An Investigation into the Impact of Traditional Indigenous Games (TIG) On Primary School Students and their Teachers

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Abstract

This study investigates the impact of embedding Traditional Indigenous Games (TIG) in the curriculum on primary school students and their teachers. Changes for both groups will be discussed. The literature review examined four specific areas related to teaching TIG to children in schools. These areas were physical activity, Indigenous perspectives, cooperation and self-efficacy. Since TIG are unique to Australian Aboriginal and Torres Strait Islander peoples, and are intrinsically linked to their histories and cultures, then playing TIG with children in school should enable learners to deepen their knowledge of Australian Indigenous peoples, their histories and culture, as recommended by the Australian National Curriculum.

It is also relevant and important for educators to consider developing cooperation and team work amongst peer groups within physical activity sessions, in order to provide opportunities for children to develop positive perceptions of themselves, or positive self-efficacy. When exploring TIG, besides developing physical skills, the cooperative nature of these Indigenous games became evident. TIG may provide students with an opportunity to experience success in physical activity while encouraging cooperative relationships with their peers, hence contribute to building children's self-efficacy. TIG could also assist teachers to embed Indigenous perspectives in the curriculum, as well as enable them to promote physical activity and cooperation within their class, contribute positively to children's self-efficacy, and ultimately improve the health and well-being of their students. All of these factors together provided the researcher with a firm rationale for the conduct of this study.

The methodology employed for this research was constructed around examining these factors utilising a quasi-experimental between groups mixed methods research design. An intervention program was created which incorporated TIG and provided an effective avenue to examine the impact of playing TIG in schools on both students and their teachers. The program was trialled in five schools within the Fraser Coast area, Queensland, Australia. An Intervention by Time repeated measures multivariate analyses of variance (MANOVA) was used to investigate the quantitative survey data obtained from the students. Paired samples *t-tests* were used to scrutinise student reflective journals for evidence of change over the intervention period. Descriptive statistics were obtained from the teacher surveys, whilst qualitative data collected from the interviews added depth and insight from the teachers' perspectives.

The findings from this research demonstrated playing TIG at least three days per week at school increased students' involvement in, and motivation towards, participating in physical activity. Playing TIG three times a week, enhanced student's self-efficacy and their ability to work with others whilst engaged in physical activity. Teachers reported TIG assisted them to embed Indigenous perspectives, facilitate regular daily physical activity, and to promote cooperation and teamwork with their students through physical activity. Overall, teachers felt the TIG intervention program had been a worthwhile investment of their time, and all were keen to continue with TIG after the study concluded. All teachers developed

sustainable ways to continue with TIG, and indeed have become advocates of TIG within their wider school community.

Certification Page

CERTIFICATE OF DISSERTATION

I certify that the ideas, experimental work, results, analyses, and conclusions reported in this dissertation are entirely my own effort, except where otherwise acknowledged. I also certify that the work is original and has not been previously submitted for any other award, except where otherwise acknowledged.

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Signature of Candidate Date

ENDORSEMENT:

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Signature of Supervisor Date

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Signature of Supervisor Date

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Glossary

Collaboration – working and learning together and drawing on one another's knowledge and skills

Competitive games – physical activity which involves the expectations that participants possess a higher level of skill than others, and that individuals attempt to outperform their competitors

Confidence - a holistic state of assurance and belief in one's ability to achieve goals and realise their ability"

Cooperative games – a way of playing games which involves students working together in groups to complete a specific task or skill

Health and well-being - an individual's balance between their physical, emotional, cognitive and social states of health

Self-concept – a collection of information, ideas, attitudes and beliefs we have about ourselves

Self-efficacy - an individual's sense of being able to manage a task effectively and successfully in a particular domain, it is skill specific, and not holistic

Self-worth – the value an individual places on themselves in terms of their perceptions and attitudes towards themselves, how they see themselves and feel about themselves as a result

Sport – physical activity which has established rules, timings and boundaries, and is highly organised, with winners and losers determined on the outcomes of the match

Traditional Indigenous Games (TIG) – Physical activities which honed skills, understanding and performance played and practiced by Australia's Indigenous people, which focused on the cooperation of all participants for the survival of the tribe

1. Introduction

> *With both heart and mind, we can build caring communities, design schools that develop children's wisdom and emotional strength along with their intellect and physical strength, and operate institutions with balance, intelligence and appreciation for people and the environment.* (Childre, 2010. n.p.electronic)

This research exemplifies Childre's quote (2010) by designing and evaluating an intervention program aimed at developing the health and well-being of students and providing supportive professional development for teachers. In this way this research reflects Childre's desire to build caring, empathetic communities through the education of children.

An investigation of the literature revealed the importance of encouraging children to be physically active, along with the impact of participating in physical activity on the health and well-being of children. Dodge, Daly, Huyton and Sanders (2012) defined health and well-being as relating to the physical, emotional, cognitive and social equilibrium or balance of individuals. Further to this, life experiences directly affect the health and well-being of individuals (Dodge et al, 2012) and influence their beliefs about their own capabilities, termed self-efficacy (Bandura, 1994). Along with physical experiences, the social experiences and relationships an individual has with their peer group influence their beliefs about their own capabilities, their self-efficacy. Hence it may be necessary to consider the type of experiences children have during physical activity sessions, how children relate to and cooperate with their peers during these sessions, and the combined influence these factors have on children's self-efficacy.

Some of the factors known to influence an individual's health and well-being are: how they see themselves, their perceptions of self; and how they feel about themselves, their attitudes toward self (Dodge et al, 2012), in short, their self-efficacy. Further to this, an individual's self-efficacy influences their participation in physical activity, which directly effects their health and well-being. The importance of investigating ways to increase physical activity and the health and well-being of children becomes apparent through the findings of the World Health Organisation (WHO), regarding children and physical activity:

> Globally in 2010 the number of overweight children under the age of five is estimated to be over 42 million, more than double the figure of 20 million estimated in 2005 ... Childhood obesity is one of the most serious public health challenges of the 21st century ... one of the fundamental causes behind the rising levels of childhood obesity is a trend towards decreased levels of physical activity. (World Health Organisation, 2011)

These WHO predictions have spurred much debate and calls for accountability across Australian society, for improvements in the health and well-being of its

youngest citizens and future generations. Schools have been urged to lead the fight against the obesity epidemic that threatens the health of our nation's children. Many government initiatives have been developed within schools to promote participation in physical activity and raise awareness of good nutrition practices. The "Smart Moves" initiative in Queensland; the "Healthy Kids Eat Well Get Active" program in New South Wales; the Victorian government's "Physical Activity Innovation Challenge"; and the Australian national "Go for 2 and 5" campaign, are all examples of the efforts of both state and federal governments in Australia to promote physical activity. A great deal of emphasis has been placed on teachers, sporting associations and community groups through such programs, to provide physical activity for children, both within and outside of schools.

Participation in competitive sports has often been used to increase levels of physical activity, but the exclusive nature of competitive sport means that in reality, sport is not inclusive. The term *sport* refers to physical activity which has established rules, timings and boundaries, and is highly organised. It also involves the expectations that participants possess a higher level of skill and that individuals attempt to outperform their opponents. This concept of sport is widely accepted and supported by several authors (Carnell, Ireland, Jones, Mackreth & van Wely, 2002; Kirk, Nauright, Hanrahan, Macdonald & Jobling, 1996; Wesson, Wiggins, Thompson & Hartigan, 2000). A competitive approach to sport, such as this, through classroom physical activity, when it is a child's main or only source of physical activity, can marginalise the average and less able children, and may have a negative impact on their perceptions of self (Orlick, 2006). As a result these less able children become less willing to participate in HPE and sport, as a defence mechanism to protect their self-efficacy (Orlick, 2006).

The position of Health and Physical Education (HPE) as a key learning area (KLA) in the Australian curriculum demonstrates the importance of physical activity for all students. Hence HPE, as a core element of the curriculum, should be inclusive, but it tends to draw on sports and games models of education which are competitive and encourage survival of the fittest, as opposed to survival of the group.

Further exploration of ways to minimise the negative effects of competitive sport on a child's self-efficacy is needed to ensure the health and well-being of each child. A more inclusive, cooperative approach to physical activity could generate more positive experiences for children (Orlick, 2006). Limited studies have explored children's perceptions of HPE (Garrett & Wrench, 2010; Jurimae & Saar, 2003; Martens, Vealey, & Burton, 1990) and the effects of sport on self-efficacy (Light & Curry, 2009; Weiss, Ebbeck, McAuley & Wiese, 1990). While other studies have examined the effects of cooperative learning strategies (McCabe & Rhoades, 1992) and espoused the positive impact these strategies have on children's self-efficacy. If more physical activity could be achieved through cooperative games, then children may be more enthusiastic about participating in physical activity, have a higher self-efficacy, and generally pursue a more active and healthy lifestyle.

Australia's Indigenous people played many traditional games that were by nature cooperative, and aimed to prepare children for life within their cooperative society. These games were researched, collected and compiled in the *Yulunga* resource (Edwards, 2008). The Australian Sports Commission has published Yulunga, which

contains over 200 of these Australian and Torres Strait Islander traditional games, on their website in a game card format, for global use. The TIG within this study are all drawn from the Yulunga resource (Edwards, 2008) and follow the guidelines given within the resource package.

The researcher prior to the research had taught some of these Traditional Indigenous Games (TIG) to pre-service teachers and observed high levels of enjoyment and physical activity displayed by participants. Further to this, these pre-service teachers made continued requests to play more TIG, especially individuals who had previously voiced their dislike of physical activity and resultant disregard for HPE in school. The change in students' attitudes towards physical activity may be explained by identifying the stark contrasts that exist between sport and TIG. For example, all students were invited to take part, with no restrictions placed on their participation. The timing of the games was flexible, along with the boundaries used within the games. There was no external rule enforcement, no umpires, since there were few rules and these were straight forward to allow participants to self-regulate their behaviour in each game. The games were task orientated, so that the emphasis was on completing a task successfully, whilst improving one's own skills, as opposed to outperforming other students within the group. The marked change in attitude of these pre-service teachers after their involvement with TIG led the researcher to wonder whether or not TIG might have a similar impact on school children.

The popularity of TIG spread through the education district as these pre-service teachers began facilitating the games learned at University within schools whilst they were on practical placement. Classroom teachers within the schools made several comments relating to how much both they and their students enjoyed playing TIG. When reflecting on these initial observations and discussions, the researcher identified a need within the local teaching community for strategies and resources designed to increase physical activity with children in school. By playing TIG, students directly experienced Indigenous perspectives in games and physical activity, hence the researcher speculated that facilitating TIG might also help teachers to integrate and develop further opportunities to embed the histories, culture and traditions of Australia's Indigenous peoples. In doing so, TIG would assist teachers to cater for the cross-curricular priorities (Australian Curriculum Assessment and Reporting Authority (ACARA), 2013) and enhance their students' learning outcomes.

The researcher conjectured that incorporating TIG within the school curriculum in a culturally sensitive manner may unite several government policies. Embedding Aboriginal and Torres Strait Islander Perspectives in Schools (EATSIPS) policy (Queensland Government, 2008) and the *Smart Moves* policy (Queensland Government Department of Education Training and the Arts Local Government Planning Sport and Recreation, 2006) are about embedding Indigenous perspectives and promoting physical activity respectively, and can be woven together through TIG. Education ideals from the *Key Values of Australian Schooling* (Department of Education Science and Training, 2005) outline nine values for Australian schools to promote, and several of these can be highlighted when playing TIG. For example, the following values: care and compassion; fair go; integrity; respect; understanding, tolerance and inclusion, are all necessary for successful participation in TIG, due to the core cooperative and inclusive nature of the games.

The *Melbourne Declaration on Educational Goals for Young Australians*, which was released by the Ministerial Council on Education, Employment Training and Youth Affairs (MCEETYA), (MCEETYA, 2008) set the direction of schooling within Australia for the following ten years. The declaration identified common elements to be found in Australian schools, and several of these can be specifically promoted when teaching TIG to children. For example, Goal 1 outlines the need for student learning outcomes to demonstrate a respect of and appreciation for culture. Since TIG showcase Australian Indigenous culture, then playing TIG can contribute to achieving this goal. Goal 2 calls for successful learners to collaborate, work in teams and communicate; the cooperative nature of TIG provides children with the opportunity to work together to achieve common goals. In this way, TIG may also assist in developing active and informed citizens who respect diversity and work for the common good, which is also highlighted within Goal 2. Further to this, Goal 2 also identifies the need for confident and creative individuals who have a sense of self-worth and manage their health and well-being. Playing TIG in schools may provide children with avenues to improve their confidence and health and well-being, through participating in physical activity, whilst developing their self-efficacy.

The development of the Australian National Curriculum was guided by the Melbourne Declaration (MCEETYA, 2008) where the learning areas, general capabilities and cross-curriculum priorities reflected the goals within the declaration. Since the teaching of TIG could be integrated across several KLAs, for example: HPE, Geography, History, Science and Technology, then teaching TIG in schools would similarly support the Australian National Curriculum.

HPE is a core element in the Australian National Curriculum (ACARA, 2012b). This means classroom teachers within Australia are required to teach HPE to their students in a way which promotes confident individuals. Some studies have explored HPE as a source of chronic stress on children's self-esteem (Chase, 2001; Gerber, 2009). These studies identify the need for further research into providing a variety of positive experiences for children in HPE to enhance their participation, skill and enjoyment levels. The SHAPE paper for HPE (ACARA, 2012a) focuses on inclusion and maximising participation for all children in physical activity. Therefore, if playing TIG can improve children's participation in physical activity through promoting inclusive and cooperative practices, then it may assist teachers to meet the requirements of the National Curriculum within Australia.

This research is significant, in that it examines a number of key issues and challenges which face Australian educators, by drawing together federal and state government policies and developing a strategy to ensure student learning experiences align with curriculum demands.
The significance of this study in relation to these government policies is represented visually in Figure 1.1.

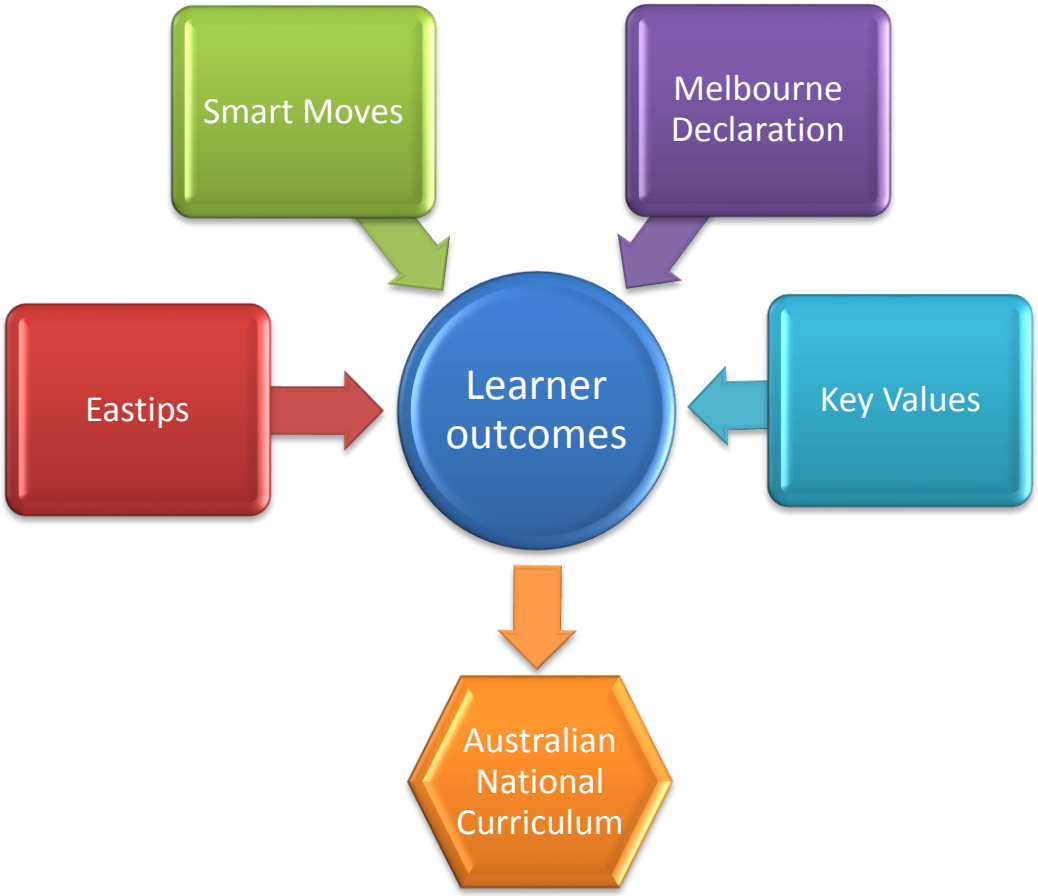

Figure 1.1. Government Policies Influencing the Australian Curriculum in Queensland

1.01 Objectives of the Research Project

This research sets out to investigate ways to improve the health and well-being of children through an intervention program, which aims to maximise students' enjoyment of, and participation in, physical activity. The intervention program involved embedding Traditional Indigenous Games (TIG) in the curriculum, as part of a daily physical activity plan to improve the health and well-being of children. Therefore this research examined the effects of playing TIG in schools, on students and their teachers, in terms of physical activity, cooperation, embedding Indigenous perspectives and self-efficacy.

The research was conducted within the Fraser Coast region of Queensland, Australia, as it was convenient for the researcher who was familiar with the environment and schools which comprise this rural district. Out of all primary schools within the district, 33% of state schools (n=8), along with 33% of the catholic schools (n=2)

took part in the research as either trial or control groups. An intervention program based on facilitating TIG was implemented with schools in the trial group to evaluate the impact of TIG on primary school students and their teachers. By using a holistic strategy such as TIG, educators and students may benefit in the following ways:

- Providing quality learning experiences for students by giving them the opportunity to participate in activities that:
  - are inclusive;
  - are enjoyable;
  - improve fundamental motor skills;
  - promote cultural awareness and reconciliation;
  - create greater understanding, appreciation and engagement of the Indigenous culture by non-Indigenous students;
  - promote cooperation and team work;
  - enhance their self-efficacy; and
  - result in a number of learning outcomes for children across cognitive, psychomotor, affective and behavioural domains (see Figure 1.2).
- Providing professional development for staff relating to:
  - teaching TIG;
  - integrating units of work across curriculum areas to incorporate TIG;
  - inclusive teaching practices;
  - promoting physical activity with their students;
  - embedding Indigenous perspectives within their classrooms; and
  - enhancing students' self-efficacy.

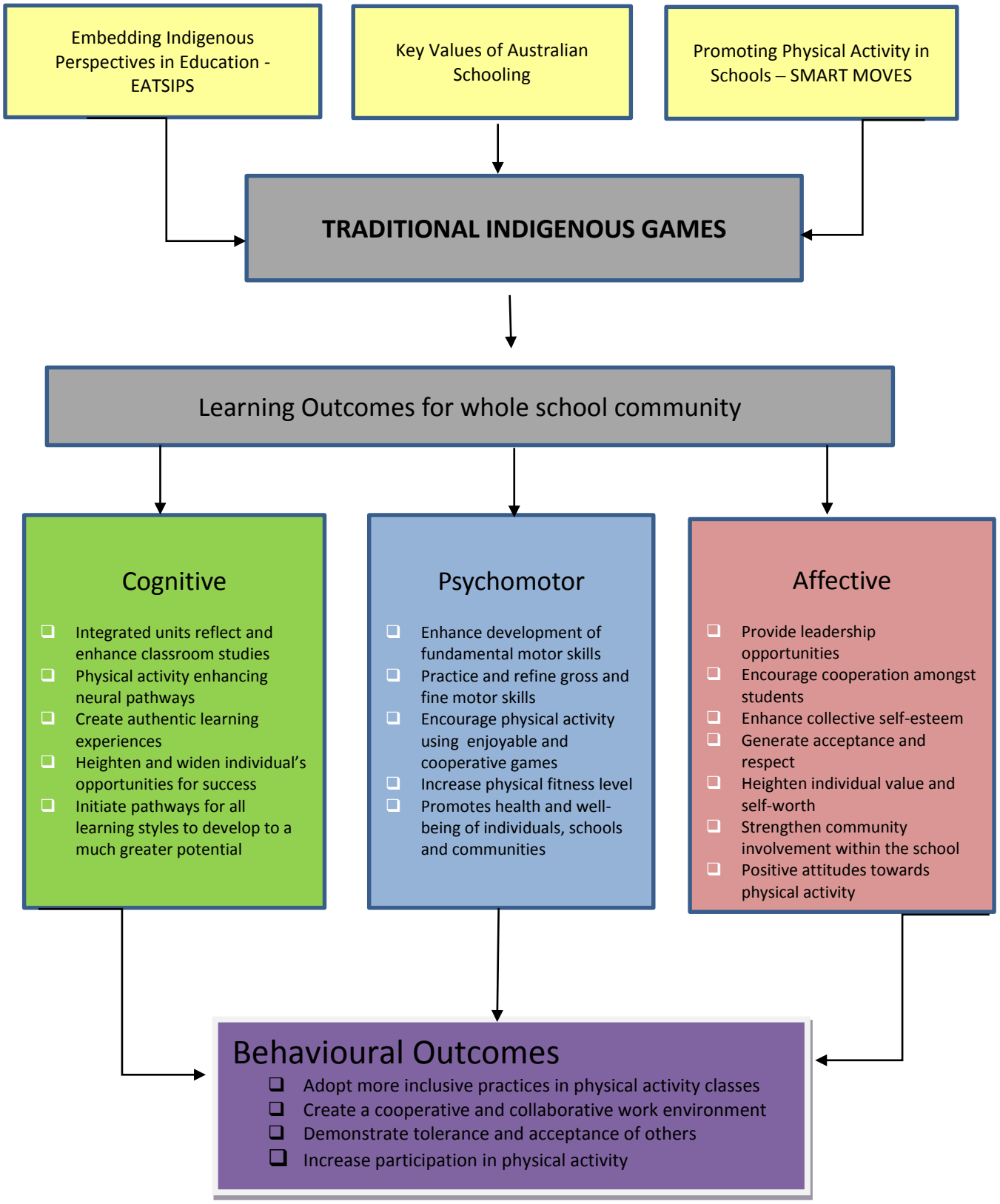

Figure 1.2. Learning Outcomes for Children and the Whole School Community

An examination of the impact of TIG on the learning outcomes for children and the whole school community, as outlined in Figure 1.2, forms the basis of this research and led to the over-arching research question this study addressed:

> How does regular and prolonged implementation of TIG in the curriculum enhance student attitudes to physical activity, student self-efficacy and teacher ability to implement the national curriculum requirements?

The over-arching research question was broken down to address the following research sub questions:

> Specifically, how does playing TIG at school:
>
> 1. enhance students' attitude towards, and involvement in, physical activity and their cooperation with other students?
>
> 2. enhance students' self-efficacy with respect to their ability to engage in physical activity and work with others?
>
> 3. assist teachers to meet the national curriculum requirements with respect to embedding Indigenous perspectives, cooperative learning and regular physical activity?

Structure of the Thesis

The following outline will be used to structure the thesis. Chapter 2 reviews and synthesises the literature relating to physical activity, cooperation and Indigenous perspectives in schools and how these may influence children's self-efficacy. Chapter 3 describes the intervention program that was developed based on the theoretical framework for this study described in Chapter 2. Chapter 4 presents the mixed method research design used in this study. Chapter 5 presents the quantitative and qualitative results obtained. Chapter 6 examines and discusses these results in the context of the research questions. Finally, Chapter 7 concludes the thesis and provides recommendations for application and further research.

2. Literature Review

2.01 Overview

This chapter reviews the literature which is significant to an investigation of the impact of Traditional Indigenous Games (TIG) on primary school students and their teachers. As this study pertains to TIG, children, schools and education, it was appropriate to begin the literature review with a definition of TIG and follow with an examination of two major elements of Australian education; those being the curriculum taught and the health and well-being of children. These two elements are further explored where they intersect within the National HPE curriculum and its plan for the 21st century learner. Two further tools for the 21st century learner which were evident in TIG; cooperation and collaboration, and reconciliation and Indigenous knowledges, are also investigated. The literature review then analyses TIG and how it reflects these three 21st century learning tools. By drawing these threads together in a unique way, the literature concludes by outlining the importance of this study and identifies the research questions arising from this review. A flow chart of the literature review can be seen below (see Figure 2.1).

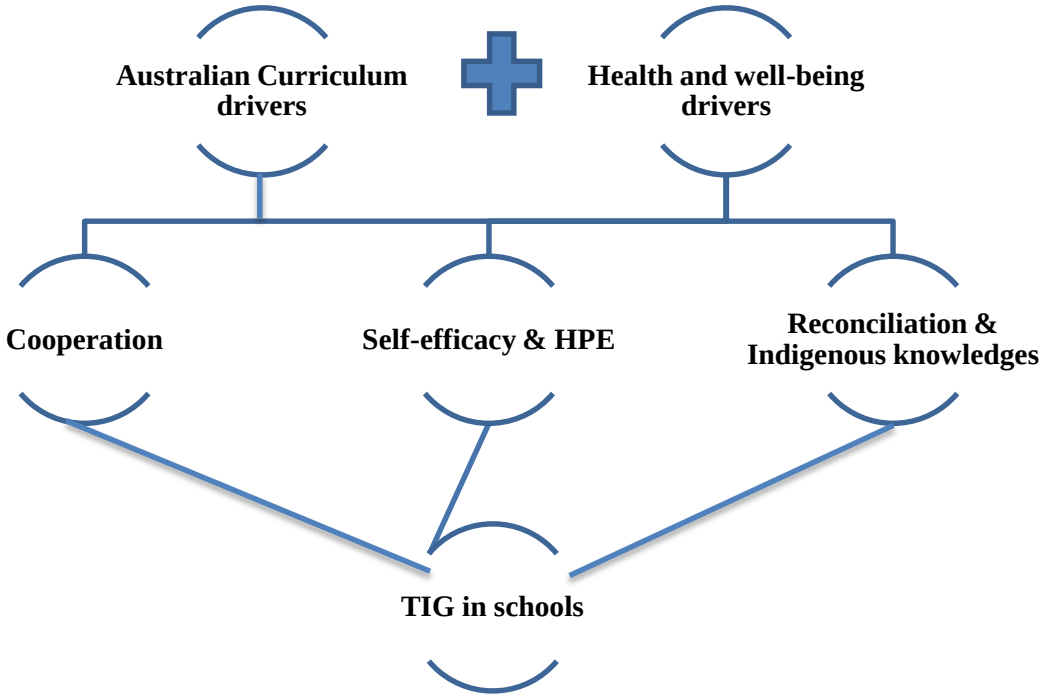

Figure 2.1. Literature Review Flow Chart

The traditional Indigenous games which were used in this thesis were gathered from around Australia and the Torres Strait Islands with the consent of the elders from each of the Indigenous communities, in a project funded by the Australian Sports Commission and collated into a resource termed *Yulunga* (Edwards, 2008). As such, Yulunga provides a recognised and published account of the games played within Australian Indigenous society throughout history.

2.02 Australian Curriculum Drivers - Government Directions within Australian Education

Since the time of the Ancient Greeks, scholars have been keenly aware of the interrelationship between a healthy mind and a healthy body (Queensland Health, 2008), and the opportunity for social interaction that athletic events provide (Swaddling, 1980). Participating in regular physical activity benefits psychomotor, cognitive, affective and behavioural domains of our being, and hence also impacts on our overall *wellness* (Hastie & Martin, 2006; Bailey 2006). In addition to these studies, an academic review by Bailey, Armour, Kirk, Jess, Pickup, Sandford and BERA (2009) found similar benefits in these four domains which were associated with regular participation in physical activity, physical education and sport. It is this reasoning then, that may be used to explain why HPE in schools is so important for our children and the overall health of our nation, and why government initiatives to promote good nutrition and regular exercise essentially arrive at our schools, and place greater demands on our teachers to deliver this message.

The importance educators and politicians within Australian society place on students' health and well-being is demonstrated through the inclusion of HPE in the school curriculum. This is further evidenced within the intended educational outcomes for young Australians, identified by the Ministerial Council on Education, Employment, Training and Youth Affairs (MCEETYA, 2008) as three broad categories of outcomes. The first of these categories relates to creating a foundation for knowledge, understanding, skills and values, while the second deepens these foundations on which further learning and adult life can be built and elaborates thus:

> The curriculum ... will also enable students to build social and emotional intelligence, and nurture student wellbeing through health and physical education in particular. The curriculum will support students to relate well to others and foster an understanding of Australian society, citizenship and national values...
> (MCEETYA, 2008. p.13)

The third category outlines general capabilities students need to develop in the way that they work with others - "flexible and analytical thinking, a capacity to work with others and an ability to move across subject disciplines to develop new expertise" (MCEETYA, 2008. p.13). These general capabilities are further identified under ten separate groups, of which five relate directly to the current HPE key learning area (KLA) and are highly relevant to this study. They are creativity, self-management, teamwork, intercultural understanding, ethical behaviour and social competence (Australian National Curriculum Board, 2009).

Further to these capabilities, the Australian National Curriculum Board have also included cross-curriculum matters and highlighted Indigenous perspectives as an area "which will be written into the national curriculum to ensure that all young Australians have the opportunity to learn about, acknowledge and respect the culture of aboriginal people and Torres Strait Islanders" (Australian National Curriculum Board, 2009. p.13).

After reviewing the Melbourne declaration and the shape of the Australian Curriculum, several elements relevant to this study became apparent. The first element was the identified need for physical education to be taught within Australian schools. Following on from this, the second element was the need to provide children with tools that will assist them to effectively communicate, cooperate and collaborate with others. A third element was to develop cross-cultural understanding and respect for all people, regardless of race or ethnicity in our society. All of these factors influence the self-efficacy of children and combine to create confident and informed learners (MCEETYA, 2008). In summary, four elements: physical activity, cooperation, Indigenous perspectives and self-efficacy, have been identified through government ministerial councils and curriculum boards, as being crucial to developing successful learners, confident individuals and active and informed citizens (MCEETYA, 2008).

2.03 Health and Well-being Drivers - Physical activity trends in Australian children

Emerging concerns from the last decade over the health of the Australian nation have sparked many campaigns alerting people to the negative effects of obesity and inactivity on health. A number of studies during this time have examined the activity levels and health of various sectors of the population within the Australian community. One study in particular, the Child and Adolescent Physical Activity and Nutrition Survey (CAPANS), conducted in Western Australia, focused on children and showed there had been a significant increase in childhood overweight and obesity statistics with an equally significant decline in physical activity participation rates at school (CAPANS, 2003).

Similarly, a report by Hands and Parker (2003) showed that between 1985 and 2003, overweight and obesity more than doubled in Western Australian male school children aged 7-15 years (9% to 23%) and almost tripled in female school children of the same age (11% to 30%). A later study in Western Australia by Hands, Chivers, Parker, Beilin, Kendall and Larkin (2011), looked at the associations between physical activity, screen time and weights of children from 6-14 years, and found sedentary patterns of behavior in early childhood were predictors of later and concurrent obesity.

Another study (Olds & Ridley, 2008) showed 76% of children aged 5-12 years report insufficient physical activity, and children aged 15 years and under spent an average of 11 hours on screen-based activities per week. Further to this, 95% spent more than the recommended two hours per day on screen-based activities. Further investigations into physical activity in children by Olds, Maher and Ridley (2011) conducted in South Australia, found the least active children were more likely to be girls; those who have a higher screen time; and those who slept more. These findings were reflected in a similar study by Magee, Caputi and Iverson (2012) conducted in New South Wales, which identified over 47% of 6-7 year old children as having unhealthy behaviours; where unhealthy behaviours were identified as having short sleep cycles; high rates of physical inactivity; engaged in more than 2

hours of screen time per day; and a greater consumption of high fat foods and sugar drinks.

These studies identified only a small percentage of children aged 5-12 met the Australian Physical Activity Guidelines (Department of Health and Ageing, 2005). These guidelines were established by the Australian Government and specify that young people should participate in at least 60 minutes of moderate to vigorous intensity of physical activity every day and should not spend more than two hours per day in sedentary activities such as computer games, internet and watching television (Department of Health and Ageing, 2005).

The Australian Physical Activity Guidelines were established in response to research which provided evidence of the health benefits associated with participating in regular physical activity. One such study by Dobbins (2001) showed there was strong evidence for positive outcomes arising from children participating in regular physical activity, including the prevention of higher blood pressure, weight maintenance/loss and enhanced blood lipid profiles; which in turn decreased the risk of chronic disease such as diabetes and cardiovascular disease.

In response to these findings, a number of government initiatives at federal, state and local levels have been implemented to combat the obesity epidemic threatening the health of our society, and the well-being of our future generations. As a result, many groups have initiated programs to encourage healthy lifestyles within specific population samples. Several programs to increase physical activity levels have specifically targeted children, since it has been found that an active childhood is a strong predictor of remaining physically active in adulthood (Raitakari, 1994).

A notable example of one such program is the Active After-schools Program, an initiative of the Australian Sports Commission, which is aimed at the children of working parents, by providing opportunities for them to participate in physical activity whilst in after school care. The Queensland State Government focus on increasing physical activity in children was evidenced through the Smart Moves program (Welford, 2007) which specified an amount of time each day schools had to spend on physical activity sessions for all children within Queensland schools. Besides the State Government, local governments operate facility and resource grants through the State Government Department of Local Planning, Sport and Recreation, which assists specific groups in the community, such as the elderly, youth and under-eights to become more physically active. All of these examples are government generated initiatives, but there are also projects by smaller community groups who have applied for funding to local council, state or federal government funding programs, to improve health, nutrition and physical activity opportunities for their own groups and clubs.

Many of these programs operate within the school system and help to educate children and their families to take part in regular physical activity as part of a healthy lifestyle. The Queensland Government within Australia introduced a policy (Smart Moves) within Queensland schools to ensure students were given greater opportunities to participate in regular physical activity. The Smart Moves policy document (Queensland Government Department of Education Training and the Arts

Local Government Planning Sport and Recreation, 2006) focused on several key areas for schools to address, namely;

1) required time for daily physical activity,
2) improved access to resources for physical activity,
3) increased capacity to deliver physical activity,
4) the provision of professional development in physical activity,
5) the building of community partnerships to enhance physical activity, and
6) schools' accountability for physical activity.

The responsibility for the implementation of Smart Moves in schools was the task of school principals, who had to develop an action plan and report annually to demonstrate how the school was addressing the six components of the policy. Primary schools experienced a number of problems implementing the policy as they lacked the specialist knowledge, resources and facilities to support daily physical activity for their students (Louth, 2011). A lack of teacher specialist knowledge in facilitating physical activity has similarly been identified in an Australian study by Begg, Bright and Harper (2008), as a major determinant which contributes to overweight and obese children. Another study by Hands, Parker & Larkin (2002) in Western Australia, specifically targeted the constraints and enablers of physical activity on children and identified the attitude and personality of the students' HPE Teacher a major influence on their regular participation in physical activity. It seems important then that schools support teaching staff to facilitate HPE by providing ongoing professional development in facilitating games and physical activity, in order to have a positive impact on promoting regular participation in physical activity.

Begg et al (2008) also identified psychological stress and low socio-economic status as determinants that affected children's regular participation in physical activity and contributed to their overweight and obesity. Research conducted in Australia by Wyn (2009a) found the social conditions under which young people were living significantly influenced their health and well-being. Further to this Wyn (2009b) found evidence that curricula and programs that were intended to improve young people's health had an adverse effect on their well-being. For example, programs which focused on "making the right food choices" and achieving "physical activity goals" heightened anxiety and pressure within youth and encouraged a "blame the victim" mentality within the classroom. This evidence suggested that such programs may be counter-productive to enhancing the health and well-being of young people. The National Heart Foundation of Australia explored the influence psychological stress has on health in a position paper (Bunker, Colquhoun, & Esler, 2003) which provided evidence to show depression, social isolation and lack of quality social support were important risk factors associated with coronary heart disease.

Several studies examined groups of children who were physically active in an attempt to look at what motivated them. Light and Curry (2009) conducted a case study on children's reasons for joining and remaining in a Sydney soccer club in Australia. The driving reasons for these children joining sporting clubs and their continued participation were identified as being: enjoyment; meaningful social interaction; a sense of belonging; the development of self-esteem; and the formation of identity tied into the club. This reflected the findings of Wyn (2009a; 2009b),

Begg et al (2008) and Bunker et al (2003) as to the importance of a young person's psyche on their participation in physical activity.

Alternative forms of physical activity might need to be considered as a way to encourage children to take part in regular physical activity to enhance social and emotional health. Another Australian study by Francis and Lu (2009) examined the Eastern approach to physical education and identified four core concepts within it: mindfulness, simplicity, oneness, and interdependency. They explored and defined these concepts in relation to physical activity and how they may be used in physical education sessions to enhance students' health and well-being. For example, the *mindful* teacher encouraged students to be present in the moment, when students were warming up they were focused on the singleness of feeling, sensation, sound, movement and thought whilst they prepared for the session. The second concept of simplicity existed when there was less emphasis on technique and more on the pleasure and appreciation of movement. The third concept of oneness was demonstrated through considering the student as a whole person, not merely their fitness level, leadership ability or being an outstanding game player. Finally, the concept of interdependency implied that while each student's uniqueness was honoured and respected, so too was the group; and the harmony of the whole class was not forfeited for one self-absorbed student or star athlete. Francis and Lu found following these four concepts promoted the health and well-being of the individuals and aligned with overarching personal and social development outcomes within the physical education praxis.

Research pertaining to children's participation in physical activity often makes connections to the health and well-being of children. It is critical therefore, to define health and well-being in order to gain an understanding of how it may be influenced by regular participation in physical activity. Dodge et al (2012) defined health and well-being as encompassing physical, emotional, cognitive and social aspects of the human psyche. When these elements are in balance, an individual experiences good health and well-being. Life experiences have a direct impact on this balance and influence an individual's perceptions, attitudes and beliefs about themselves. How an individual perceives themselves and their own capabilities is known as self-efficacy. Bandura (1994) developed the concept of self-efficacy, and found that it was affected by physical and social experiences, relationships with others and a person's own beliefs about their capabilities. Therefore an individual's self-efficacy and their health and well-being are interrelated and reciprocally influenced by experiences, perceptions, attitudes and beliefs. For the physical education praxis then it is imperative that enhancing a child's self-efficacy in physical activity is considered as an important learning outcome within the HPE curriculum.

Inherent difficulties arise when attempting to measure health and well-being learning outcomes in terms of performance and achievement. Bradley and O'Connor (2009) acknowledged these difficulties and explored factors which influenced physical activity within Australian school settings. They found by raising school administrators' awareness of socio-cultural factors that potentially impacted physical activity in schools, momentum was generated which led to changes in practices and policies within schools.

Socio-cultural factors affecting physical activity within school contexts were specifically examined in several studies which focused on groups of students whose

social conditions precluded them from participating in regular physical activity. A study by Lehmann, Tennant, and Silva (2003) examined the impact of the provision of swimming pools in remote Australian Indigenous communities. They reported improvements in health, increased levels of participation in physical activity and advances in children's educational and social outcomes. A project by Rowley, Daniel and Skinner (2000) had similar success improving the health and well-being of remote Australian Indigenous peoples by introducing community based physical activity programs which then were embedded within the school community. In contrast to rural/remote studies on physical activity and health and well-being within Australian Indigenous communities, Nelson (2009) explored the attitudes and perceptions of urban Indigenous young people towards sport and physical activity. She found the young Indigenous people she interviewed, participated in sport for fun and for social reasons, more so than a desire to improve their fitness. Participants identified how their social and emotional well-being was directly influenced by their participation in physical activity.

These studies reflect the close association of health and well-being to physical activity and self-efficacy, especially within disadvantaged populations whose health and well-being is at risk. An examination of these studies reflected a range of strategies which have been employed to increase physical activity and improve the health and well-being of participants. Such variety demonstrates the importance of considering school contexts and the specific socio-cultural factors of each group when developing strategies to increase physical activity and well-being.

