model. The interaction was a significant (p=<.001). In stage two language (p=.18) and culture (p=.92) were not significantly related to the outcome variable. In stage three school year was not significant (p=.36).

Stage Three Findings: The final model’s residual error variance estimate was 0.51 (s.e.=.06).

Interpreting the Interaction:
Table 11

Mean Change in General Self-Esteem from Time One to Time Two as Estimated from the Model for Different Levels of the Time One Variable for the Control and Programme Groups.

<table>
<thead>
<tr>
<th>T1 value</th>
<th>n</th>
<th>Programme</th>
<th>Control</th>
<th>Estimated Change from T1 to T2</th>
<th>Wald test for the Difference at Specified T1 value</th>
<th>s.e.</th>
<th>95% CI</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3.56</td>
<td>0.67</td>
<td>-2.89</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>2.61</td>
<td>0.45</td>
<td>-2.16</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>8</td>
<td>1.65</td>
<td>0.23</td>
<td>-1.42</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>25</td>
<td>0.70</td>
<td>0.02</td>
<td>-0.68</td>
<td>0.15</td>
<td>(.39, .97)</td>
<td>&lt;.001</td>
<td></td>
</tr>
<tr>
<td>4.66**</td>
<td>NA</td>
<td>0.07</td>
<td>-0.12</td>
<td>-0.20</td>
<td>0.11</td>
<td>(-.02, .42)</td>
<td>0.074</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>132</td>
<td>-0.25</td>
<td>-0.20</td>
<td>0.05</td>
<td>0.12</td>
<td>(-.29, .19)</td>
<td>0.659</td>
<td></td>
</tr>
</tbody>
</table>

*Difference in change scores (Programme – Control)

**Mean of the T1 value of General Self-Esteem

Assumption Testing: The diagnostic plot had a random horizontal band scattered around zero with a very slight funnel pattern, and one point had a larger residual but it was not a strong outlier. Overall there was no concern about violations. While the normality histogram showed most residuals were clustered around zero, it was left skewed (skewness $z=-14.05$, kurtosis $z=26.93$). The Levene’s test was not significant ($F=1.55$, $p=0.21$), therefore there is no evidence of differing variances between the groups in terms of the outcome variable.

Stage Four: School and class effects were not included in the multi-level model.

Interpreting the Stage Four Interaction:
Table 12

*Mean Change in General Self-Esteem from Time One to Time Two as Estimated from the Model for Different Levels of the Time One Variable for Three Hours Groups.*

<table>
<thead>
<tr>
<th>T1 value</th>
<th>n</th>
<th>Control (0 Hours)</th>
<th>2 Hours</th>
<th>4 Hours</th>
<th>F Statistic</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>0.67</td>
<td>3.74</td>
<td>3.07</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>0.45</td>
<td>2.75</td>
<td>2.23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>8</td>
<td>0.23</td>
<td>1.75</td>
<td>1.39</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>25</td>
<td>0.02</td>
<td>0.76</td>
<td>0.55</td>
<td>11.21</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>4.66*</td>
<td>NA</td>
<td>-0.12</td>
<td>0.10</td>
<td>0.00</td>
<td>1.81</td>
<td>0.167</td>
</tr>
<tr>
<td>5</td>
<td>132</td>
<td>-0.20</td>
<td>-0.23</td>
<td>-0.28</td>
<td>0.11</td>
<td>0.892</td>
</tr>
</tbody>
</table>

*Mean of the T1 value of General Self-Esteem

Table 13

*Pairwise Differences when the Time One Value of General Self-Esteem is 4*

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Estimated Difference</th>
<th>s.e.</th>
<th>df</th>
<th>t</th>
<th>p</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 Hours - Control</td>
<td>0.54</td>
<td>0.22</td>
<td>164</td>
<td>-2.40</td>
<td>0.018</td>
<td>(.09, .98)</td>
</tr>
<tr>
<td>2 Hours - Control</td>
<td>0.74</td>
<td>0.16</td>
<td>164</td>
<td>4.61</td>
<td>&lt;.001</td>
<td>(.42, 1.06)</td>
</tr>
<tr>
<td>4 Hours – 2 Hours</td>
<td>-0.20</td>
<td>0.23</td>
<td>164</td>
<td>0.88</td>
<td>0.381</td>
<td>(-.66, .26)</td>
</tr>
</tbody>
</table>