After reviewing these studies relating to children and physical activity, it becomes apparent that few have examined how these activities can be sustained within the context of schools. Studies need to be conducted within Australia which relate to classroom teachers and their ability to facilitate physical activity with their students. Further to this, limited evaluation has taken place on the impact of government policies, such as the Queensland Government Smart Moves policy (Queensland Government Department of Education Training and the Arts Local Government Planning Sport and Recreation, 2006), to measure the achievement of the intended outcomes of the policy which focus on encouraging physical activity and well-being.

2.04 Tools for the 21st century

Self-efficacy in Health and Physical Education –Motivating and Inclusive Practices

Westernised cultures within the modern world display many attributes of capitalist societies. As capitalist societies function to produce commodities and promote private gain, competition is vital to growth, and an imbalance of power is frequently created (Cohen, Manion, & Morrison, 2007). Sport sociologists advocate that sport is a microcosm of society, whatever we find in society, we will also find in sport (Kirk, Nauright, Hanrahan, MacDonald, & Jobling, 1996). Competitive drive is found in the sport played in Western societies, where winners and losers are created.

Current Physical Education in schools revolves around sport and games models of education, where skill acquisition and competition are foregrounded and underpin the school physical education experience. The importance of competition within the Australian sporting culture is a reflection of the wider Australian society. Works of Kirk et al. (1996) and Coakley and Pike (1998) stress the importance of analysing broad socio-cultural factors that impact on participation.

Research within the Australian context has explored the impact of organised, competitive sports through participation in clubs on children's social development (Light, 2006, 2008, 2010; Light & Curry, 2009; Light & Nash, 2006; Nelson, 2009). All of these studies point towards the high priority children place on their social and emotional reasons for participating in sport, with little emphasis on competition as being a determining factor in their sustained participation.

Research into children's competitive sport has reported the positive effects of exercise on the participants and the sustainability of any such effects. An early examination of research by Rowley (1987) into the effects of intensive training in child athletes revealed several studies on the growth and development of young athletes. The level of enquiry was concentrated on physicality and where research did delve into psychological aspects, these tended to centre on the psychological determinants of competitive success. Rowley called for further attention to be paid to the psychological developmental consequences of prolonged intensive training on children.

Some studies examined children's psychological motivators and deterrents relating to continued participation in sport and physical activity and revealed motivation as a crucial ingredient in a child's participation and involvement in physical activity. Taylor and Wilson (2005) supported several earlier theories of motivation and how it improves participation and performance in physical activity.

Firstly, Taylor and Wilson (2005) found that motivation to participate in physical activity can arise from a need to achieve a *social goal*, in terms of increasing one's self-worth. Harter (1978) originally identified achieving a social goal as needing to behave competently and receive positive feedback from others in challenging situations. Therefore when trying to increase a child's motivation to participate in physical activity it would seem important to ensure children were given the opportunity to provide one another with positive feedback about their performances. Traditional Indigenous Games (TIG) were originally constructed to provide peer demonstrations, feedback and support, so that everyone within the tribe was able to develop their physical skills to a higher level of proficiency and enhance the survival of the tribe. For example, if there was a skilled spear thrower, it was his responsibility to the tribe to teach others to be just as good as he. By teaching others to perform to the same level of proficiency, the tribe was not dependant on one person, who was the best spear thrower, for food, hence their chances of survival were increased. It is feasible to suggest if TIG were played with this same original focus, positive feedback provided by peers may contribute to increasing children's self-worth, thereby achieving a social goal, and acting to motivate children to participate in further physical activity.

Taylor and Wilson (2005) found a second factor which influenced motivation was *task orientation,* which supported findings from an earlier study by Nicholls (1984).

Task orientation occurs when the focus of the game or physical activity is on the completion of particular tasks as a measure of success. Taylor and Wilson (2005) identified the positive influence task orientation had on children's motivation to participate in physical activity. Many of the TIG in the Yulunga resource (Edwards, 2008) involve participants working together to achieve set tasks. For example, the game of *Kai* (Appendix 5) is played with a group of five to seven children who stand in a circle facing each other. The aim of Kai is for the team to keep the ball in the air by tapping it with the hands, for as long as possible. Teams may count the number of hits they achieve before the ball hits the ground, and each time they try to better their previous score. The set task involves the group working together to keep the ball in the air, and is a clear demonstration of task orientation. Many Indigenous games had a particular task the group had to achieve, which was directly related to improving the tribe's hunting and gathering skills to enhance the survival of the clan. Since the concept of task orientation is prevalent in many TIG in the Yulunga resource (Edwards, 2008), it is reasonable to suggest that playing TIG with children might also positively influence children's motivation to participate in physical activity.

A third factor identified by Taylor and Wilson (2005) as influencing motivation was the *motivational climate* (Ames, 1992; Nicholls, 1989) within the given situation. The motivational climate is the extent to which the environment is oriented towards promoting task mastery and learning goals, as opposed to social comparison and performance goals (Ames, 1992). Several studies with children (Biddle, 2001; Duda, 1992, 1993; Roberts, 2001; Roberts, Treasure & Kavussanu, 1997; Treasure, 2001) have found that when attempting to learn new skills or hone existing ones, then a mastery climate that promotes task involvement fosters motivation, persistence and participation in physical activity. As previously discussed, the underlying concept of the TIG resource was to develop skills through peer teaching, and hence aligns with establishing a motivational climate of task mastery and achieving learning goals. Since studies by Taylor and Wilson (2005), Ames (1992) and Nicholls (1989) all suggest a motivational climate of task mastery and learning goals positively influence children's motivation to participate in physical activity, it is practicable to suggest that playing TIG would similarly have a positive influence on children's motivation to participate in physical activity.

Taylor and Wilson (2005) also recognised human motivation was influenced by a person's motives for participating, which can be classified as either *extrinsic or intrinsic motivation* (Deci & Ryan, 1985). Extrinsic motivation occurs when behaviour is directed towards the successful attainment of tangible rewards, for example medals or money, whilst intrinsic motivation is driven by the pleasure or satisfaction gained from participating in the activity. Studies have shown (Taylor & Wilson, 2005; Deci & Ryan, 1985) continued participation in physical activity is more likely to occur when participants are driven by intrinsic motives rather than by the lure of external rewards. When TIG are facilitated with a focus on improving skills and working together to achieve tasks, intrinsic rewards are maximised and it is therefore conceivable that playing TIG may increase children's motivation to participate in physical activity through the use of intrinsic rather than extrinsic rewards.

The literature findings related to factors that positively influence children's motivation to participate in physical activity (Taylor & Wilson, 2005; Harter, 1978;

Nicholls, 1984; Nicholls, 1989; Ames, 1992; Deci & Ryan, 1985) have been identified as: having a social goal, being task orientated, having a motivational climate of task mastery and learning goals, and, maximising intrinsic motives. Since TIG have these four motivational factors present, the potential impact of playing TIG on increasing students' motivation to participate in physical activity, warrants further investigation in schools.

Several studies have also examined the motivational climate created by the coach and how this climate impacted on children's self-concept (Brady, 2004; Cumming, Smoll, Smith & Grossbard, 2007; Miller, 1989; Smith, Smoll & Cumming, 2007). These studies supported the theory that children and young people participated more often and more willingly in sport when the coach emphasised mastery of skills rather than winning or losing. Using this approach provided children with positive experiences and encouraged continued participation in sport and games. These studies reflect the crucial role of the teacher in generating a positive motivational climate when facilitating physical activity with children, in order to capitalise on student motivation and enhance student participation in physical activity.

Further studies arising from children's participation in sport and games have examined self-perceptions and self-efficacy (Brady, 2004; Moriarty, 2013; Noack, Kauper, Benbow & Eckstein, 2013). These studies all agreed that positive sporting experiences were beneficial to a child's self-concept and self-efficacy. Research conducted within specific groups of children participating in sports have found similar results. For example, Slutzky and Simpkins (2009) looked at primary school children and found that those who participated in team sports had a greater physical self-concept and self-efficacy than their non-participating peers. Findlay and Bowker (2009) focused on elite athletes and found higher levels of physical self-concept and self-efficacy when compared to non-athletes with the same demographic indicators. Rinn and Wininger (2007) and Dishman, Hales, Pfeiffer, Felton, Saunders, Ward, Dowda and Pate (2006) looked at adolescents and found similar evidence for the effects of sport participation on increasing the physical self-concept and self-efficacy of participants.

A meta-analysis conducted by Spence, McGannon and Poon (2005) examined 113 studies relating to exercise and global self-efficacy and found that participation in physical activity resulted in small significant improvements in global self-efficacy. The meta-analysis found that exercise participation is thought to have the greatest influence on domain-specific self-efficacy, for example physical self-worth and physical competence. Even though this meta-analysis incorporated research with adult participants only, where exercise intervention programs had to last longer than one week, small significant differences in global self-efficacy were found. Other determinants for the selection of the 113 studies were the inclusion of a non-exercising control group, and that the outcomes provided quantifiable data. The research identified several areas for future consideration and development with respect to research into self-efficacy and physical activity. The researchers proposed that future studies examine perceived levels of physical fitness and its effect on self-efficacy, as well as focussing more directly on the mechanisms of change involved in the self-system, and how this may impact on the design of exercise intervention programs.

The findings of this meta-analysis have had an impact on the direction this research study has taken by highlighting the need to investigate the effect of TIG on children's self-efficacy and exploring their self-reflection regarding their perceptions and attitudes towards their own physical skills and activity. This study therefore examines TIG as a mechanism to positively impact children's self-efficacy. It was hypothesised that TIG might have potential from a practical standpoint, to assist teachers to promote physical activity whilst enhancing the physical self-worth of their students, through facilitating cooperative rather than competitive physical activity and games.

When facilitating sport and games activities for children, the imbalance of power that is created through competition (Cohen et al., 2007; Woods, 2001) becomes evident to both participants and spectators. The skills of all children are clearly on display and easily judged by all present; this visibility of skills can be referred to as open dialogue. It is essential teachers are aware of the open dialogue that exists within HPE, so that the negative impact it may have on a child's self-efficacy, generated and perpetuated on the sporting field as a result of unchecked competition, is minimised.

Several studies clearly identified strategies which were used to promote inclusive practices within HPE and generated a positive sense of self-efficacy, and in doing so identified practices which excluded and isolated less skilled performers through an over-emphasis on competition. For example, Garrett and Wrench (2010) raised several suggestions to facilitate inclusive practices such as: increasing knowledge and understanding of cultural mores, expectations and practices; the inclusion of traditional and holistic approaches to health and physical activity; the use of peer teaching and group work; and, the integration of ideas and strategies across the curriculum. Shilton and Brown (2004) supported their view and also highlighted the need to incorporate building pride, cultural identity and self-efficacy in physical activity programs for Indigenous youth.

To promote inclusive practices in HPE, an investigation into more cooperative approaches to skill development is required. The need to improve physical skills and activity levels, along with providing opportunities for personal development and growth becomes evident after reviewing the literature within this area. Orlick (2006) as a proponent of cooperative games, claims cooperative games provide children with positive, joyful experiences and set them on a path to lifelong engagement in physical activities. Kirk et al., (1996) also espoused the need for inclusive practices and identified fun as the primary motivation for young people to participate in physical activity. Further consideration should be given to the type of physical activities, games and sports played in schools, and how appropriate these are from a child's perspective, rather than an adult one. Work by Orlick and Mccaffrey (1991) advocated reducing the significance of winning for children in order to reduce their stress levels regarding sports participation. An investigation into identifying games that are inclusive, have few rules and emphasise enjoyment and participation is warranted in order to examine the effects of physical activity on self-efficacy.

If earlier sport sociologists (Coakley & Pike, 1998; Frey & Eitzen, 1991; Wilson, 1994) are correct in suggesting that sport is a reflection of the social and cultural life of the society in which they exist, then to find cooperative games, one might look for a society that relied on cooperation for survival and advancement. Australia's Indigenous people historically existed as a cooperative society with a kinship system

at the core of their community. It was vital to the continued successful existence of their clan that every member of the group worked together rather than compete with each other. In this way, Australian Indigenous society was deeply connected to their spirituality, extended family and the land which sustained them (Cummins, Gentle, & Hull, 2008).

Australia's Indigenous peoples played many cooperative games to prepare their children for life within their society. The ethos within TIG aligns with the mastery approach to teaching physical activity and games, in that they promote cooperation to achieve skill mastery and the accomplishment of a common goal. Playing TIG involves high levels of physical activity, and can allow opportunities for children to work together and teach one another in a supportive and collaborative environment. The proposed use of TIG within this study as a mechanism to support and promote physical activity and self-efficacy is therefore well-founded in the research literature in relation to inclusivity in HPE.

Self-efficacy in Health and Physical Education - Fundamental Motor Skills and Physical Activity

The HPE curriculum throughout Australia has a common focus on physical skills, health and personal development as essential elements of this learning area (Tinning, McCuaig, & Hunter, 2006). In primary schools, all Australian states refer to developing fundamental motor skills as a major outcome of the physical skills component of physical education. These fundamental motor skills are general movement patterns that children need for living, and are the precursor movement patterns to more specialised, complex skills in games, sports, dance, aquatics, gymnastics and recreational activities (Department of Education and Early Childhood Development 2009). Research into fundamental motor skills (Pangrazi & Beighle, 2010) has led to the distinction of these skills into two major categories: locomotor and non-locomotor. Locomotor skills are used to move the body from one place to another, for example walking, running, leaping and jumping. In contrast to this, non-locomotor skills are performed without appreciable movement from place to place and examples include bending, stretching, twisting, turning, rocking and balancing (Pangrazi & Beighle, 2010).

Early development of skills, such as running, skipping, throwing, catching and balancing, allow children to establish healthy and safe involvement in physical activity. These fundamental motor skills have long been practised by children in their play time, both at home and at school, and include activities like climbing trees, rocks and fences; throwing, catching and kicking balls; and, running around with friends, which all help to build strength, fitness and balance. Several recent studies have noted a decline in the physical activity of Australian children (Olds et al., 2004; Olds & Ridley, 2008), and one study in particular by Timperio, Salmon and Ball (2004) indicated that 60% of Australian children had moderate to poor motor skills and 30% had low fitness levels.

Another study (Department of Education and Early Childhood Development, 2009) showed that improvements in self-efficacy and confidence associated with a sound development in fundamental motor skills had a flow on effect to other areas of a

child's education. Studies have shown (Hoffnung, Hoffnung, Seifert, Burton Smith, & Hine, 2010; Pangrazi & Beighle, 2010) that children have developed the physical and neural pathways for their fundamental motor skills by 12 years of age, so that during adolescence these skills are honed to develop more complex movement patterns. Studies gauging children's perceptions and attitudes to physical activity (Pangrazi & Beighle, 2010) have found that by the age of eight, children have already developed a firm perception of their own skill level in physical education, and have formed a positive or negative attitude towards physical education based on this perception. Hence a child's early experiences and perceptions in physical activity have enormous consequences for their life-long participation in physical activity and their health and well-being. Further research into the effects these perceptions have on a child's self-efficacy would be beneficial in developing strategies which help to avoid activities which build negative perceptions and attitudes towards physical activity.

The links between physical activity and self-efficacy have been explored by numerous researchers where the inter-relationship that connects self-efficacy to physical activity was demonstrated. The seminal work of McNair, Lorr and Droppleman (1971) developed a *Profile of Mood States (POMS)* to measure moods and their resulting effect on physical performance. The relationship between psychology and physical performance has since been examined by other researchers (Berger, Friedmann & Eaton, 1988; DiLorenzo, Bargman, Stucky-Ropp, Brassington, Frensch, & LaFontaine, 1999; Leith & Taylor, 1990; Morgan, 1979; Morgan and Goldstone, 2013; Woods, 2001) who found a number of psychological benefits gained through participating in physical activity.

Woods (2001) explored these psychological benefits further and determined the following benefits of involvement in physical activity:

- Increased self-efficacy by developing a sense of mastery, skill and accomplishment.
- Increased social interaction with others by associating with people to perform similar tasks.
- A temporary distraction from other worries is provided.
- Increased production of exercise induced chemicals within the body which stimulates neurotransmitters.
- Greater psychological improvements for individuals who had lower levels of mental health.

Counter-views exist regarding the psychological impact of physical activity when considering the athlete who becomes obsessive and extremist in their attitude towards participating in physical activity. This can be seen as over-conformity to participating in physical activity and several studies have examined different forms of this deviant over-conformity within various sports. Some studies have looked at evidence of this through over-training and self-injurious behaviour (Howe, 2004; Liston, Reacher, Smith & Waddington, 2006; Waldron & Krane, 2005), whilst others look at playing through injury (Hanley & Pearson, 1999; Howe, 2004). Other forms of this positive deviancy include extreme weight control strategies and disordered

eating (Beals & Hill, 2000; Patel, Greydanus, Pratt & Phillips, 2003) and taking performance enhancing drugs (Kidd, 2013; Pitsch & Emrich, 2012), to make extreme sacrifices in order to further their participation and success. These dysfunctional behaviours arise from excessive over-commitment to participation in sport and games, and are not the topic of this study. Suffice to say they have received attention in the literature and are considered extreme and the focus of this study is to increase the participation of school students to a healthy, balanced level.

To summarise these studies, the literature supports the beneficial effects of physical activity on self-efficacy resulting from positive experiences in games and sport. It is feasible to suggest there could be equally damaging effects on self-efficacy for those who have negative experiences when participating in games and sport. Early studies have found direct links between a child's self-efficacy, their competence in sport and their own perceptions of their physical abilities (Weiss, Ebbeck, McAuley, & Wiese, 1990). Castelli and Valley (2007) built on these links when they found a child's perceived motor competence directly affected their enjoyment of and participation in physical activity. In fact research by Stodden et al., (2008) supports a causal relationship between motor skill competence and levels of physical activity.

After an examination of the literature and research pertaining to the development and mastery of fundamental motor skills and a child's self-efficacy, the evidence to support a close relationship is strong. Indeed, a child's perception of their own skills is directly associated with their enjoyment of the activity, hence the perceptions and attitudes of children towards physical activity is of utmost importance when encouraging children to participate in regular physical activity. The relationship between mastery of fundamental motor skills and self-efficacy may be a double-edged one however, which can build or reduce a child's self-efficacy. A child's experiences in developing fundamental motor skills can be positive by being constructive, enhancing participation and enjoyment and having an uplifting effect on self-efficacy. The opposite effects on self-efficacy must also be considered for children who have negative experiences and perceptions. Hence when children have enjoyable experiences in physical activity, their attitudes and perceptions relating to their participation in physical activity are constructive, so they are more likely to experience positive influences on their self-efficacy. It is feasible to suggest that the inclusive and cooperative nature of TIG may provide enjoyable and constructive learning experiences which may foster positive self-efficacy in children. The multiple influencing factors affecting self-efficacy and how TIG may assist in generating positive self-efficacy are displayed in Figure 2.2.

Physical skills and confidence and their influence on an individual's self-efficacy have been investigated in several studies (Tutko & Tosi, 1976; Vealey, 1986, 2001; Zinsser, Bunker, & Williams, 2001). The results of these studies have identified close links between self-efficacy and confidence, where confidence was defined as a 'state of assurance' and 'belief in one's own powers'. The distinction between self-efficacy and confidence becomes less discernible, as both relate to self-belief, and both are built up through success. It can be said that self-efficacy is skill specific, whilst confidence is more holistic. These two terms are used interchangeably in more recent literature (Taylor, 2001; Taylor & Wilson, 2005; Vealey, 2001; Zinsser et

al., 2001) where confidence is defined as a "belief in one's ability to achieve goals and realize their ability" (Taylor & Wilson, 2005, p. 22).

Positive Self-efficacy	**Negative Self-efficacy**
Perceptions of high skill	Perceptions of low skill
Positive attitudes towards physical activity	Negative attitudes towards physical activity
Enjoyment of physical activity	Dislike of physical activity
Participation in physical activity	Avoidance of physical activity

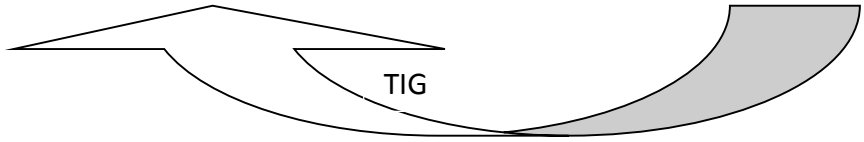

Figure 2.2. Possible impact of TIG on self-efficacy factors

Taylor and Wilson (2005) constructed an emotion matrix, which indicated the specific influence several emotions have on confidence and improving performance. They defined a category of 'Pleasant – Helpful' emotions such as joy, happiness, excitement and pride, as emotions that motivated the individual to pursue goals and increased their confidence in their ability to succeed. Therefore, any games which generated happiness and fun would have a positive influence on the motivation and confidence of the individuals playing them.

As TIG involve cooperation, team work, collaboration and self-improvement the rationale for the inclusion of these games in schools becomes apparent. TIG may be an effective strategy to build social inclusion in physical activity and provide an opportunity for children to establish a more positive self-efficacy and reap the psychological, social, cognitive, physical and affective rewards of participating regularly in physical activity.

Cooperation - Building Social Responsibility

The teaching of cooperative learning strategies has been found to be intrinsic to the development of thinking skills, where students have to work together to complete tasks, and are responsible for one another's learning as well as their own (Slavin, Hurley & Chamberlain, 2003). Slavin et al., (2003) taught students to cooperate through nurturing social skills, developing personal responsibility, encouraging individual accountability and defining terms of engagement for relationships between learners. They found cognitive processes were enhanced through cooperative learning as each student had to explain their thought processes, and provide a justification for their response. Slavin et al., (2003) supported the early research by Rhoades and McCabe (1992), who found cooperative learning promoted students'

cognitive development, since they had to think about thinking (metacognition), create an internal dialogue and share this process with their peers.

Earlier research into cooperative learning (Dalton, 1994; Gibbs, 1994; Johnson & Johnson, 1992) has shown placing students into groups and telling them to cooperate is unsuccessful. Gibbs (1994) summarised four key elements that contributed to effective learning communities as: attentive listening; appreciation/no put downs; right to pass; and, mutual respect. Later research by Hellison (2003) supported the effectiveness of these four elements, and adapted the idea of developing personal responsibility through cooperation within the physical education context. Hellison's model encouraged personal, social and cognitive development through physical activity and scaffolded cooperative learning opportunities that provided self-evaluation, self-reporting and self-reflection for the individual within the group context.

The use of cooperative learning in physical education has been found to foster constructive relationships among students, enhance cognitive understanding of skills, and foster the social and psychological growth of students (Callado, 2012; Gallahue & Donnelly, 2003; Goudas & Magotsiou, 2009; Hellison, 2003; Mosston & Ashworth, 2002). Orlick (2006) found through his work with children as a sports psychologist, that cooperative games helped children to accept one another, and play with one another, rather than against one another. Furthermore, Orlick found that cooperative games eliminated the fear and feeling of failure children associated with physical activity, and acted to nurture and reaffirm a child's sense of self- worth. Several studies have found that increasing a child's sense of self-worth built their self-efficacy and directly supported their social and emotional well-being (Mahoney, Larson, Eccles, & Lord, 2005; McHale, Vinden, Bush, Richer, Shaw, & Smith, 2005; Simpkins, Fredricks, Davis-Kean, & Eccles, 2006; Slutzky & Simpkins, 2009).

The importance of the overall health and well-being of children within Australian society can be evidenced through the priority given to children's health and well-being by the Australian government in the Melbourne Declaration (MCEETYA, 2008) and the Australian National Curriculum (ACARA, 2012a, 2012b). In addition to improving the health and well-being of children, the Australian National curriculum also encourages cooperative learning within Australian schools (ACARA, 2012a, 2012b). Prior to the national curriculum, cooperative learning was combined with physical education in the Queensland school curriculum in the Queensland Studies Authority (QSA) HPE Essential Learnings. For example, the Year 5 physical activity strand stated: "working cooperatively, and being aware of others and fair play, can enhance the experience of physical activities for individuals and groups" (Queensland Studies Authority, 2007 pp. 3).

When considering the demands of the Australian National Curriculum in terms of developing the cognitive, social and emotional well-being of children, it is pertinent to consider pedagogical approaches which may assist in achieving these demands. Research findings (Slavin et al, 2003; Callado, 2012; Gallahue & Donnelly, 2003; Goudas & Magotsiou, 2009; Hellison, 2003; Mahoney et al, 2005; McHale et al, 2005; Simpkins et al, 2006; Slutzky & Simpkins, 2009) regarding cooperative learning strongly indicate the cognitive, social and emotional benefits cooperative learning activities bring to all learners. In the key learning area of Physical

Education, teaching TIG may provide an opportunity to include cooperative learning strategies to enhance the cognitive, social and emotional well-being of children.

It is worth investigating if the cooperation and awareness of others that is required to play TIG may be extended to other aspects of the classroom. The inclusive practices of the games may help to create a more cooperative classroom culture. When participating in TIG, the more competent, skilful children are required to share their skills with their group so that all participants are successful. In this way, playing TIG may provide opportunities for children to think about why they are ultimately successful, compare and contrast their styles to others and share these with their peers. The success of a group is often dependent on an individual's ability to communicate effectively with their group. As a result of the collaborative process used within TIG, they may provide a platform for teaching cooperation, responsibility and personal development, alongside improving fundamental motor skills through physical activity, which are all essential components of the HPE national curriculum.

Reconciliation and Indigenous Knowledge

Reconciliation Australia (2005) identified the significant difference in life expectancy between Indigenous and non-Indigenous people within Australia and put forward processes dedicated to narrowing the gap in health and educational outcomes between these two groups. These processes were summarised into four categories: building mutually respectful relationships; raising awareness and knowledge of Indigenous history and culture; changing attitudes based on misunderstandings; and, encouraging action to build better relationships among fellow Australians. The vision for reconciliation within Australia was given momentum when the Australian Law Reform Commission established a Reconciliation Action Plan (2009) for a more harmonious Australian community. This model attempted to address the four categories put forward by Reconciliation Australia (Reconciliation Australia, 2005) and highlighted several strategies which informed the action plan. These strategies involved fostering "respect for Indigenous peoples, participation and representation of Indigenous peoples, and consideration and understanding of issues that are important to Indigenous peoples" (Australian Law Reform Commission Australian Government, 2009 p.1) across all areas of Australian society.

These issues and practices were taken on board by the education community within Australia and were reflected in MCEETYA (2008). The Melbourne Declaration identified a major goal for Australian schooling as being the promotion of equity within schools. The declaration implored schools to "… build on the local cultural knowledge and experience of Indigenous students as a foundation for learning, and work in partnership with local communities on all aspects of the schooling process" (MCEETYA, 2008 p.7).

As a result, teaching Aboriginal and Torres Strait Islander perspectives within schools (ACARA, 2012b) has become a cross-curricular priority within the national curriculum. Several ways to integrate Indigenous perspectives into schools through the environment, the pedagogy and the curriculum have been suggested (ACARA, 2012b). In practice, teachers still struggle with or avoid including Indigenous

perspectives within their classrooms for a number of reasons. A study conducted in New South Wales found teachers did not include Indigenous perspectives because they felt they did not know the rules relating to Indigenous social norms, were worried about offending Indigenous and non-Indigenous people, and just wanted to find safe ground for themselves professionally (Western NSW Region RAET, 2010).

Clearly, from the findings of the Regional Aboriginal Education Team (RAET) report (Western NSW Region RAET, 2010), further research is needed to provide teachers with a wide range of methods to integrate Indigenous culture into their lessons. Some studies have identified Indigenous ways of learning (Donovan, 2007; Hughes, Khan & Matthews, 2007; Yunkaporta & McGinty, 2009) as being concrete and holistic, and learning in wholes rather than parts (Hughes et al., 2007; Stairs, 1994). Studies conducted by Harris (1984) identified a number of learning preferences for Indigenous people including learning through performance, observation and imitation, learning by trial and error, learning about people rather than tasks or information, and connecting knowledge to the land.

Many subsequent studies support this hands-on or kinaesthetic approach to learning (Donovan, 2007; Flamsteed, 1999; Harris, 1990; Hughes et al., 2007; Robinson & Nichol, 1998; Stiffarm, 1998; Yunkaporta & McGinty, 2009). Additional studies (Andersen & Walter, 2010; McRae, 2000, 2002) have identified three key elements for success in teaching and embedding Indigenous perspectives, namely cultural recognition and support, skill development and participation for individuals and the community.

When reflecting on Indigenous "ways of learning" it becomes apparent that hands-on kinaesthetic learning environments provide crucial support to improve learning outcomes for Indigenous children. The construction of hands on learning experiences for children demonstrates a pedagogical approach which caters for the diverse needs of the learners and promotes inclusive education in schools. The use of kinaesthetic learning experiences to foster more inclusive educational practices has been supported by a number of research findings (Hyde, Carpenter & Conway, 2014; Lengel & Kuczala, 2010; Ratey, 2008).

The cooperative nature and hands-on kinaesthetic learning experiences playing TIG provide for participants, may therefore act to establish a more inclusive classroom. Indeed, providing a wide range of learning experiences which promote student participation and engagement is a core ingredient for inclusive education in schools (Hyde, 2014). The differentiation that is present in TIG occurs through student self-monitoring, and ensures all students are involved, experience success, and yet are still challenged to improve their performance. By involving all students in this way, TIG can cater for diverse learning needs and cultures and promote skill development and participation in physical activity. Playing TIG would also deepen students' understanding of Indigenous culture by situating the games in context and acknowledging the purpose and intent for each game.

TIG are unique to Australian and Torres Strait Island cultures, and as such create opportunities for children to participate, understand, recognise and celebrate Indigenous cultures. The cooperative nature of the games, along with the supportive and collaborative way in which they are taught, would not only assist teachers to

embed Indigenous perspectives in a non-threatening way, but allow for truly inclusive pedagogy in the classroom.

2.05 Traditional Indigenous Games in Schools

The topics discussed throughout this literature review provide a context for this study and together, supply a sound rationale for the inclusion of TIG in schools. These topics can be combined and presented to form a powerful justification for the teaching of TIG in schools (see Figure 2.3).

To date there have been several programs conducted within schools to introduce both students and teachers to Traditional Indigenous Games. The impetus for a TIG revival came from the investigative work of Edwards (1999) who collected a number of Indigenous games throughout Australia and published a resource book called '*Choopadoo: games from the dreamtime'*. Following this publication, a TIG program involving Indigenous communities from Cherbourg and North Stradbroke Island was funded by Queensland Health. Although this program was enjoyed by all participants, several flaws existed within the structure and implementation of the project, in terms of evaluating the impact of the program, and this affected the sustainability of the games (Parker et al., 2006).

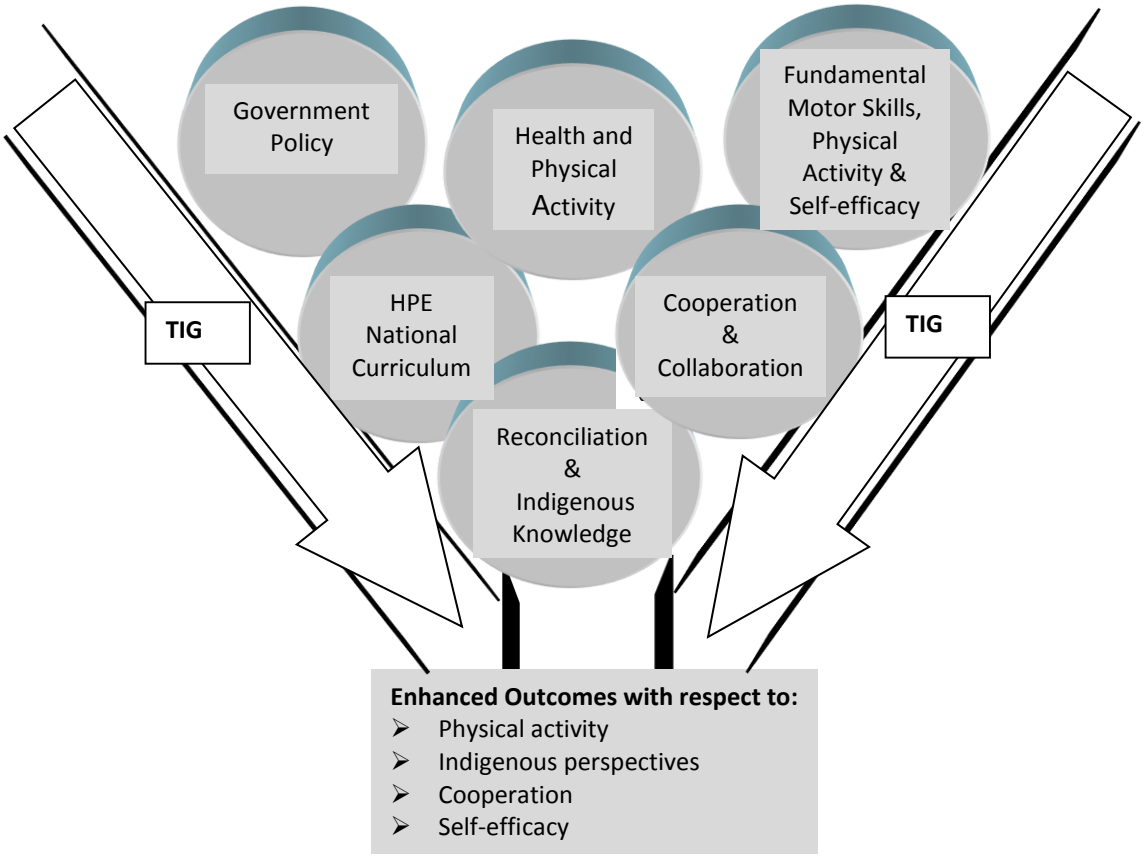

Figure 2.3. Research and Government Policy drivers which provide a Theoretical Rationale for the Teaching of TIG in Schools

Further projects were undertaken to implement TIG in schools within Brisbane (Dickson, 2007; Heerschop, 2009) and Townsville (Johnston, 2008; Kiran & Knights, 2010) with participation and enjoyment as the primary outcomes for these projects. Maintaining sustainability seemed to be a recurring problem in the delivery of these programs. In the *Bayside* project (Dickson, 2007), a lack of effective monitoring and ongoing support for the teachers delivering the games at the student interface was evident. A more rigorous approach to the evaluation of the TIG program was needed so that outcomes could provide a sound justification for further projects.

The *Wavell Heights* project (Heerschop, 2009) attempted to support teachers by providing a booklet to assist them to implement the games, and also addressed evaluating the study through surveys. The questions focused on specific elements of the program and most were in a dichotomous closed ended format, allowing the participants to give only a '*yes or no'* response, and hence left no room for a continuum of responses. Heerschop (2009) reported positive outcomes for increasing both physical activity and knowledge of Indigenous cultures as a result of the TIG project. Greater understanding and discussion of Indigenous perspectives and increased cultural connectedness for students were previously reported by teachers in a Townsville project, (Johnston, 2008) as a result of their participation in TIG.
Hence the results reported by Johnston (2008) and Heerschop (2009) both supported the regular inclusion of TIG in schools, even if their approaches to evaluation of the various TIG programs might have been improved.

However, an initial study of a TIG program in Townsville in 2007 (Kiran & Knights, 2010) used sound methodology and evaluation techniques, and reported no significant changes to physical activity levels or cultural connectedness as a result of the TIG intervention. This may be due in part to the low frequency, intensity and duration of participation in the games during the intervention. One hour per week over three months may not have allowed adequate exposure to the games - a point noted by the researchers. Similarly, summary evaluation reports by Queensland Health on TIG programs in Brisbane, (Dickson, 2009), identified the need for more regular delivery sessions to the students.

Further studies which have a greater weekly frequency of TIG sessions, examined over a longer trial period, is warranted to provide a more detailed analysis of the effects of a TIG intervention program on children's physical activity levels. Additionally, consideration should be given to organising appropriate professional development for teachers to enable them to effectively and confidently teach the games. Regular teacher facilitation would directly impact the physical activity levels of children whilst they are at school, and contribute to more sustainable TIG programs within schools.

Other publications regarding TIG centred on the use of carnivals and festivals to showcase TIG to the wider community (Lyons, 2008; Meston & Hickey, 2004). These manuals do not attempt to evaluate the games or generate support for the inclusion of TIG into mainstream schools, but suggest ways to make the games

accessible for all schools to use through a "one-off" cultural celebration event. These publications provided all schools with ways to organise and access the games in the form of a carnival, but failed to highlight the deeper significance of the games to the educational community and Australian society. Further investigations exploring the cooperative nature of the games and the holistic benefits of TIG to the health and well-being of the individual, school and community are therefore warranted.

2.06 The Importance of this Study

Traditional Indigenous Games (TIG) were explored for links as to how they may contribute to creating non-competitive, non-threatening, inclusive practices within physical education in primary schools. This research examines the impact of TIG on students' enjoyment of, and participation in, physical activity through an extended intervention program. The research also examined the effects of participation in TIG on students' self-efficacy, cooperation, teamwork and cultural awareness. In summary, four elements: physical activity and well-being, cooperation, Indigenous perspectives and self-efficacy, provided the theoretical framework for this study, (see Figure 2.4) where it was envisaged that TIG might positively contribute to each element.

Figure 2.4. Theoretical Framework of the Study

After synthesising the literature relating to Traditional Indigenous Games in schools, several themes became apparent. There is a need for further studies to conclusively demonstrate the variety of outcomes that arise from teaching TIG in schools, and how they may be integrated into various aspects of the curriculum. It is also evident classroom teachers need support to effectively facilitate playing the games so as to ensure they are taught in a culturally appropriate and sensitive manner, with support from the whole school community. If educational institutions and government bodies within Australia are to support the inclusion of TIG within the national curriculum, then they must understand the rationale behind its inclusion, and be

shown evidence to prove this rationale is sound. Furthermore, the effects of participating in TIG on perceptions and attitudes of students towards physical activity should be measured and explored to further demonstrate the impact TIG could have on encouraging children to take part in regular physical activity. It has been shown that the perceptions and attitudes of students may impact on their participation in physical education, and influence their knowledge, skills, values and self-efficacy, which in turn have a direct bearing on their health and well-being.

An emphasis on the health and well-being of all children was supported by the Australian National Curriculum Board (2009), in the development of the Australian National Curriculum, which was a direct reflection of the specific goals of the Melbourne Declaration (MCEETYA, 2008), where the responsibility to assist young people to achieve these goals was attributed to all Australians.

> Goal 1: Australian schooling promotes equity and excellence
> Goal 2: All young Australians become:
> - Successful learners
> - Confident and creative individuals
> - Active and informed citizens
>
> Achieving these educational goals is the collective responsibility of governments, school sectors and individual schools as well as parents and carers, young Australians, families, other education and training providers, business and the broader community.
>
> (MCEETYA, 2008, p.7)

This study aims to demonstrate the impact of TIG on primary school students and their teachers, in relation to increasing physical activity and well-being; enabling cooperation, enhancing self-efficacy; and embedding Indigenous perspectives. This study is important since, to date, evaluations of the specific effect of TIG on these factors, has never been done before.

2.07 Research Questions

Following this review of relevant topics and literature relating to the impact of TIG on primary school students and their teachers, the following research questions that drive this study were formulated:

The over-arching research question that this study addresses is:

> How does regular and prolonged implementation of TIG in the curriculum enhance student attitudes to physical activity, student self-efficacy and teacher ability to implement the national curriculum requirements?

This over-arching research question can be broken down to address the following research sub-questions:

Specifically, how does playing TIG at school:

1. enhance students' attitude towards, and involvement in, physical activity and their cooperation with other students?

2. enhance students' self-efficacy with respect to their ability to engage in physical activity and work with others?

3. assist teachers to meet the national curriculum requirements with respect to embedding Indigenous perspectives, cooperative learning and regular physical activity?