Assumption Testing of Stage Four (Given Interaction Finding): As there was an interaction finding, assumptions were retested. The diagnostic plot again showed nothing of concern. The normality histogram was left skewed (skewness z=-14.00, kurtosis z=27.12), with the majority of residuals clustered around zero. Levene’s testing revealed no significant difference between the control and programme groups in their variance on the outcome variable (F=0.01, p=.93).

Stage Five: Stage Five included class level random effects.
Academic Self-Esteem

Stage One, Two and Three Analyses: School and class levels random effects were not included in the model. The interaction was not significant ($p=.156$). In stage two, language had a t-test $p$-value of .09 and was therefore included in the model in stage three. Culture was not significant ($p=.995$). In stage three school year was not significant ($p=.48$).

Stage Three Findings: By including language in the model this difference was controlled for, meaning the main effect can be interpreted with confidence. The overall residual error variance was 0.77 (s.e.=.09).

Assumption Testing: The diagnostic plot had a random horizontal band scattered around zero and no significant outliers. The normality histogram was slightly left skewed (skewness $z=-2.26$, kurtosis $z=.53$). The Levene’s test was not significant ($F=.84$, $p=.47$), therefore there is no evidence of differing variances between the groups in terms of the outcome variable.

Stage Four: School and class random effects were not included in the multi-level model.

Stage Five: Stage Five included no random effects.

Resiliency Full Scale

Stage One, Two and Three Analyses: School random effects were not included in the model, however class level random effects were included. The interaction between time one and group was non-significant ($p=.52$). In stage two language ($p=.59$) was not significantly related to the outcome variable, however culture was ($p=.01$), and would be included in stage three as a potential confounding variable. In stage three school year was not significantly related to the outcome variable ($p=.49$).

Stage Three Findings: The variance of the class random effects was 0.02 (s.e.= .02), while the overall residual error variance was 0.20 (s.e. = 02).

Assumption Testing: Again the diagnostic plot revealed a nearly random horizontal band scattered around zero, indicating homogeneity of variance. There were no significant outliers. The normality histogram was close to normal (skewness $z=-2.15$, kurtosis $z=1.62$). The Levene’s test was non-significant ($F=1.18$, $p=.3158$,) indicating homogeneity of variance between the two groups.

Stage Four: Class random effects were included in the multi-level model.

Stage Five: Stage Five included no random effects.
Resilience Communication Subscale

*Stage One, Two and Three Analyses:* School and class level random effects were not included in the model. The interaction between time one and group was non-significant \((p=.63)\). In stage two language \((p=.46)\) and culture \((p=.18)\) were not significantly related to the outcome variable. In stage three school year was not significantly related to the outcome variable \((p=.15)\).

*Stage Three Findings:* The residual error variance estimate was 0.39 (s.e.=.04).

*Assumption Testing:* The overall diagnostic plot had a tightly clustered random horizontal band scattered around zero and no significant outliers. The residuals histogram was roughly normal, with most residuals clustered around zero. However the curve was left skewed and violated both skewness and kurtosis \((skewness z=-5.05, kurtosis z=5.51)\). Again the Levene’s test was not significant \((F=.14, p=.71)\), therefore there was no evidence of differing variances between the groups in terms of the outcome variable.

*Stage Four:* School and class level random effects were not included in the model.

*Stage Five:* Stage Five included no random effects.

**Variable Five: Resilience Self-Esteem**

*Stage One, Two and Three Analyses:* Class level random effects were included in the model. In stage one, the interaction was not significant \((p=.67)\). In stage two, due to language \((p=.09)\) and culture \((p=.004)\) both having p-values less than 0.01 in terms of their relationship with the outcome variable, a two way ANOVA was run and language \((p=.52)\) was excluded from stage three while culture \((p=.005)\) was included in stage three. In stage three school year was not significant \((p=.26)\).

*Stage Three Findings:* The variance of the class random effects was 0.02 (s.e.= .02), while the overall residual error variance estimate was 0.29 (s.e.=.03).

*Assumption Testing:* The diagnostic plot had a random horizontal band scattered around zero with a very slight funnel pattern, and no significant outliers. The residuals histogram was left skewed and violated both skewness and kurtosis \((skewness z=-4.1486, kurtosis z=4.1473)\). The Levene’s test was not significant \((f=.59, p=.77)\), therefore there is no evidence of differing variances between the groups in terms of the outcome variable.

*Stage Four:* Class level random effects were included in the multi-level model.

*Stage Five:* Stage Five included no random effects.
Resilience Empathy

Stage One, Two and Three Analyses: Class level random effects were included in the model. The interaction was not significant ($p=.87$). In stage two, language ($p=.87$) and culture ($p=.13$) were not related to the outcome variable. In stage three school year was not significant ($p=.59$).

Stage Three Findings: The variance estimate of the class group effects was 0.06 (s.e.=.06), while the overall residual error variance estimate was 0.81 (s.e.=.09).

Assumption Testing: The diagnostic plot had a random horizontal band scattered around zero and no significant outliers. Most residuals were clustered around zero, however the histogram was left skewed (skewness $z=-4.47$, kurtosis $z=1.82$). The Levene’s test was not significant ($f=.12$, $p=.73$), therefore there is no evidence of differing variances between the groups in terms of the outcome variable.

Stage Four: Class random effects were included in the multi-level model.

Stage Five: Stage Five included no random effects.

Resilience Problem Solving

Stage One, Two and Three Analyses: Class level random effects were included in the model. The interaction was not significant ($p=.162$). In stage two, language was not related to the outcome variable ($p=.88$). Culture ($p=.051$) would be taken to stage three. In stage three school year was not significant ($p=.502$).

Stage Three Findings: The variance estimate of the class random effects was 0.04 (s.e.=.04), while the overall residual variance estimate was 0.58 (s.e.= .07).

Assumption Testing: Again, the diagnostic plot had a random horizontal band scattered around zero and no significant outliers. The residuals histogram had most residuals clustered around zero, yet it was slightly left skewed (skewness $z=-4.00$, kurtosis $z=.25$). The Levene’s test was not significant ($f=.83$, $p=.57$).

Stage Four: Class random effects were included in the multi-level model.

Stage Five: Stage Five included no random effects.
Resilience Goals and Aspirations

*Stage One, Two and Three Analyses:* School and class level random effects were included in the model. The interaction was significant \((p=.001)\). In stage two, language \((p=.44)\) and culture \((p=.39)\) were not related to the outcome variable. In stage three school year was not significantly related to the outcome variable \((p=.63)\).

*Stage Three Findings:* The variance estimate of the school random effects was 0.01 (s.e.=.04), while variance of the class random effects was 0.01 (s.e.=.03). The overall residual error variance estimate was 0.54 (s.e.=.06).

*Interpreting the Interaction:*

Table 14

<table>
<thead>
<tr>
<th>T1 value</th>
<th>n**</th>
<th>Programme</th>
<th>Control</th>
<th>Difference*</th>
<th>s.e.</th>
<th>95% CI</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1.22</td>
<td>2.70</td>
<td>1.48</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>6</td>
<td>0.86</td>
<td>1.87</td>
<td>1.02</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>15</td>
<td>0.50</td>
<td>1.05</td>
<td>0.56</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>47</td>
<td>0.12</td>
<td>0.22</td>
<td>0.09</td>
<td>0.17</td>
<td>(-6.02, 5.83)</td>
<td>0.701</td>
</tr>
<tr>
<td>4.22***</td>
<td>NA</td>
<td>0.04</td>
<td>0.04</td>
<td>-0.01</td>
<td>0.16</td>
<td>(-7.88, 7.89)</td>
<td>0.976</td>
</tr>
<tr>
<td>5</td>
<td>101</td>
<td>-0.24</td>
<td>-0.61</td>
<td>-0.37</td>
<td>0.19</td>
<td>(-1.13, 1.86)</td>
<td>0.265</td>
</tr>
</tbody>
</table>