2.08 In Summary

The major purpose of this study was to assess the impact of a TIG based intervention program on children's enjoyment of, and participation in, physical activity. This TIG intervention study differs from others which have been conducted within Queensland, specifically relating to frequency, intensity, duration, teacher support and evaluation techniques. Furthermore, this intervention program used TIG to support teachers in achieving specific outcomes for their students related to encouraging physical activity, embedding Indigenous perspectives, enhancing cultural awareness, enabling teamwork and cooperation and generating student self-efficacy. The TIG intervention program developed for this research also considered Government policy regarding health, physical activity, Indigenous knowledges and reconciliation, along with the development of fundamental motor skills and facilitating cooperative learning within the classroom. Unlike other studies where TIG programs have been conducted in schools, this program involved TIG working within the school curriculum and context to achieve outcomes related to student well-being as well as the professional development of teachers.

Further, the intervention program provided a sustainable professional development resource which integrated TIG into the daily curriculum. This study also investigated how teachers were assisted to implement national curriculum demands relating to physical activity, embedding Indigenous perspectives and cooperative learning. The overarching aim of this study was to provide regular, meaningful and inclusive experiences in physical activity for children. The next chapter will describe the design of the TIG intervention program which was used as a basis to investigate the proposed research questions.

3. Indigenous Games as an Intervention Design

3.01 Overview

This chapter will outline the rationale for a TIG intervention program, and the development and implementation of the TIG intervention program used in this study. The TIG intervention program was conducted over six months and was implemented with approximately 279 Year 5 students. The intervention was specifically designed around the theoretical framework for this study outlined in the literature review (Figure 2.4, p 51), and focused on achieving the following key outcomes for students and their teachers:

- Encouraging student physical activity and wellbeing,
- Enabling student cooperation and collaboration across the curriculum,
- Embedding Indigenous perspectives across the curriculum, and
- Enhancing student self-efficacy.

3.02 Intervention Rationale

The review of the literature in Chapter Two suggested there are several national priorities that all Australian schools should strive to achieve (MCEETYA, 2008; ACARA, 2012b). Particularly relevant to this research study are those pertaining to physical activity, cooperative learning, Indigenous perspectives and self-efficacy.

The Australian National Curriculum (ACARA, 2012b) outlined the importance of self-worth for students and how this enabled students to manage their emotional, mental, spiritual and physical wellbeing. The paper also highlighted the need for students to have the knowledge, skills, understandings and values to establish and maintain healthy, satisfying lives. Indeed, the scope of the Australian National Curriculum stated "The curriculum... will enable students to build social and emotional intelligence, and nurture student wellbeing through health and physical education in particular" (ACARA, 2012b, p. 13). These statements reflect the importance of regular health and physical activity within the Australian curriculum and hence Australian schools.

One of the primary goals of the Australian Curriculum is to promote successful learners and confident and creative individuals. For this goal to be realised, an individual needs to have positive *self-efficacy*. Bandura (1977) coined the term self-efficacy and defined it as an individual's belief that he or she has the necessary skills to produce a desired outcome. For students to have positive, physical activity related self-efficacy, students need to believe they possess the physical skills to enable them to be successful in sport and physical activity. Bandura's concept of self-efficacy, related to physical activity, and the positive effects of this on students' participation in physical activity, provided the foundations on which the rationale for this study developed. The Australian Curriculum Assessment and Reporting Authority (2012b)

recognised the importance of positive self-efficacy for students and how this developed a sense of optimism about their lives and the future (ACARA, 2012b).

The Australian Curriculum (2012b) also outlined clear goals relating to assisting young people to communicate and cooperate in teams in order to become successful learners. The Australian Curriculum goes further to state that to promote confident and creative individuals, young people should "relate well to others and form and maintain healthy relationships; be well prepared for their potential life roles as family, community and workforce members" (ACARA, 2012b, p. 9). The need for young people to work collaboratively was also demonstrated through the curriculum aim to "promote active and informed citizens who are responsible global and local citizens" (ACARA, 2012b, p. 9). Hence it becomes a recurring theme that the curriculum needed to provide students with the opportunity to socialise with their peers in order to encourage the development of communication and cooperation skills. By enabling students to work with their peers in the classroom, teachers could cultivate students' empathy for one another and foster a sense of social justice, where students relate well to others and possess a greater understanding of their fellow citizens. The importance of peers working together was reflected in the general capabilities outlined specifically under "personal and social capability" in the Australian Curriculum as follows:

> Students develop personal and social competence as they learn to understand themselves and others more fully, and to manage their relationships, lives, learning and work effectively. This includes recognising and regulating their emotions, establishing positive relationships, making responsible decisions, working effectively in teams and handling challenging situations constructively. (ACARA, 2012b, p. 21)

Another general capability outlined in the Australian Curriculum is "intercultural understanding" (2012b) which highlights the need for students to respect and appreciate other cultures and beliefs as well as their own, in order to recognise differences, create connections and cultivate mutual respect. Intercultural understanding is seen as an essential feature of achieving reconciliation in Australia, and was evidenced in the Australian Law Reform Commission's Reconciliation Action Plan (2009). The Australian Curriculum sets out to achieve these reconciliation goals by promoting active and informed citizens who understand and acknowledge the value of Indigenous cultures, and possess the knowledge, skills and understandings to contribute to, and benefit from, reconciliation between Indigenous and non-Indigenous Australians (ACARA, 2012b). The Australian Curriculum identified Aboriginal and Torres Strait Islander histories and cultures as being a cross-curricular priority that all young Australians should learn about by directing:

> ...to ensure that all young Australians will be given the opportunity to gain a deeper understanding and appreciation of Aboriginal and Torres Strait islander histories and cultures, their significance for Australia and the impact that these have had, and continue to have, on our world. (ACARA, 2012b, p. 22)

For this to be achieved, learning experiences which incorporate Indigenous perspectives need to be "consistent across the curriculum and reinforced in learning areas" (ACARA, 2012b, p. 22).

This intervention study focused on TIG as offering a unique solution to the issues of increasing participation in physical activity and providing opportunities for young people to work cooperatively, whilst learning more about Australian Indigenous history and culture. The original aim of TIG was to develop competence in physical skills within the tribes, so that all members of the tribe were skilled hunters and gatherers. The survival of each Indigenous tribe was directly dependant on the ability of all tribal members to be skilled in gathering food and resources for their clan. For example, if one member of the clan was an outstanding hunter with the boomerang, then it was his duty to his clan to teach others to be as good as he. In that way, if anything ever happened to him and he could not hunt with his boomerang, it would not jeopardise the survival of the tribe, since there were others who were just as good who continued to hunt, which ensured the continued existence of the tribe. The ability to share skills and help one another to improve was crucial to the continued survival of the tribes, so the games they developed to hone their physical skills reflected communication, support and cooperation with one another, to achieve a common goal.

The PD sessions within the intervention were conducted with this same focus of communication, support and cooperation, where the spirit and intent of the games were task orientated and team members had to work together in order to achieve success. By establishing a sense of cooperation and skill mastery when participating in TIG, as opposed to competitive games, which often create winners and losers, a more supportive team environment was generated. For this reason, the TIG intervention program was geared towards inclusion and cooperation in order to increase participation in physical activity.

The game of *Kolap* (Appendix 3) which comes from the Torres Strait region and is a throwing game played with teams of 2-6 people, illustrates the cooperative nature of the games. *Kolap* encourages communication and cooperation through peer teaching, since each player must land their kolap on a target, and once successful, they assist their team mates to accomplish the task by teaching them, not by throwing for them. The game of *Kolap* therefore acts to improve communication and cooperation, whilst also adapting and refining motor skills. Since *Kolap* can be played against the clock, with teams getting quicker times as their level of skill improves, no winners or losers are created, thereby reinforcing the notion of cooperation with one another, as opposed to competing against one another.

The inclusive nature of TIG promotes participation in physical activity and can be demonstrated through *Puloga* (Appendix 4) which is a mock warfare game from North Queensland. The game is played by two teams within a set boundary, with each player wearing two tags in their team's colours. The aim of the game is to de-tag the opposition, either by removing their tags or by hitting them below the chest with a soft ball. When a player loses both tags, they step outside the designated area, replace their tags, and then re-enter the area and continue playing. The continuous nature of the game combined with the concept of "re-tagging" allows all students to choose to re-tag more slowly if they require a little longer recovery time from the

exercise. *Puloga* demonstrates differentiation since it is up to the student to choose when they are ready to re-join the game, by allowing them to work at their own level. By differentiating within the activity all students are then actively included in the activity. *Puloga* is usually played for an agreed length of time and there is no way to discern winners and losers at the conclusion of the game, since the focus is on playing the game. The concept of participation and inclusion is reinforced through *Puloga* and further demonstrates how TIG encourage participation in physical activity.

Since the purpose of the TIG intervention study was to promote participation in physical activity and encourage cooperation and teamwork, whilst embedding Indigenous perspectives, then it is pertinent that TIG were facilitated with children in the trial schools on a regular basis (optimally one session per day, with a minimum of three sessions per week, with a session length of at least 30 minutes). The regularity of the TIG sessions was considered a crucial element of the intervention program.

The research study used a school based intervention program as this was the most effective way to study the effects of the program on children. This research sought to measure the change in attitudes and behaviours of the participants (students and teachers). According to O'Toole and Beckett (2010), Kervin, Vialle, Herrington and Okely (2006), McTaggart and Kemmis (2005) and Carr and Kemmis (1986), the defining element of action research is to find solutions to real problems. The TIG intervention program was formulated as a possible solution for the problems of decreased participation in physical activity, negative attitudes towards physical activity and difficulties associated with embedding Indigenous perspectives within schools.

This study views positive self-efficacy as defined by Bandura (1977) as being integral to the participation in, and enjoyment of, physical activity. As children experience success when playing TIG, their confidence levels are elevated, which in turn increases performance (McAuley, 1985). The success children experience enhances confidence and further success ensues (Graham & Stabler, 1999; Jackson, 1996; Ravizza, 1977). An upward spiral of confidence and performance and greater self-efficacy is created. To apply the notion of upward spirals to this study, it is thought that as students experience success in physical activity, namely TIG, they may be more likely to participate repeatedly in the activity. The underlying premise here is based on positive reinforcement (Skinner, 1971), where participation in the games is fun and students enjoy it, therefore will be more likely to participate again in the future. Further, the TIG played during this intervention centred on cooperation and team work, where all participants were included and achieved success as a result of cooperating with others.

This study used TIG as a vehicle to promote self-efficacy, participation and cooperation, and also allowed teachers the opportunity to integrate Indigenous perspectives. As the need to embed Indigenous perspectives grows within our educational institutions (Queensland Government, 2008), the practicalities of achieving this have not yet begun to emerge. Government policies to embed Indigenous perspectives are gradually being put into place in schools (Australian National Curriculum Board, 2009; Queensland Government, 2008). The onus has

been placed on classroom teachers to provide opportunities for children to learn about Indigenous culture in order to recognise Indigenous perspectives and foster respect for Indigenous peoples and knowledges (Australian National Curriculum Board, 2009). Many teachers have the appropriate pedagogical skills and attitudes to embed Indigenous perspectives, but are hesitant to do so as they feel they lack the knowledge and expertise needed to do this effectively (Cummins, Gentle & Hull, 2008). The Yulunga resource (Edwards, 2008) allowed teachers to access knowledge about TIG and both the explicit and implicit culture surrounding the rationale and conduct of each of the games. In this way Yulunga can be used as a vehicle to assist teachers to embed Indigenous perspectives and develop integrated units of work across multiple key learning areas, including HPE.

The intervention program addressed all four areas of the theoretical framework for this study. Playing and learning about TIG in this intervention program allowed teachers to embed Indigenous perspectives in the classroom. The program also provided classroom teachers with the knowledge and skills to facilitate quality physical activities that promote participation and inclusion, hence maximise the opportunity for all children in their class to succeed at, and enjoy, participating in physical activities. Since TIG promotes inclusion and cooperation, it was theorised that the intervention program would also allow teachers to foster personal development and social skills within their students.

The remainder of this chapter will outline the development and implementation of the TIG intervention, and concludes with a broad statement of the aims of the study for both children and teachers involved in the research.

3.03 Development of the TIG Teaching and Learning Context

The researcher's role within the University as a pre-service teacher educator allowed for key discussions with several disparate groups within the community, those being: practising teachers, pre-service teachers, Indigenous school support workers, community Elders, and children. Through discussions, practising teachers within the local area admitted experiencing difficulties in implementing curriculum demands relating to regular daily physical activity, group activities and embedding Indigenous perspectives. Indigenous school support workers raised feelings of frustration as they felt their roles were valued mainly during National Aboriginal and Islanders Day Observance Committee (NAIDOC) week, and they wanted to have a more consistent role in assisting teachers to embed Indigenous perspectives throughout the year. Community Elders wanted to support Indigenous children in schools so that they would feel more connected to the school community and, hence, have a better chance of success in their educational aspirations. Pre-service teachers highlighted concerns over students' not getting regular, daily physical activity in schools. They were also anxious about embedding Indigenous perspectives sensitively and appropriately in schools. When speaking with children about Indigenous culture, many wanted to learn and understand more about it, and looked forward to NAIDOC week where they could experience some aspects of Australian Indigenous culture.

In order to draw together all of the information from discussions with local education community stakeholders, a SWOT analysis was conducted which identified needs and outcomes required by the education community with respect to daily physical activity and embedding Indigenous perspectives (See Figure 3.1). As a result of this analysis some key needs were identified as follows:

- Teachers within the local community needed appropriate knowledge, skills and attitudes to facilitate daily physical activity and to embed Indigenous perspectives in the curriculum.
- Students within the local schools needed regular daily physical activity.
- Students within the local schools had a desire to learn about Indigenous culture.
- Local Indigenous Community leaders were eager to assist schools to learn about Indigenous culture and perspectives.

Strengths	**Weaknesses**
• HPE specialists within all local schools • Mild climate conducive to outdoor physical activity • Local school community receptive to regular physical activity • Accessible Indigenous community • Very talented individuals within the local Indigenous community • Local school community open to Indigenous input because of the government legislation involving embedding Indigenous perspectives within classrooms • Local schools respectful to Indigenous perspectives • Higher representation of Indigenous students in local schools than the Australian average	• Teacher professional development in daily physical activity not readily available • Difficult to find time for physical activity due to other curriculum demands and pressures created by national testing programs • Lack of knowledge of local Indigenous community issues • Indigenous people feel alienated from educational institutions • Indigenous people feel they have no voice and no power within education systems • Teachers worried about causing offence so not embedding Indigenous perspectives at all
Opportunities	**Threats**
• Provide Professional development workshops to assist classroom teachers to facilitate daily physical activity • Up-skill pre-service teachers with the knowledge and skills to facilitate regular physical activity • Develop a sense of respect for Indigenous knowledges amongst the local community	• Instilling confidence in teachers to facilitate meaningful daily physical activity • Providing adequate professional development to increase the knowledge and skills of teachers to embed Indigenous perspectives in their current pedagogical practices • Schools lack the equipment needed to support TIG

Figure 3.1. SWOT Analysis of the Education Community in relation to Daily Physical Activity and Embedding Indigenous Perspectives in the Curriculum

After a detailed re-examination of the local school context, the main barriers to both daily physical activity and embedding Indigenous perspectives were acknowledged as follows:

- Access to equipment for daily physical activity.
- Knowledge of "fun" physical activities that appealed to all students on a regular basis.
- Provision of meaningful daily physical activity for students.

- Improved understanding of cultural protocols and Indigenous knowledge to assist teachers to embed Indigenous perspectives within their classroom.

A change in attitude or behaviour as a result of facilitating TIG with children was hypothesised. A TIG intervention program based on the Yulunga resource (Edwards, 2008) was planned to incorporate ongoing professional development for teachers over a six month trial period to provide time for a change in the level of knowledge and expertise of teachers in facilitating TIG with their students. The TIG intervention program also involved using TIG as a means of providing regular daily physical activity experiences to students over a six month period, to investigate changes in learner beliefs and behaviours.

The intervention program was designed to provide professional development in stages to allow for further adaptation and refinement for each specific school and class context involved in the research. The professional development continued over a period of six months to allow teachers the opportunity to seek further assistance and ongoing support as their confidence and knowledge base grew. Providing individualised support allowed for a broader knowledge base to be built within each school over time, and gave teachers the opportunity to practice what they had learnt and reflect on the outcomes. Sustainability of this intervention program was further enhanced by using an individualised and ongoing model of professional development. The diverse needs of teachers involved in the intervention program were then better accommodated and clarified throughout the duration of the study.

The intervention program ran for six months from April to September 2011, thereby allowing a substantial amount of time for TIG to be played by students on a regular basis. The six month time period allowed students to develop and refine their skills through familiarity and repetition of the games. Learning and repeating the games would provide the opportunity for students' to develop success and confidence in playing the games and perhaps might ultimately have a positive influence on their self-efficacy and long term participation in physical activity. Prolonged time to play TIG and exposure to the nature of TIG are crucial factors for children and teachers to develop an understanding of the cooperative nature of the games. The six month trial period should provide adequate time for this deeper understanding of cooperation and collaboration to develop and infiltrate other areas of their classroom teaching and learning experiences.

A six month intervention program to facilitate TIG within schools provided the basis for the project. Sagor (1992) supported the use of intervention programs based on action research as it helped to professionalise teaching, enhance teacher motivation and efficacy, and assisted to meet the needs of diverse learners by searching for solutions to ever-changing problems within the school community. Thomas (2005) discussed the idea that ongoing professional development provided a mechanism both for individual teachers to improve their practice and for entire schools to implement reform, and this view was reflected in the aims of the program. The whole group and school group phases of the professional development workshops within the intervention program provided an opportunity for teachers to build a collaborative support network where ideas could be shared and reflected. Dana and Yendol-Silva (2003) and Ary, Jacobs and Sorensen (2010) believed collaborating in action research made education a less isolating activity and it enabled teachers to

support and help one another. It was planned that teachers participating in the TIG professional development workshops were able to form support networks and share good practice so that the TIG intervention program could be sustainable within the local education community, at the conclusion of this study.

The individual class based phase of professional development within the intervention program provided teachers with the opportunity to reflect on and adapt the program to the specific needs of their students. The nature of the delivery of the individual professional development sessions allowed for subtle changes within each specific school context so that it was relevant to the needs of each class and school environment. Since there was a unique blend of 534 children and 20 teachers from across seven schools who participated in the study, rich and diverse learning environments existed across schools and classrooms. It was therefore necessary to provide flexible and differentiated professional development to accommodate for the varying needs of teachers, students and school communities. The establishment of differentiated professional development in this study, was reflected and supported by other complimentary experimental researchers (Kervin, Vialle, Herrington & Okely, 2006; McTaggart & Kemmis, 2005; O'Toole & Beckett, 2010) who recognised that "education occurs in diverse and messy 'naturalistic' settings... and the intervention program allows for subtle changes within each specific school context so that it is relevant to the needs of each group of participants" (O'Toole & Beckett, 2010, p. 67).

3.04 Professional Development Plan

The intervention program was designed to support classroom teachers to implement TIG on a daily basis in schools. The program began by providing a series of professional development (PD) workshops to teachers on TIG and the theoretical framework of the study. All PD during the intervention was developed and facilitated by the researcher, who must therefore be considered in the context of the PD as a participant researcher. Possible risks to the validity of the study due to the effects of the researcher directly participating in the program, were mitigated by constantly checking and extending the material used in the program for researcher bias, and by carefully planning the content and process of the PD sessions. The advantages of participatory research in the PD sessions enabled the study to take into account a subjective understanding of the issues and relationships regarding the research matter. Furthermore, these issues and relationships are important features of feminist research (Stringer, 2004) and reflect the researcher's epistemology.

Participating in TIG during the Intervention

Once the trial schools had taken part in the whole group professional development session, teachers began playing TIG with their students each day for half an hour, as part of their commitment to achieving government daily physical activity targets for school children.
One month into the intervention program, school group professional development workshops were held to further support the facilitation of TIG within each school. From that point on the researcher visited the schools on a monthly basis to provide any further guidance and/ or assistance with the interpretation and implementation of

TIG relative to their specific classroom context. The PD provided during this time took on the role of "trouble shooting" for any particular areas of concern highlighted by the teachers implementing TIG with their class. This individualised assistance continued for the duration of the intervention, which was for a period of six months. The progressive facilitation of the Professional Development sessions throughout the intervention period is demonstrated pictorially (In Figure 3.2).

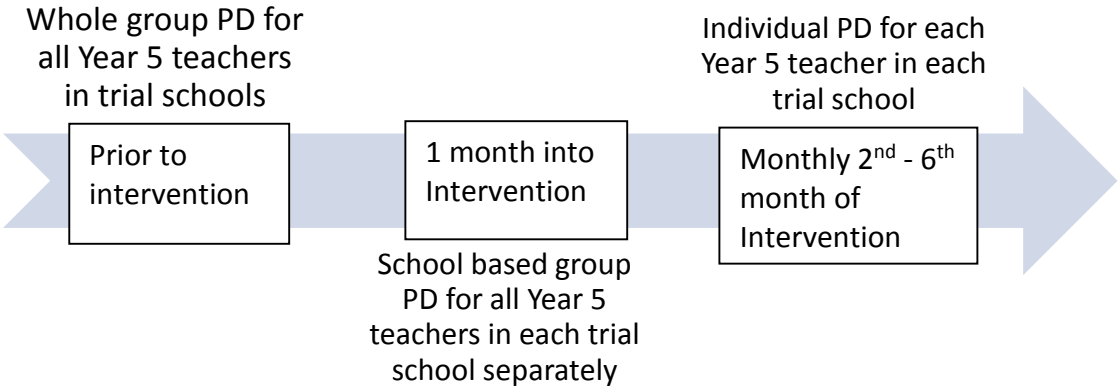

Figure 3.2. Flow chart of teacher professional development activities in the trial schools

Professional development workshops and 1:1 sessions were used to inform and support teachers who were involved in the intervention trial group, and ensured consistency and reliability of the program. The whole group and school by school workshops also allowed teachers to network with one another and promoted the concept of collaboration within and across schools.

Whole Group PD for All Year 5 Teachers in Trial Schools

The whole group one day professional development program was conducted after the pre intervention teacher surveys and interviews. It introduced teachers to the intervention study and the Yulunga resource (Edwards, 2008). The workshop provided a balance between theoretical and practical sessions regarding the TIG intervention program, and a plan of this can be found in Appendix 1. The theoretical sessions discussed detailed information accompanied by a PowerPoint presentation of the rationale behind the TIG intervention study, a copy of which can be found in Appendix 2.

The practical sessions provided hands-on experience for teachers to play some of the games and identified solutions to introducing and playing the games in a culturally sensitive and appropriate way. Several games were identified as age appropriate and straight forward in establishing an understanding of the games for both teachers and students alike and were identified in the workshop plan. These games provided teachers with an initial starting point to implement the games in their class.

The program facilitated alignment of the resource to the curriculum and provided some sample integrated units of work for the teachers to peruse. Assistance was

provided for the practical application of TIG to the curriculum, through collaborative planning, preparation and implementation of the games. The professional development sessions were conducted with all Year 5 teachers, one HPE specialist and one principal from the intervention schools; all together 18 participants. The session was held at the university campus prior to the commencement of the intervention program and conducted over a whole day. The professional development workshop allowed the researcher to explain and the teachers to explore Traditional Indigenous Games and the intervention program, specifically the notion of "cooperation" as opposed to "competition" within the delivery of TIG. Teachers were provided a clear picture of the roles and responsibilities of all involved in the TIG intervention program and its implementation. Specifically, to play TIG each day during the thirty minutes school curriculum allocated to providing regular daily physical activity with their students. It was also suggested teachers introduce a new game each week, to allow students time to become familiar with each game and increasing their confidence to play the game. The sample of TIG chosen for the PD had few rules, limited organisation and maximised participation, so that teachers could easily and safely replicate the games with their students. All TIG used in the PD demonstrated task mastery, skill development, cooperation and differentiated learning, so that teachers could provide meaningful and developmentally appropriate activities for their students.

The whole group PD was developed using the 5E pedagogical approach to teaching and learning (Australian Academy of Science, 2008) which is based on an inquiry-orientated teaching and learning model. Using this model, teaching and learning progressed through five phases: Engage; Explore; Explain; Elaborate; and Evaluate (Bybee, 1997), which are identified and outlined below. All TIG played in these sessions were taken from the Yulunga resource (Edwards, 2008).

The *Engage* phase of the workshop acted to capture the interest of the participants by playing *Kai* (Appendix 5) and developed by providing the opportunity for discussion of the following key issues within the session: inclusive physical activity; development of fundamental motor skills; connections with Indigenous culture; working as a team and cooperating; and establishing self-efficacy with children. This phase culminated with participants making connections between what they know and the new ideas arising from this study, as well as the theoretical framework of the research.

The *Explore* phase involved hands-on activities where participants played the following TIG together: *Keentan* (Appendix 6), *Kolap* (Appendix 3), *Puloga* (Appendix 4), *Kalq* (Appendix 7), *Dabi* (Appendix 8), *Tarnambai* (Appendix 9), and *Gorri* (Appendix 10). Participants acquired a common set of experiences that they could later use to further their understanding of TIG.

Once participants had played these games, the *Explain* phase followed and enabled participants to begin to understand the concepts and nature of TIG. During this phase participants deconstructed the Yulunga resource (Edwards, 2008) provided by the Australian Sports Commission on their website (Australian Sports Commission, 2004) to further their understanding of specific aspects of the games, and they were given school sets of the resource to enable them to facilitate the games with their students.

The *Elaborate* phase provided participants with the opportunity to apply what they had learnt about TIG to their specific school and year level setting. Teachers also had the opportunity to compare and contrast sample curriculum programs and units of work to their own programs and units, and discussed ideas as to how they might develop a deeper understanding of TIG.

The final *Evaluate* phase enabled participants to review and reflect on their own learning and new understanding and skills. There was an open forum for discussion about TIG and the framework used for the study. Further direction on the requirements of data collection for the study was given, along with how teachers would provide anecdotal notes regarding their perceptions of the effects of the intervention program on students, their understandings, beliefs and skills. The learning experiences associated with achieving these educational outcomes were detailed in the whole group professional development workshop plan (Appendix 1) and associated PowerPoint (Appendix 2).

School Group PD for All Year 5 Teachers in Each Trial School

Further support was provided to each school in the form of school based professional development which was conducted one month into the intervention period. This was held over a three hour block at each individual school and attended by the Year 5 teaching staff from each school. The school group professional development focused specifically on individual school contexts and cemented the notion of inclusion and cooperation as opposed to "competition" within the delivery of TIG. The PD followed a similar 5E approach to teaching and learning (Bybee, 1997) where further guidance and assistance with the interpretation and implementation of TIG at a school level was provided.

In the *Engage* phase, the prior knowledge and experience teachers had gained from facilitating TIG over the first month of the intervention was sought through the use of '*Y charts'* to determine their perceptions of TIG to date. This activity captured the interest of the participants and provided a focus for the workshop (See Figure 3.3).

Following this, teachers explored a further six games in which they actively participated, and discussed modifications they might make whilst facilitating these games with their students. The *Explain* phase then gave teachers the opportunity to compare and contrast TIG with current sport and physical activity practices through '*think, pair, share'* activities. Further discussion during this phase centred on deepening the understandings of cultural protocols associated with playing TIG.

The *Elaborate* phase prompted teachers to devise how they might teach and facilitate the new games within their own school context, and how they might apply these ideas when planning learning experiences for their students. The *Evaluate* phase provided teachers with the opportunity to reflect on their facilitation of TIG and their students' response to playing TIG each day over the first month of the program.

This same structure was followed for each school.

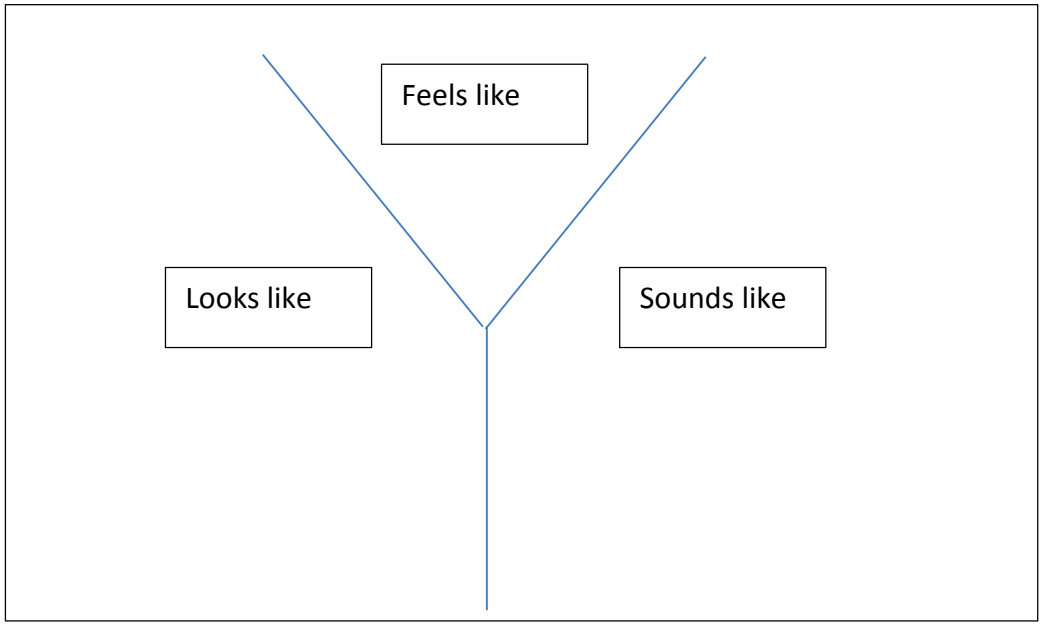

Figure 3.3. Y-Chart to Describe the Classroom Learning Environment when Playing TIG

Individualised PD for Each Year 5 Teacher in the Trial Schools

Additional individualised assistance was provided to teachers for the duration of the intervention as, and when, particular needs were highlighted and specifically began two months into the study. The researcher communicated by email and telephone with individual teachers involved in the intervention and visited with them on a monthly basis in an advisory capacity, in order to assist with any issues in the facilitation of the games they may have experienced. The researcher also assisted teachers with the practical application of TIG to the wider curriculum and community.

3.05 Professional Development Aims

The TIG intervention provided support for the implementation of TIG to principals, teachers and students in the trial schools. These professional development participants were engaged in TIG through both theoretical and practical activities which assisted them to introduce TIG to the school community and the students within their class for the purposes of the intervention study.

The PD throughout the intervention sought to achieve the following broad learning outcomes:

1. Increased pedagogical competencies in relation to teacher knowledge, skills and attitudes specifically:

- Knowledge – up-skilling teachers with an understanding of TIG through the development of physical skills and cultural competencies,
- Skills - to implement games safely, inclusively and in a way that promotes the development of fundamental motor skills and enjoyment of physical activity, and
- Attitudes – to generate a deeper understanding of the games and recognise the importance of daily physical activity for children and cultural protocols within the Indigenous community.

2. Confidence and competence in:
    - Implementing TIG on a daily basis,
    - Addressing cultural and community issues and protocols, and
    - Clear understanding of the nature and context of the games, and their relevance to, and place within, the school curriculum and community.

3.06 In Summary

This chapter described the TIG intervention program specifically designed to assist teachers to encourage student participation in physical activity, enhance student cooperation, embed Indigenous perspectives and promote positive student self-efficacy. The program was developed to align with the theoretical framework described in Chapter 2, and focused on cooperative learning strategies to facilitate teaching and learning the games. The next chapter will describe the methodology which was used to investigate the proposed research questions.

4. Methodology

4.01 Overview

This chapter will detail the research paradigm; research design principles, including the choice of subjects, school contexts, the methods employed, development of the measurement instruments, including scale refinement, data collection methods and analytical procedures used.

4.02 Research Paradigm

The impetus for this study and the resultant formulation of the research questions arose from the researcher's focus on inclusion and social justice. These values and beliefs grew from extensive experience teaching HPE to children, both in Australia and the United Kingdom. From this cross-cultural experience the researcher found similar trends amongst children in their perceptions and attitudes around competition and self-efficacy and how these affected their participation in physical activity. Those children who excelled at sport and physical education often appeared to have a positive sense of self, whilst those who were very weak at sport and physical education, appeared to feel they were inferior to others and seemed not to like or enjoy physical activity.

These interactions evoked an emotional understanding for the researcher of what it felt like for students not to be successful and included in sport and physical activity. Through connecting with her students and empathising with the way they were disadvantaged and excluded from participating in physical activity, the researcher's perceptions were socially situated within the perspective of the disadvantaged minority who were subjugated by the dominant, more physically skilled group. From the researcher's standpoint, several practices of the dominant knowledge of physical education, acted to systematically disadvantage groups of students who were less physically able to participate in sport and physical activity. Four of these practices involving the less physically able student were observed and identified as follows: 1) they were often excluded from participating in sport and physical activity; 2) their understanding and ability was denigrated; 3) their ability was represented as inferior; and, 4) they were often rendered invisible in the power relations existing within the physical education classroom. The researcher's conceptions of the way in which students' lack of physical prowess disadvantaged them in terms of knowledge attribution, acquisition and justification aligns the researcher to a Feminist Epistemology (Anderson, 2012; Lincoln, Lynham & Guba, 2011).

Anderson (2012) outlines the central concept of feminist epistemology as being knowledge that reflects the particular perspectives of the minority group. Further to

this, those who strive to reform these conceptions and practices so that they serve the interests of these minority groups, adopt an emancipatory outlook (Anderson, 2012). The notion of trying to effect change for the voiceless minorities, who are not included, either by ability, gender or race, further demonstrates the researcher's emancipatory feminist epistemology (Howie, 2010; Olesen, 2011).

The researcher recognised the need to be more objective and rational in order to convey the importance of physical activity self-efficacy for all children. In understanding the duality of the concepts of emotion and reason, and objectivity and subjectivity, the researcher adopts an *a posteriori* ontological position (Gironi, 2011), because the knowledge sought through the research is gathered both through experience and empirical evidence.

This thesis examines knowledge through an emancipatory feminist epistemology where the researcher reflects the perspectives of the less physically able students within the physical education classroom, and *a posteriori* ontology which requires knowledge be justified through the examination of experience and empirical evidence. The instruments used to collect data provided evidence of the impact of the intervention, using qualitative and quantitative methods, which allowed the researcher to draw conclusions about the value of the TIG intervention program, and act as an agent of change to the existing status quo.

Quantitative data collected through surveys and structured interviews, sought to examine the levels of and liking for physical activity, cooperation and cultural awareness in children. Qualitative data were collected in the form of teacher interviews, student reflective journals and teacher field notes, and examined and analysed the impact of the intervention as perceived by the individual participants. Differences in the application of the intervention among teachers were also identified and considered in the discussion of the results.

The researcher's philosophy of inclusion and social justice was demonstrated by considering how the intervention might change the social order, through influencing the self-efficacy of the participants. The researcher's emancipatory feminist epistemology and an *a posteriori* ontology underpin the quasi-experimental between groups mixed method approach taken within this study. By collecting quantitative and qualitative data, this research generated a rich tapestry of outcomes that sought to measure, describe and understand the behaviours of the participants in the exploration of the impact of Traditional Indigenous games (TIG) in schools.

4.03 Research design

The purpose of this research was to assess the impact of a Traditional Indigenous Games (TIG) intervention program, as described in the Intervention Design Chapter, on several dependant variables, those being; 1) student physical activity; 2) student cooperation and teamwork; 3) teachers ability to embed Indigenous perspectives; and 4) student self-efficacy.

The overall strategy employed in this study was to locate the research within nearby schools, as they were easily accessible to the researcher. A mixed methods approach was adopted and both quantitative and qualitative data were collected. The variety of data collected in this study afforded the researcher multiple data sources to build a coherent analysis of the effect of the TIG intervention program. Data were triangulated by collecting and corroborating information through cross verification from several sources and this process supported the validity and reliability of the study.

Triangulation within this study has occurred in three of the four dimensions identified by Janesick (1994). The first of which is data triangulation which involves using a variety of data sources in a study. This research demonstrates data triangulation as the following sources provided data for this study: surveys with students and teachers, semi-structured teacher interviews, student reflective journals and teacher anecdotal notes. To further align the data collection instruments, each source of data built on information obtained from earlier sources. For example the interview questions with teachers were based on the survey item responses. By elaborating on each data collection instrument, a wider picture of the context was gained, and more reliable conclusions were drawn from the data gathered.

Theory triangulation (Janesick, 1994) occurs within this study by using a number of dimensions to interpret the results of the TIG intervention program. These dimensions align to the overall theoretical framework of the research (see figure 2.4, p 51). For example, the data allowed for an analysis of the effects of the TIG intervention program on several factors, namely participation in and enjoyment of physical activity; cultural awareness and Indigenous perspectives; cooperation and collaboration within the classroom; and the influence these had on students' self-efficacy.

The third dimension of triangulation identified by Janesick (1994) and supported by Kanter (2006) is methodological triangulation which was achieved by using multiple methods to study a single problem. This study takes a quasi-experimental between groups mixed methods approach and, as such, used both quantitative and qualitative methods of data collection and analysis. For example, using the student surveys at pre and post intervention, in conjunction with student reflective journals, reflects the multiple instruments used to collect data measuring similar constructs at multiple and overlapping times. In this way, this study demonstrates methodological triangulation within the research design.

Investigator triangulation (Janesick, 1994) involves aligning multiple researchers within an investigation. Since the teachers implemented TIG with their students and provided comment on any effects they perceived the intervention had on their students, it could be said the teachers were co-researchers in the study. Investigator triangulation was demonstrated through the interviews with the teachers, since the interviews provided an opportunity for the researcher to clarify the interpretations of the teachers' observations. In addition, the methods, data, analysis and results were thoroughly discussed with the researcher's supervisors and this process also demonstrated investigator triangulation.

4.04 Participants and Context

The research took place in seven primary schools on the Central Queensland coast of Australia, around the Fraser Coast area, including Hervey Bay and Maryborough. The area has been identified by the Australian Bureau of Statistics as having high levels of unemployment, and is a low socio-economic area (Australian Bureau of Statistics, 2011). The composition of Fraser Coast's population, in terms of Indigenous heritage, is approximately 3.6%, which is higher than the national average of 2.5% of the Australian population who identify as Indigenous. Children aged between 0-19 years of age make up 25.2% of the population on the Fraser Coast, which is close to the national average of 25.8%.

Children in schools from the Fraser Coast were involved in this research, and as such, provided a non-probability sample, since all schools were from the same region. These schools were located close to the university campus, and provided a convenience sample that was easily accessible to the researcher. All primary schools within driving distance of the campus were invited to take part in the research project by email to the principals. The researcher met with the principals of the seven schools who responded, and outlined the requirements of the study along with the roles and expectations of those involved in the study (see Figure 4.1).

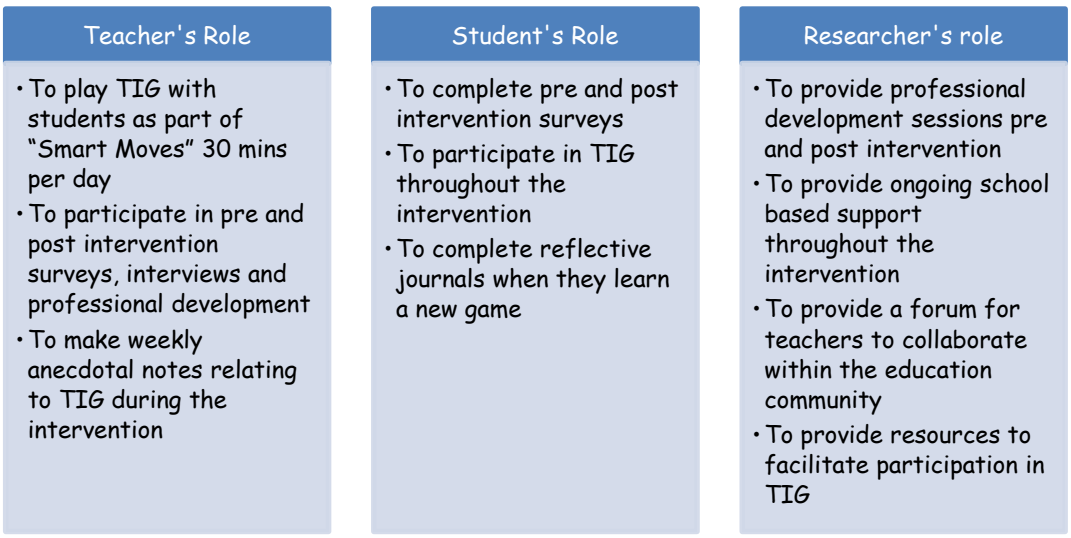

Figure 4.1. Roles and Expectations of Those Involved in the Study

Principals gauged their ability to participate in the research at a level which was appropriate for them. Some schools found they could commit to the study as intervention schools, whilst others could commit as control schools only. Hence the decision to put schools into either trial or control groups was made through consultation with principals prior to the study. This resulted in one group of two schools forming the control group where no TIG intervention occurred, whilst the other group of five schools were the trial schools who participated in the TIG intervention program. Although the number of schools in trial and control groups

was not equal, the total number of children participating in trial and control groups were roughly equal.
Of these seven schools, six were state schools in the Maryborough/Hervey Bay area out of a total of eighteen state primary schools in the region. The remaining school in the study was a Catholic school in the Maryborough/Hervey Bay area, from a total of seven private and Independent schools in the region. Since this equates to one third of the primary state schools and one seventh of the private and Independent schools in the region taking part in the research, the sample provided a fair representation of schools from the Fraser Coast region.

The target group for the study was Year 5 students and their teachers, from the seven participating schools. This involved approximately 534 students, 233 male and 301 female students and their 20 teachers. Using this number and variety of schools provided adequate sample data to investigate the research questions. A breakdown of the size of each participating school in terms of student and teacher numbers in both trial and control schools is provided in Table 4.01.

Year 5 students were selected as the target group for this study for several reasons. According to Hoffnung, Hoffnung, Seifert, Burton-Smith, and Hine (2010), middle childhood is a time for rapid increases in height and weight as children prepare to move into puberty. Studies prior to this (Engels, 1993) have also shown that there was a greater development of the extremities than the torso in this age group. These factors combined can lead to an increase in clumsiness and can result in the child becoming self-conscious of their bodies and how they move (Hoffnung et al., 2010). Furthermore, according to studies of children's motor abilities (Jurimae & Saar, 2003) the differences between sexes in strength and gross motor skills is minimal at this age. Hence children between 9 and 11 years of age are more able to take part in the same sports and physical activities in mixed gender groups, than older children, whose differences in these areas are more pronounced.

Studies have also shown children between the age of 9 and 11 years were able to do more complex physical activity (Haywood & Getchell, 2001) involving gross motor skills because they have greater balance, co-ordination and agility (Kail, 2003) than their younger counterparts. This fact allowed teachers to choose from a wider range of Indigenous games for their students.

Targeting Year 5 students ensured most children had already developed the necessary fundamental motor skills with which to participate effectively in the games and reduced the need for teachers to have specialist knowledge of teaching motor skills, so that they just facilitated the playing of the games. The impact of the teacher's prior knowledge, skill and ability on facilitating the games effectively with the children was reduced as a result.

As the primary participants in the program were Year 5 students in seven schools, their teachers were the secondary participants and from necessity, this defined the teacher participants. An information session was conducted to allow the researcher to fully describe the intervention program to the participating Year 5 teachers to ensure their full participation and cooperation in the research.

Table 4.01. Size of Participating Schools in Terms of Student and Teacher Numbers

School	Year 5 students	Year 5 teachers
Trial School		
A	76	3
B	38	2
C	64	2
D	44	2
E	57	2
Total (Trial Schools)	**279**	**11**
Control school		
Z	135	5
Y	120	4
Total (Control Schools)	**255**	**9**

4.05 Method

This study collected quantitative and qualitative data at several times throughout the intervention program on the identified variables namely: 1) physical activity; 2) cooperation; 3) embedding Indigenous perspectives; and 4) self-efficacy.

Quantitative surveys were administered pre and post intervention with the student participants from both control and trial groups. Further, quantitative surveys were used with teacher participants from both control and trial groups prior to and at the conclusion of the intervention.

Qualitative data were collected pre and post intervention in the form of teacher interviews, from the trial schools only. This helped to gauge the classroom atmosphere and the teacher's feelings towards implementing physical activity and embedding Indigenous perspectives in their daily classroom activities in the trial groups as a result of implementing TIG. Teachers were also asked to make anecdotal notes for the duration of the intervention and these were used to evaluate their attitude toward embedding the games. For the duration of the study, students in the trial groups were expected to participate in daily TIG during their normal classroom lesson time and complete reflective journals each time a new game was introduced.

Students in the control schools completed pre and post intervention surveys, and participated in their normal physical activity during school.

There were a number of phases of data collection used in this study, adapted from Creswell & Plano Clark (2007, p. 82) and displayed in Figure 4.2.

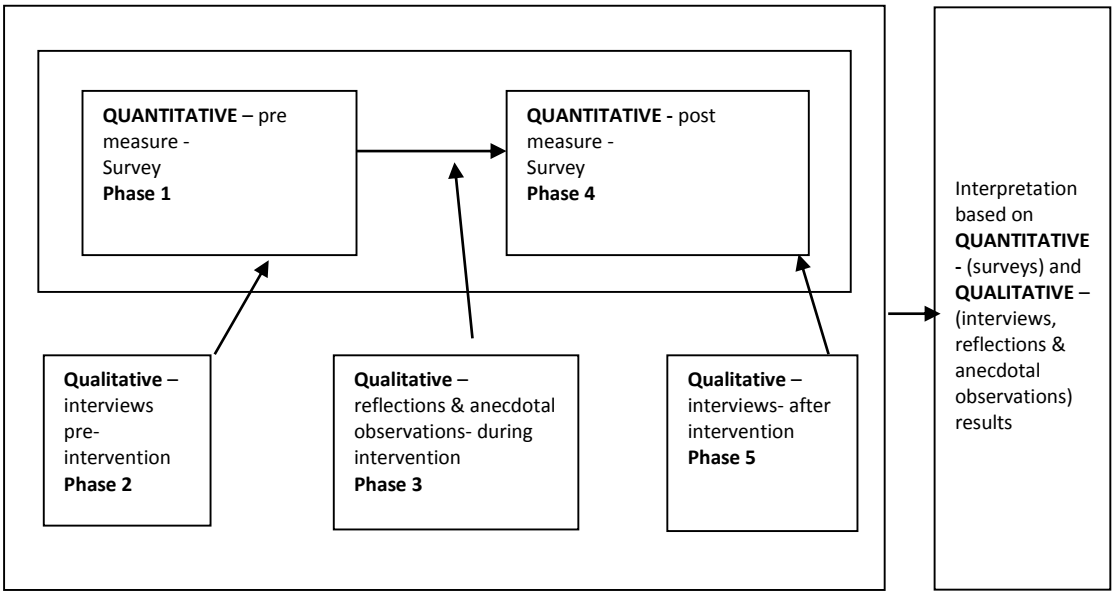

Figure 4.2. Data Collection Phases

Phase 1 of the data collection involved emailing teacher participants with two separate links to the electronic survey site in which the teacher and student surveys were housed. Teachers completed their surveys (Appendix 13) (approximately 20 mins duration), and then provided their students with the link to the electronic student surveys (Appendix 11) for completion during class time (approximately 20 mins duration). This same process was followed at the completion of the intervention program at Phase 4 of the study. During Phase 4 of the data collection, three classes could not access computers, so students completed paper copies of the survey, which the researcher later uploaded electronically to the survey site.

During Phases 2 and 5 of the data collection process, semi-structured interviews were conducted (approximately 20 mins duration) with each trial teacher at convenient times and places for the interviewees. A closed, confidential environment was used to conduct the interviews, in a one-on-one situation, after teachers had completed the survey.

At Phase 3 of the data collection process, copies of student reflective journals (Appendix 12) were given to teachers, both in hard copy and electronic format, so that teachers could distribute these easily to their students. Similarly, teachers were given electronic and hard copies of the anecdotal notes template (Appendix 15) so that their reflections were structured and organised in a similar format to allow for ease of comparison and analysis.

4.06 Measurement and Analytic Procedures Timeline

All instruments were intentionally developed to measure specific aspects of the theoretical framework proposed in Chapter 2; specifically; 1) physical activity; 2) cooperation; 3) Indigenous perspectives; and 4) self-efficacy. These variables were considered of significant importance to the TIG intervention program within a classroom system used in this study. The TIG intervention program ran for six months, where participating trial groups were expected to conduct daily TIG sessions of approximately 30 minutes duration. Table 4.02 illustrates the data collection instruments used in the study to address each of the research questions.

Table 4.02. Data Collection Timeline and Instruments Used to Address Each Research Question

Research Question	Instrument	Time	Treatment Group
1, 2 & 3	Teacher Surveys	Feb 2011	Control and Trial
1 & 2	Student Surveys	Mar 2011	Control and Trial
1, 2 & 3	Teacher Semi-Structured Interviews	Feb/Mar 2011	Trial
1 & 2	Student Reflective Journals	April – Oct 2011	Trial
1, 2 & 3	Teacher Anecdotal Notes	April – Oct 2011	Trial
1 & 2	Student Surveys	Oct/Nov 2011	Control and Trial
1, 2 & 3	Teacher Surveys	Oct/Nov 2011	Trial
1, 2 & 3	Teacher Interviews	Nov 2011	Trial

Note: Research questions can be found on p. 20.

The following section outlines the development process for each instrument used in the study and listed in Table 4.02, including their intended purpose and the rationale for their development. In Sections 4.07 and 4.08 the psychometric procedures used to determine the reliability and construct validity of the student and teacher surveys is presented. The procedures used to create the student reflective journals and teacher anecdotal notes are described.

4.07 Quantitative Instruments

Student survey design and development

Student surveys were chosen as a research instrument because they allowed for the investigation of specific dimensions identified by the literature. Items within the

surveys were constructed for each of the identified variables in the study: 1) physical activity; 2) cooperation; 3) Indigenous perspectives; and 4) self-efficacy. Surveys were also an efficient and effective way to collect data from a relatively large group of people. The use of surveys as a data collection instrument in this mixed method approach, also aligned with the researcher's ontology and epistemology in that the surveys provided an empirical measure of the intervention, from which inferences regarding the value of the intervention could be made. The surveys were completed pre and post intervention and allowed a comparison of each variable for each group across time. The items within the survey were composed in an age appropriate way, in that the questions and choice of responses used language and descriptors that were familiar to children. The data from the survey was self-reported and as such has limitations as to the reliability of the responses. In an effort to mediate these limitations, students completed the surveys individually, in an effort to ensure questions were answered honestly and without influence from their peers. Students were assured by their teachers and researcher that their responses would be anonymous, and this added to the reliability of responses. Further, the surveys were completed by both the treatment and control groups, so limitations in the final results due to mis-information potentially provided by students was countered.

The student survey was electronic and was conducted using Survey Monkey to administer, collect and record responses from the student participants. The student survey can be found in Appendix 11 and was divided into six sections: (1) a statement of confidentiality; (2) demographic information about each student; (3) perceptions and attitudes regarding physical activity; (4) sport; (5) peer relationships; and (6) collaboration with others. The six sections of the survey directly related to the theoretical framework for the study which arose from a review of literature relating to physical activity, cooperation and self-efficacy. Hence the sections of the survey were planned and formulated to specifically align with the literature review and theoretical framework developed within this study.

Sections 3 to 6 of the survey regarding each of the four topics: 1) physical activity; 2) sport; 3) peer relationships; and 4) cooperation with others; asked a series of questions designed to measure a child's perceptions of their *abilities* regarding the topic, and their *attitude* towards the topic. Questions which aimed to measure perceptions of ability sought to determine "how good" children thought they were at various tasks, while questions which measured attitudes asked children "how much they liked" these same tasks. The questions differentiated between perceptions and attitudes, as these items specifically influence participation, motivation and self-efficacy of children in different ways.

Perception of ability related to how an individual rated their ability in a particular topic, compared to their peers, and may not necessarily impact on their levels of participation, but may impact on their self-efficacy. Attitude related to how an individual felt about specific topics, which may be influenced by both external and internal factors. External factors might include success, peers, environment and prior experience, while internal factors may involve motivation and self-efficacy (Schmidt & Lee, 2011; Taylor & Wilson, 2005). In other words, a child may perceive his/her self to be very good at playing physically active games and have a good "game" self-efficacy, but if his/her peers do not play or value these games, then the child may not be motivated to continue participating in the games. Hence, in order to clarify results

regarding participation and self-efficacy, questions were formulated to try to separate the notions of perception of ability and attitude towards the activity.

Questions measuring perceptions of abilities, required children to judge how good they thought they were in relation to the topic, using a 5-point Likert scale. For example, students were asked "How good are you at playing physically active games?" Response choices gave a measure of their perceived ability, for example, "I'm really awful", "I'm not very good", "I'm ok", "I'm pretty good", or "I'm really good". Items measuring attitudes asked children to identify how much they "liked" a topic, again, using a 5-point Likert scale. For example, students were asked "Do you like playing physically active games?" where response choices were: "not at all I hate it", "not really"; "sometimes"; "most of the time"; and "yes I love it". Table 4.03 provides a summary of the dimensions covered within each section of the student survey.

Table 4.03. Alignment of Topics within the Student Survey to the Theoretical Framework

Section Number	Topic	Alignment to Theoretical Framework
1	Statement of confidentiality	na
2	Demographic information	na
3	Perceptions and attitudes relating to physical activity	➢ Physical activity ➢ Self-efficacy
4	Perceptions and attitudes relating to sport	➢ Physical activity ➢ Self-efficacy
5	Perceptions and attitudes relating to peer relationships	➢ Cooperating ➢ Self-efficacy
6	Perceptions and attitudes relating to cooperating with others	➢ Cooperating ➢ Self-efficacy

Items within the student survey were formulated after reviewing a number of existing valid and reliable scales that sought to determine how students felt about themselves. For example, the Culture-Free Self-Esteem Inventory (Battle, 2002) measures psychological health in children and adolescents, as does the Piers-Harris Children's Self-concept Scale (Dana & Yendol-Silva, 2003). Both of these scales assess self-esteem or self-concept in a culturally fair manner, in an age appropriate way and correlate with other measures of self-esteem and self-concept, and are widely used by school guidance officers and school psychologists in Australian schools. These

scales provided guiding principles only for the construction of the survey items used in this study.

Items in this study's survey were created to establish student enjoyment of, and participation in, physical activity, along with student cooperation with others in their class. The items within the student survey directly align with research questions 1, 2 and 3 of this study identified on page 20. Figure 4.3 demonstrates the theoretical framework which guided the construction of the student survey. Two dimensions, physical activity and cooperation, were explored within the survey, using three key factors: time spent participating, perceptions of abilities, and attitude towards, these two dimensions.

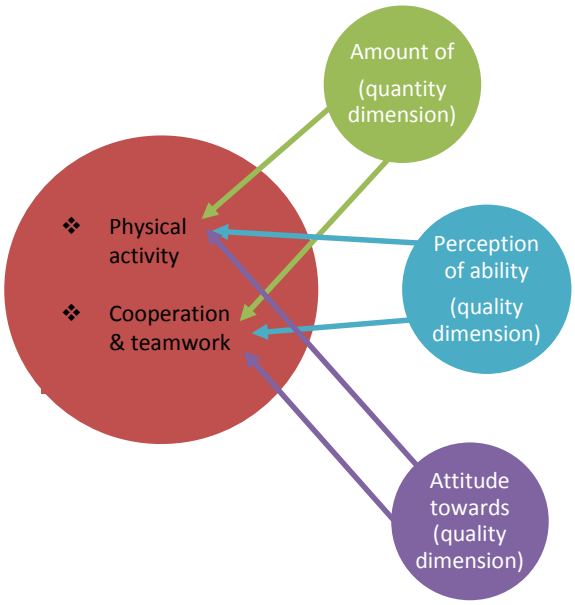

Figure 4.3. Theoretical Framework for the Student Survey

A total of 24 items were created for the student survey, with 3 of these items collecting demographic data on name, gender and age, to allow the researcher to compare changes across time for each demographic variable. The remaining 21 items were grouped according to the three variables: amount, perception, and attitude identified in Figure 4.3. Of these, one item asked students to nominate when they usually participated in physical activity and they could choose from eight responses: 1) before school, 2) during school in the morning, 3) first break, 4) during school between breaks, 5) second break, 6) during school in the afternoon, 7) after school, and 8) weekends. This item was treated separately as an indicator of when physical activity occurred, to identify any changes over time.

A five-point Likert scale was used for the other 20 items, with responses which ranged from 1) to 5) where different word descriptors were used according to which of the three variables, amount, perception or attitude, the items were measuring.

Examples of the word descriptors used for amount / perception / attitude were as follows: 1) never / I'm really awful / I hate it, 2) not very often / I'm not very good / not really, if I have to, 3) sometimes / I'm ok / I'm not bothered, 4) often / I'm pretty good / I like it, 5) most of the time / I'm really good / I love it.

Items aligned to the first variable, amount, measured frequency of behaviour relating to physical activity and working in groups. Two of the twenty items were constructed by asking students to describe "how much" or "how often" this occurred. The 5-point Likert scale used the word descriptors: "never, once a week, 2 or 3 times a week, everyday, 2-3 times every day".

Items created to align with the second variable, perceptions, asked students to rate their abilities to determine "how good they thought they were". Asking students to rate their abilities provided an opportunity to gauge their self-efficacy in these areas. Studies by Stodden, Goodway, Langendorfer, Roberton, Rudisill, Garcia, and Garcia (2008) and Castelli and Valley (2007) have similarly used survey questions to establish students' perceived self-efficacy with respect to physical activities. Five of the twenty items were constructed to measure students' perceptions relating to physical activity and cooperation, using the word descriptors: "I'm really awful, I'm not very good, I'm ok, I'm pretty good, and I'm really good".

The third variable, attitude, used the word descriptors: "no not at all, not really, sometimes, mostly, and yes", to respond to thirteen items which ascertained if students "liked" or "enjoyed" physical or cooperative activities. Students' responses gave an indication of each child's attitude to physical or cooperative activity and theoretically how their attitude may affect their behaviours. Previous research which focused on children's participation in physical activity (Castelli & Valley, 2007) and their attitudes towards physical activity (Weiss, Ebbeck, McAuley & Wiese, 1990) have used similar surveys to identify the likes and dislikes of participants, in an effort to discover how this was related to their levels of engagement in physical activity.

In summary, besides collecting demographic data, a total of 4 variables were measured which used different word descriptors for items within the student survey and these are presented in Table 4.04. The student survey can be found in Appendix 11.

Table 4.04. Item Preparation Variables for Student Survey

Variable	Word descriptors	Scale	No. of Items
Occurrence	When physical activity occurs	Choice of eight times	1
Amount	Never to 2-3 times every day	5 point Likert	2
Perceptions	I'm really awful to I'm really good	5 point Likert	5
Attitudes	Not at all to Yes (varying suffixes)	5 point Likert	13

The student survey used at both pre and post intervention was validated using factor analysis. Exploratory factor analyses were conducted on the pre-test data. This allowed for an exploration of commonalities among items. It also enabled a large set

of items to be reduced to a smaller number of underlying trustworthy factors, to explain the theoretical constructs. Confirmatory factor analyses were conducted on the post-test data, to confirm reliability over time. This process of instrument validation was recommended by Jamieson-Proctor (1999) and is supported by Burnett and Dart (1997), Cohen, Manion and Morrison (2007), Newman and Ramlo (2010) and Pallant (2011).

An exploratory principal components analysis with a Varimax rotation and Kaiser Normalization was conducted with the data from 354 Year 5 primary school students in the Fraser Coast region who completed the pre-test. Four factors with Eigenvalues equal to or greater than one were extracted. Varimax rotation of the variables yielded factors, accounting for greater than 60% of the total variance. To enhance the interpretability of the factors, all items with a loading of less than .3 were deleted, along with items that loaded on more than one factor at .4 or greater. This process was recommended by Stevens (1986) and supported by Jamieson-Proctor (1999). These initial exploratory factor analyses were open and unconstrained for all four variables. Confirmatory factor analyses were then conducted on post-test data to test the solutions provided in the exploratory factor analysis.

Further statistical analyses were then conducted to determine the strength of the relationship among the items within the solutions by using Bartlett's test of sphericity (Bartlett, 1954), and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (Kaiser, 1970, 1974). If Bartlett's test of sphericity was significant (p=.05) then the factor analysis was considered appropriate. Cronbach's alpha reliability coefficients were then computed for each of the identified factors to evaluate the internal consistency of the survey instrument.

Variable: Occurrence

The exploratory factor analysis for the eight responses to the item "when physical activity occurs" was conducted and yielded a three factor solution. The response "during school between breaks" loaded on two factors and was removed, as students did not seem to have a clear conceptual understanding of what this meant. Hence this response was excluded on statistical and theoretical grounds. The confirmatory factor analysis was conducted on the three factor solution, and these three factors accounted for 63% of the total variance. Table 4.05 presents the rotated component matrix of the three factor solution.

Table 4.05. Confirmatory Factor Analysis for "Occurrence" with a 3 Factor Solution

Extraction Method: Principal Component Analysis.

Rotated Component Matrix[a]

	Component		
When the body is moving …	**During breaks**	**Out of school**	**During school**
at second break	.91		
at first break	.88		
after school		.85	
on weekends		.60	
before school		.59	.30
during school in morning			.80
during school in afternoon			.65

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

Further statistical tests for data suitability and internal consistency were conducted, as stated previously. Bartlett's test of sphericity was significant (p=.005) hence the factor analysis was considered appropriate. The KMO index was .59 which is a good minimum value for a factor analysis given the sample size was 204, and that it contained several high loading marker variables (above .80). Table 4.06 presents these results.

Table 4.06. Factor Analysis on "Occurrence" for Data Suitability

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.59
Bartlett's Test of Sphericity	Approx. Chi-Square	208.15
	df	21
	Sig.	.005

The Cronbach's alpha coefficients for the three factors showed moderate to high reliability, with the exception of "during school", which demonstrated a weak reliability. This weak reliability may be explained by considering the wording used within the items, which may not have allowed students to differentiate clearly between times. For example, students may have interpreted the term "during school" to encompass the entire school day, from their arrival at school to their departure from school. In addition to the wording, the absence of a scale for this item did not allow students to differentiate between the amount of physical activity they took part in, and is a weakness in the construction of the item. Therefore, the wording used and the absence of scale in the item may have contributed to a weak reliability for the "during school" factor. It was concluded however that the survey instrument measured the three dimensions consistently across student participants; hence the items within each factor appeared to be measuring the same theoretical construct. The three factors with alpha, mean and standard deviations are represented in Table 4.07.

Table 4.07. Reliability Statistics for "Occurrence"

Rotated Component Matrix	Move during breaks	Move out of school	Move during school
Cronbach's Alpha	0.81 (high)	0.48 (moderate to weak)	0.24 (weak)
Mean score	0.52	0.47	0.15
SD	0.46	0.32	0.27

After these tests for reliability and validity were conducted, the three factor solution was accepted to be both theoretically and statistically sound for the response category "Occurrence".

The three factor solution can be identified as follows:
F1: Physical activity during school breaks (Eigenvalues = 2.12) accounted for 25% of the variance with two items.
F2: Physical activity outside of school hours (Eigenvalues = 1.14) accounted for 22% of the variance with three items.
F3: Physical activity during school (Eigenvalues = 1.12) accounted for 17% of the variance with two items.

These three factors align with the theoretical framework explored in this study around when children participate in physical activity. The three factor solution was used to provide data to answer research question one which was:

> How does playing TIG at school enhance *students' attitude towards and involvement in physical activity* and their and cooperation with other students?

Variable: Amount

This category was made up of two items: 1) how often do you do physical activity during class time? 2) how often do you play with other children at school? Responses used a five point Likert scale, which ranged from "never; once a week; 2-3 times a week; once every day; 2-3 times every day". These two items were not part of a single scale, and this was reflected in the Cronbach's Alpha score of .15. This response category was then considered as a short scale because it had less than ten items, and hence was allowed a minimum of .5 Cronbach's Alpha, as suggested by DeVellis (2003). The result still reflected the need to consider the items in this response category as unrelated, and consequently the data for this response category needed to be treated as separate items using paired samples *t*-tests.

Variable: Perceptions

The exploratory principal component analysis was conducted with the theorised five items within this category and it yielded a single factor solution. This pattern could clearly be described theoretically and linked to the constructs of the survey by

explaining how children perceived their own abilities. Table 4.08 presents the component matrix results of the exploratory factor analysis.

Table 4.08. Exploratory Factor Analysis for Variable: Perceptions

Component Matrix[a]

How good are you at …	Alpha coefficients
physical games	.63
individual sports	.57
team sports	.71
helping classmates with their school work	.65
working in groups with classmates on set task	.67

Extraction Method: Principal Component Analysis.

a. One component extracted.

A single factor with an Eigenvalue equal to or greater than one was extracted and accounted for 42% of the total variance. Bartlett's test of sphericity was significant (p=.000) and the KMO index was .7, therefore the factor result was accepted. Table 4.09 presents the results of both Bartlett's and KMO's statistical analyses.

Table 4.09. Factor Analysis on "Perceptions" for Data Suitability

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.70
Bartlett's Test of Sphericity	Approx. Chi-Square	121.05
	df	10
	Sig.	.005

The Cronbach's alpha coefficients showed moderate reliability (.65) with the single factor for the response category "Perceptions". Table 4.10 shows the reliability statistics for the response category "Perceptions".

Table 4.10: Reliability Statistics for "Perceptions" Variable

Component Matrix	**Component**
Cronbach's alpha	0.65
Average score	4.05
SD	0.58

After these tests for reliability and validity were conducted, this single factor solution was accepted to be both theoretically and statistically sound. The single factor solution can be identified as follows:

F1: Students' perceptions of abilities (Eigenvalues = 2.1) accounted for 42% of the variance with five items.

This single factor aligns with the theoretical framework explored in this study around how children perceive their own abilities relating to physical activity and cooperation and team work. The single factor solution also aligns with research sub-question two for this study as follows:

> How does playing TIG at school enhance students' self-efficacy with respect to their ability to engage in physical activity and work with others?

Variable: Attitudes

An exploratory principal component analysis was conducted with 14 items theorised to measure students' attitudes towards physical activity and cooperation and team work and yielded a three factor solution. As a result of the exploratory principal component analysis, six items were excluded on statistical grounds, which were "How much do you like playing physically active games"; "Do you think other children like to play with you"; "How much do you think students in your class help each other with their school work"; "Do you like helping your classmates with their school work"; "How much do you work with your classmates in a group on a set task"; and "Do you like working with your classmates in groups on set tasks". When these questions were reviewed, it could be suggested that children found it difficult to understand some of the language used in the items, for example "set tasks". Furthermore, students' interpretations of the items were different, for example students may have construed that "helping with school work" was considered cheating, and this would impact on their results.

A confirmatory factor analysis was conducted with the remaining eight items, which yielded a three factor solution, which accounted for 59% of the total variance and provided the clearest extraction, which was both statistically and theoretically sound. One item (How much do you like playing with other children?) loaded on two factors, the group activity and the individual activity. Since this particular item loaded at less than 0.4 in the individual activity, it was not counted within that component, but as it loaded at better than 0.4 in the group activity it was counted as part of that component. Table 4.11 represents the rotated component matrix of the eight-item three factor solution.

Table 4.11.Confirmatory Factor Analysis for Variable "Attitudes"

Rotated Component Matrix[a]

	Component			
	Class happiness	**Group Activity**		**Individual Activity**
Would you like to do more physical activity at school?				.72
Do you like playing individual sports?				.85
Do you like playing team sports?			.76	
How much do you like playing with other children?			.60	.31
How well do you think children get on with each other in your class?	.74			
Would you like to do more group work in your class time at school?			.68	
How much fun do you have in class learning?	.70			
How happy do you think your class is?	.78			

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in five iterations.

Bartlett's test of sphericity was significant (p=.005) and the KMO index was .69 which is above the minimum value for a factor analysis. Table 4.12 presents the results of both Bartlett's and KMO's statistical analyses.

Table 4.12. Factor Analysis on "Attitudes" for Data Suitability

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.69
Bartlett's Test of Sphericity	Approx. Chi-Square	192.47
	df	28
	Sig.	.005

The Cronbach's alpha coefficients showed moderate reliability (.61) with the three factor solution for the response category "attitudes" (See Table 4.13).

Table 4.13. Reliability Statistics for "Attitudes" Variable

Rotated Component Matrix	Class happiness	Group activity	Individual activity
Cronbach's Alpha	.61	.48	.52
Mean score	3.96	4.23	4.14
SD	0.69	0.68	0.91

The validity and reliability of the three factor solution was demonstrated to be statistically sound and is identified as follows:

F1: Class happiness (Eigenvalues = 2.4) accounted for 22% of the variance with three items.
F2: Group activity (Eigenvalues = 1.2) accounted for 19% of the variance with three items.
F3: Physical activity (Eigenvalues = 1.1) accounted for 18% of the variance with three items.

The "attitudes" three factor solution is in alignment with the theoretical framework explored in this study around how children's attitudes affect their perceptions and participation relating to physical activity and cooperation and teamwork, hence is theoretically sound. The three factor solution also aligns with research sub-question one and two for this study as follows:

How does playing TIG at school:

1. Enhance students' motivation towards, and involvement in, physical activity and their collaboration and cooperation with other students?
2. Enhance students' self-efficacy with respect to their ability to engage in physical activity and work with others?

Summary: Student Survey

This section will give a synopsis of the student survey instrument used in this study. The items on the student survey were grouped as follows: demographic data, amount of participation in physical activity, perceptions relating to physical activity, attitudes relating to physical activity, perceptions relating to sport, attitudes relating to sport, perceptions relating to peer relationships, attitudes relating to peer relationships, amount of participation in collaborative activities, perceptions relating to collaborating with others, and, attitudes relating to collaborating with others. The items were chosen as a means to measure the students' amount of participation in, perception of, and attitude towards two variables; 1) physical activity; and 2) cooperation. The measurement scale used for the amount of participation was a nominal scale which allowed for a comparison of changes across time. A 5-point Likert scale was used to measure attitudes and perceptions, and provided the opportunity to not only compare changes over time, but to compare differences between groups, and to give a strength, or weighting to these measures.

The student survey data provided information which could be analysed to answer research questions 1 and 2 as follows:

Specifically, how does playing TIG at school:

1. enhance students' attitude towards, and involvement in, physical activity and their cooperation with other students?

2. enhance students' self-efficacy with respect to their ability to engage in physical activity and work with others?

Student reflective journal design and development

The student reflective journal was completed each time the children learnt a new game. The journal used a four point scaled response, based on emoticons, that sought to determine the students' perceptions and attitudes towards physical activity and cooperation (Figure 4.4).

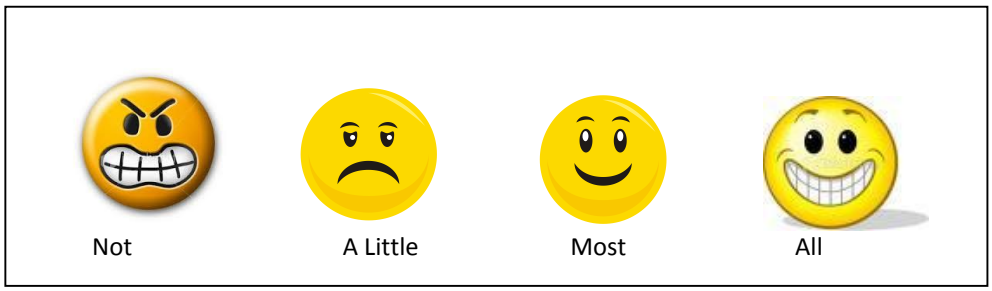

Figure 4.4. Four Point Scale based on Emoticons

A four point scaled response was used in the reflective journals, as opposed to a five or three point scale, as it most closely resembled the language students used to describe their participation in physical activity. Several formats for the reflective journal were trialled with a small sample of 12 ten and eleven year old students. These students found it difficult to differentiate their responses to TIG using a five point scale, and felt a three point scale did not allow them to adequately comment fairly on their overall participation in TIG during a lesson. The four point scale using emoticons was developed to reflect the following base response descriptors: "not", "a little", "most", and "all", but used varying stems in line with the question topic. These emoticons were explained to students who then practiced and became proficient at using this scale to rate a variety of topics prior to completing the reflective journals.

Students were asked four questions: 1) Did I play the game today? 2) Did I like the game we played today? 3) How good was I at the game we played today? 4) Did I help my classmates play the game today? Students were also asked to show, by drawing their own face emoticon, how they felt about themselves after playing the

game. The student reflective journal enabled students to accurately and concisely differentiate and reflect on their TIG lesson, in a format that could be applied consistently across all TIG and schools. A copy of the journal format can be found in Appendix 12.

The reflective journal was readily integrated into the classroom as a reflective tool, but did rely on the students' accurate assessment of their levels of participation and enjoyment of the games and how they felt about themselves. By minimising the time taken for students to complete the journals, delayed response time was reduced, and this contributed to the accuracy of student responses. The reflective journal developed in this study was guided by an ultra-brief outcome measure called the Child Outcome Rating Scale (Miller, Duncan, Brown, Sparks & Claud, 2003) which is a valid and reliable scale used to evaluate children's psychotherapy sessions.

The children completed the journal each time they learnt a new game, as this is when learners experience the most stress associated with skill acquisition (Martens, Vealey & Burton, 1990). If students take pleasure in learning the game then they are more likely to actively enjoy and participate in the activity, and continue to do so over the course of their lifetimes (Orlick, 2006). The data collected from the student reflective journals regarding their attitudes and perceptions to their participation and enjoyment, were aligned to the theoretical dimensions related to self-efficacy in this research.

The reflective journals were completed by 186 year 5 students involved in the TIG intervention, and their individual results were matched and recorded throughout the six month intervention period. Matching individual's journals allowed for a comparison of results for each student across the intervention period using descriptive statistics. Student reflective journals consisted of five questions: Four of these questions were based on a 4-point Likert scale, which allowed paired samples *t-tests* to be conducted for each of the four questions. The fifth question was an open-ended question, which was categorised into one of three responses, those being either "happy", "not sure" or "unhappy". The researcher checked the accuracy of their interpretation by asking two colleagues to also categorise the results. From this it was found that there was less than a 1% difference in interpretation of the results, hence demonstrating high inter-rater reliability. Once the data for the open ended response was coded in this way, it allowed for paired samples *t*-tests to be conducted on each of the five responses.

Means and standard deviations along with paired sample *t*-tests were calculated across the intervention period. A paired samples *t*-test allowed a comparison of scores over time for each participant. Hence any changes in scores for participants tested at Time 1 and then again at Time 2 were identified. This method of data analysis is also known as a repeated measures test and recommended by Pallant (2011) and Cohen, Manion and Morrison (2007).

The student reflective journal data collection instrument was checked to ensure the assumptions that apply to paired sample *t*-tests were adhered to. These assumptions were: level of measurement, random sampling, independence of observations, normality of distribution, and homogeneity of variance. Students were asked to reflect on their own ideas and experiences from their involvement with the specific

TIG they had just learnt. They were instructed to disregard the views of others within the class; hence independence of their observations was sought.

As this was a large sample (N=186) it can be assumed that the sample follows a normal distribution (Cohen et al., 2007; Pallant, 2011), and that the paired samples *t*-test is a robust statistical technique (Cohen et al., 2007; Pallant, 2011). The paired samples *t*-test used for the student reflective journals tests the same group of students and matches their responses over two separate times, where Time 1 was the first TIG the students played in the intervention period and Time 2 was the last TIG students played at the end of the intervention. A comparison over time allowed changes in student involvement, perceptions and attitudes to be measured between the beginning and end of the TIG intervention. The number and variety of TIG each class played throughout the intervention period varied (between two and ten different games) according to the preferences of the teachers and their students. Hence comparisons between specific games would have yielded smaller samples and limited the reliability of the results. A comparison over two separate times, one early in the intervention and the other towards the end of the intervention, allowed for a more consistent and reliable method of data collection and analysis.

Since the same students are used, then the variance within each of the populations is equal, hence the assumption of homogeneity of variance is met. Since the sample size for the student reflective journals is greater than 30 (N=186), it can be assumed that the differences between the two scores obtained for each subject is normally distributed. Pallant (2011) supports the notion that any individual violations of this assumption with a sample size greater than 30, is unlikely to cause any serious problems in analysing the data.

Since the data collected from the student reflective journals met the assumptions for paired samples *t*-tests, these tests were then run for each item. The paired samples *t*-tests allowed the researcher to compare changes across the intervention program time by demographic variables. In identifying class groups within schools, it allowed for group comparisons over time, and a contrast between groups within the same school, and to groups at other schools. By identifying teachers and class groups, it enabled the researcher to account for individual differences between teachers in the way in which they implemented TIG with their class. Further comparisons could then be made across classes to see if "teacher" was a significant variable in the TIG intervention program.

The eta squared values obtained from the paired samples *t*-test allowed for the calculation of an effect size statistic. The eta squared value then permits comment on the magnitude of the size difference. The guidelines as outlined by Cohen (1988), for interpreting this value are: .01 = small effect; .06 = moderate effect; .14 = large effect; >.2 = very large effect. These guidelines are also verified by Pallant (2011).

This method of analysis was aligned to research questions one and two as follows:

How does playing TIG at school:

1. enhance students' motivation towards and involvement in physical activity and their collaboration and cooperation with other students?
2. enhance students' self-efficacy with respect to their ability to engage in physical activity and work with others?

Teacher survey design and development

Electronic surveys pre and post intervention, were chosen as a means of collecting data from teacher participants (Appendix 13) to give teachers an opportunity to experience completing an on-line survey so that they could then draw on this knowledge to assist students to access and complete the on-line student survey.

The survey was divided into six sections, the first of which was a statement of confidentiality. The second section collected demographic data about each teacher, including gender, age and years of experience, while the third section asked teachers to identify the occurrence of different types of behaviours in their class. A 5-Point Likert scale was used with the following descriptors: 1) never, 2) rarely, 3) sometimes, 4) regularly, and 5) almost always. By using this scale, information was provided on the classroom climate and the relationships which existed within the classroom, at both pre and post intervention stages, and allowed for a comparison of behaviours over time.

The fourth, fifth and sixth sections of the survey aligned to the theoretical framework for this study, where items within each section related to the following dimensions respectively: physical activity, cooperation, and Indigenous perspectives (see Table 4.14).

Table 4.14. Alignment of Topics within the Teacher Survey to the Theoretical Framework

Section Number	Topic	Alignment to Theoretical Framework
1	Statement of confidentiality	na
2	Demographic items	na
3	Student classroom behaviors	➢ Cooperation ➢ Self-efficacy
4	Participation, perceptions, attitudes, knowledge, skill and confidence relating to physical activity	➢ Physical activity ➢ Self-efficacy
5	Participation, perceptions, attitudes, knowledge, skill and confidence relating to classroom relationships	➢ Cooperation ➢ Self-efficacy
6	Participation, perceptions, attitudes, knowledge, skill and confidence relating to cultural awareness	➢ Indigenous perspectives ➢ Self-efficacy

Items in this survey were created to identify teacher's perceptions of existing classroom relationships, along with the frequency, duration and type of participation in each of the dimensions: 1) physical activity, 2) cooperation; and 3) Indigenous perspectives. In addition to this, items were also constructed to measure teacher's perceptions and attitudes in relation to the three identified dimensions. Items relating to perceptions included the following: teacher's observations of students' enjoyment and engagement, teacher's knowledge, and teacher's confidence in facilitating each of the three variables. Items connected to attitudes involved how teachers felt about each of the three dimensions, in terms of their own enjoyment, difficulties they may have experienced, and assistance they may have received. Figure 4.5 demonstrates the theoretical principles that guided the construction of the teacher survey. Each of the three dimensions: physical activity, cooperation, and Indigenous perspectives, explored the identified variables which align to the theoretical framework for teachers within this study being: participation, perceptions, attitudes, knowledge, skills, and confidence.