*Difference in change scores (Programme – Control)*  
**Based on rounding the composite scale score**  
***Mean of the T1 value of Enjoyment of Sport***

*Assumption Testing:* The diagnostic plot showed nothing of major concern. The residuals histogram was clustered between zero and one and was left skewed (skewness \(z=-7.05\), kurtosis \(z=4.93\)). The Levene’s test p-value was not significant at the .05 level, \((F=3.63, p=.0585)\).

*Stage Four:* School and class random effects were included in the multi-level model.

*Interpreting the Stage Four Interaction:*
Table 15

Mean Change in Goals and Aspirations Resiliency sub-scale from Time One to Time Two as Estimated from the Model for Different Levels of the Time One Variable for Three Hours Groups.

<table>
<thead>
<tr>
<th>T1 value</th>
<th>n**</th>
<th>Estimated Change from T1 to T2</th>
<th>Type 3 test p-value for Any Pairwise Differences Between the Hours Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Control (0 Hours) 2 Hours 4 Hours</td>
<td>F Statistic</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>2.71 1.20 1.54</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>6</td>
<td>1.88 0.85 1.05</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>15</td>
<td>1.05 0.50 0.57</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>47</td>
<td>0.22 0.14 0.08 0.13</td>
<td>0.09</td>
</tr>
<tr>
<td>5</td>
<td>101</td>
<td>-0.61 -0.21 -0.40</td>
<td>1.51</td>
</tr>
</tbody>
</table>

*Mean of the T1 value of Goals and Aspirations Resiliency sub-scale
**Based on rounding the composite scale score

Assumption Testing of Stage Four (Given Interaction Finding): As there was an interaction finding, assumptions were retested. The diagnostic plot again showed nothing of concern, with a near random horizontal band scattered around zero, indicating homogeneity of variance and no strong outliers. The residuals histogram was left skewed (skewness z=-6.95, kurtosis z=4.69), however the majority of residuals were close to zero. Levene’s testing revealed no significant difference between the control and programme groups in their variance on the outcome variable (F=1.23, p=.27).

Stage Five: Stage Five included class level random effects.

Performance Character

Stage One, Two and Three Analyses: School and class level random effects were included in the model. The interaction was not significant (p=.22). In stage two, culture was significantly related to the outcome variable (p=.03). In stage three school year was significant (p=.02).

Stage Three Findings: The variance of the school random effects was 0.05 (s.e.=.06). The variance of the class random effects was 0.003 (v.e.=.01), while the overall residual error variance estimate was 0.26 (v.e.=.03).

Assumption Testing: The diagnostic plot had a random horizontal band scattered around zero with a no significant outliers. The normality histogram had a normal distribution (skewness z=-1.22, kurtosis z=-.68). Only two predictor variables can be tested at a time when performing
Levene’s test, however in this case there were three (programme vs. control, culture and school year). To perform the Levene’s test three tests were conducted, one for each of the possible two-way combinations of the three variables, none of which were significant. None were significantly different; programme and culture (F=1.88, \( p = .08 \)); programme and school year (F=1.15, \( p = .33 \)), and culture and school year (F=1.74, \( p = .10 \)). Therefore there is no evidence of differing variances between the groups in terms of the outcome variable.

**Stage Four:** School and class random effects were included in the multi-level model.

**Stage Five:** Stage Five included class level random effects.

**Liking for School**

**Stage One, Two and Three Analyses:** School and class random effects were not included in the model. The interaction was not significant (\( p = .19 \)). In stage two, language (\( p = .59 \)) and culture (\( p = .88 \)) were not significantly related to the outcome variable. In stage three school year was not significant (\( p = .35 \)).

**Stage Three Findings:** The overall residual error variance was 0.31 (s.e.=.03).

**Assumption Testing:** The diagnostic plot had a mostly random horizontal band scattered around zero with a no significant outliers. The normality histogram violated both skewness and kurtosis (skewness \( z = -14.67 \), kurtosis \( z = 25.04 \)). The Levene’s test was not significant (F=0.00, \( p = .996 \)), therefore there was no evidence of differing variances between the groups in terms of the outcome variable.

**Stage Four:** Class random effects were included in the multi-level model.

**Stage Five:** Stage Five included class random effects.

**How Good are You at Physical Activity / Sport**

**Stage One, Two and Three Analyses:** In this model school level random effects were not included while class random effects were. In stage one the interaction between time one and group was non-significant (\( p = .98 \)) and was removed. In stage two language (\( p = .25 \)) and culture (\( p = .346 \)) were not significantly related to the outcome variable. In stage three school year was not significantly related to the outcome variable (\( p = .57 \)).

**Stage Three Findings:** The variance of the class random effect was 0.01 (s.e.= .02), while the overall residual error variance was 0.46 (s.e.=.05).
**Assumption Testing:** Again the diagnostic plot had a random horizontal band scattered around zero, indicating the homogeneity of variance. There were no strong outliers. The normality histogram was skewed left (skewness z=-5.38, kurtosis z=.44). Levene’s testing revealed no significant difference between the control and programme groups in their variance on the outcome variable (F=.58, p=.45).

**Stage Four:** School and class random effects were included in the multi-level model.

**Stage Five:** Stage Five included no school or class random effects.

**How Much Do You Enjoy Physical Activity / Sport**

**Stage One, Two and Three Analyses:** In stage one we found school and class random effects did not need to be included in the model, the time one centred score was significantly related to the outcome variable (p<.001), and there was a significant interaction between group membership and the time one variable (p=.001). In stage two neither language (p=.66) or culture (p=.11) were significantly related to the outcome variable, therefore neither were included in stage three. In stage three school year was added to the model but was not significantly related to the outcome variable (p=.45) and was therefore removed.

**Stage Three Findings:** The final model’s residual error variance estimate was 0.29 (s.e.=.03).

**Interpreting the Interaction:**

**Table 16**  
**Mean Change in Enjoyment of Sport from Time One to Time Two as Estimated from the Model for Different Levels of the Time One Variable for the Control and Programme Groups.**

<table>
<thead>
<tr>
<th>T1 value</th>
<th>n</th>
<th>Programme</th>
<th>Control</th>
<th>Difference*</th>
<th>s.e.</th>
<th>95% CI</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
<td>2.73</td>
<td>1.33</td>
<td>-1.40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>2.01</td>
<td>0.97</td>
<td>-1.04</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>11</td>
<td>1.29</td>
<td>0.61</td>
<td>-0.68</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>13</td>
<td>0.57</td>
<td>0.24</td>
<td>-0.32</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.71**</td>
<td>NA</td>
<td>0.06</td>
<td>-0.01</td>
<td>-0.07</td>
<td>0.08</td>
<td>(-0.09, 0.23)</td>
<td>0.390</td>
</tr>
<tr>
<td>5</td>
<td>142</td>
<td>-0.15</td>
<td>-0.12</td>
<td>0.04</td>
<td>0.09</td>
<td>(-0.21, 0.14)</td>
<td>0.691</td>
</tr>
</tbody>
</table>

*Difference in change scores (Programme – Control)  
**Mean of the T1 value of Enjoyment of Sport*
Assumption Testing: Assumptions were then tested. The diagnostic plot of predictor variables and residuals showed nothing of concern, with a near random horizontal band scattered around zero, indicating homogeneity of variance and no strong outliers. The normality histogram of residuals did show some skewness and kurtosis (skewness $z=-8.84$, kurtosis $z=12.42$), however the majority of residuals were close to zero. Levene’s testing revealed no significant difference between the control and programme groups in their variance on the outcome variable ($F=11, p=.31$).