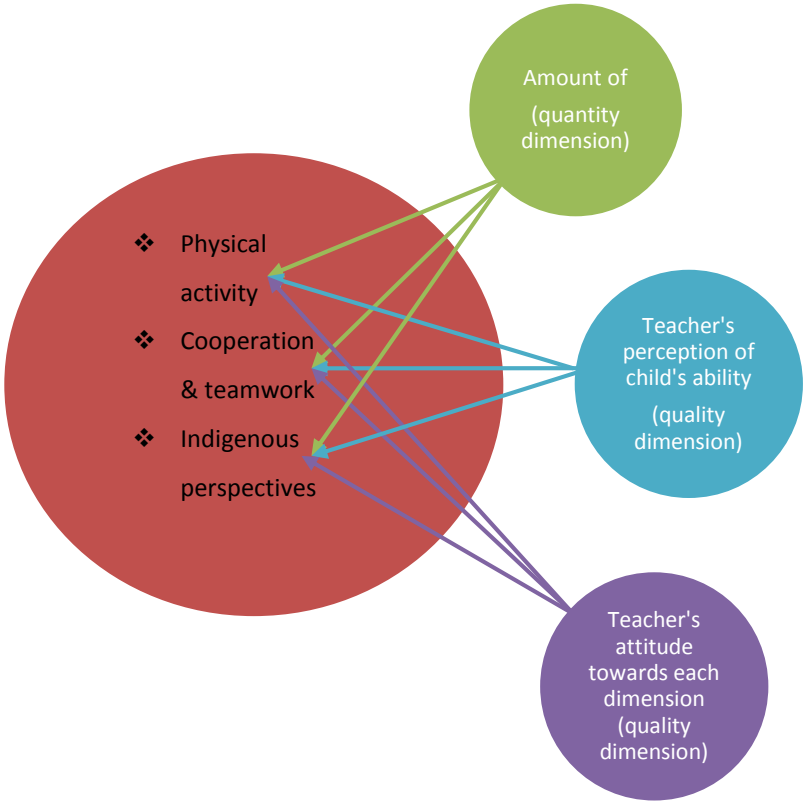

Figure 4.5. Theoretical Framework for the Teacher Survey

The teacher survey used two response formats; closed scale and a five point Likert scale. The closed scale was used to identify time, type and barriers for each topic (select the appropriate response) with the opportunity for respondents to elaborate in these areas if they chose (see Appendix 13).

The scaled response format was selected to measure the following categories: participation, perception, attitudes, knowledge, skill, and confidence of teachers, and used appropriate word descriptors for each category. Table 4.15 demonstrates the response sets for each category. The scaled response format provided a consistency of responses across all respondents and allowed comparison of results across individuals and groups, at both pre and post testing phases which was supported by several leading researchers in education (Creswell, 2005; Frazer & Lawley, 2000; Wiersma & Jurs, 2009).

The data obtained from both closed and scaled responses were analysed using descriptive statistics which involved calculating the number (*n*) and representing this information as a percentage of the total group. Comparisons of percentages were conducted at pre and post-tests to identify any specific changes over time within each variable, as a result of the intervention program. The use of descriptive statistics for the analysis of the teacher survey data was due to the small sample size of teacher participants. The analytical approach used with the teacher survey data was different to the inferential statistics used for the analysis of the student survey data, since there was a larger sample size of student participants.

Table 4.15. Item Preparation Variables for Teacher Survey

Variable	Word descriptors	Scale	No. Items
Classroom Behaviours	never; rarely; sometimes; regularly; almost always	5 point Likert	11
Participation	never; once a week; 2-3 times a week; everyday; 2-3 times every day	5 point Likert	1
Perceptions and Attitudes	intensely dislike; dislike; indifferent; like; immensely like	5 point Likert	6
Knowledge and Skills	none; a little; an adequate amount; quite a bit; a great deal	5 point Likert	5
Confidence	not; hesitant; ok; confident; very confident	5 point Likert	3

By using the demographic data with the descriptive statistics, research questions one and three could be addressed.

How does playing TIG at school:

1. enhance students' attitude towards, and involvement in, physical activity and their cooperation with other students?

3. assist teachers to meet the national curriculum requirements with respect to embedding Indigenous perspectives, cooperative learning and regular physical activity?

4.08 Qualitative Instruments

Teacher semi-structured interview design and development

Teacher semi-structured interviews were a useful data collection tool in that they allowed teachers to describe how the TIG intervention was implemented in each class. The semi-structured teacher interview format allowed the interviewer to explore the theoretical dimensions of the research through questions in the interview. It also allowed respondents to use their own words and provided the participants with the opportunity to reveal additional information throughout the conversation (O'Toole & Beckett, 2010). The semi-structured interview enabled teachers to speak at length on the sensitive topics woven into the study, for example, the Smart Moves (Queensland Government regulation of 30 minutes per day of physical activity for Primary school students) and EATSIPS (Embedding Aboriginal and Torres Strait Islander Perspectives in the school curriculum) government initiatives, and how these have impacted their classrooms, teaching and students. The semi-structured interview process assisted teachers to clarify their perception of student involvement in TIG and this added to the richness and detail of the data collected.

The researcher conducted all of the interviews one to one in a private room. The teacher interview was audio–recorded to allow for ease of data collection and transcription. During the interview frequent perception checks were conducted. The interviews sought to ascertain and clarify the perceptions and attitudes of the teachers to specific criteria within their classroom environment: physical activity, cooperation, and Indigenous perspectives. An outline of the guiding questions used in the semi-structured interviews can be found in Appendix 14.

Teacher anecdotal notes design and development

Anecdotal notes were selected as an instrument for data collection from teachers, as it allowed the researcher a valuable insight into what was happening in the classroom in response to the TIG program on a continuous basis, as first hand observations were not possible. The teacher was able to note any unusual aspects that resulted from, or that might impact on, the research. Teachers from trial schools were asked to make anecdotal notes at the end of each week for the duration of the study to share in the post-trial interview sessions. Teachers were given a template (see Appendix 15) on which to compile their notes, for their convenience, and to ensure aspects important to the research framework were discussed. The format selected for these notes followed Edward de Bono's six thinking hats (1990), as it allowed teachers to reflect in a structured way, through multiple lenses, and collected various perspectives from the teachers. They were prompted to note particular details on their class's experiences with TIG in relation to each of the six thinking hats. For example, information, facts or figures (white hat), positive changes (yellow hat),

problems or concerns (black hat), intuitive reaction to the game (red hat), other ways the games were integrated into the week (green hat) and anything else they felt should be noted (blue hat).

Teacher anecdotal notes were expected to be completed each week over a period of six months by the teachers involved in the intervention, so over this extended period of time numerous observations were recorded from each teacher. These anecdotal notes added value to the study by enabling each teacher to highlight particular instances where TIG had directly affected their class, particular students or themselves. These qualitative notes allowed more depth and discussion to the analysis of the intervention program so that a detailed picture of the effects of TIG on students and teachers could be observed.

4.09 Data Analysis

The quantitative data obtained from the surveys and reflective journals were analysed using version 19 of the Statistical Package for the Social Sciences (SPSS) computer software package (IBM, 2010).

An Intervention by Time repeated measures multivariate analyses of variance (MANOVA) was used on student survey data to investigate the research questions. If the overall MANOVA was significant, ($p < .05$) it was followed by univariate analyses of variance (F tests) for each significant dependent variable. Probability was set at .05 for all post hoc comparisons of significant univariate analyses, so that experiment wise error could be accounted for. Scheffe comparisons were conducted to evaluate pairwise between groups comparisons for the treatment group, while independent *t*-tests were computed for the within group pairwise comparisons.

Paired samples *t-tests* were used on student reflective journals which allowed a comparison of mean scores for the same group of students on two separate occasions. The first occasion was students' first experience and reflections on TIG early in the intervention. The second occasion was their final reflective journal towards the end of the intervention period. Probability was set at 0.05 for a two tailed test, and although this increases the risk of a Type I Error, that is rejecting the null hypothesis when it is true, it prevented the statistical analysis from missing a true difference between the variables over the intervention period. Eta squared values were calculated to determine the magnitude of any significant differences that were found for each of the five paired samples *t-tests*.

Descriptive statistics were used on the teacher survey data and were compared pre and post intervention to determine any change in classroom teaching characteristics. Any changes were elaborated on in the post intervention teacher interviews.

The Qualitative data collected from the teacher anecdotal notes and interview data were analysed using the *nVivo 10* (QSR, 2012) software package for descriptive and inferential statistics. All qualitative data collected from interviews and anecdotal notes were transcribed and imported into the *nVivo 10* software package. The

analysis of the qualitative data was based on an interative approach (Bassett, 2010), where specific themes emerged as a result of continuous meaning making and progressive focusing of the qualitative data. In the coding of data, a repetitive sequence of actions occurred, where data were conceptualized, then tagged with a meaningful code. This sequence was executed multiple times in exactly the same way.

In this way, a thematic analysis was conducted on the qualitative date using an iterative approach. Responses were reviewed and coded into several common groups, termed nodes. The nodes provide a way of organising data around similar ideas or themes. The researcher manually coded the data and the themes that arose then provided the basis for the nodes to which data could be coded within the nVivo program. This method of coding data and ascribing it to a group, termed "node", is supported by Maddern (2011), Ary, Jacobs and Sorensen (2010) and Dey (1993).

When the data were coded into nodes, only the teacher's direct responses or comments were coded. Restatements of questions by teachers were not coded, nor were questions from the interviewer. Specific trends emerged through this iterative analytical approach, where reviewing the data repeatedly to reflect and reanalyse meanings, gave depth and context to the themes within the data. Once these themes (nodes) emerged, several queries were conducted through the *nVivo 10* software package to assist in exploring the identified themes within the data. The use of computer programs in qualitative research does have some limitations regarding the value of quantifying qualitative data. It has been argued that such software programs substitute numbers for words; can lose the context and meaning; and reduces the analytical power of the research. However, Sorensen (2014) supports the use of *nVivo* in qualitative research and states it has a strong capacity for use with mixed methods research. As this research adopts a mixed methods approach, the use of *nVivo* allows data to be converted and combined to give a broader and deeper understanding of the impact of the intervention program.

The use of *nVivo* in this study to analyse the qualitative data allows the presentation of both frequency supporting the strength of the theme (TAG clouds) and the illustrative evidence (quotes) that lay behind it. The use of TAG clouds and quotes in this mixed method research to demonstrate data analysis is supported by Sorensen (2014) and Bazeley and Jackson (2013), and forms the justification for its use in this study.

Using *nVivo* 10, a word frequency query was used to explore what words were used in each context from each theme (node). The word frequency was scoped to select a particular node so that commonly used terms within the node could be identified. *nVivo* produced a summary showing the ranking of the 1000 most commonly used words within the nodes, and this process was followed for each of the nodes which emerged. The word frequency analyses were represented visually in the form of a TAG cloud, where the greater the size and boldness of the font, the more often these words were used within the analysis. Perception checks were conducted on the 8 most common words, by going back to the raw data to ensure the original context of the teacher statements was maintained. Direct quotes were then used to demonstrate the context and validity of the analysis, to give further depth to the study.

4.10 Research Quality

Alignment

The aim of this study was to investigate if daily implementation of TIG in the curriculum impacted student attitudes to physical activity, cooperation and self-efficacy and teacher ability to implement the national curriculum with respect to embedding Indigenous perspectives and HPE as a key learning area. The quasi experimental between groups mixed methods approach used allowed for data collection and analysis to align with the over-riding aim of the study. The instruments used provided the researcher with the opportunity to analyse large amounts of quantitative data collected from students. The qualitative data collected from teachers gave personalised examples of how the intervention directly affected the teaching and learning within specific classrooms.

To ensure the validity and reliability of this study, the instruments used in the collection of data for this research have been aligned to specific research questions for this study. Table 4.16 provides a detailed summary of the research questions and the data collection tools used to answer the research questions.

Research Integrity

This research followed a planned, systematic and thorough investigation of the effects of Traditional Indigenous Games (TIG) on encouraging physical activity and wellbeing; enabling cooperation and collaboration; embedding Indigenous perspectives; and enhancing self-efficacy. The variables have been clearly identified within this study, and these have been strongly linked to robust theoretical perspectives (Creswell, 2005; Kumar, 1999; Ravizza, 1977; Taylor & Wilson, 2005).

Implementation of the treatment occurred over a six month period using a large sample so that trends could be fairly identified and transferred to other populations. The multiple data sources were compared and helped to build a coherent analysis of data and reduce research bias.

The measurement instruments were triangulated through data, theory and method with direct links to the research questions under investigation. All participants, schools and systems will remain anonymous in any subsequent published report of the study. In this way, the outcomes from this research may be considered socially relevant and act to make education more effective for students and teachers.

Validity

Additional measures to address potential threats to internal validity included the use of intervention and control groups for a comparison of data (Sagor, 1992). Also, the prolonged engagement of the intervention allowed for deeper understandings of the relationships that developed as a result of the intervention program. An atmosphere of trust was created through disclosure, honesty and privacy relating to the research, which added to the internal validity of the research.

The participant population involved large sample sizes, and used both control and trial groups, across multiple sites, groups and perspectives, to ensure external validity. The methodology employed in this research allowed the findings and results to be generalised so that similar outcomes would be expected to occur under the same circumstances to similar populations outside the context of the study (Ravizza, 1977).

Table 4.16. Method Summary

Research Question	***Instrument***	***Group 1 – intervention***		***Group 2 - control***		***Time conducted***		
Does playing TIG at school:		**T**	**S**	**T**	**S**	**Pre**	**D**	**Post**
1. enhance students' motivation towards, and involvement in, physical activity and their collaboration and cooperation with other students?	Survey Interview Reflection journal Anecdotal notes	✓ ✓ ✓	✓ ✓ 	✓	✓	✓ ✓	 ✓ ✓	✓ ✓
2. enhance students' self-efficacy with respect to their ability to engage in physical activity and work with others?	Survey Interview Reflection journal Anecdotal notes	✓ ✓ ✓	✓ ✓ 	✓	✓	✓ ✓	 ✓ ✓	✓ ✓
3. assist teachers to meet the national curriculum requirements with respect to embedding Indigenous perspectives, cooperative learning and regular physical activity?	Survey Interview Reflection journal Anecdotal notes	✓ ✓ ✓		✓		✓ ✓	 ✓ ✓	✓ ✓

Legend: T=Teachers; S= Students; Pre=Pre intervention; D=During intervention; Post=Post intervention

Trustworthiness

The extent to which this research can be relied on was increased by using a quasi-experimental between groups mixed methods approach, as it allowed for the collection of both quantitative and qualitative data from participants within the intervention program to answer the research questions. Through employing a mixed methods approach within this research and ensuring validity, reliability and generalisability across all processes, the research design and data collection were shown to be trustworthy (Thomas, 2005).

Ethical considerations

One of the fundamental aims of this project is to enhance the cultural awareness of students in schools. To do this, the research follows protocols and demonstrates cultural sensitivity in its entirety. At all times the Traditional Owners of the games were acknowledged. Consent to conduct this research using TIG was sought and given by the local elders at the Community Education Advisory Council (CEAC) meetings conducted at the University of Southern Queensland, Fraser Coast Campus. Through collaboration with Wide Bay Burnett Public Health Unit, the researcher engaged, consulted, sought and received approval through Traditional and Local Elders. Discussion and support for the study was also generated through the Wide Bay Burnett Negotiation Table (Department of Communities Queensland Government, 2006), a process endorsed by Queensland State Cabinet, and acknowledged as 'cultural affirmation' under 'caring for country'. This formed part of the Queensland Government initiative to 'close the gap' for Australian Indigenous People in the areas of health, education and employment (Aboriginal and Torres Strait Islander Services & Department of Communities, 2009).

As the intervention study was conducted within Queensland State and Catholic Schools, and involved the collection of data from participants, ethics approval was sought and granted from three separate entities, namely the University of Southern Queensland (Appendix 17), Brisbane Catholic Education (Appendix 18) and the Queensland Department of Education, Training and Youth Affairs (Appendix 19), to conduct the research within the participating schools. The control schools were offered the intervention at the conclusion of the data collection period if they wanted to also integrate TIG.

Prior to the intervention study, all potential participants in the study received letters of informed consent, written in a plain language statement, where anonymity and confidentiality were assured. All collected data were locked in a secure filing cabinet and electronic data were password protected. Participant information statements were issued prior to the study to principals and teachers and to parents and students (Appendix 20), along with consent forms (Appendix 21), to address the two groups of participants within the study; students and teachers.

School information sessions were held in each intervention school, so that all teachers had the opportunity to ask questions or raise any concerns regarding the intervention study. At the conclusion of the study, following the analysis of data, the findings of the study were disseminated to the participating schools. Any

photographs of the participants were only taken and used if talent release forms were signed prior to the intervention study (Appendix 22).

4.11 In Summary

This Chapter has provided an overview of the methods used within the study. It has outlined the research paradigm for the study along with the research design, context and participants for the study. This was followed by a detailed plan for the conduct of the study along with a summary of the instruments used for data collection. The construction of the instruments used in the collection of data was described. The scale development and parametric analysis of the psychometric properties of the instruments used within the study were detailed. Leading on from this, was an outline of the methods employed to analyse both the quantitative and qualitative data sets. The alignment of the choice of methodology with the research questions was demonstrated, and accompanied by descriptions of the ethical considerations employed for this study, to complete the Methodology Chapter.

The following chapter provides the results for each research question.

5. Data Analysis: Results

5.01 Overview

This chapter will begin with the demographic data related to the specifics of the participant groups involved in the study. For clarity and ease of reference, the results will be presented for each of the three research questions separately. The research questions all relate to an Intervention by Time repeated measures methodology, where differences between control and intervention groups were measured both quantitatively and qualitatively.

5.02 Demographic Data

Student Participants

The student participants involved in this study were in Year 5 across seven participating schools. There were approximately 534 students (44% male), with a mean age of 9.9 years. All seven schools are co-educational regional schools in the Fraser Coast district, which has been identified by the Australian Bureau of Statistics (Australian Bureau of Statistics, 2007) as a low socio-economic area due to the high levels of unemployment in the region. As stated previously, the population of the Fraser Coast region is made up of approximately 3.6% of Indigenous peoples, which is above the national average of 2.5% (Australian Bureau of Statistics, 2011).

Each class within the study contained a heterogeneous mixture of student academic ability levels which facilitated an even spread of aptitude and behaviours among class groups. Any students whose data was incomplete were extracted from the data set. This procedure then permitted a direct comparison across time for each of the groups. The demographic data from the final complete data set is displayed in Table 5.01.

Table 5.01. Demographics of Student Participants by Schools

School	Participants		Gender				Research group
	No.	%	Male		Female		
			No.	%	No.	%	
1	46	16.2	22	48	24	52	T
2	39	13.7	13	33	26	67	T
3	44	15.5	17	39	27	61	T
4	48	16.9	21	44	27	56	T
5	58	20.4	33	57	25	43	T
6	24	8.5	10	42	14	58	C
7	25	8.8	9	36	16	64	C
Total	**284**	**100**	**125**	**44**	**159**	**56**	

T= Trial group
C= Control group

Teacher Participants

The teacher participants involved in this study at the pre-intervention phase consisted of 20 Year 5 teachers across seven participating schools. The 20 teachers at pre-intervention comprised 9 from trial schools and 11 from control schools. The demographic data collected from the teacher surveys indicate the majority of teachers in the study were female (70%). Approximately 70% of teacher participants were over 40 years of age, and over half had taught for more than 15 years (55%). Post-intervention there were seven Year 5 teachers across five trial schools, of whom 57% were female, who completed the surveys. Two teachers from the trial schools, who completed the pre-intervention survey, left their respective schools prior to the conclusion of the intervention, hence only seven as opposed to nine teachers responded post intervention. The 11 teachers from control schools were asked to complete the post intervention survey, but due to other events taking place within these schools at the time, it transpired that they did not complete the final survey. The pre-intervention teacher survey data showed both trial and control groups were the same on all dimensions, hence the discussion will focus on changes over time for the trial group. Table 5.02 displays the demographic data collected from teacher participants through the survey.

Table 5.02. Demographic Characteristics of Teacher Participants (N=20)

	Pre intervention (*n*=20)		**Post intervention (*n*=7)**	
Characteristics	***n***	**%**	***n***	**%**
Gender				
Male	6	30	3	43
Female	14	70	4	57
Age range				
< 30 years old	1	5	0	0
30-39 years old	5	25	1	14
40-49 years old	8	40	2	29
50-59 years old	6	30	4	57
Number of years teaching experience				
< 5 years				
5-9 years	4	20	1	14
10-14 years	4	20	1	14
15-19 years	5	25	5	72
	7	35	0	0

5.03 The Quantitative Data Analysis Process

The quantitative data were analysed using the computer program SPSS Version 19. Data collected from the student surveys were analysed using an Intervention by Time repeated measures multivariate analyses of variance (MANOVA) to investigate the quantitative research questions. This was followed if the overall MANOVA was significant ($p < .05$), by a univariate analyses of variance (F-tests) for each

significant dependent variable. In order to take experiment wise error rate into account, probability was set at .05 for all post hoc comparisons of significant univariate analyses. Dependent *t*-tests were computed for the within group pairwise comparisons to indicate where and how the differences between groups were significant.

Quantitative data from the student reflective journals were analysed using paired samples *t-tests* (where $p = .05$ for a two-tailed test) on the difference between scores at Time 1 and time 2. The Eta squared value was used to indicate the magnitude of any significant differences that were found.

Teacher survey data were analysed using descriptive statistics, which allowed for a description of their existing learning environment, along with comparisons between Time 1 and Time 2 of the trial group to determine if, and in what way, the TIG intervention had affected teachers and their learning environment.

5.04 The Qualitative Data Analysis Process

Instruments used in the collection of data from the teachers in the form of interviews and anecdotal notes were designed to allow teachers to describe and interpret the TIG intervention as they perceived it. The collection and analysis of this subjective teacher data followed a Phenomenological approach, since the essence of the TIG intervention was examined through the eyes of the teachers (Ary, Jacobs, & Sorenson, 2010). The instruments explored the TIG experience and the contexts which affected those experiences and teacher responses were transcribed into the *nVivo 10* software package for qualitative research. Phenomenological analysis was conducted by examining significant statements and developing clusters of meaning and themes, termed nodes, in *nVivo* (Ary et al, 2010; Bazeley, 2011).

The themes followed five broad topics which were represented as: physical activity; Indigenous perspectives; cooperation; self-efficacy; and future plans. Since the TIG intervention targeted physical activity, Indigenous perspectives, cooperation and self-efficacy, when comments pertaining to these dimensions were made, the researcher, for the purposes of consistency and clarity, chose to name the themes (or nodes) in line with the dimensions under investigation within the study. It is interesting to note the development of a fifth theme which the researcher termed "future plans". Comments assigned to this theme related to plans made by the teacher for the continuation and expansions of TIG within their school, beyond the intervention period.

Word frequency queries were conducted for each node to identify the most common words used within the node, and were represented in the form of a tag cloud. The use of numeric counts within each theme gave a sense of the importance of the words as they pertained to the theme (Onwuegbuzie & Teddlie, 2003), while the tag clouds provided a visual representation of these word frequencies within each theme.

The remainder of this chapter will now present the results of the study for each of the research questions in turn.

5.05 Research Question 1:

How does playing TIG at school enhance students' motivation towards, and involvement in, physical activity and their cooperation with other students?

In order to answer this research question, three quantitative measurement instruments were used; Student Reflective Journals; Student Surveys; and Teacher Surveys, along with the qualitative data obtained from teachers through the semi-structured interviews and anecdotal notes. The student reflective journals and surveys were a self-reporting measurement, and these were used with the teacher surveys and anecdotal notes. It was anticipated that using these instruments together would provide sufficient data from the two different participant groups to answer the first research question.

Student Reflective Journal

Paired samples *t-tests* were conducted on each of the four items in the reflective journal to compare the means of the TIG intervention group across time, which related to research question one.

Student Participation
For item one, regarding student's participation level, there was a statistically significant increase in the amount of student participation in physical activity in the games, from Time 1 (M=3.69, SD=.65) to Time 2 (M=3.89, SD=.37), t (185) = 3.76, p =.0005 (two-tailed). The mean increase in student participation was .20 with a 95% confidence interval ranging from-.30 to -.09. The eta squared statistic (.07) indicated a moderate effect size. Student participation had increased by a moderate, statistically significant amount, at the end of the intervention program. Table 5.03 demonstrates the results of the paired samples *t*-test for student participation.

Student Enjoyment
Student enjoyment was the key element for item two, and the paired samples *t-tests* revealed there was a statistically significant increase in the amount of student enjoyment from Time 1 (M=3.16, SD=.97) to Time 2 (M=3.70, SD=.65), t (185) = 7.02, p =.0005 (two-tailed). The mean increase in student enjoyment was .54 with a 95% confidence interval ranging from-.70 to -.39. The eta squared statistic (.11) indicated a large effect size, hence it can be said that item two measured a large, statistically significant difference, in student enjoyment at the end of the intervention program (See Table 5.03).

Student Perceptions of Ability
Item three on the student reflective journal measured students perceptions of their abilities whilst playing TIG, and the results of the *t-tests* showed a statistically significant increase in student's perceptions of their abilities from Time 1 (M=2.96, SD=.99) to Time 2 (M=3.46, SD=.70), t (185) = 6.87, p =.0005 (two-tailed). The

mean increase in student perception was .50 with a 95% confidence interval ranging from -.64 to -.35. The eta squared statistic (.20) indicated a very large effect size; hence student's perceptions of their own abilities had increased by a very large, statistically significant amount, at the end of the intervention program (See Table 5.03).

Student Cooperation

The fourth item in the student reflective journal measured how much students felt they cooperated with their classmates whilst playing the games. Results demonstrated a significant increase in student cooperation between Time 1 (M=3.12, SD=.96) to Time 2 (M=3.41, SD=.83), t (185) = 4.61, p =.0005 (two-tailed). The mean increase in students reported cooperation was .29 with a 95% confidence interval ranging from-.41 to -.17. The eta squared statistic (.05) indicated a moderate effect size. Hence, the fourth item has shown student's perception of their cooperation increased by a moderate, statistically significant amount, at the end of the intervention program (See Table 5.03).

Table 5.03. Paired Samples T-Test for Student Reflective Journals

	Paired Differences					t	df	Sig. (2-tailed)	Eta squared value: $t^2/t^2 + (N-1)$
	Mean diff	Std. Devn	Std. Err. Mean	95% Confidence Interval of the Difference					
				Lower	Upper				
Participation level	-.19*	.70	.05	-.36	-.09	-3.76	185	.000	.07
Enjoyment level	-.54*	1.06	.08	-.70	-.39	-7.02	185	.000	.11
Perception of abilities	-.46*	.98	.07	-.64	-.35	-6.87	185	.000	.20
Cooperation level	-.29*	.86	.06	-.41	-.17	-4.61	185	.000	.05

NB * significant *at p<.05*

Teacher Surveys

Attitude to Physical Activity

Teachers' perceptions of the students within their class, which were obtained from data collected pre and post intervention from the intervention schools, were compared using descriptive statistics. When teachers were asked for their perceptions of their students' enjoyment of physical activity sessions their responses prior to the intervention were that 86% of students "liked" or "loved" the sessions. Post intervention, teachers commented that 100% of their students liked or loved the physical activity sessions. Table 5.04 demonstrates teachers' perceptions of their students' enjoyment of physical activity class sessions.

Attitude to Cooperation

When teachers in the treatment schools were asked for their perceptions of their students' enjoyment of cooperative learning sessions their responses prior to the intervention were that 86% of students liked or loved cooperative activity. Post intervention, teachers commented that 86% of their students liked or loved cooperative learning sessions. Table 5.04 demonstrates teachers' perceptions of their students' enjoyment of cooperative learning sessions.

Table 5.04. Teacher Perceptions of Student Enjoyment – Treatment schools

Characteristic	Pre intervention (*n*=7)		Post intervention (*n*=7)	
	n	**%**	***n***	**%**
Physical Activity				
Indifferent	1	14	0	0
Like	4	57	4	57
Love	2	29	3	43
Cooperative Learning				
Indifferent	1	14	1	14
Like	5	72	5	72
Love	1	14	1	14

Teacher Qualitative Data

Qualitative data collected through interviews and anecdotal notes identified two of the themes (nodes) as: physical activity, and cooperation and teamwork.
A word frequency was conducted on the qualitative data coded to the physical activity node where the most common words used to describe the impact of TIG on physical activity were as follows: "increased" and "students", followed by "involved", "fun" and "games". Other words arose which also described the positive impact teachers felt TIG had on the physical activity of their students, but were used to a lesser extent. Explicit statements made by teachers during the interviews bore further testimony to the positive impact TIG had on students physical activity, for example: "TIG undoubtedly increased physical activity and students were more actively involved in playing the games" (Teacher 1, School 1, Appendix 16); "TIG increased the amount of physical activity and more students participated, especially the non-sporty kids" (Teacher 2, School 1, Appendix 16); "TIG increased physical activity and the games went on for much longer than expected because kids were enjoying them" (Teacher 7, School 4, Appendix 16); and, "TIG has made physical activity more enjoyable for all students" (Teacher 9, School 5, Appendix 16). Further transcripts from the teacher interviews can be found in Appendix 16.

The results of the word frequency query for the physical activity node are presented in the form of a tag cloud (See Figure 5.1).

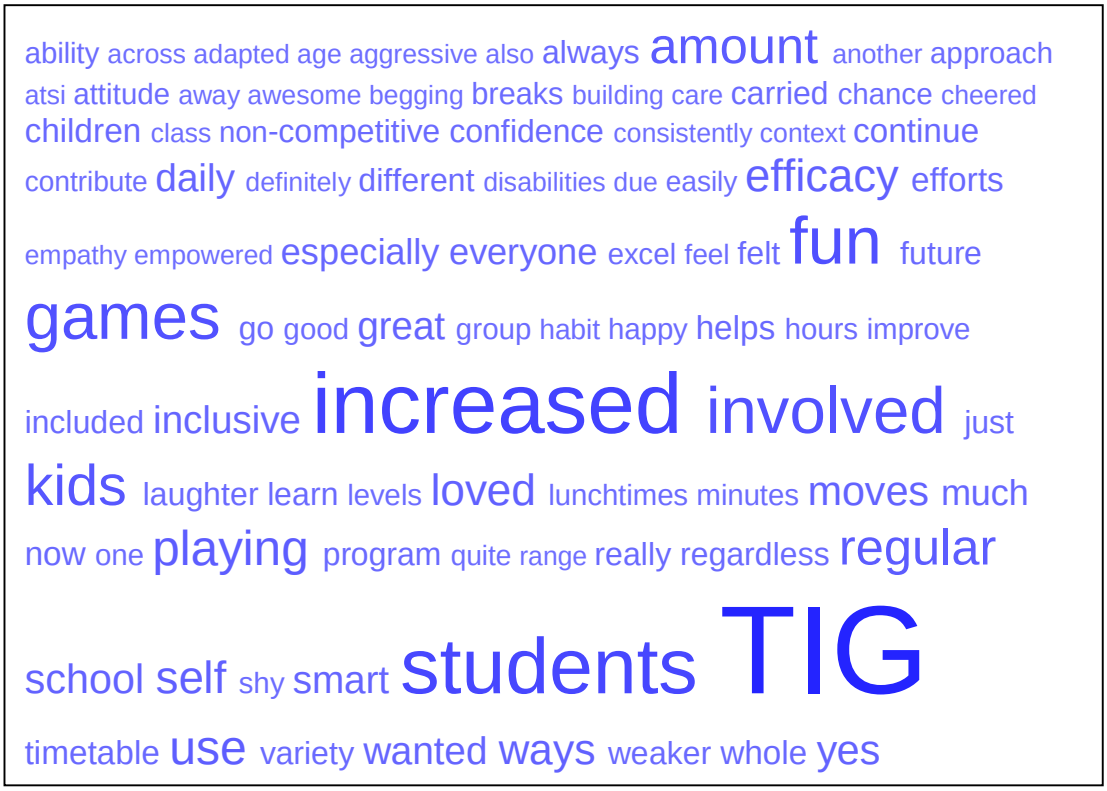

Figure 5.1. Tag Cloud of Teachers' Perceptions of the Impact of TIG on Physical Activity

A similar word frequency analysis was conducted on the cooperation and teamwork node, where positive words like, "learning", "helped", "increased", "one another", "empathy", and "relationships" occurred most often. Other words also added to describe the positive impact teachers felt the TIG intervention program had on students' cooperation. Specific in context comments teachers made which reflect this analysis can be seen in the following quotes: "Students enthusiasm for the games helped the class feel connected and nurtured team work" (Teacher 3, School 2, Appendix 16); "The positive interactions developed a great sense of community" (Teacher 4, School 2, Appendix 16); "Really helped students to develop empathy for one another" (Teacher 5, School 3, Appendix 16); and, "TIG helped to increase their empathy and cooperation with one another" (Teacher 10, School 5, Appendix 16). For further transcripts from teacher interviews see Appendix 16.

The results of the word frequency query for the cooperation node are displayed in the form of a tag cloud for the cooperation node (See Figure 5.2).

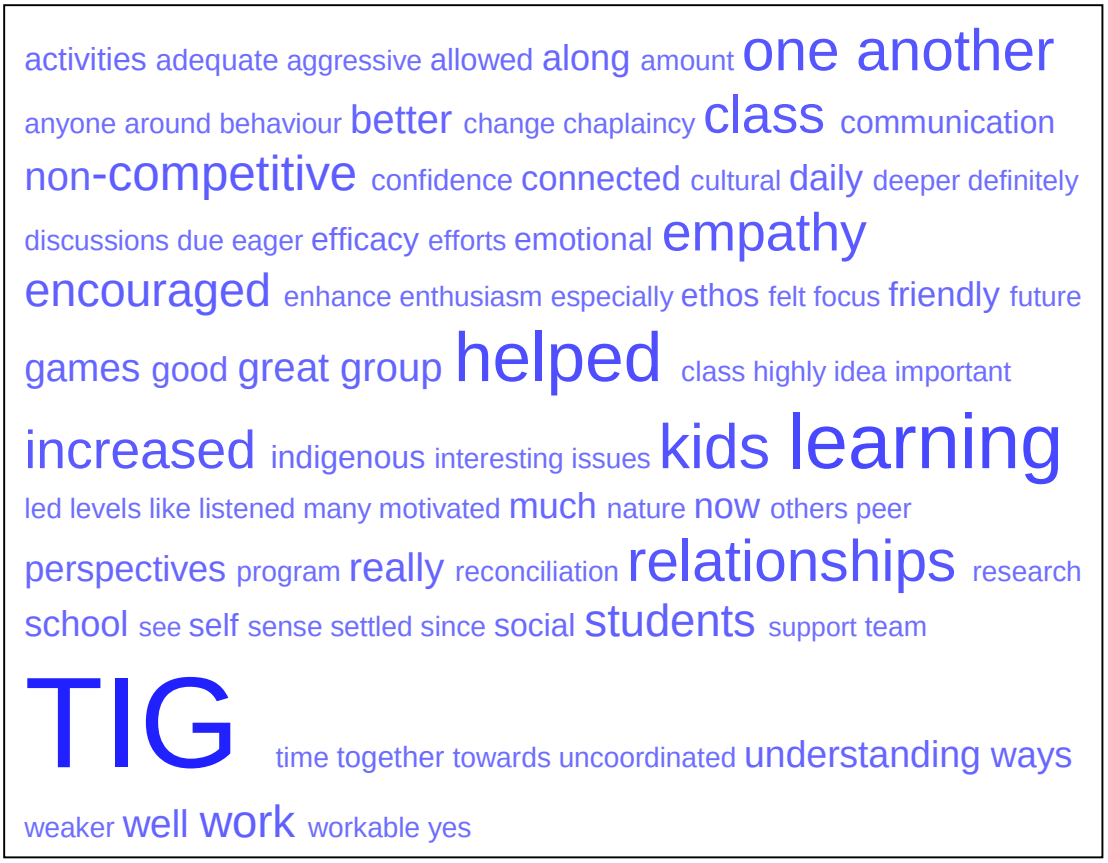

Figure 5.2. Tag Cloud of Teachers' Perceptions of the Impact of TIG on Cooperation

Student Surveys

Response categories from the student survey data were analysed using a MANOVA to compare the means of the trial and control groups across time. The response categories which related specifically to research question 1 were: "Occurrence" of physical activity; "Attitudes" towards physical activity and cooperation; and "Behaviours"; and are addressed separately to aid clarity of results.

The multivariate result was significant for the group by time analysis, for the variable "Occurrence" of physical activity, Pillai's = .000, F = 8.353, df = (3, 200), p <.001, which indicated a multivariate interaction effect. The univariate F-tests (ANOVA) showed there was a significant difference for all three factors; physical activity during breaks, F = 5.276, df = (1, 202), p=*.023*; physical activity outside of school, F = 19.497, df = (1, 202), p<*.001*; and physical activity during school, F = 9.071, df = (1, 202), p=*.003;* from Time 1 to Time 2.

Scheffe post hoc comparisons revealed significant pairwise differences between control and trial groups for all three dependent variables (p<.05). The trial group scored higher than the control group, for participating in physical activity; during breaks; outside school; and, during school, at the end of the intervention program. Table 5.05 displays the mean differences, significance and confidence interval for the trial and control groups for the "Occurrence" of physical activity response category, between Time 1 and Time 2.

Table 5.05. Pairwise Comparison of Trial and Control Groups over Time for Variable "Occurrence of Physical Activity"

Dependent Variable	(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
						Lower Bound	Upper Bound
Physical Activity During breaks	Trial	Control	.27*	.12	.023	.04	.50
Physical Activity Outside school	Trial	Control	.36*	.08	.000	.20	.51
Physical Activity During school	Trial	Control	.23*	.08	.003	.08	.38

Based on estimated marginal means
*. The mean difference is significant
b. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

Similarly, a MANOVA was used to explore differences across time and between groups for the student response category "Attitudes". The multivariate result was not significant for the group by time analysis, indicating that there was no difference between the trial and control groups over time. Further analysis of the data also indicated that there were no significant differences across any of the three variables: class happiness; group activity; and physical activity.

The student response category "Behaviours" in class time, were analysed using a paired samples *t*-test, to compare the two items: physical activity and playing together, at pre and post intervention. When assessing how often students did physical activity during class time, the paired samples *t*-test revealed no significant difference over time. Similarly, when assessing how often students played with each other at school, no significant difference over time was found between the two groups.

5.06 Research Question 2:

How does playing TIG at school enhance students' self-efficacy with respect to their ability to engage in physical activity and work with others?

Several instruments, both quantitative and qualitative, were used to answer this research question. The self-reporting Student Reflective Journals and the Student Surveys provided quantitative measurements, whilst the qualitative data collected from teachers would allow their perspective to be considered also, in order to answer this research question.

Student Reflective Journals

Paired sample *t*-tests were conducted on items within the student reflective journals. Specifically, three items related to this research question, two of which involved students' perceptions of their ability in terms of physical activity and cooperation, whilst the third involved how the students felt about themselves after participating in the games.

As reported previously in the Section for Research Question 1, the item relating to students' perceptions of their ability to play the games, increased statistically at the end of the intervention program with a very large effect size (See Table 5.03). Similarly, as previously reported in Research Question 1 Results, the item involving students' perceptions of their cooperation, had increased by a moderate, statistically significant amount at the end of the intervention program (See Table 5.03).

The third item related to self-efficacy reported a statistically significant increase in how students felt about themselves, from Time 1 (M=2.86, SD=.413) to Time 2 (M=2.96, SD=.28), t (116) = 2.45, p =.0005 (two-tailed). The mean increase in student self-efficacy was .10 with a 95% confidence interval ranging from -.17 to -.02. The eta squared statistic (.01) indicated a small effect size; hence student self-efficacy had increased by a small, statistically significant amount, at the end of the intervention program. Table 5.06 demonstrates the results of the paired samples *t*-test.