Stage Four: School and class level random effects did not need to be included in the model.

Interpreting the Stage Four Interaction:

Table 17
Mean Change in Enjoyment of Sport from Time One to Time Two as Estimated from the Model for Different Levels of the Time One Variable for the Three Hours Groups.

<table>
<thead>
<tr>
<th>T1 value</th>
<th>$n^*$</th>
<th>Control (0 Hours)</th>
<th>2 Hours</th>
<th>4 Hours</th>
<th>F Statistic</th>
<th>$p$-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
<td>1.34</td>
<td>2.63</td>
<td>2.88</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>0.97</td>
<td>1.94</td>
<td>2.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>11</td>
<td>0.61</td>
<td>1.25</td>
<td>1.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>13</td>
<td>0.25</td>
<td>0.56</td>
<td>0.55</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.71*</td>
<td>NA</td>
<td>-0.01</td>
<td>0.08</td>
<td>0.00</td>
<td>0.50</td>
<td>0.607</td>
</tr>
<tr>
<td>5</td>
<td>142</td>
<td>-0.12</td>
<td>-0.12</td>
<td>-0.23</td>
<td>0.33</td>
<td>0.719</td>
</tr>
</tbody>
</table>

*Mean of the T1 value of Enjoyment of Sport

Assumption Testing of Stage Four: The diagnostic plot again showed nothing of concern, with a near random horizontal band scattered around zero, indicating homogeneity of variance and no strong outliers. The normality histogram did show some skewness and kurtosis (skewness $z=-9.04$, kurtosis $z=12.82$), however the majority of residuals were close to zero. Levene’s testing revealed no significant difference between the control and programme groups in their variance on the outcome variable ($F=2.03, p=.16$).

Stage Five: There were no random school or class effects in the model.
APPENDIX E

TEACHER SHORT ANSWER QUESTIONS

Teachers were asked as series of yes / no questions and were also asked to make short comments after each response in spaces provided on the questionnaire. Other short answer questions were then asked. All short answer questions and responses are detailed below.

As a teacher, did you find the KRIC programme useful / beneficial? How/Why?
Teacher One: “Lesson plans, AO’s (achievement Objectives) and LIs (Learning Intentions) are provided”.
Teacher Two: “Sequential lesson plans. Work sheets/resources provided. Values teaching – links”.
Teacher Four: “Promotes team-work, co-operation, respect and fair-play. Allowing the students to understand the importance of rules/boundaries in any game. This is a programme that allows our students to step up and take leadership and initiative”.
Teacher Seven: “Setting up the backgrounds to games. E.g. Rules and boundaries”.
Teacher Eight: “It brings aspects of 'thinking' into the process. What makes a good team? Why do we need rules and boundaries?”

Did the KRIC programme change the children’s willingness to engage in physical activity / physical education class? How/Why?
Teacher One: “It's slightly different from what we usually do as a class/school”.
Teacher Two: “They have always been quite enthusiastic. This has remained the same”.
Teacher Four: “This is a programme that has promoted children's willingness to engage in physical education because of the opportunities the programme provided to allow the students to work as a team, be supportive of their team members, to work co-operatively and in a fair play environment. It is also a programme that supports those children who do have difficulty with physical education because it promotes a “HAVE A GO”, “TAKE A RISK” attitude”.
Teacher Five: “More confidence to participate in a range of activities”.

Teacher Six: “Children who were reluctant to join in seemed more willing when they had input into what was happening”.

Teacher Seven: “Able to articulate feelings/attitudes/skills in games”.

Teacher Eight: “My class have always been willing to engage in physical activity :)”.

Did you notice changes in the children who participated in the KRIC programme?