Table 5.06. Paired Samples *t*-Test for Self Efficacy in Student Reflective Journals

	Paired Differences					t	df	Sig. (2-tailed)	Eta squared value: $t^2/t^2 + (N-1)$
	Mean diff	Std. Dev	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper				
Perceived Self-efficacy	-.09*	.42	.04	-.17	-.02	-2.45	116	.016	.01

NB * significant *at p<.05*

Teacher Qualitative Data

Data coded to the "self-efficacy" node in *nVivo*, from the teacher interviews and teacher anecdotal notes were analysed using a word frequency query to identify common words associated with student self-efficacy, as perceived by the teachers. The most common words to arise were: "TIG", "involved", "students", "kids", "games", "increased", "activity", "Indigenous", "self-efficacy", "fun" and "enjoyable". Other words also add to the optimistic flavour of the perceptions of teachers with respect to the impact of TIG on student self-efficacy. The results can be found in the form of a tag cloud (See Figure 5.3). Furthermore, the following direct quotes from the teachers regarding the impact they felt TIG had on students' self-efficacy also adds value to the data collected: "Shy kids who have never been interested in physical activity now take part and communicate with others in the

class" (Teacher 3, School 2, Appendix 16); "TIG increased confidence especially in the uncoordinated kids who would not have participated in other games" (Teacher 4, School 2, Appendix 16); "The ATSI students who were normally quite withdrawn really got involved in TIG and this carried over into their class work" (Teacher 9, School 5, Appendix 16); and, "The non-competitive philosophy stopped weaker kids from shying away from TIG. They were more willing to participate and have a go; they wanted to do it, not because they had to do it" (Teacher 10, School 5, Appendix 16). A complete transcript of quotes from the interviews can be found in Appendix 16.

Figure 5.3. Tag Cloud Analysis of Teachers' Perceptions of the Impact of TIG on Students' Self-Efficacy

Student Surveys

Two response categories, perceptions and attitudes, within the survey instrument, measured how students perceived their abilities regarding physical activity and working with others, and, how they felt about physical activity and working with others. A univariate analysis was conducted on the data from the response category "Perceptions", and no significant difference over time in the perceptions of the trial group, were found. A MANOVA was performed on the data from the response category "Attitudes", for the three factors: class happiness, group activity, and physical activity. However, no significant differences over time in the attitudes of the trial group, across any of these three variables, were identified.

5.07 Research Question 3:

How does playing TIG at school assist teachers to meet the national curriculum requirements with respect to embedding Indigenous perspectives, cooperative learning and regular physical activity?

The answers to this question were gathered through the quantitative data from the teacher surveys and the qualitative data collected from the semi-structured interviews and the anecdotal notes. This question related to the impact TIG had on teachers' facilitation of three distinct curriculum areas: embedding Indigenous perspectives, cooperative learning, and regular physical activity. Therefore, to aid clarity, the results relating to each distinct area will be discussed separately.

Embedding Indigenous Perspectives

Quantitative Data

Survey data prior to the intervention indicated all teachers from the trial schools acknowledged a lack of knowledge and understanding as the most common obstacle to embedding Indigenous perspectives in their classrooms. Post intervention, only 57% of teachers felt their lack of knowledge was an obstacle to embedding Indigenous perspectives within their classroom. Other factors were identified as obstacles: not wanting to cause offence, ignorance and prejudice of others, and lack of resources, which all decreased quite markedly in post-trial surveys, except for 'not wanting to cause offence' which remained relatively constant at the post trial interviews. The results are demonstrated in Table 5.07 below.

Table 5.07. Obstacles to Embedding Indigenous Perspectives

	Pre intervention		Post intervention	
Obstacles	***n* = 7**	**%**	***n* = 7**	**%**
Lack of knowledge and understanding	7	100	4	57
Not wanting to cause offence	4	57	4	57
Ignorance and prejudice of others	3	43	1	14
Lack of resources	1	14	0	0

When teachers were asked to identify how much time was spent each day embedding Indigenous perspectives, prior to the intervention, 29% of respondents spent more than 10 minutes each day incorporating Indigenous perspectives in their learning experiences. At the end of the intervention, approximately 57% of teachers spent more than 10 minutes each day on providing Indigenous perspectives in their learning experiences. Table 5.08 presents the results for time spent each day embedding Indigenous perspectives in their learning experiences.

When teachers were asked for their perceptions of their students' enjoyment in learning about Indigenous perspectives, their responses prior to the intervention were that 71% of students liked or loved the sessions. Post intervention, teachers commented that 100% of their students liked or loved learning about Indigenous perspectives. Table 5.08 demonstrates teachers' perceptions of their students' enjoyment learning about Indigenous perspectives.

When teachers were asked if they enjoyed embedding Indigenous perspectives into their learning programs, their responses prior to the interventions were that 71% liked or loved embedding Indigenous perspectives into their learning programs. Post intervention, 86% of teachers liked or loved embedding Indigenous perspectives into their learning programs. Table 5.08 demonstrates teachers' enjoyment of embedding Indigenous perspectives into their learning programs.

When teachers were asked how confident they felt embedding Indigenous perspectives into their daily programs with their students, their responses prior to the interventions were that 71% were ok, confident or very confident embedding Indigenous perspectives into their learning programs. Post intervention, 86% of teachers felt they were ok; confident; or very confident embedding Indigenous perspectives into their learning programs. Table 5.08 demonstrates teachers' confidence embedding Indigenous perspectives into their learning programs.

Table 5.08. Teachers' Responses to Embedding Indigenous Perspectives – Treatment schools

Characteristic	Pre intervention (*n*=7)		Post intervention (*n*=7)	
	n	**%**	***n***	**%**
Time				
0-10 mins	5	71	3	42
11-20 mins	2	29	3	42
21-30 mins	0	0	1	16
31-45 mins	0	0	0	0
46-60 mins	0	0	0	0
Perception of student enjoyment				
Indifferent	2	29	0	0
Like	4	57	6	86
Love	1	14	1	14
Teacher enjoyment				
Dislike	0	0	0	0
Indifferent	2	29	1	14
Like	4	57	5	72
Love	1	14	1	14
Teacher Confidence				
Not confident	0	0	0	0
A little hesitant	2	29	1	14
OK	4	57	3	43
Confident	1	14	2	29
Very confident	0	0	1	14

Qualitative Data

Data from the interviews and the anecdotal notes which were coded into the node "Indigenous Perspectives" revealed the most common words were "TIG", "games", "good", "increased", "understanding", "helped", "students", "address", "culture" and "knowledge". Other less common words arose to give an overall sense of positive teacher descriptions and perceptions relating to TIG and embedding Indigenous perspectives. These results are displayed in a tag cloud (See Figure 5.4).

In addition to the tag cloud the following direct quotes from the teacher interviews provided further elaborations as to the impact teachers' felt TIG had on embedding Indigenous perspectives in their classrooms: "TIG provided the opportunity for students to engage with culture" (Teacher 4, School 2, Appendix 16); "Increased their understanding of how and why Indigenous culture is important to everyone" (Teacher 5, School 3, Appendix 16); "TIG PD made me feel more confident and empowered me to embed Indigenous perspectives more readily" (Teacher 6, School

4, Appendix 16); and, "Not as much stigma attached to the games and students felt they could talk about it more openly, rather than the serious issues kids of this age find difficult to grasp" (Teacher 8, School 4, Appendix 16). For further quotes from the teacher interviews, see Appendix 16.

Figure 5.4. Tag Cloud of Teachers' Perceptions of the Impact of TIG on Embedding Indigenous Perspectives

Cooperative Learning

Quantitative Data

When teachers were asked during the interviews to identify obstacles they faced implementing cooperative learning, prior to the intervention, most cited difficulties organising and managing the learning experience, followed by student competitiveness, lack of resources, lack of time, and a lack of professional development opportunities advocating cooperative learning. Post intervention, none cited student competitiveness as an obstacle to implementing cooperative learning in their classrooms. The results are demonstrated in Table 5.09 below.

Table 5.09. Obstacles to Developing Cooperation and Teamwork

	Pre intervention		Post intervention	
Obstacles	***n* = 7**	**%**	***n* = 7**	**%**
Organising and managing the learning experience	7	100	7	100
Student competitiveness	4	57	0	0
Resources	3	43	1	14
Time	3	43	3	43
Limited professional development	3	43	3	43

Data collected from teacher surveys pre and post intervention did not demonstrate any noticeable change to each of the following categories: time spent on cooperative learning tasks; teacher enjoyment conducting cooperative learning tasks; teacher knowledge of cooperative learning strategies; and teacher confidence facilitating cooperative learning.

Qualitative Data

The word frequency analysis of the "Cooperation" node demonstrated teachers used common, constructive words like "helped one another", "increased relationships" and "empathy" to describe their perceptions of the impact of TIG on their students' cooperation (See Results, Research Question 1, Figure 5.2). Specific comments like: "The games were fun and promoted respectful behaviour and encourage students to cooperate" (Teacher 1, School 1, Appendix 16); "The games were so inclusive that students enjoyed playing the games and encouraged them to help their peers" (Teacher 2, School 1, Appendix 16); and, "TIG really helped to enhance students communication skills" (Teacher 9, School 5, Appendix 16); reflect the benefits teachers felt TIG bought to their classroom.

Physical Activity

Quantitative Data

Finding the time to conduct class physical activity was the most common barrier to providing regular physical activity for students that teachers from the trial group experienced in both pre and post intervention phases. At pre intervention, curriculum, knowledge and equipment were also common obstacles to implementing regular physical activity with their class. At post intervention, these factors were no longer considered to be obstacles to facilitating regular physical activity with their students. These results are demonstrated in Table 5.10 below.

Table 5.10. Obstacles to Regular Daily Physical Activity

	Pre intervention		Post Intervention	
Obstacles	***n* = 7**	**%**	***n* = 7**	**%**
Time	7	100	7	100
Curriculum	5	71	4	57
Knowledge	5	71	2	28
Equipment	4	57	0	0
Negative attitudes	1	14	0	0
Disruption/ noise	1	14	0	0
Weather	1	14	1	14

A comparison of results from the teacher surveys of control and trial groups at the pre-intervention phase, revealed 76% of respondents in the control group, compared to only 29% of respondents in the trial group, spent 20 minutes or more on physical activity. It can be said that teachers from the trial groups spent less class time on physical activity than their colleagues in the control groups prior to the intervention. When considering teacher enjoyment, 85% of respondents in the control group liked or loved promoting physical activity with their students, while only 58% of teachers in the trial group reported this same level of enjoyment. Further to this, 63% of teachers from the control group, compared to only 14% of teachers from the trial group, reported having quite a bit to a great deal of knowledge about physical activity prior to the intervention. Teacher confidence also demonstrated approximately 85% of teachers from the control group were confident or very confident in teaching physical activity to their students, as opposed to only 14% of teachers from the trial schools reported these levels of confidence. It can be said that prior to the intervention, teachers from the trial group spent less time on physical activity, derived less enjoyment from physical activity, possessed less knowledge of physical activity and had less confidence in teaching physical activity than teachers in the control group. Table 5.11 demonstrates these results.

When examining the results of the teacher surveys of the trial group at pre and post-intervention there appears to have been no change in the time spent on physical activity during class time. However, teacher enjoyment for the trial group who liked or loved promoting physical activity to students at pre-intervention was recorded at 58% which soared to 100% post-intervention. The percentage of teachers who had reported having quite a bit to a great deal of knowledge of physical activity, rose markedly from 14% pre-intervention, to 57% post-intervention. Furthermore, 14%

of trial teachers reported being confident to very confident teaching physical activity pre-intervention, which rocketed to 71% post-intervention. In summary, although trial teachers spent a similar amount of class time on physical activity at pre and post intervention, there were marked increases in their levels of enjoyment, knowledge and confidence relating to promoting and teaching physical activity with their students. Table 5.11 demonstrates these results.

A comparison of the results of the post-intervention trial and control groups is not possible, since there was no post-intervention data from the control groups. Repeated attempts were made with the control groups to return the surveys, but due to numerous other events and constraints within the control schools, the surveys were not returned. The lack of data available from teachers within the control group at post intervention means there is no data to support a between groups study, but still allows for an across time study for the TIG intervention group. Predominantly this study looks at changes to the intervention groups as a result of their participation in the TIG intervention program, hence the lack of post intervention data from the control group in the teacher survey did not impact on the outcomes of the research.

Table 5.11. Teacher Responses to Physical Activity

Characteristic	Pre intervention (*n*=20)				Post intervention (*n*=7)	
	Control *n* = 13		**Trial *n* = 7**		**Trial *n* = 7**	
	n	**%**	***n***	**%**	***n***	**%**
Time						
0-10 mins	0	0	3	42	3	42
11-20 mins	3	22	2	29	2	29
21-30 mins	8	62	2	29	2	29
31-45 mins	1	7	0	0	0	0
46-60 mins	1	7	0	0	0	0
Teacher enjoyment						
Indifferent	2	15	3	42	0	0
Like	9	70	2	29	5	71
Love	2	15	2	29	2	29
Teacher knowledge of physical activity						
A little	2	15	2	29	0	0
An adequate amount	3	22	4	57	3	43
Quite a bit	3	22	1	14	3	43
A great deal	5	41	0	0	1	14
Confidence in teaching physical activity						
Not confident	0	0	1	14	0	0
A little hesitant	0	0	1	14	0	0
ok	2	15	4	58	2	29
Confident	5	41	1	14	3	43
Very confident	6	44	0	0	2	28

Qualitative Data

The word frequency analysis of the qualitative data relating to the physical activity node demonstrated that teachers were quite positive and confident that the TIG intervention program helped to increase student involvement in physical activity. This is demonstrated in the tag cloud for the physical activity node (See Results, Research Question 1, and Figure 5.1). Specific statements teachers made during the interview, for example "Everyone was involved" (Teacher 6, School 4, Appendix 16); "Students definitely played more often" (Teacher 8, School 4, Appendix 16); and, "Increased the amount of physical activity during school hours" (Teacher 2, School 1, Appendix 16).

Overall

The final node, of the five nodes from the qualitative data coded into *nVivo*, obtained from teachers: "future plans", was also analysed using a word frequency query. This node consisted of comments made by teachers regarding any future plans they had for TIG, post intervention. The most common words which arose were: "increase", "Indigenous perspectives", "physical activity", "sustainability", "year", "students", "continue", "timetabled" and "learning". Other words also arose to describe the enthusiasm which teachers demonstrated to continue to facilitate TIG with their students. The tag cloud is displayed in Figure 5.5.

Direct comments from teachers regarding any plans they had for TIG in their classrooms post-intervention demonstrated their enthusiasm for TIG. For example: "We will use this and develop further resources to integrate TIG into other KLAs and with other year groups" (Teacher 1, School 1, Appendix 16); "We will conduct TIG awareness on pupil free days next year and share it with staff at staff meetings" (Teacher 4, School 2, Appendix 16); "My students are teaching TIG to younger buddies in lower year groups in a timetabled activity session" (Teacher 7, School 4, Appendix 16); and, "There is a school commitment to developing TIG across the school community" (Teacher 10, School 5, Appendix 16).
Teachers' willingness to spend time playing and developing TIG post-intervention further demonstrates the value they placed on TIG and their commitment to continuing to include it in their teaching schedules.

Figure 5.5. Tag Cloud of Teachers' Future Plans for TIG in Their Teaching Programs

5.08 In Summary

The results of this research can now be summarised for each of the research questions.

Research question 1:

How does playing TIG at school enhance students' motivation towards, and involvement in, physical activity and cooperation with other students?

The results of the analysis of the student reflective journals indicated there were statistically significant differences across time for each of the four variables: 1. student participation; 2. student enjoyment; 3. student perceptions of their abilities; and 4. student cooperation. There was a very large effect size for students' perceptions of their abilities, and a large effect size for student enjoyment level. Student participation and cooperation levels had increased by a moderate, statistically significant amount, as demonstrated by the eta squared statistics for these variables.

The descriptive statistics obtained from the teacher surveys have shown that post intervention, all trial teachers reported their students liked or loved the physical activity sessions they provided through TIG. Teachers perceived no change in students' enjoyment of cooperative learning sessions at the conclusion of the intervention program, however, reported TIG helped their students to cooperate more during the physical activity sessions.

Tag clouds were used to represent the word frequency analysis of the qualitative data obtained from teachers and particularly rich data were obtained from the teacher comments. When teachers' perceptions of the impact of TIG on students' physical activity were analysed, the words used most often, described TIG as having had a positive impact on the physical activity participation levels of their students. The cooperation tag cloud similarly inferred that TIG had an encouraging impact on students' ability to cooperate.

The MANOVA conducted on student surveys revealed the trial groups participated in significantly more physical activity than the control groups at the end of the intervention program. The trial groups participated in more physical activity during breaks; outside school; and during school; than the control groups.

Other data collected through the student surveys did not demonstrate any significant differences over time between the trial and control groups for the variables attitudes and behaviours.

Research question 2:

How does playing TIG at school enhance students' self-efficacy with respect to their ability to engage in physical activity and work with others?

An analysis of the student reflective journals revealed statistically significant differences for the variable self-efficacy, but the eta squared statistic for self-efficacy indicated a small effect size. However an analysis of the qualitative data collected from teachers, revealed self-efficacy as a main theme within the results. The word frequency shows common words like "increased", "self-efficacy", "involved",

"confidence" and "developed"; were most often used by teachers in the context of inferring TIG had increased student self-efficacy with respect to physical activity and how much fun students had together.

Furthermore, as stated in Research Question 1 summary, statistically significant differences across time were found for the variables student perception (very large effect size); and cooperation (large effect size), from the analysis of the student reflective journals. Thus student's perceptions of their ability to engage in physical activity were significantly increased. Similarly, students' perceptions of their levels of cooperation demonstrated a statistically significant increase with a large effect size at the conclusion of the intervention.

Quantitative data collected through student surveys and analysed using a MANOVA however, did not reveal any significant differences over time in the two variables: (1) students' perception of ability; or (2) students attitudes; involving either physical activity or cooperation.

Research question3:

How does playing TIG at school assist teachers to meet the national curriculum requirements with respect to embedding Indigenous perspectives, cooperative learning and regular physical activity?

An analysis of qualitative data collected from teachers through interviews and anecdotal notes revealed the emergence of "future plans" as a theme within the data. A word frequency analysis of the "future plans" theme identified common words like "sustainability", "continue", "year", "use" and "future", were used in similar contexts relating to teachers plans for TIG, post intervention.

Indigenous perspectives:

Survey and interview data collected from teachers' pre and post intervention, demonstrated teachers reported spending more time embedding Indigenous perspectives in their teaching practices post-intervention. Teachers' comments also reflected an increase in the amount students enjoyed learning about Indigenous perspectives along with an increase in the teachers' own enjoyment of embedding Indigenous perspectives at the conclusion of the intervention. Qualitative data collected from interviews and anecdotal notes revealed teachers felt TIG had been a positive influence in assisting them to embed Indigenous perspectives into their teaching and learning programs.

Cooperative learning:

Quantitative and qualitative data collected from teachers through surveys and interviews, at both pre and post intervention, demonstrated teachers no longer

identified student competitiveness as an obstacle to implementing cooperative learning in their classrooms. The word frequency analysis of the qualitative data within the "cooperation" node, reflected teachers felt TIG had made a positive impact on their students' cooperation. Other categories relating to time spent on cooperative learning, and teacher enjoyment, knowledge and confidence of cooperative learning tasks, did not demonstrate any noticeable change at the conclusion of the intervention.

Physical activity:
The teacher surveys and interviews conducted at pre and post intervention provided quantitative data which demonstrated teachers no longer perceived the curriculum, their knowledge and use of equipment as barriers to providing daily physical activity for their students. Results indicate post intervention teachers reported an increase in physical activity during class time, along with an increase in teacher enjoyment, knowledge and confidence incorporating daily physical activity in their programs with their students. A word frequency analysis generated from the physical activity node, using the qualitative data collected from teachers reflected teachers were very positive about the contribution TIG made to increasing students' physical activity levels. Teachers reported TIG had helped to increase their level of confidence to increase student engagement in daily physical activity.

5.09 In Synthesis

The data presented in this chapter were analysed over time for the trial groups, and between trial and control groups prior to the intervention. Changes that occurred over time for the trial groups were found for both teachers and students who participated in the intervention. Analysis of the student survey data demonstrated students spent more time during and outside of class being more physically active and playing games at the end of the intervention period. In addition to this, students' perceptions of their own participation, enjoyment, ability, cooperation and self-efficacy also increased over time, through analysis of the student reflective journals.

Analysis of data collected from teachers in the trial groups demonstrated changes over time, as teachers' perceived and reported increases in their students' enjoyment, participation, and cooperation in physical activity as a result of the intervention program. Further changes over time were found for teachers in the trial groups whose enjoyment, knowledge and confidence in both facilitating physical activity and embedding Indigenous perspectives, were enhanced as a result of the intervention program.

These results will be discussed in more detail in the next chapter, with reference to the research questions. A decision will be made as to how the results from this study provide answers to these research questions, and directions for further research are considered.

6. Discussion

6.01 Overview

The major goal of this study was to address and unite a number of key issues and challenges facing educators within Australian schools. The significance of this study was to create a quality intervention program based on Traditional Indigenous Games (TIG) which added value to the teaching and learning environment. The TIG intervention was facilitated by using a holistic strategy which benefited educators and students alike by up-skilling teachers to facilitate the provision of quality learning experiences in physical activity. This was accomplished by providing initial professional development and then offering a continuous base of support and further assistance throughout the trial period, whilst also embedding Indigenous perspectives and encouraging cooperation amongst students.

An assessment of the effectiveness of the program to bring about positive learning outcomes for students, whilst assisting teachers to deliver on key national educational reform targets was undertaken. Both quantitative and qualitative instruments were used to assess the impact of the intervention program and comparisons across time were made for both student and teacher participants in the intervention program. This mixed methods approach was driven by the overriding research question for this study, which was:

> How does regular and prolonged implementation of TIG in the curriculum enhance attitudes to physical activity, student self-efficacy and teacher ability, to implement the national curriculum requirements?

This chapter will discuss the major impact of the six month TIG intervention program on the two participant groups; children and teachers. The results will be discussed in relation to the theoretical framework which evolved as a result of the review of relevant literature pertaining to this study (Figure 2.4, p 51).

6.02 The Impact of TIG on Students

Encouraging Physical Activity and Well-being

The TIG played during the intervention program involved situations where participants' individual skills and physical abilities were challenged, while their success was also dependant on cooperating with one another to achieve success in the games. In this way TIG provided ideal conditions for *social goal motivation* ((Taylor & Wilson, 2005) to become established as a key motivational factor to participation in TIG. Another key motivational ingredient was the task specific nature of TIG, as there were no external standards or norm-based comparisons to be made. The participant's compared their current progress to their own past achievements (Ames, 1992). The non-competitive and cooperative nature of the games allowed participants to be motivated by the desire to master tasks and expand

their performance repertoire; hence motivation was *task oriented* (Nicholls, 1984). Several studies (Duda, 1989; Roberts, Treasure, & Kavussanu, 1997) have demonstrated that task-orientation motivation encourages participation, effort and performance. Since TIG were task orientated, then a *mastery motivational climate* was established (Ames, 1992; Nicholls, 1989) where participants did their best and improvement was emphasised, as opposed to competition, winning and being better than others.

The TIG intervention program was constructed using motives identified in the literature, which capitalised on enhancing participation and creating a climate of cooperation amongst participants. This study found conclusive evidence that students participated more often in physical activity, that their attitudes towards participating in physical activity improved, and that their perceptions of their ability to participate in physical activity increased. These findings support the literature relating to the positive effects a mastery motivational climate has on increasing student participation, effort and performance in physical activity (Ames, 1992; Nicholls, 1989; Biddle, 2001; Treasure, 2001; Morgan & Kingston, 2010; Braithwaite, Spray & Warburton, 2011).

This intervention study provides evidence of a large increase in student enjoyment in physical activity when playing TIG. The significant increase in student enjoyment would explain why students participated more during and out of class time, because they were enjoying playing TIG. This line of thought reflects existing literature regarding motivation, where enjoyment has been identified as a key contributing factor towards an individual's motives to participate in physical activity (Biddle, 2001; Duda, 1992, 1993; Roberts, 2001; Roberts, Treasure & Kavussanu, 1997; Treasure, 2001; Taylor & Wilson, 2005). These motivational theories linking enjoyment as a motive, may explain why children were more physically active during break times and outside school. Students were playing TIG at lunch times because they enjoyed playing them so much during class time they chose to continue to play TIG voluntarily in their break times, and before or after school.

Since students were motivated to play TIG both in and out of class time, for no external rewards, it can be said that students were motivated to participate by intrinsic factors. The intrinsic factors gained from playing TIG were the high levels of enjoyment students' reported experiencing from TIG. Intrinsic motivational factors were identified by Deci and Ryan (1985; 2000) as having a positive influence on participation in physical activity. Taylor and Wilson (2005) further discussed the importance of intrinsic motivators to improve participation and performance in sport and physical activity.

Intrinsic motivation was a vital element in the construction of the TIG intervention program. The games were played so that no winners or losers were created, that the weaker participants stayed in longer, so that they had more time to practice and improve their skills, and that participants were not weighed down by a fear of failure.

The intrinsic rewards gained from playing TIG, along with the cooperative nature of TIG fostered in participants' *intrinsic motivation towards accomplishments* (Deci & Ryan, 1985; 2000). The positive impact the TIG intervention program had on students' levels of participation in, and their attitudes and perceptions towards

physical activity, further aligns with the literature identified in a meta-analysis by Braithwaite, Spray and Warburton (2011), regarding mastery motivation, task orientation and intrinsic motivation and their positive impact on participation, effort and performance in physical activity.

This study provides evidence that students involved in the intervention program were intrinsically motivated to achieve success when playing TIG. Regarding physical activity, for the previously less enthusiastic or skilled student, TIG provided them with the opportunity to receive positive feedback from their peers in situations they found challenging, that is, playing skilful games. Participants' motivation came from a desire for self-improvement and to be part of a community. This provides social goal motivators for students since TIG allowed students to gain approval from their peers and their success to be admired by the group and supports the literature which identified motivation as a function of social goals (Taylor & Wilson, 2005; Cheng & Lam, 2013; King & McInerney, 2012).

The presence of social goals and intrinsic rewards in the TIG intervention program can help to explain students' motivation in terms of self-worth (Harter, 1978: 1998). Taylor and Wilson (2005) also identified the important influence increasing one's self-worth has on motivation to participate in physical activity. Student's self-worth was measured in terms of their perceptions of their physical abilities and revealed a very large statistically significant increase in students' perceptions at the end of the TIG intervention program. It is likely that since students enjoyed playing TIG this resulted in more positive perceptions about their own physical prowess, and encouraged further participation. In addition, the focus on task mastery in the TIG program meant that winners and losers were not created, and this may have increased students self-worth, since they were not always the loser. This study supports the literature surrounding motivational theories with respect to physical activity and the impact on self-efficacy (Biddle, 2001; Deci & Ryan, 1985; Duda, 1993; Roberts, 2001; Roberts, Treasure & Kavussanu, 1997; Schmidt & Lee, 2011; Taylor & Wilson, 2005; Treasure, 2001; Harter, 1978; 1998), by providing compelling evidence to support the reciprocal influence that enjoyment, perception and motivation have on attitude and self-efficacy.

When considering the results of the study, combined with the existing literature on motivation, participation and self-worth, it is feasible to suggest that the positive perceptions students developed from playing TIG in the intervention program affected their self-worth, and therefore increased their motivation to participate. This supports findings from a meta-analysis of studies which examined motives and self-regulating factors influencing physical activity conducted by Teixeira, Carraca, Markland, Silva and Ryan (2012). Further justification is given then, to the positive influence the TIG intervention program had on students' motivation towards and involvement in physical activity. Since students' sense of self-worth was improved through their participation in TIG, it can be said that the TIG intervention program enhanced students' health and well-being, and supports current findings within the literature (Teixeira et al., 2012).

The evidence collected from students who participated in the TIG intervention program is also verified by their teachers' observations. Teachers felt the TIG intervention program helped to increase student involvement in physical activity by

promoting involvement, fun and inclusion and teachers felt that participating in TIG enhanced student self-efficacy and had a positive impact on their health and well-being.

All of these results demonstrate that the TIG intervention program boosted students' levels of participation in regular physical activity; improved their attitudes towards physical activity; and, raised their perceptions of their own ability in physical activity. Since the control group did not experience an increase across time, it could be concluded that the TIG intervention program was a mitigating factor in increasing levels of participation in regular physical activity by maximising enjoyment and inclusion. The control schools experienced a decrease in levels of participation in regular physical activity over the test period. This apparent decrease may support research indicating the decrease in physical activity levels which occurs at approximately 10-12 years of age (Pangrazi & Beighle, 2010). Reasons for the decrease in physical activity in children as age increases, are not the focus of this study, but open up avenues for further investigation in the future.

Enabling Cooperation

Existing research into effective cooperation identifies the importance for team members to enjoy the social interactive processes within the team, and to be reflective about their own personal practices which contributed to the effective functioning of the team (Friend & Cook, 2010; Idol, Paolucci-Whitcomb & Nevin, 1995; Pugach & Johnson, 1995). Cook and Friend (2010) recognised a number of components which were crucial to the development of effective cooperative teams that apply to all team members, and are as follows: 1) voluntary engagement; 2) equal power and value; 3) common goals; 4) shared responsibility and decision making; 5) shared resources and information; and 6) equal accountability for outcomes. These components were supported by Kasser and Lytle (2013) and arose from earlier research into facilitating effective team practices and cooperative processes (Bradley, 1994; Brehm & Kassin, 1996; Edmonson & Thompson, 2001; Pugach & Johnson, 1995).

When examining the dynamics that existed within TIG the six crucial components outlined by Friend and Cook (2010) were evident. Participants were encouraged to play, not forced, and all players had the same value and power within the game. There were no set 'positions' to which different values were attributed within the games, and all team members had to work together in order to experience success in the games. There were no officials to referee the games, and since there were only a small number of rules, participants shared the responsibility of monitoring the rules of the game. These ideals demonstrated the components identified by Friend and Cook (2010) that existed within TIG, namely, a sharing of responsibility, decision making, resources, information and accountability.

The ethos of TIG promotes the values of cooperation, inclusion, empathy, fun, versatility and adaptability, which therefore, according to Orlick (2006), distinguishes TIG as an example of cooperative games. For these reasons, several instruments were used to measure any changes in the level of cooperation exhibited by students over the TIG intervention period. The results from the student reflective journals suggested students were more cooperative when playing TIG during their

lessons at the end of the intervention program, than at the start of the program. This is supported by the qualitative data from the teacher interviews, whereby teachers felt the TIG intervention program enhanced students' cooperation with one another during physical activity sessions. These results combined demonstrate that playing TIG at school enhanced students' cooperation with other students during physical activity sessions.

When examining how the TIG intervention program influenced student cooperation in academic work within the classroom, the results from the student surveys showed no significant difference across time in students' attitudes towards; and, perceptions of, group work. This may be explained in that most students liked playing and working with each other and wanted to do more of this at the pre-test phase, which left little room for improvement at the post-test phase. The results from the teacher surveys similarly supported these findings, where students' enjoyment levels with respect to group activities was high to begin with and did not change over the course of the intervention program. These results are probably best explained by considering the age of the students and their stage of development. Students desire to work with their peers remained consistently high at pre and post intervention phases. Children of this age want to communicate with their peers, and engage with them in a variety of activities to enhance their social skills (Rubin, Bukowski & Parker, 2006). Therefore, it comes as no surprise when students report their continued need to play and work with their peers. Further reasons for the lack of definitive results for this variable are elaborated on in the limitations section of the conclusions chapter.

In summary, the results of this study provide conclusive evidence to support the claim that playing TIG at school did enhance students' motivation towards, and involvement in, physical activity and their collaboration and cooperation with other students.

Enhancing Self-efficacy

Self-efficacy was defined in the seminal work of Bandura (1977) as an individual's belief that they possessed the necessary skills to produce a desired outcome. It follows, if a person feels they have the skills to succeed, then, it is likely they will choose to participate in the activity. Bandura (1997) also found the greater a person's self-efficacy, the more success they experienced. These events were all interrelated and built on each other where success added to participation, which added to self-efficacy, which added to further success. It can be said that a positive cyclical relationship between participation, success, confidence and self-efficacy generated further self-belief. Several studies (Tutko & Tosi, 1976; Vealey, 1986, 2001; Zinsser, Bunker, & Williams, 2001; Taylor & Wilson, 2005; Stankov, Lee, Luo & Hogan, 2012) have provided evidence that close links exist between self-efficacy and confidence.

The TIG intervention program was planned to increase the confidence of children when playing the games by providing them with the opportunity to experience success in a cooperative, non-threatening environment. The TIG intervention program focused on task orientated goals where success was based on mastery of

tasks. Research into confidence-building experiences (Bandura, 1997; Cook, 1992; Vealey, 2001) has found mastery, demonstration of ability, physical self-presentation, social support, feeling comfortable in the environment and being in a favourable situation, as factors which act to build confidence.

The TIG intervention program found statistically significant increases across time in students' perceptions of their own physical ability and cooperation with others, along with an increase in student self-efficacy. The TIG intervention program was facilitated with all of these factors present, and provided children with opportunities to experience success. These results support the literature relating to confidence building (Bandura, 1997; Cook, 1992; Vealey, 2001) and its effect on self-efficacy (Vealey, 2001; Zinsser, Bunker & Williams, 2001; Taylor & Wilson, 2005; Stankov, Lee, Luo & Hogan, 2012).

Student emotions were another factor contributing to student self-efficacy within this study. Previous studies (Cerin, Szabo, Hunt, & Williams, 2000; D'Urso, Petrosso, & Robazza, 2002; Hanin & Syrja, 1995a, 1995b, 1996; Jones, 1991) have determined the impact of emotions on an individual's confidence and performance. This study provides compelling evidence of high levels of enjoyment, happiness, excitement and pride generated in participants as a result of the TIG intervention program. The presence of such high levels of these "pleasant, helpful" emotions (Taylor & Wilson, 2005), combined with the statistically significant increase in student self-efficacy as a result of the TIG intervention program, provide powerful support for the existing literature on the existence of a reciprocity spiral of confidence, performance and self-efficacy in physical activity.

Teachers involved in the TIG intervention program added further support for the positive effects they believed TIG had on their students' confidence, performance and self-efficacy. Teachers felt students really enjoyed playing TIG; that their students were happier about themselves; and that their students' self-efficacy had improved as a result. These results indicated the presence of an upward spiral of confidence and performance in students' who participation in the TIG intervention program. This concurs with previous studies (Cerin, Szabo, Hunt & Williams, 2000; McAuley, 1985; Taylor, 2001), where positive emotions arising from participation created an upward spiral of confidence and performance.

Further results from the TIG intervention program suggest the increase in confidence students experienced and reported through participating in TIG, did not translate to increasing students' holistic confidence across all tasks. The reason for the non-transference of the situation specific positive self-efficacy from TIG to students' overall confidence may be that this transfer takes time to infuse into other areas of a child's psyche. The six month time period of the intervention program may not have been long enough to generate a knock-on effect from self-efficacy to confidence for the students. A study by McAuley (1985) recognised that the upward spiral of confidence and performance that is created through success could be situation specific, and this may take time to diffuse to other areas of a child's life. This is echoed by other studies (Cook, 1992; Taylor, 2001) relating to the time needed to prepare and develop confidence. Orlick (2006) also emphasises the need for repeated exposure to cooperative games, along with enlightened supervision, to ease

the transition process and allow students to begin to play cooperatively. These theories may act to explain why the results of this program indicated changes in situation specific self-efficacy, but not in holistic self-efficacy as a result of the TIG intervention program.

In summary, the results from this research align with several theories surrounding factors which influence self-efficacy, and provides evidence which demonstrates that playing TIG at school enhances students' self-efficacy with respect to their ability to engage in physical activity and work with others.

6.03 The Impact of TIG on Teachers

Embedding Indigenous Perspectives

Aboriginal and Torres Strait Islander histories and cultures are a cross-curriculum priority within the Australian National Curriculum. Specifically, all students should be provided with the opportunity to gain a deeper knowledge of Australian Indigenous cultures, through the development of considered and focused content that fits naturally within learning areas (ACARA, 2012b). Prior to the TIG intervention program teachers identified a lack of knowledge and understanding of Indigenous issues, along with a lack of confidence to address Indigenous issues as their main barriers to embedding Indigenous perspectives in their classroom learning experiences.

Teachers who participated in the TIG intervention program felt playing TIG with their students gave them more opportunities to discuss Indigenous culture and issues with their class. Teachers reported greater confidence, knowledge and understanding of Indigenous culture and issues, as a result of the TIG intervention program. Teachers also felt this enabled them to embed Indigenous perspectives more readily in the learning experiences they planned for their class.

The literature regarding confidence discussed earlier in this chapter indicated the existence of an upward spiral of confidence, performance and further success (McAuley, 1985). It is reasonable to suggest this spiral also influenced teachers in the TIG intervention program. The success teachers experienced embedding Indigenous perspectives through playing TIG may have assisted them to build on, and continue to look for, further ways to include Indigenous cultures and histories in the learning experiences they planned for their students. Since the qualitative data demonstrated that this was indeed the case, then playing TIG in class acted as a catalyst for teachers to address national curriculum requirements relating to embedding Indigenous perspectives as a cross-curriculum priority. Further, when teachers were provided with the TIG resource package *and* professional development they were able to integrate the national cross-curriculum priority of Indigenous Perspectives in the curriculum with confidence, and specifically in relation to health and physical education. Thus, ongoing support to gain knowledge about Indigenous perspectives and assistance with integrating the new knowledge into the curriculum will assist teachers to overcome the barrier of time.

Enabling Cooperative Learning

In addition to the cross-curriculum priorities, the Australian National Curriculum identifies several attributes to be developed across all learning areas. These are termed general capabilities (ACARA, 2012b) and of these, personal and social capability specifically relates to the need for children to work in teams and communicate effectively. Teachers identified time as a major barrier to developing activities which promoted cooperative learning with their students, and this was reported at both pre and post intervention. Teachers involved in the intervention program felt the cooperative nature of TIG encouraged students to help one another and work together to achieve common goals. Students had become less competitive with one another, and were more focused on improving their skills. The emphasis on task mastery in TIG built a more cooperative classroom climate where students were encouraged to improve on their previous efforts, rather than compared to the abilities of others in the class. Teachers also felt TIG stimulated positive relationships and empathy for one another, and provided a solid basis for them to promote cooperation with their students.

Teachers felt TIG paved the way for more productive class relationships, but felt the time it took to organise and integrate cooperative learning within their classroom practices still remained a barrier to more regular group learning. Teachers reported that finding suitable resources which promoted cooperation amongst their students was less of a barrier post-intervention than pre-intervention, and probably due to their use of the Yulunga resource (Edwards, 2008) and their growing confidence in facilitating TIG with their students. Several authors (Gibbs, 1994; Glover & Midura, 1992; McCabe & Rhoades, 1992; Orlick, 2006) emphasise the need for cooperative learning in schools, and recognised the time that needs to be invested into establishing simple cooperation within a classroom. They also supported the notion that effective cooperation comes from a sustained effort that is not coincidental, but planned to occur across all learning areas. When considering this literature, along with the results which indicated that the frequency of cooperative learning experiences had not changed, it is reasonable to assume the intervention period was not long enough. A longer intervention program which further targeted cooperative learning may have given teachers the time and opportunity to respond to the positive influences TIG had on students' cooperation, by influencing teachers to plan and facilitate meaningful cooperative learning experiences on a regular basis across a variety of learning areas. TIG helped teachers to assist students to communicate more effectively and to work cooperatively whilst playing the games, but this did not transfer to an impact on classroom practices across other key learning areas across the six months of the TIG intervention. The notion of sustained and ongoing professional development for teachers in cooperative learning was evident in the results of the teacher surveys, since even after the PD sessions the intervention provided, teachers still reported they felt did not get enough PD to enable them to plan effective learning experiences for their students.

Encouraging Regular Physical Activity

HPE was a key learning area the TIG intervention program was targeted to influence. Results specifically demonstrated teachers felt the TIG intervention program encouraged them to conduct regular, daily physical activity with their students. Teachers felt TIG increased students' involvement in the games and attributed this to the fun students had playing the games. These findings support the literature regarding the reciprocal influence of enjoyment and participation in physical activity (Glover & Midura, 1992; Orlick, 2006; Taylor & Wilson, 2005). Teachers also enjoyed the positive atmosphere TIG created and this similarly encouraged teachers to conduct more regular, daily physical activity with their students.

The results of the TIG intervention program demonstrate teachers felt more confident and enjoyed teaching TIG, and since they could see how much the children enjoyed playing TIG, then they were more motivated to conduct daily physical activity sessions. This reflects the theory put forward by McAuley (1985) and supported by Taylor and Wilson (2005), on the upward spiral of confidence and performance that is created when one experiences success. Since teachers were more motivated and confident to conduct daily physical activity sessions, their actions boosted their students' levels of participation in regular physical activity.

A comparison of results from the teacher surveys between control and trial groups prior to the intervention, revealed teachers from the trial group spent less class time doing physical activity, enjoyed teaching physical activity less, had less knowledge and less confidence than their counterparts in the control group. The positive impact the TIG intervention program had on teachers from the lowest group, with respect to amount, enjoyment, knowledge and confidence relating to physical activity across time is noteworthy.

Implementing the national curriculum

A central theme which emerged during the teacher interviews was one which related to the *sustainability* of TIG at the end of the intervention period. All teachers in the trial schools discussed ways in which they would continue to facilitate TIG with the children they taught. All teachers commented that their reasons for continuing to play TIG with their students, and indeed with other students throughout the school, was because it helped them to conduct daily inclusive physical activity, to embed Indigenous perspectives, and to help students to cooperate more with one another.

A lack of time was noted as a major barrier for teachers when implementing physical activity, cooperative learning and Indigenous perspectives in their daily classroom activities. Yet it seems with the support given to teachers within the intervention in the form of ongoing professional development and the TIG resource package, teachers indeed found the time to facilitate TIG with their students.

Furthermore, teachers from the intervention schools planned to continue to facilitate TIG in their classroom; to introduce TIG to other year levels within the school; and

to integrate TIG into other key learning areas. At the conclusion of the intervention program teachers continued to invest their time and energy facilitating TIG in their schools with other year levels and teaching staff. In reality, once teachers had participated in the intervention program they all found time to expand TIG within their school communities. The TIG intervention study allowed teachers to observe first-hand the positive outcomes that increasing physical activity, encouraging cooperative learning and embedding Indigenous perspectives had on their students. By witnessing these successful learning experiences, teachers were no longer focused on barriers, but on ways to share TIG within their school communities. Their commitment post-intervention, strongly indicated teachers believed TIG provided worthwhile learning opportunities which assisted them to achieve key deliverables from Australia's national curriculum.

The results from the research demonstrate the TIG intervention program helped teachers to assist children to achieve key goals from the Australian National Curriculum, regarding physical activity, Indigenous perspectives and cooperation. More specifically, TIG enabled teachers to encourage and nurture a sense of self-worth within their students, and to have a positive impact on the emotional and physical wellbeing of their students (ACARA, 2012b). The results of this study provide conclusive evidence that prolonged use of TIG assisted teachers to meet the Australian national curriculum requirements with respect to embedding Indigenous perspectives, cooperative learning and regular physical activity. However, to achieve these results, TIG must be played in accordance with the original philosophy of TIG, which focused on cooperation, inclusion, participation and enjoyment, and ideally, on a daily basis.

6.04 In summary

This chapter contains a detailed discussion based on the results that were presented in the previous chapter and one that is linked to the literature surrounding the themes and the theoretical framework for the study (Figure 2.4, p 51). The examination of the results are centred on the study's overarching research question and present a case for either accepting or rejecting these findings. That is: that regular and prolonged implementation of TIG in the curriculum enhanced attitudes to physical activity, student self-efficacy and teacher ability to implement the national curriculum requirements.

The final chapter will present the conclusions that can be drawn from this study, including the contribution to knowledge this study makes, as well as practical recommendations, along with limitations of the study and possibilities for further research. This will be followed by a reflexive account of the research process to conclude the dissertation.

7. Conclusion

7.01 Overview

This chapter concludes the dissertation by drawing together the threads of the research study by considering how the aims of the research have been met, and how the study provides an original contribution to existing knowledge within the field of education. Some practical recommendations are made, coupled with a discussion of the limitations of the research and possibilities for further research. It concludes with a reflexive account of the research process and what the researcher has learned as a result of the process.

7.02 Examination of aims

The purpose of this study was to assess the impact of a TIG intervention program on children's enjoyment of, and participation in, physical activity. The research involved close examination of the effects of participation in TIG on students' physical activity, cooperation and self-efficacy. In doing so, the study also investigated how TIG assisted teachers to implement national curriculum demands relating to physical activity, cooperative learning and embedding Indigenous perspectives.

The results discussed in the previous chapter clearly identified how the research has achieved the aims of the study. The TIG intervention program increased daily physical activity levels in students, and impacted positively on their self-efficacy and how they work with others whilst playing the games. Teachers involved in the TIG intervention program reported on the assistance the program has given them to achieve Australian national curriculum requirements. In light of the findings from this research, it is appropriate to state that the aims of the study have been achieved. The TIG intervention program provided regular, meaningful and inclusive experiences in physical activity for all children. The TIG intervention program also provided professional development for teachers to assist them to meet key national curriculum deliverables around encouraging physical activity and well-being, embedding Indigenous perspectives, enabling cooperation and enhancing self-efficacy.

7.03 Contribution to knowledge

This study investigated the impact of traditional Indigenous games on primary school students and their teachers. It was developed in an attempt to solve some of the problems teachers faced implementing Australian National Curriculum requirements. In particular, the difficulties teachers faced embedding Indigenous perspectives into key learning areas, facilitating regular physical activity, and assisting students to grow and develop socially and emotionally through their interactions with peers, teachers and the school community.

The use of TIG as a vehicle to achieve regular physical activity; embed Indigenous perspectives; and assist students to cooperate with one another; enabled both teachers and students to integrate these topics across the curriculum. The TIG intervention program in schools had two target audiences, students and teachers. This research recognised the importance of both groups and was structured to address issues that were unique to each group.

The questions surrounding student participants in this study focused on physical, emotional and social well-being, all issues which are clearly raised in the Melbourne Declaration (MCEETYA, 2008) and reflected in the Australian National Curriculum (ACARA, 2012b). The results of this research indicate the need for more attention to be given to widening children's experience and exposure to TIG, through schools, as a way to support and develop students physically, emotionally and socially.

Teacher participants in this study reported difficulties meeting the requirements of the national curriculum relating to embedding Indigenous perspectives and facilitating regular physical activity. These teachers reported the main barriers to achieving these targets as time and curriculum demands, coupled with a lack of specialist knowledge in these areas. It is pertinent for TIG to be used to integrate the requirements of the national curriculum, into a more manageable, time efficient and enjoyable learning experience for both students and teachers.

This study provides an original contribution to knowledge by connecting the key areas of physical activity, cooperation and Indigenous perspectives through the common theme of TIG. By synthesising physical activity with Indigenous perspectives and cooperation, through playing TIG at school, the research provides innovative solutions to issues relating to promoting regular physical activity; embedding Indigenous perspectives; and, stimulating cooperative learning environments.

The form of professional development (PD) delivered in this program is crucial to the success of the program. All of the dimensions that changed were due to the PD program delivered, and the ongoing support it provided. The Yulunga resource on its own is not enough to assist teachers to facilitate TIG with their class. Similarly, the Indigenous perspectives statement in the Australian National Curriculum is not enough to assist teachers to integrate traditions and culture that are foreign to them. The model of PD implemented in this study which provided ongoing support to teachers proved to be successful.

The benefits of participating in the TIG intervention program, based on the PD model provided, for students and teachers, can be summarised as follows:

- Encourages student participation in regular physical activity,
- Embeds Indigenous perspectives in a non-confrontational way,
- Encourages social and emotional learning through the cooperative nature of the games,
- Enhances students' self-efficacy with respect to physical activity and cooperation with their peers,

- Provides teachers with a wider knowledge base to plan comprehensive learning experiences for students, and
- Builds teacher confidence and capacity to: facilitate regular physical activity; embed Indigenous perspectives; and, provide opportunities for cooperation and team work with their students.

The TIG intervention program provides an original approach to establishing a platform for teachers from which they can facilitate the physical, social and emotional growth of their students, and hence contribute to supporting the health and well-being of their students.

The methodology used within this study was successful and the instruments used to collect data from both groups of participants proved to be powerful tools. The instrument developed for the collection of teachers' anecdotal notes proved to be an easy way for teachers to record their reflections. Since the template for the teachers' notes was based on deBono's thinking hats (1990), it stimulated teachers to think deeply and critically about the effects of TIG on their students. These data collection instruments can be applied to any research methodology which requires participants to think deeply and reflect on their experiences.

The students' reflective journal was developed to examine changes in students' perceptions and attitudes of themselves and proved to be a very useful instrument in this study. The use of faces enabled students to rate their responses accurately, since students could easily identify, understand and respond to the questions in the journal. The small time impost required for the students to complete the journals, along with the reflective practices the journals developed with students, meant teachers readily encouraged students to actively complete the journals. The teachers' enthusiasm to complete the journals, combined with the child-friendly, simplistic nature of the journals for students, meant a large amount of valid and reliable data from each individual student were collected. Since the journals measured changes in the attitudes and perceptions of students over time, specifically relating to physical activity, the quantity of data gathered through this instrument permitted more robust data analysis.

The student survey instrument was theoretically constructed and statistically validated and provided crucial data relating to students for each area under investigation, that is, physical activity, cooperation and self-efficacy.

All the instruments developed within this study can be adapted for use in further studies which rely on collecting data across time from both children and adults. The rigorous methodology employed in this study, along with the unique, valid and reliable instruments created, have never been used in other studies investigating TIG. Furthermore, the instruments, PD framework and methodology used in this study can be applied to the wider research community.

7.04 Practical Recommendations

This study specifically targeted schools through the teachers and students who participated. The results of the study indicated regular and prolonged implementation of TIG in the curriculum enhanced attitudes towards physical activity, student self-efficacy and teacher ability to implement the requirements of the Australian national curriculum. For this reason, it is recommended that teachers, principals, school boards and education officials consider using the TIG intervention program as a way to address similar issues that may exist within their context.

The realistic implications of this study specifically relate to each participant group targeted in the study. The TIG intervention program successfully engaged students in meaningful, inclusive, enjoyable physical activity, while the nature of the PD delivered throughout the program was crucial to the success both teachers and students experienced. The consistency and duration of the ongoing support the PD provided was integral to the success of the program, along with the emphasis on providing a cooperative rather than competitive structure to the games. Ideally, teachers were encouraged to facilitate daily TIG sessions with their students, but realistically, not all teachers followed the study's guidelines. Some teachers had difficulties running sessions each day, and scaled the number of sessions down to three per week. Even under these circumstances, the results of the study still demonstrate the effectiveness the TIG intervention program had on achieving the aims of the study.

Furthermore, the overwhelming evidence of the success of the TIG intervention program was generated from a relatively small sample which involved five trial schools. If a larger study was conducted on a national scale, which employed the PD model used in this study and also focused on the TIG intervention program, it may add further weight to the findings within this study as to the benefits the TIG intervention program brought to students and teachers alike.

The positive outcomes for the participants in this study demonstrate the huge potential for TIG and programs like it, to enhance the health and well-being of children and youth. The production of a teachers' guide to implement the TIG intervention program may well be an effective way to disseminate this positive life enhancement program not only within Australia, but throughout the world.

If the TIG intervention program were built into the Australian National Curriculum then the practical implications this would have for students and teachers would be numerous. The program would give direction and support to teachers, while nurturing physical activity, cooperation and self-efficacy in our children, the future leaders of our society.

7.05 Limitations

When reflecting on the conduct of the research, it becomes apparent there were some areas where the research could have been improved. Although the aims of the study were achieved, these may have been too broad, and made it necessary to use a number of data collection instruments to adequately address the aims of the study. Specifically, when considering the effect TIG had on students' cooperation and collaboration, and how they worked with others, it was difficult to measure this quantitatively. Instead, the study considered the teachers' perceptions of the impact TIG had on student cooperation, and this may have been open to researcher bias. When teachers discussed the effects of TIG with the researcher at the conclusion of the intervention program, they were very effusive about TIG and enjoyed it so much they had become advocates for TIG in their schools. Therefore any questions regarding their perceptions, especially relating to cooperation, which were not directly measurable by the other instruments used in the study, may have been coloured by the teachers' enjoyment in facilitating, and their students' enjoyment in playing TIG. Qualitative research would argue that this, indeed, is a valid tool to measure the effectiveness of the program, as it demonstrates the richness of the TIG experience and the perceived value TIG brought to the classroom by the teacher practitioners.

Another aspect of this study which may be considered a limitation is that the results were dependant on the strength of enthusiasm for the project by the teachers at each school. The commitment each teacher had towards the program, along with their enthusiasm for implementing the program, would definitely affect the learning outcomes and experiences of the learners, and ultimately influence the results of the study. Previous research indicates very strongly that the single, most important factor which influences learning outcomes for the learner is their teacher (Chetty, Friedman & Rockoff, 2011; Hanushek, 2011; Harris & Sass, 2011; Leithwood, Patten & Jantzi, 2010; Supovitz, Sirinides & May, 2010). In the case of this research, it is acknowledged that a limitation of the study is that the level of commitment and enthusiasm each teacher brought to the intervention program varied according to each individual. However, individual teacher's enthusiasm for and commitment to their work, is a factor which remains outside of the control of the researcher.

The convenience sampling method employed in this study can be seen as a limitation, since it created an inherent bias to the sample. It is recognised that random sampling is preferable as a way to eliminate bias and have a fair representation of the population, but in this case, was not practicable nor possible for the researcher. However, the percentage of schools, year 5 students and teachers within one school district was quite large and in many respects would overcome the impact of a non-random sample.

An analysis of the student survey data revealed no significant differences were found in the variables which measured *perceptions* and *attitudes*. Several factors related to the survey instrument may have impacted on the lack of definitive results for these variables, including the style of survey used, the language used within the survey,

and student's interpretation and response to the question. Each of these factors require further exploration to identify if they were a limiting factor within this study.

The style of survey used asked students to report on their own perceptions of their participation and ability, along with how they felt about certain activities. The results of the research were reliant on the student's ability to honestly respond to the questions, rather than to respond in a manner that pleased the adults or peers who were present at the time they completed the survey. The accuracy of the students' responses may have also been affected by the students' inability to be introspective, and view themselves from a neutral perspective.
The subjective nature of the responses could also be open to the influence of outside factors, unrelated to the TIG intervention program. For example, when students were asked "how much they liked playing with others in their class", or, "how well did they get on with children in their class", their responses may be driven by what has happened to them in their immediate circle of friends and series of events on the day they completed the survey.

The language used within the student survey could have also contributed to the inconclusive results obtained through this instrument. For example, the terms 'sport' and 'physical activity' were used in the items, but no definition of these terms were provided to allow students to differentiate between physical activity and sport. It is quite feasible children saw sport and physical activity as the same entity, and used these terms interchangeably, without understanding the fundamental differences between sport and physical activity, outlined previously in the introductory chapter. The exploratory factor analysis conducted on the student survey data provided evidence to support this idea, in that the items relating to sport and physical activity were grouped together, and fell within the same factor. It is quite probable then, that students did not discriminate between sport and physical activity when responding to these questions, and this may be why no significant changes over time in students' attitudes relating to sport and physical activity were found in the student survey data.

Additionally, the results of the student survey were also dependant on the student's ability to interpret the question in the way the researcher intended. For example, one of the items which measured the variable "attitude" asked students if they wanted to do more physical activity during school. For many students who enjoyed playing TIG, they thought they needed a lot more physical activity at school. Since the results from the student reflective journals indicated playing TIG was a pleasurable experience for students, it is understandable students wanted to take part in even more TIG. This effect is as an example of the seminal work of Atkinson with his *Achievement Motivation Theory* (Atkinson, 1957). This theory has been supported over time by further research into the concept of motivation where an individual's drive to participate and their perseverance, stems from a need to repeat pleasurable experiences. The enjoyment derived from the experience stimulates the individual to seek further success through repeated participation (Biddle, 2001; Duda, 1993; Roberts, Treasure & Kavussanu, 1997; Treasure, 2001). This would explain students' responses where they felt they needed more time to play TIG, since it had been a pleasurable experience for them, and one they wanted to repeat more often.

The same effect may have been present with similar items which measured "attitude" towards playing with others. Results indicated most students liked playing with

others and wanted to do more of this at both pre and post-test phases. Since students were quite positive about playing and working with others at the pre-test phase, it is difficult to identify further positive increments in their attitude over time. Students' interpretation of the question might also have differed from the intended interpretation of the researcher, and may have contributed to the lack of clarity within the results from the student survey pertaining to the variables "attitudes" and "perceptions".

An additional limitation of the student survey may involve students' responses to the general nature of the questions, rather than specifically targeting their participation in TIG through direct questions. For example, instead of comparing students reported levels of cooperation at pre and post intervention to determine if their cooperation with others had changed, a direct question could have been used to ascertain if students felt TIG had influenced their cooperation with others. However, the use of direct questions could equally bias results, since participants may tell the researcher what they think the researcher wants to hear. In the case of this study, the chances of bias through direct questions were thought to be high, because of the age of the participants, hence a general approach to questions was used to provide a comparison across time.

After considering these examples within the student survey regarding the style of survey, language, problems regarding interpretation of the questions and student responses, it is feasible to suggest these factors may have contributed to the inconclusive results obtained from the student survey data regarding attitudes and perceptions and limited the results of the research.

7.06 Further research

When considering the limitations of this research, some possibilities for consideration and further research arose. Since teachers are one of the most important factors influencing curriculum content and delivery, a follow up study investigating the sustainability of TIG in the trial schools from this research would be interesting. This type of longitudinal investigation may provide deeper insights into program planning within schools. Furthermore, this may give an indication into the transferability and permanency of intervention programs and the uptake of these programs by the wider school community.

Results from this study indicated positive situation specific effects of TIG on students' cooperation and self-efficacy. Further areas for investigation may involve the transfer and permanence of situation specific concepts and ideals to the students' wider context. Specifically, when students demonstrate cooperation in TIG, how can this be transferred to increasing students' cooperation in the classroom?

Further research into the concept of learning transfer could be based on the SOLO taxonomy of Biggs and Collis (1982) where the existence of levels of shallow and deep learning were identified and discussed. Based on the theories provided by Biggs and Collis (1982) in their SOLO taxonomy, it could be said that since TIG were new to students, they had to learn the games and how to cooperate to play them,

then they were still at a shallow level of learning. It follows that students were at the multi-structural level of learning in the SOLO taxonomy, where they were able to do, combine and describe TIG and the cooperative skills needed to play them. Students had not achieved deeper learning, where they could apply their cooperative skills from TIG in a new setting. Since the PD which drove the intervention program related to playing TIG cooperatively, then teachers focused on achieving this throughout the program. Further research could investigate the effects of making the cooperative learning skills students developed through playing TIG obvious and explicit to students, therefore enabling an analysis of the effect of transfer from TIG to classroom possible.

Current research into the transfer of learning have similarly identified situations where learning transfer has failed to take place. Larsen-Freeman (2013) refers to this phenomena as the inert knowledge problem and suggests ways to overcome this problem lies in adapting and transforming the learning environment. Further research arising from the TIG intervention program may be to identify any inert knowledge learners might acquire as a result of the TIG program, and examine ways to overcome these problems.

Goldstone and Day (2012) conducted an analysis of existing literature regarding the transfer of learning and identified three common themes. Firstly, the importance of considering the learner's perspectives, secondly, how little attention had been previously paid to the effect of motivation on learning transfer, and thirdly, validated teaching techniques which focused on facilitating learning transfer. These three themes are also evident in the TIG intervention program, and suggest pathways for further research into each specific theme, in relation to the transfer of learning from TIG to other key learning areas within the curriculum. For example, the effect of TIG on the learner, in terms of increasing situation specific self-efficacy, and how this might be transferred to other learning areas, reflects the first theme relating to the learner's perspectives. The positive effect TIG had on the learner's motivation links to the second theme identified by Goldstone and Day (2012), whereby incorporating task mastery, social goals, intrinsic motives, enjoyment, cooperation and skill development certainly opens the door for further studies which could examine the effect of each of these on the transfer of learning.

The third theme from the work of Goldstone and Day (2012) related to teaching techniques which facilitated learning transfer. Research by Kalyuga (2013) also examined teaching strategies which facilitated learning transfer and identified explicit teaching and instructional sequencing as key factors to consider. These studies could inform further research arising from the TIG program to target increasing cooperative learning in the classroom. Subsequent professional development provided to teachers would be explicitly aimed at cooperative learning and hence would have an entirely different focus and context, and may provide further strategies which support the transfer of learning.

Additional studies could also be conducted to examine the transfer of situational specific self- efficacy in physical activity to other areas of a child's life. Future research could examine this transfer, and if there was some effect on a child's psyche. Further research into these types of studies may refine future intervention

programs so positive effects could be transferred from specific situational tasks, to infuse across other areas of a child's life. In this way, the TIG intervention program could support the holistic development of a child's physical, social and emotional well-being.

Any further studies which involved sustained participation in TIG would also act to support the holistic development of children. This research has identified intrinsic motivational factors that exist within TIG and have contributed to achieving successful learning outcomes for both students and teachers. Recent studies by Schmidt and Lee (2011) espouse that intrinsic motivational factors have a longer lasting effect on participation and performance in physical activity, than extrinsic motivators. Furthermore, those who participate in physical activity for personal satisfaction and intrinsic motives were more likely to continue their participation throughout their lives, than those driven by external rewards. Future research into physical activity could examine the role intrinsic motivators may play in encouraging lifelong and life wide participation in regular physical activity.

Further studies may consider a whole school focus on the impact of TIG by selecting a broader age range of participants and examining the effects of TIG on the whole school community. This may help identify optimal participant ages for this type of intervention program where motivation, transference and permanency could be maximised. This type of age wide research, combined with a longitudinal study within schools, would extend the breadth of the research and may provide further evidence which supports the benefits of TIG in schools.

There are also additional opportunities to extend the depth of the study in the future by conducting case studies on specific individuals in the intervention program. Issues of individual differences such as gender, ability and ethnicity could be explored further in relation to students' experiences and how TIG may have had a specific impact on them.

The foundation for the rationale for TIG in schools already exists within the Australian National Curriculum through the inclusion of the need to assist children to develop their physical, emotional and social well-being (ACARA, 2012b; MCEETYA, 2008). Any further positive outcomes from these studies could provide strong justification for the inclusion of TIG in the school curriculum and the associated benefits to the wider Australian community.

7.07 Reflexive account

Throughout the course of this research there have been a number of factors which have affected the way in which the subject matter was analysed and interpreted by the researcher. The study began by focusing on ways to encourage children to be more physically active and to participate more fully in class physical activities. This arose from the researcher's experience teaching HPE to secondary school students for over twenty years. During this time the researcher developed an interest in examining and understanding students' attitudes and behaviours regarding sport and physical activity, and how these affected their performance of physical skills within

games and sports. Ways to encourage maximum participation and effort from all students during class physical activities, whilst developing empathy and respect within the class group, were continuously sought.

When the researcher began to explore TIG, it became evident there were several key factors built into the ethos of these games which she believed encouraged participation, skill development and respect for others. Certainly the absence of a *win at all costs* mentality from the ethos of TIG could be a crucial factor in student engagement and enjoyment. After playing TIG with pre-service teachers at the University where the researcher lectures, it became apparent TIG seemed to dispel the fear of failure and dislike of sport, HPE many of the students possessed.

Observations made by the researcher led to speculations about how TIG would be received by children in schools. Since the researcher was an experienced teacher this influenced her perceptions of how teachers might be encouraged to play TIG with their students. The researcher identified links between current curriculum demands and TIG and developed a sound rationale for their inclusion into the daily learning program. An intervention program was used as the medium through which the research was conducted, so that data from the field would help to justify the inclusion of TIG in the curriculum.

During the course of the study, the researcher provided regular updates to the local Indigenous community through the University's Community Education Advisory Committee (CEAC). This afforded the researcher the opportunity to develop rapport with local community elders and, through them, the wider Indigenous community. These connections provided the researcher with the opportunity to gain greater knowledge and understanding of the perspectives of Australian Indigenous people. The researcher gained greater insights into the way Australian Indigenous people were disadvantaged in education, which excluded them from career pathways which required tertiary educational qualifications. The deeper knowledge, understanding and experience the researcher gained as a result of these connections with the local Indigenous community, further strengthened her feminist epistemology.

The researcher developed multiple collaborative projects with the local Indigenous community to act on the knowledge and understanding of Indigenous issues she had gained as a result of the relationships she had built with the local Indigenous elders within the community. These projects addressed the imbalance of knowledge, education and career pathways that existed for them as a voiceless minority group. Through these multiple projects the researcher strove to reform conceptions and practices to enable local Indigenous people, a minority group, to gain greater opportunities to access the dominant societal groups' education and knowledge structures and provide wider career pathways. These actions taken by the researcher further support and demonstrate her emancipatory feminist epistemology.

One such project arose as a result of the PD and ongoing support the researcher provided to trial schools during the study to explore Indigenous perspectives in other key learning areas. Several schools not involved in the study, made inquiries for similar assistance to embed Indigenous perspectives in their school curriculum. In response to these requests the researcher developed projects which celebrated local Indigenous knowledges through conducting festivals for the school community

within the area. Local Indigenous elders facilitated activities at these events, where the context of sharing cultural knowledges and learning and playing together were key ingredients.

Following on from these projects schools and teachers have since used the researcher as a conduit to assist them to embed Indigenous perspectives in the learning experiences they facilitated for their students. The researcher has also conducted regular PD sessions for educators to embed Indigenous perspectives in the Australian National Curriculum. The actions taken by the researcher further demonstrates how the TIG intervention research aligned with the epistemological stance of the researcher.

Throughout these projects the researcher observed an increase in confidence of the Indigenous facilitators, who then began to identify and connect with the University. Further discussions with local Indigenous people led the researcher into the area of recruitment and retention of Indigenous peoples within the tertiary sector. The researcher developed further programs in conjunction with the Community Education Advisory Council and the University's Indigenous Education Unit, to nurture the educational aspirations of Indigenous secondary school students. These projects helped to establish a sense of connectedness to the University with local Indigenous peoples. The course of action followed by the researcher further demonstrated and reinforced the researcher's epistemology.

The subtle changes in the course of the researcher's area of interest, directly demonstrates how the researcher has impacted on the social setting in this study. Her research pathway has moved to incorporate not only encouraging maximum participation in physical activity and embedding Indigenous perspectives in schools, but expanded to encouraging maximum participation in school and education to Indigenous peoples in the area.

Correspondingly, the participants have affected the perspective of the researcher in that she sought to ensure Indigenous perspectives were embedded within the courses she taught. The researcher encourages pre-service teachers to examine their practices so that they too embed Indigenous perspectives in the learning experiences they create for their students. In this way, they can begin to foster positive relationships, and a sense of empathy and respect amongst their students.

Over the course of the TIG intervention study, the researcher developed associated programs to effect change for voiceless minorities, for example children and Indigenous people, who were excluded from physical activity, knowledge, education and future career pathways. All of these projects reinforced the researcher's emancipatory feminist epistemology. Further to this, the knowledge the researcher collected and analysed prior to, during and at the conclusion of these projects, was gathered through both experience and empirical evidence, and as such, further supports the *a posteriori* ontology of the researcher.

The research process stimulated the researcher to continuously reflect on her own teaching practice, so that an atmosphere of cooperation and respect became normal, expected practice. By establishing this type of supportive environment, the researcher has found people work together more often, and strive to achieve their

personal best in their chosen career pathway, whilst acknowledging and respecting the different choices and pathways others may take.

As a direct result of this study, the researcher has formed many networks based on communication and respect for individuals. The researcher has become increasingly aware of the circle of influence within which she works, and the need for reflective and selfless leadership to truly empower those people within her circle of influence. The researcher's emancipatory feminist epistemology and *a posteriori* ontology has been strengthened as a result of this research and demonstrated through the ongoing research and methodology she continues to undertake.

Through this study, the researcher has learnt effective leadership can involve working beside people, rather than leading from in front, or pushing from the back. From this sidelong position, leaders are aware of their impact on their surroundings and how they influence others. By adopting an understanding of the perspectives of others, leaders can assist people to take ownership of their own ideals and strive to achieve them, without having to follow the same path that the leader has chosen. This type of leadership is really *togethership*, where the leader becomes an activist for the empowerment of individuals, and reflects an emancipatory feminist epistemology. Through developing a network of support and empowerment, the researcher has found people can be inspired to take ownership of their personal challenges and work simultaneously to overcome these to the best of their ability.

The TIG intervention exploration has reinforced the researcher's emancipatory feminist epistemology and strengthened the researcher's *a posteriori* ontology. As a result of these new understandings, the researcher reflects on issues through multiple lenses, thereby gaining insights from the perspectives of others, in order to see issues differently. In doing so, the researcher recognises the power of both experience and empirical evidence to provide these insights. The following final quotation acknowledges and exemplifies the reflexive impact this learning journey has had on the researcher:

> In finding new ways forward, efforts to placate a driving or unforgiving ego can prevent us from finding space for compassion, connection and being in the moment. The ego is not the whole self. It is freeing to find ways to put a space between one's ego and one's self, in order to do the work of liberating leadership. (Sinclair, 2007p.182).

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Appendices

Appendix 1
TIG Intervention Workshop Plan (Pre-Intervention)

PROFESSIONAL DEVELOPMENT IN TRADITIONAL INDIGENOUS GAMES

Engage: 45 minutes

Outcomes	Activities	Resources
➢ Identify, understand and outline the nature of the research study	➢ Play Kai ➢ Powerpoint presentation on Birrbam gambay	➢ Two material balls ➢ SL powerpoint

Explore: 45 minutes

Outcomes	Activities	Resources
➢ Deconstructing the Yulunga resource	Go through Yulunga cards and discuss • acknowledgement vs welcome to country • background • language • description • equipment • rules	Sets of Yulunga cards per school set

Explain: 2 hours

Outcomes	Activities	Resources
➢ Play, Participate and enjoy a number of TIG ➢ Compare and contrast TIG with current Sport and physical activity practices. ➢ Groups report back and share their experiences of each game. ➢ Understand and model data collection procedures	The first two activities will be modeled by facilitator 1) Kolap 2) Puloga The following 5 activities will be developed and modeled by PD participants. Participants will be divided into 5 sub-groups, and each will lead the whole group in the game. 3) Kalq 4) Keentan 5) Dabi 6) Gorri 7) Tarnambai	Yulunga cards 1) Hoops(4), bean bags(25), Markers(8) 2) Gator skin ball (4), oz tag belts (2 sets), bibs (2 sets), markers (8) 3) Bats (20), small air flow balls (4) 4) Gator skin ball (2), markers (8), bibs (2 sets) 5) Hockey sticks (20), large air flow balls (2), markers (8), bibs (4 sets)

	To model data collection for the study, at the conclusion of the games, participants will be asked to ➢ choose a game and complete a "student reflective journal" ➢ review prompters for "teacher's anecdotal notes"	6) Tennis balls (40), markers (8), large balls (2) 7) Tennis balls (10), markers (8) H/O student reflective journals for completion H/O teacher prompter guide for anecdotal notes

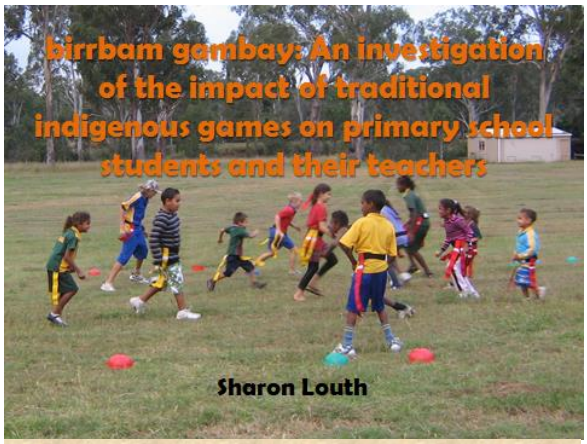
Elaborate: 1 hour

Outcomes	**Activities**	**Resources**
➢ Devising how the games can fit into their current school units of work for the Year 5 cohort in Terms 2 and 3. ➢ Judge how effectively the games can be incorporated into integrated units of work.	➢ Provide 1 example of integrated unit of work – discuss KLA's – relevance, manageability, appropriateness, time ➢ Evaluate how TIG have been written in to work sample provided **NB: TIG not an "add on" – not extra "volume" but integrated into pre-existing good practice. Can be viewed as "purposeful learning time" – working smarter with Smart Moves and EATSIPS** ➢ Further examples provided and group discussions by schools as to how this has been done. ➢ This can also be demonstrated through the Healthy Communities website. ➢ Also supplement this with resources from Wide Bay Public Health – Nutrition – Anthea Oorloff ➢ Experiment with some of the games for ways that they may mesh with some of the units of work you may be doing with your students in a similar or better way. ➢ Group feedback: Share one idea your group has come up with regarding TIG.	1. Provide 4 samples of units of work where TIG has been used. 2. Provide "Healthy Communities" website material as a bonus resource for their use. 3. Nutrition resources 4. Schools bring their units of work for Term 2 and 3

Evaluate: 45 minutes

Outcomes	**Activities**	**Resources**
➢ Judge how TIG can influence a child's : o Participation, attitudes and perceptions of ▪ PA ▪ Cooperation ▪ Cultural Awareness ▪ Self-esteem and self-efficacy	Measuring the impact of TIG ➢ How have things changed for **teachers and students?** ➢ How effective has TIG been in changing: ▪ Participation ▪ Attitudes ▪ Perceptions Of: o Physical activity o Cooperation o Cultural awareness o Self-esteem and self-efficacy Recap on data collection requirements of the study ➢ Teachers – surveys, interviews, anecdotal notes – pre and post ➢ Students – surveys – pre and post and reflection journals – after first experience of each game Further questions??? Opportunity to regroup at the end of the study as a professional working group?	Handout of Table to demonstrate data collection points Handout of reflection journals Handout of example topics to reflect on for anecdotal notes

Appendix 2
TIG Intervention Power Point Presentation – Initial Teacher PD



ACKNOWLEDGEMENT

- I would like to acknowledge the "Butchulla" people, the traditional custodians of the country where we meet today.
- I would also like to pay respect to all Elders, past and present who have forged the way ahead, which allows me the opportunity to speak to you today.

Outcomes & Significance

- Inclusive physical activity
- Develop fundamental motor skills
- Connecting with Indigenous culture
- Working as a team and cooperating
- Establishing Self efficacy

Government Policy

Psychological Benefits of Physical Activity

- ↑ Self efficacy through developing a sense of mastery, skill and accomplishment.
- Interacting with others to achieve a task.
- Distraction from other problems.
- ↑ production of endorphins which stimulate neurotransmitters in the brain.

Cooperation and Collaboration

- Metacognition
- Nurturing social skills
- Personal responsibility
- Individual accountability

Cooperative Vs Competitive

Sociology tells us that sport and physical activity are reflections of the social and cultural life of the society in which they exist.

Indigenous Knowledge & Reconciliation

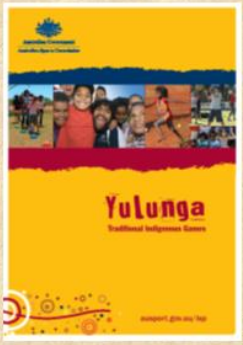
- Recognising and celebrating Indigenous culture
- Using kinaesthetic learning styles to promote skill development
- Connecting to the land through a rationale for each game
- Inclusive and cooperative nature of the games

Reconciliation Australia

Fundamental Motor Skills & Self Efficacy

Positive Self Efficacy	Negative Self Efficacy
Perceptions of high skill	Perceptions of low skill
Positive attitudes towards physical activity	Negative attitudes towards physical activity
Enjoyment of physical activity	Dislike of physical activity
Participation in physical activity	Avoidance of physical activity

TIGS



Dr. Ken Edwards from USQ researched, collected and compiled the games which will be used in this study from across Australia in consultation with and approval from local communities and Elders.

The project was funded by the Indigenous Sport Program of the Australian Sports Commission.

Theoretical Framework

Intervention Program

Duration of intervention – 6 months

Daily TIGs participation – 30 mins *Smart Moves* / day

Participant	Tool	Pre-test	Post-test	Ongoing
Teachers	Survey	✓	✓	
	Interview	✓	✓	
	Professional development	✓		✓
	Anecdotal observations			✓
Students	Survey	✓	✓	
	Reflective journal			✓
	TIGs participation			✓

Teacher's Role

- To play TIGs with students as part of "Smart Moves" 30 mins per day
- To participate in pre and post intervention surveys, interviews and professional development
- To make weekly anecdotal notes relating to TIGs during the intervention

Student's Role

- To complete pre and post intervention surveys
- To participate in TIGs throughout the intervention
- To complete reflective journals when they learn a new game

Researcher's Role

To provide

- professional development sessions pre and post intervention
- ongoing school based support throughout the intervention
- a forum for teachers to collaborate within the education community
- resources and equipment to facilitate participation in TIGs

Traditional Indigenous Games

Changing the mindset ?

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Appendix 3
Kolap

kolap

'ko-lap'

All school-age groups (K–12)

Post-school age

Background

This object throwing game was observed being played on Mer Island in the Torres Strait region in the nineteenth century. More recent versions have also been observed.

Short description

A game based on throwing accuracy. Teams of one to two players throw objects, attempting to make them land on a target on the ground.

Players

- Two players form a team to compete against another team, or the game can be played with one player against another.

Playing area

- A designated indoor or outdoor area suitable for the activity

Equipment

- Two mats (softball bases, carpet squares, rubber mats or small towels) placed 5–7 metres apart
- Beanbags, coins, large buttons or flat bocce balls to represent the *kolap* beans

Game play and basic rules

- Two players sit (or stand) behind each mat.
- The players who are partners are diagonally opposite each other.
- Each player has four *kolaps*, which he or she attempts to throw to land on the mat opposite.
- One player has a turn. The *kolaps* are collected and then the player on the opposite team at the other mat has a turn. Continue in this manner.

Scoring

A combined total of 20 finishes the game for a team. The kolap must land completely on the mat to count.

Variations

- Use wooden markers such as used in the game of draughts.
- Players stand to play the game and use rubber mats or carpet squares.
- Throw coins or flat bocce markers onto large carpet squares, or into hoops.
- Skills practice — consecutive throws
- Players take turns to see how many times in a row they can land the kolap beans (markers) on the mat. Play from a standing position.
- Tabloid kolap: Players (two to six) line up behind each other and take it in turns to attempt to land the kolap on the mat. Throwers collect the kolap and give it to the next player. Count the number in a set time (2–3 minutes).

Teaching points

- Line up behind the mat.
- Teams face each other.
- First thrower ready. Go.
- Underarm or sidearm throws. Be careful. Aim for the target. Bend the knees a bit.
- Good throw. Watch the target. Point your hand and follow through.
- Next turn. Keep playing.

Appendix 4
Puloga

puloga

'pul-o-ga'

SCHOOL YEARS 4–6

SCHOOL YEARS 7–9

Background

Regular mock combat tournaments took place in the Cardwell and Tully River areas of north Queensland. The Mallanpara people called this a *prun*. It was essentially an entertainment activity, though the opportunity was taken to settle disputes, real or imaginary. It also gave the men a chance to show off their prowess and courage before the women.

At Cairns the Yidinji people called these activities *puloga*.

Short description

A game of mock warfare held between two groups, with players using 'soft' balls in an attempt to contact an opposing player.

Players

- Two teams of eight to 15 players or more. Use animal names such as 'emu' and 'cockatoo' for team names.

Equipment

- A number of size 3 gator skin balls or similar
- A belt and two tags, such as those used in Oztag, for each player to wear
- A number of coloured team bibs

Playing area

- An area approximately 30–40 metres wide and 60–70 metres long

Duration

- Play a game of five to ten minutes.