Comments.

Teacher One: “They participate in physical activities quite often at school. Might be because the projector was not available at the time”.

Teacher Two: “As teachers we are often reinforcing the skills and life lessons presented in the KRIC programme”.

Teacher Four: “I have students who have great leadership abilities, but prior to the programme these students struggled to use the abilities appropriately. Since the programme, I’ve noticed that these students have made progress to use these special leadership qualities appropriately. I have students showing signs of not engaging in physical activity prior to the programme and now with the introduction of this programme these students attitude and confidence with physical education has changed - they are enjoying physical activity now because they feel more included, the support from their peers to "HAVE A GO", the teamwork/co-operation in a team situation is more evident and because the programme promotes self-esteem and confidence”.

Teacher Five: “Teamwork improved”.

Teacher Seven: “Children talked about their attitudes”.

Teacher Eight: “A lot of the less confident children contributed more”.

How many hours a week did you use the KRIC programme? Was this enough?

Teacher Two: “Difficult to incorporate more as we have such a crowded curriculum”.

Teacher Four: “Don’t want to exhaust a good thing”.

Teacher Six: “Didn’t get as far with the programme as T would have liked due to a number of factors”.

Teacher Seven: “Curriculum so tight”

Teacher Eight: “I would have liked more but curriculum constraints didn’t allow this”.
Do you feel the two KRIC professional development sessions (given by the KRIC team to staff) helped you in your approach to teaching physical education? Comments.

Teacher One: “It was practical”.
Teacher Two: “Good modelling. Time to discuss ideas”.
Teacher Four: “Understanding how and why the programme is an integral part of students’ well-being, self-worth and growth (personal). To understand how to teach the programme. The importance of this programme in a school setting”.

Having done the introductory part of the KRIC programme, would you want to use it in the future? Comments.

Teacher Two: “Good curriculum links. Great skills to reinforce for life”.
Teacher Seven: “Different games now”.

Do you have any recommendations for how to improve the programme?

Teacher Two: “Personally found it difficult with slides as we do not have a projector in class and comp suite used every block. Perhaps big posters?”
Teacher Four: “To provide required resources to all classroom teachers”.
Teacher Five: “More workshops for all staff and students”.

Is there anything about the programme you would like to share? (e.g. how the programme helped change a child’s behaviour, and/or the general mood of the classroom?).

Teacher Two: “Helped reinforce good characteristics and dealing with life's challenges”.
Teacher Four: “To be able to observe some of my students grow in self-esteem and confidence has been rewarding as a teacher. To be able to see some of my students participate in physical activity willingly as a result of the programme is also very exciting because the programme has promoted self-confidence, self-worth and self-esteem. It's a programme that has promoted sportsmanship and fair-play. The programme has supported particular students to work in a team situation in a positive way, promoting fair-play and team work”.

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Teacher Five: “More focused. Leading a group (students). Less confident children now more eager to participate willingly (&) Prepared to lead groups”.

Teacher Eight: “All of the class certainly looked forward to and enjoyed every session. A lot of the children commented that it was cool to think of things in the classroom as they didn't have time to think when playing :)

Has this programme impacted upon you personally, and if so, how?

Teacher Two: “No”.

Teacher Five: “More confident to take PE/PA”.

Teacher Eight: “Made things clearer and easy to follow. A lot of the concepts, I've developed in other areas of the curriculum as well”.

Any other comments?

Teacher Three: “Confidence of the children has grown using this programme. Children took charge of their own learning. Reluctant participants of the past have disappeared and now fully engaged”.

Teacher Four: “The teacher work book is brilliant. As a teacher, I have not had to re-invent the wheel. The specific booklet is well structured, clearly outlined re learning intentions, outcomes. The activities are challenging yet fun and motivating”.

Teacher Five: “Great to have this programme. Thanks”.

Teacher Six: “Have just made a tentative beginning to the programme so might take a while to fully evaluate the impact of the programme in relation to other areas”.
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