Game play and basic rules

- Players organise into two teams and start by facing each other from opposite ends of the playing area. Teams wear different coloured tags to identify their team (clan).

- Each player has one to two soft balls, and on the start signal move into the playing area and attempt to contact a player of the opposing team below the shoulders by throwing the ball. For older and stronger players throws may be limited to underarm throws. For safety reasons, throws should not be made from closer than 3 metres and only with moderate force.
- Play in the game is continuous and players can retrieve the balls thrown by other players. If a player is contacted by a ball thrown by an opposing player the contacted player must drop the ball/s, he or she has and remove one of the tags — but can then continue in the game. The removed tag is dropped on the ground.
- Players with or without a ball can attempt to remove a tag from opposing players (no physical contact allowed). Players may not protect their tags from being removed.
- A player who loses two tags — either by being hit with a ball and/or having a tag removed by an opposing player — will be required to collect two tags from the ground and go to the side of the playing area for a set time (count aloud to 30 by 'one and two and three') before putting on his or her tags again and rejoining the game.

Variations

- 'Capture the flag' version. Mark circles with a diameter of 10 metres at each end of the playing area and place a flag in the middle of this area. Defending players may not be inside their own area. Attacking players attempt to enter the circle at the other end of the playing area and return to their own circle with the flag. When a player with the flag is either hit by a ball or 'tagged' the flag is returned to the circle.
- A player who is hit with a ball — loss of tag — or has a tag removed by an opposing player must return to his or her team's end of the field before being allowed to continue in the game.

Comment

This game works well for physical education classes.

Safety

Fair play is important in this game.

Teaching points

- Teams ready. Lined up and ready.
- Collect the balls. Ready. Go.
- Throw and dodge.
- Hit, drop a tag.
- Good throws. Keep moving.
- Try to tag. Tag the other players.
- Keep going. Watch out for other players.
- Dodge and move.

Appendix 5
Kai

kaI

'kaI'

School Years 4–6 | School Years 7–9 | School Years 10–12 | Post-school age

Background

In this game from the Torres Strait Islands, a number of players stood in a circle and sang the kaI wed (ball song) as they hit a ball up in the air with the palms of their hands. The game was played using the thick, oval, deep red fruit of the kai tree, which is quite light when dry.

Language

KaI wed, also used as kamut wed for string figure 'ball playing'.

KaI tupitare abubkak kai o atimed kak kai o
Ball strike without dropping it —
ball throw not the ball.

Short description

This is a hand-hitting (volley) game in which players attempt to keep the ball in the air as long as they can.

Players

- Groups of four to eight players

Playing area

- A designated indoor or outdoor area suitable for the activity

Equipment

- A tennis ball, small beach ball, paketa or a small, soft ball

Game play and basic rules

- Players form a circle. The ball is thrown into the air and each player passes it to another by striking the ball upwards with the palm of the hand.
- The ball is usually passed around the circle (players at least 1.8 metres apart) but the game can be played by hitting to any player in the circle other than the one next to the player.

Scoring

In a team contest, the game is won by the group that is able to keep the ball going the best and does not allow it to hit the ground. If the ball hits the ground while attempting to achieve a designated target score, continue the score.

Variations

- Group Kai: Use a sponge ball, beach ball or other light ball. Players hit the ball — with hands and arms only — around the playing area (30 metres x 15 metres) to each other, or divide into two teams and attempt to hit (volley) the ball past the baseline (or a wall) to score. After a score the ball is hit back to the other team to continue play. Only one hit at a time is allowed for players in general play. No physical contact is allowed.
- Allow players to make two contacts (one to control the ball and one to hit it).
- Team Kai: This can be played as a cooperative game in which players as a group attempt to make as many hits as they can without missing. Players stand in a circle about 1 metre apart. One player throws the ball into the air, and the players take turns hitting it upwards with the palm of one hand. They may not catch the ball, but must keep their hands open and flat. A player may not hit the ball twice in a row. Players may sing a song or recite the alphabet as they play (one letter for each hit).
- The ball must be hit to at least head height for younger players and at least 1 metre above head height for more experienced or older players. When the ball hits the ground the game is restarted. The game can be played with the players taking turns in a set order, random hitting (with the ball not hit by the same player twice in a row), or individual players attempting to hit the ball the most number of times.
- Individual contest or practice kai: Players compete to see who can hit the ball into the air (above head height) with their hand the most number of times without it hitting the ground. This can be played using either hand, alternating, or combined with other stunts/skills such as through the legs, etc.

Suggestion

- Use as a practice activity for sports such as tennis, touch football, Australian rules football, volleyball and speedball.
- In a physical education class the game can be played with a number of modifications as part of a hitting skill activity. Progressions are:
  - Players hit the ball around in a circle (either direction).
  - Players hit the ball to other players who call out their name. Attempt to work through the whole team.
  - Players work as a team to hit the ball in the air and go through the letters of the alphabet. No player is allowed to touch it twice in succession or receive it straight back from another player.
  - Give each player a number and work through the numbers in a set order.
  - One player stands in the middle of the circle and the ball is deflected to the other players who in turn hit it back to the middle player. Change the middle player each time any player makes an error. The aim is to keep the centre player in as long as possible.

Teaching points

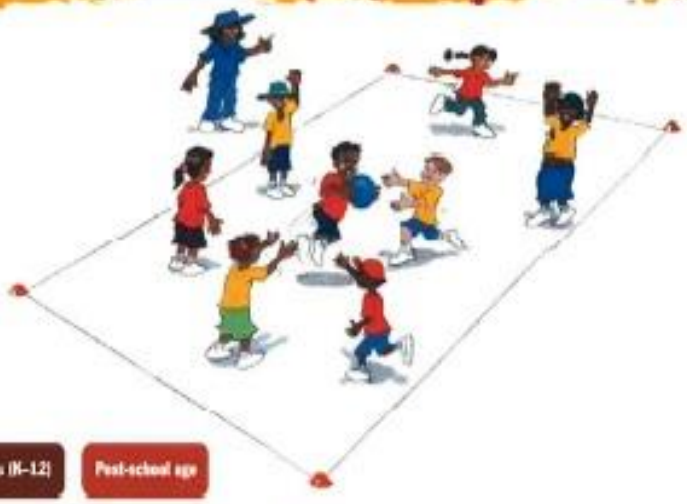
- Players in a circle. Palms of hand up. Hit to start.
- Hit to different players.
- Hit and move back out of the way.
- Count the volleys. Keep going. Let's start again.
- Good work. Call for the ball.
- Watch out for each other.
- Direct the ball to another player.

Kai

Appendix 6
Keentan

keentan

'keen-tan'



All school-age groups (K–12) | Post-school age

Background

A keep-away game of catch-ball was played everywhere by both genders in the northwest central districts of Queensland. Because the action of the players jumping up to catch the ball resembled the movements of a kangaroo, the Kalkadoon people sometimes described this game as the 'kangaroo-play'. The ball itself was made from possum, wallaby or kangaroo hide tied up with twine.

Language

Keentan is 'play' in the Wik-Mungkan language from northern Queensland. This name has been used in the absence of an identifiable Kalkadoon word for the game.

Short description

This is a running, passing and catching team keep-away game.

Players

- Teams of four to eight players

Playing area

- A designated area suitable for the activity

Equipment

- A ball such as a size 3 football (soccer ball) or gator skin ball

Game play and basic rules

- When this game is played in teams the ball is thrown from one player to another player of the same team. The players of the opposing team attempt to intercept the ball while they are off the ground (only a small jump is needed). The ball is only gained if it is caught while the defender is in the air.
- If the ball is dropped or knocked to the ground by a player attempting to catch it, the other team

gains possession. A change of possession also occurs when a thrown ball falls to the ground untouched. No physical contact is allowed.

- Players cannot stop opposing players from moving around the area — no interference is allowed. Passes must be a minimum of 3 metres.
- The player in possession of the ball may run around the playing area for up to 5 metres. This player cannot be guarded (marked) or obstructed while he or she is attempting to pass the ball — the defender must be at least 1 metre away.

Variations

- After catching the ball a player may pivot on one foot only (as in netball). Opposing players must be at least 1 metre away while a pass is attempted.
- All players (team in possession and defenders) must be in the air (two feet off the ground) to play the ball — throwing and catching. Players jump to catch (receive) the ball and jump to pass the ball. (This is recommended as the most successful way to play the game.)

Suggestions

- Practice activities: Practise in pairs or with one player standing 5–10 metres out in front of a line of players. The player in front throws the ball for the first player in line to run out and jump into the air to catch it. After catching the ball and landing on the ground the player then jumps in the air and passes it to the thrower — players may take a few steps with the ball if they wish. Players may also jump into the air to catch the ball and throw it back to the thrower before they land on the ground.
- Team practice. Groups of four to six players form a team by running around and passing in a playing area. Teams could count the number of successful passes or play a cooperative game for fun.

Comment

This game could be used as a skill game in sports such as netball, basketball, Australian rules football, rugby league and rugby union.

Teaching points

- Teams ready. Go.
- Pass and move.
- Call for the ball.
- Move to open spaces. Keep moving.
- No contacts. Watch the guarding.
- Quick passes. Jump to pass, jump to catch.
- Call for the ball.

Appendix 7
Kalq

kalq

'kal-q'

SCHOOL YEARS 4–6 | SCHOOL YEARS 7–9 | SCHOOL YEARS 10–12 | Post-school age

Background

This was a spear game observed being played by some Aboriginal groups on Cape York Peninsula in north Queensland. The men used a throwing stick (woomera) to project a big killing spear (kalq) towards the next player. The spear would travel around the circle of men, who were armed only with their woomera, which they then used to deflect the spear to the next player. When the small boys played they used spears with blunted ends.

Language

Although no name was given to this game in the source it has been named after the word for spear (kalq) in the language of the Yir-Yoront people from north Queensland.

Short description

This is a cooperative team game in which players use a bat or racquet to continuously hit (volley) a ball in the air. The game outlined is a modified form of *kalq* for younger players.

Players

- Four to six players form a circle about 2–3 metres apart — the distance depends on age and ability.

Playing area

- A designated indoor or outdoor area suitable for the activity

Equipment

- Each player has a small bat or a tennis racquet.
- Use a tennis ball or airflow ball.

Game play and basic rules

- Players stand in a circle.
- The aim of the game is to attempt to hit (volley) the ball without it hitting the ground. The ball may not bounce on the ground between hits. An underarm hitting action is the most successful and the ball must go above head height and travel at least 2 metres to another player — players will take turns to hit the ball in the air.
- For younger players two hits — one to control the ball and a second to pass it — may be used.

Variations

- Players stand in a semi-circle with a player 2–3 metres in front. This front player lobs the ball to the first player, who attempts to hit it to the next player and around three to four players in the semi-circle and back to the thrower, who catches the ball. Repeat in the other direction and swap over. The group 'wins' if they can go all the way around and back to the thrower. Swap around positions.
- For younger players allow the ball to bounce on the ground between hits. Players may also be allowed a couple of volley hits to control it before hitting it.
- Hit the ball around the circle of players without allowing it to touch the ground — a player hits the ball to the player next to them in a set direction. Repeat in the other direction.
- As a group, aim for the highest number of consecutive hits (for example, 21).
- Count the most hits (not consecutive) made within a set time limit.

Suggestion

This game could be used as a practice activity for tennis or other racquet sports.

Teaching points

- Players in a circle. Racquet faces up.
- Drop the ball and hit.
- Hit to different players.
- Hit and move back out of the way.
- Count the volleys. Keep going.
- Let's start again.
- Good work. Call for the ball.
- Watch out for each other.
- Direct the ball to another player.

Appendix 8
Dabi

dabi

'dab-i'

Post-school age

Background

Various hockey-type games were played in many areas of the Torres Strait and Papua and New Guinea. A hockey game called kokan was played on Mabuiag Island.

The kokan (or ball) was struck with a rough bat or club, balwain or dabi, which was usually cut from bamboo. On Mabuiag Island the game was played by both genders.

Language

This game is named after the stick (balwain or dabi) used in the game as part of the game of kokan.

Short description

This is a practice version of kokan (hockey), where players are allowed two touches of the ball — usually one to control the ball and another hit to pass to another player as part of a continuous activity. More skilled players could use one contact only.

Players

- Teams of four or five players

Playing area

- A half tennis court or similar sized area

Equipment

- Each player has a hockey or unihoc stick (for the balwain or dabi).
- Use a softball-sized, perforated ball (unihoc) or a tennis ball or larger, light ball as the kokan.

Duration

- Play for 5–7 minutes per game.

Game play and basic rules

- Players hit the kokan to other players within the playing area as part of a continuous and random passing activity.

- The object of the game is for the players to pass the kokan around among themselves while moving around the playing area. Use one or two contacts. The team counts the number of passes made in a designated period of time (for example, one minute). The kokan must travel at least 2–3 metres to count as a pass. It is recommended that players use push passes only

Variations

- One team may challenge another team to find a winner or a number of teams can compete against a time limit.
- Two teams use the same area and perform the same activity — one ball for each team in the area.
- Keep-away dabi: Two teams in the playing area attempt to pass to other players on the same team. Count the number of passes up to ten.
- Players might be restricted to areas of the court. For example, two defenders who stay in their own half, two attackers who stay in the attacking half and a centre who can go anywhere (instead of a centre, a goalkeeper may be used). Players rotate around positions. The goal is 1–2 metres wide.

Safety

- Players are expected to play the game with some consideration for other players.
- For safety reasons the game should be played with no swings of the stick above waist high and the ball cannot be hit or bounced above the knees at any time.

Teaching points

- Ready. Go.
- Pass and move. Two hands on the stick.
- Keep the sticks below the waist. Ball below the ankles.
- One to control, one to pass. Push and pull on the stick to pass.
- Call for the ball. Move to space.
- Be careful of others.
- Count the passes.
- Do not use your body to stop the ball.
- Play on. Keep going. Good. A fast game is a good game. Spread out.
- Pass to everyone.

Appendix 9
Tarnambai

tarnambai

'tar-nam-bai'

All school-age groups (K–12) | Post-school age

Background

Although not a universal activity, athletics-type events were common. On Tiwi (Bathurst) Island the children collected the seed heads of the 'spring rolling grass' (*Spinifex hirsutis*) that grew on the sand hills near the coast. These were taken to the beach and released. The children allowed these to be blown along by the wind and after a start chased after them and picked them up while running at full speed past them.

In the same area the children competed in running and jumping.

In the Batavia area of north Queensland running (*tarnambai*) as well as long-jumping (*brá-acha*) was often indulged in.

Language

Tarnambai means 'running' in the language used in the Batavia area of north Queensland.

Short description

This is a running and chasing game in which a ball is rolled and returned to the starting line.

Game play and basic rules

- Players roll a ball away from their partners, who sprint after it, pick it up on the run after it crosses a line 20 metres away, and return to the starting line. Time the attempts, hold a team relay, or use this as a tabloid event in small groups (two to four players) with a set time (2–3 minutes).

Variations

- Players roll a ball so it passes a line 20 metres away. As soon as it is released they chase and retrieve the ball and return across the starting line. Players time each other. Add the time together for all players to set a class or 'world' record. Repeat for a number of turns or at another time.
- A version of this activity has been successfully used by special-needs students who use wheelchairs. The student works with a partner and after rolling the ball is either pushed or accompanied to retrieve the ball. The ball is placed in the lap of the player in the wheelchair and both players return to the start.

Suggestion

This activity could be included as part of a track-and-field carnival event, recognising traditional Indigenous Australian play culture.

Teaching points

- Players ready. Roller with the ball. Runner ready. Go.
- Run. Let it cross the line. Pick it up. Run hard.
- Change over. Try your best.
- Good work. Time your rolls to their speed so your partner picks it up as it crosses the line.

Appendix 10
Gorri

gorri

'gor-ri'

All school-age groups (R–12) | Post-school age

Background

Bowling-ball or disc games were played by Aboriginal boys and men in all parts of Australia. A piece of rounded bark (disc) was rolled by one of the players for the other boys to use as a target for their short spears.

A version of this activity is still played in the Kimberley area and Northern Territory (and perhaps elsewhere) using flattened tin lids as targets and stones or other missiles.

Language

Gorri was a disc-bowling game played in central Australia.

Short description

This is a game involving the throwing of a ball (for a spear) at a moving target.

Players

- A group of players of up to 20 or more

Playing area

- Use an area about 15–30 metres long. Markers are placed at each end of the area, and throws may only be made by players when the target is between these markers.

Equipment

- Marker cones are used to designate the playing area
- Large gym balls
- Two tennis balls for each player

Game play and basic rules

- The player who will roll the target ball stands 5–10 metres to one side of the playing area, away from the throwing marker, and about 10 metres or more in front of the other players.

- The players who are to throw at the target stand behind a line along one side of the playing area and parallel to the direction that the ball is to be thrown.
- These players call out for the ball to be rolled when they are all ready.
- The thrower calls out 'goal-goal' and starts the ball rolling towards the other end of the area.
- As the target ball rolls between the markers in the playing area the players either throw or roll their tennis balls at the target in an attempt to hit it. Players stop throwing when the rolled ball goes past the marker at the other end of the area.
- After their turn players wait until told and then collect the balls they have thrown. (A whistle is useful here.)
- Vary the speed, distance and angle of the rolls and the number of balls rolled. For younger players some stationary targets might be used.
- Note: When a player makes a hit he or she is greeted with applause. Successful players are expected to be modest about their achievement.

Variations

- Spear the hoop. Use a small hula-hoop or rubber quoit as the target and 1-metre pieces of medium-sized dowel that can be marked with different colours. Players stand behind a line marked 5 metres away from a target area, which is 10–15 metres long. The aim is to either make the hoop (or quoit) stop rolling, or to throw through it.
- Human gorri: Have players either side of the area and 15 metres apart. Players gently roll a soft ball underarm at a target player so they run through the area between them. Players must be hit below the knees. This can be played with three teams (two throwing and one running).
- Attach a cardboard box to a long length of strong twine and pull it through the target area.
- Use spear throwers (woomeras).
- Gorri contest: Conduct a contest for a set time or number of turns. Each player or team has a set number of balls. The player or team that hits the target the most number of times is the winner.

Safety

The area to be used should be marked out and players who roll the ball have no chance of a thrown ball being directed towards them. The players should not move after they have thrown their balls, until a signal to retrieve the balls is given.

Teaching points

- Wait for the signal.
- Pick your target. Stand side on. Ball in your fingers.
- Ready. Ball back behind the ear, wrist bent.
- Step, elbow leads, points the fingers.
- Throw and follow through.
- Wait. Retrieve.

Appendix 11
Student Survey

1. Birrbam Gambay - Student survey

Thank you for taking the time to participate in this study.

The survey is being conducted using Survey Monkey which is based in the United States of America. Information you provide on this survey will be transferred to Survey Monkey's server in the United States of America. By completing this survey, you agree to this transfer.
Please note that all data will be confidential and only the researchers with the login and pasword will have access to the data.

Once again, thank you for your response.

2. Birrbam Gambay - Student Survey

Demographics - This is general information concerning you.
Please click on the answer that describes you.

1. Name:

2. I am a

- girl
- boy

3. I am

- younger than 9 years old
- 9 years old
- 10 years old
- 11 years old
- older than 11 years old

3. Birrbam Gambay Student Survey

How much physical activity I do:-

1. Choose the answers that describe when your body is moving and you get out of breath.
(You may choose more than 1)

- ☐ before school
- ☐ during school in the morning
- ☐ first break
- ☐ during school between breaks
- ☐ second break
- ☐ during school in the afternoon
- ☐ after school
- ☐ weekends

2. How often do you do physical activity during class time?

- ◯ never
- ◯ once a week
- ◯ 2 or 3 times a week
- ◯ everyday
- ◯ 2 or 3 times everyday

4. Birrbam Gambay Student Survey

How much I like doing physical activity and how good I am at physical activity:-

1. Do you like playing physically active games?

- ◯ No not at all, I hate it!
- ◯ Not really, only if I have to!
- ◯ Sometimes, I'm not bothered, I don't really care!
- ◯ Most of the time, I like moving and playing games!
- ◯ Yes I love moving and playing games!

Why do you like or don't like physically active games?

2. How good are you at playing physically active games?

- ◯ I'm really awful!
- ◯ I'm not very good!
- ◯ I'm ok!
- ◯ I'm pretty good!
- ◯ I'm really good!

How do you know you are good at or not so good at playing physically active games?

3. Would you like to do more physical activity at school?

- ◯ No - not at all!
- ◯ Sometimes!
- ◯ Yes - a lot more!

5. Birrbam Gambay Student Survey

How much I like sport and how good I am at physical activity:-

1. Do you like playing individual sports? (e.g athletics, tennis, etc??)

- ◯ No not at all, I hate them!
- ◯ Not really, only if I have to!
- ◯ Sometimes, I'm not bothered, I don't really care!
- ◯ Most of the time, I like playing individual sports!
- ◯ Yes I love individual sports!

Please explain why you like or don't like playing individual sports.

2. How good are you at individual sports?

- ◯ I'm really awful!
- ◯ I'm not very good!
- ◯ I'm ok!
- ◯ I'm pretty good!
- ◯ I'm really good!

How do you know you are good or not so good at playing individual sports?

3. Which individual sport are you best at?

4. Do you like playing team sports? (e.g netball, football, hockey, etc??)

- ◯ No not at all, I hate them!
- ◯ Not really, only if I have to!
- ◯ Sometimes, I'm not bothered, I don't really care!
- ◯ Most of the time, I like playing team sports!
- ◯ Yes I love team sports!

Please explain why you like or don't like playing team sports.

5. How good are you at team sports?

- ◯ I'm really awful!
- ◯ I'm not very good!
- ◯ I'm ok!
- ◯ I'm pretty good!
- ◯ I'm really good!

How do you know you are good or not so good at playing team sports?

6. Which team sport are you best at?

6. Birrbam Gambay Student Survey

How much I like playing with other students:-

1. How often do you play with other children at school?

- ◯ never
- ◯ once a week
- ◯ 2 or 3 times a week
- ◯ once everyday
- ◯ 2 or 3 times everyday

2. How much do you like playing with other children?

- ◯ Not at all - I hate it!
- ◯ Not very much - I don't like it!
- ◯ Sometimes - if I feel like it!
- ◯ Often - I like to play with others!
- ◯ All the time - I love to play with others!

3. Do you think other children like to play with you?

- ◯ No, they stay away from me!
- ◯ Not usually, I play on my own a lot!
- ◯ Sometimes other children join in with me!
- ◯ Most times other children like to play with me!
- ◯ All of the time other children want to play with me!

4. How well do you think children get on with each other in your class?

- ◯ They really do not like each other.
- ◯ They do not like each other.
- ◯ Sometimes they like each other.
- ◯ They like each other.
- ◯ They really like each other.

7. Birrbam Gambay

How my classmates and I work together:-

1. How much do you think students in your class help each other with their school work?

- ◯ Not at all - we do not help each other!
- ◯ Not often - we rarely help each other!
- ◯ Sometimes - when we have to!
- ◯ Often - we help each other!
- ◯ Most of the time we help each other!

2. Do you like helping your classmates with their schoolwork?

- ◯ No, not at all, I hate it!
- ◯ Not really, only if I have to!
- ◯ sometimes, I'm not bothered, I don't really care!
- ◯ Most of the time I like helping my classmates!
- ◯ Yes, I love helping my classmates!

Please explain why you like or don't like helping your classmates with schoolwork.

3. How good are you at helping your classmates with their schoolwork?

- ◯ I'm really awful!
- ◯ I'm not very good!
- ◯ I'm ok!
- ◯ I'm pretty good!
- ◯ I'm really good!

How do you know you are good or not good at helping your classmates with their schoolwork?

4. How much do you work with your classmates in a group on a set task?

- ◯ Not at all!
- ◯ Not very much!
- ◯ Sometimes!
- ◯ Often!
- ◯ Most of the time!

5. Do you like working with your classmates in a group on set tasks?

- ◯ Not at all - I hate it!
- ◯ Not really, only if I have to!
- ◯ Sometimes - I'm not bothered, I don't really care!
- ◯ Most of the time I like working with my classmates!
- ◯ Yes I love working with my classmates!

Please explain why you like or don't like working in groups with your classmates on set tasks.

6. How good are you at working in a group with your classmates on set tasks?

- ◯ I'm really awful!
- ◯ I'm not very good!
- ◯ I'm ok!
- ◯ I'm pretty good!
- ◯ I'm really good!

How do you know you are good at or not so good at working in a group with your classmates on set tasks?

7. Would you like to do more group work in your class time at school?

- ◯ No - not at all!
- ◯ Sometimes!
- ◯ Yes - a lot more!

8. How much fun do you have in class learning?

- ◯ None at all
- ◯ A little bit of fun.
- ◯ Sometimes have fun.
- ◯ Have fun.
- ◯ Most times we have fun.

9. How happy do you think your class is?

- ◯ Very unhappy.
- ◯ Not happy.
- ◯ Sometimes happy.
- ◯ Often happy.
- ◯ Really happy.

Appendix 12
Student Reflective Journal

NAME: _____

ACTIVITY: _____ DATE: _____

Please circle one face that describes you.

1. **Did I play the game today?**


I did **not** play **at all**!


I played **a little bit** of it!


I played **most** of it!


I played **all** of it!

2. **Did I like the game we played today?**


I did **not like any** of it!


I liked **a little bit** of it!


I liked **most** of it!


I liked it **all**!

3. **How good was I at the game we played today?**


I was **no good** at all!


I was **sort of ok** at it!


I was **pretty good** at it!


I was **really good** at it!

4. **Did I help my classmates play the game today?**

Not at all!

A **little bit** of the time!

A **fair bit** of the time!

Most of the time!

5. **How I feel about ME after playing the game today!**

Draw a face that shows how YOU feel! ***DRAW YOUR FACE.***

Appendix 13
Teacher Survey

1. Birrbam Gambay - Teacher Survey

Thank you for taking the time to participate in this study.

The survey is being conducted using Survey Monkey which is based in the United States of America. Information you provide on this survey will be transferred to Survey Monkey's server in the United States of America. By completing this survey, you agree to this transfer.
Please note that all data will be confidential and only the researchers with the login and pasword will have access to the data.

Once again, thank you for your response.

2. Demographics

Demographics - General information concerning school context.
Please select one response only.

1. Please identify gender.

◯ Male ◯ Female

2. Please identify age range.

◯ <30yrs ◯ 30-39yrs ◯ 40-49yrs ◯ 50-59yrs ◯ >59yrs

3. Please identify number of years teaching.

◯ <5yrs ◯ 5-9yrs ◯ 10-14yrs ◯ 15-19yrs ◯ >19yrs

4. Please list your tertiary qualifications.

3. Whole class group behaviors in your classroom.

For each of the following behaviors please rate the frequency of occurrences within your whole class group.
Please select one response only.

1. On task behaviour

○ never ○ rarely ○ sometimes ○ regularly ○ almost always

2. Turn taking

○ never ○ rarely ○ sometimes ○ regularly ○ almost always

3. Cooperative learning

○ never ○ rarely ○ sometimes ○ regularly ○ almost always

4. Democratic decision making

○ never ○ rarely ○ sometimes ○ regularly ○ almost always

5. Focused problem solving

○ never ○ rarely ○ sometimes ○ regularly ○ almost always

6. Respectful discourse

○ never ○ rarely ○ sometimes ○ regularly ○ almost always

7. Off task passive behaviour

○ never ○ rarely ○ sometimes ○ regularly ○ almost always

8. Off task disruptive behaviour

○ never ○ rarely ○ sometimes ○ regularly ○ almost always

9. Disagreements

○ never ○ rarely ○ sometimes ○ regularly ○ almost always

10. Heated discussions

○ never ○ rarely ○ sometimes ○ regularly ○ almost always

11. Total communication breakdowns

○ never ○ rarely ○ sometimes ○ regularly ○ almost always

4. Physical Activity

To gain a sense of time spent, type of activities undertaken and perceptions of physical activity.
Please select one response only, except for question 8.

1. How often do you do physical activity during class time?

- ◯ never
- ◯ once a week
- ◯ 2 or 3 times a week
- ◯ everyday
- ◯ 2 or 3 times everyday

2. For how long do your students undertake physical activity each day in your class time together? (Where they are moving their body and getting out of breath?)

◯ 0 - 10 minutes ◯ 11 - 20 minutes ◯ 21 - 30 minutes ◯ 31 - 45 minutes ◯ 46 - 60 minutes ◯ > 60 minutes

3. How is this time made up?

- ◯ Part practice (several short sessions (10 mins) repeated throughout the day)
- ◯ Whole practice (one large sessions (30 mins) during the day)
- ◯ Combination of both throughout the week

Other (please specify)

4. How is class time physical activity delivered to your students?

- ◯ Incorporated within integrated units of work
- ◯ Taught as separate lessons/activities
- ◯ Used as an energiser

Other (please specify)

5. How would you rate your class's level of enjoyment as a group when participating in physical activities?

◯ most intensely dislike ◯ dislike ◯ Indifferent ◯ like/enjoy ◯ immensely like/enjoy

6. Do you enjoy promoting and actively encouraging your students to undertake regular physical activity?

◯ Intensely dislike ◯ dislike ◯ Indifferent ◯ like/enjoy ◯ Immensely like/enjoy

Please explain why you like or dislike encouraging yours students to undertake regular physical activity.

7. How much knowledge do you have in regards to engaging children in physical activity?

◯ none ◯ a little ◯ an adequate amount ◯ quite a bit ◯ a great deal

8. How confident do you feel incorporating physical activity into your program/curriculum with your students?

◯ not confident ◯ a little hesitant ◯ ok ◯ confident ◯ very confident

9. Please identify some of the difficulties you may be experiencing implementing regular physical activity with your students? (You may choose more than one)

☐ Time ☐ Equipment ☐ Motivating students

☐ Knowledge ☐ Integrating into curriculum ☐ Motivating yourself

☐ Experience ☐ Making it meaningful

Other (please specify)

10. How much professional development have you had to assist you in delivering physical activity sessions to your students?

◯ no sessions in the past year ◯ one session in the past year ◯ two to four sessions in the past year ◯ more than four sessions in the past year

11. What assistance, if any, do you feel you need to actively encourage and support children to be physically active every day?

5. Classroom relationships

Teacher observations and perceptions of relationships within the classroom regarding communication, cooperation and team work.
Please select one response only, except for questions 3 and 7.

1. How long do you estimate that your students spend engaged in cooperative learning tasks each day in your class time together?

◯ 0 - 10 minutes ◯ 11 - 20 minutes ◯ 21 - 30 minutes ◯ 31 - 45 minutes ◯ 46 - 60 minutes ◯ > 60 minutes

2. How is this time made up?

◯ Part practice (several short sessions (10 mins) repeated throughout the day)

◯ Whole practice (one large sessions (30 mins) during the day)

◯ Combination of both throughout the week

Other (please specify)

3. Which of the following processes do you use to facilitate opportunities for discussion and group work within your classroom?
(You may choose more than one)

☐ Brainstorming ☐ Pros/cons/questions

☐ Think/pair/share ☐ Group activity

☐ Hot potato activities(each student adds their ideas) ☐ Group inquiry

Other (please specify)

4. How would you rate your class's level of enjoyment as a group when participaitng in co-operative learning?

◯ Intensely dislike ◯ dislike ◯ indifferent ◯ like/enjoy ◯ Immensely like/enjoy

5. Do you enjoy planning cooperative learning experiences for your students?

◯ Intensely dislike ◯ dislike ◯ indifferent ◯ like/enjoy ◯ Immensely like/enjoy

Please explain why you like or dislike encouraging your students to work cooperatively in class?

6. How much knowledge do you have in regards to facilitating cooperative learning?

◯ none ◯ a little ◯ an adequate amount ◯ quite a bit ◯ a great deal

7. How confident do you feel teaching children to "work cooperatively"?

◯ not confident ◯ a little hesitant ◯ ok ◯ confident ◯ very confident

8. Please identify some of the difficulties you may be experiencing when incorporating a cooperative learning framework into your classroom.
(You may choose more than one)

☐ Time ☐ Equipment ☐ Motivating students

☐ Knowledge ☐ Integrating into curriculum ☐ Motivating yourself

☐ Experience ☐ Making it meaningful

Other (please specify)

9. How much professional development have you had to assist you in facilitating effective cooperative learning strategies in your classroom?

◯ none ◯ a little ◯ an adequate amount ◯ quite a bit ◯ a great deal

10. What assistance, if any, do you feel you need to include cooperative learning approaches in your classroom?

6. Cultural awareness

To identify current knowledge of Indigenous Culture and gain some understanding of peroeptions of cultural awareness and how this can effect reconciliation.
Please select one response only, except for question 8.

1. How much time do you spend each day incorporating Indigenous perspectives in your classroom?

◯ 0 - 10 minutes ◯ 11 - 20 minutes ◯ 21 - 30 minutes ◯ 31 - 45 minutes ◯ 46 - 60 minutes ◯ > 60 minutes

2. How is this time made up?

◯ Part practice (several short sessions (10 mins) repeated throughout the day)

◯ Whole practice (one large sessions (30 mins) during the day)

◯ Combination of both throughout the week

Other (please specify)

3. How are Indigenous perspectives addressed in your classroom?

◯ Incorporated within integrated units of work

◯ Taught as separate lessons/activities

Other (please specify)

4. How would you rate your class's level of enjoyment as a group when engaging with Indigenous perspectives?

◯ Intensely dislike ◯ dislike ◯ Indifferent ◯ like/enjoy ◯ Immensely like/enjoy

5. Do you enjoy embedding Indigenous perspectives in your lessons?

◯ Intensely dislike ◯ dislike ◯ Indifferent ◯ like/enjoy ◯ Immensely like/enjoy

Why or why not? (Please elaborate)

6. How much knowledge do you have of Indigenous culture?

◯ none ◯ a little ◯ an adequate amount ◯ quite a bit ◯ a great deal

7. How confident are you to embed Indigenous perspectives within your classroom?

◯ not confident ◯ a little hesitant ◯ ok ◯ confident ◯ very confident

8. Please identify some of the difficulties you may be experiencing embedding Indigenous perspectives in your lessons.
(You may choose more than one)

- ☐ Time
- ☐ Knowledge
- ☐ Experience
- ☐ Equipment
- ☐ Integrating into curriculum
- ☐ Making it meaningful
- ☐ As situations arise that need to be addressed
- ☐ Motivating students
- ☐ Motivating yourself

Other (please specify)

9. How much professional development have you had to assist you in embedding Indigenous perspectives within your classroom?

- ◯ none
- ◯ a little
- ◯ an adequate amount
- ◯ quite a bit
- ◯ a great deal

10. What assistance, if any, do you feel you need to actively encourage cultural awareness and support reconciliation within your classroom active every day?

Appendix 14
Teacher Semi-structured Interviews

Birrbam Gambay – Teacher Semi-structured Interview Questions

A. Perceptions and attitudes of physical activity:

1. Do you enjoy helping your students to be more physically active? Why? Why not?
2. Do you feel children in your class get 30 mins per day of physical activity? Why? Why not?
3. How do you achieve "smart moves"? Why? Why not?
4. What things have you tried as part of increasing students' participation in physical activity? Did it work? Why? Why not?

B. Perceptions and attitudes of personal relationships, cooperation and teamwork:

1. How would you describe the classroom relationships that exist within your classroom?
2. Do you use cooperative learning as a way to facilitate better relationships and learning in your classroom? Why? Why not?
3. What measures have worked, or not, to enhance cooperation and team work with your students?

C. Perceptions and attitudes of cultural awareness and reconciliation:

1. How do you address and embed Indigenous perspectives in your classroom?
2. Do you feel this is enough? Why? Why not? Obstacles?
3. Do you feel you have adequate knowledge, skills and attitude to facilitate embedding Indigenous perspectives? Why? Why not?

Appendix 15
Teacher Anecdotal Notes

What time was spent on TIG? How did you teach TIG this week? Were there any children who did not participate?

Did you notice any positive changes to the children that could be attributed to the games?

What problems/issues/concerns did you encounter with TIG this week?

Were the games appropriate for your class this week? Would you continue to teach this week's games in your curriculum?

Did you integrate the games into other class work this week?

Is there something else about TIG you think is important for me to know?

Appendix 16
nVivo transcripts

Sample Transcripts of Teacher Interviews

Dimension	School	Teacher	Statement
Physical activity	1	1	TIG undoubtedly increased physical activity and students were more actively involved in playing the games Simple and inclusive nature of the games allowed everyone to participate
	1	2	TIG increased the amount of physical activity and more students participated, especially the non-sporty kids Students are having more fun because they are not competitive. Students feel empowered to learn. Sessions were energetic and active where everyone got involved Increased the amount of physical activity during school hours
	2	4	Increased amount of physical activity during school hours High energy, non-competitive games helped to establish maximum participation Short introductions maximize engagement and include students with disabilities
	3	5	Increase amount of physical activity and the children loved it. Everyone was included regardless of ability. Students always wanted more than just 30 mins. Great variety of games. TIG has enabled me to give students a range of games to play We have played TIG every day and it has increased their activity levels
	4	6	Everyone was involved. TIG helps us to meet daily physical activity goals.
	4	7	TIG increased physical activity and the games went on for much longer than expected because kids were enjoying them Some continued to play at lunchtimes and at home.
	4	8	Students definitely played more often. They are more active and not realising it as they are having so much fun.
	5	9	TIG has made physical activity more enjoyable for all students Increased participation levels
	5	10	Children loved it, everyone could excel at one game or another. TIG has especially helped to get the girls to participate in physical activity

Dimension	School	Teacher	Statement
Cooperation and teamwork	1	1	Increased and were more tolerant of each other's views. The games were fun and promoted respectful behaviour and encouraged students to cooperate
	1	2	Had more empathy for one another The games were so inclusive that students enjoyed playing the games and encouraged them to help their peers.
	2	3	Students enthusiasm for the games helped the class feel connected and nurtured team work TIG definitely increased their levels of cooperation.
	2	4	The positive interactions developed a great sense of community Worked together much better
	3	5	Really helped students to develop empathy for one another TIG increased their cooperation and children can laugh at themselves and enjoy playing
	4	6	Students had a better understanding of one another My students all get along very well now since TIG My students are more friendly and helpful to one another since TIG
	4	7	Developed much more empathy for one another.
	4	8	Listened to each other and got along much better as a group. Increased peer teaching through TIG
	5	9	TIG really helped to enhance students communication skills Their cooperation has improved and they are learning to get on with it by doing TIG daily
	5	10	Really helped to develop empathy for one another My students are highly motivated and very competitive, and TIG helped to increase their empathy and cooperation with one another

Dimension	School	Teacher	Statement
Indigenous perspectives	1	1	Indigenous students identified with their culture and were proud of these Indigenous games TIG gives great background information about the activity, the meaning, purpose and significance of the games within Indigenous communities
	1	2	Increased discussion. Students less reluctant to discuss issues and more aware of how this impacts upon Indigenous peoples. TIG gives prominent links to Indigenous culture
	2	3	TIG is really good for kids, it is a great resource. Wide variety of games that relate well to kids. I try to integrate IP's through TIG now into a number of KLAs
	2	4	TIG provided the opportunity for students to engage with culture I am more comfortable now that I have a better understanding of the cultural significance of the games
	3	5	I teach a unit on the stolen generation through history and TIG has helped to identify culture and games. Increased their understanding of how and why Indigenous culture is important to everyone.
	4	6	Increased student understanding of survival and Indigenous teachings. Playing TIG made it much more adaptable and broke down many barriers. TIG PD made me feel more confident and empowered me to embed Indigenous perspectives more readily.
	4	7	Increased the awareness of the games and why they were played. TIG has made me more confident to discuss Indigenous issues, and shows I am trying and that I recognise and respect other cultures. Indigenous students identified with their culture and were proud of these Indigenous games
	4	8	Not as much stigma attached to the games and students felt they could talk about it more openly, rather than the serious issues kids of this age find difficult to grasp. Small informal chunks of discussion worked better.
	5	9	Easily integrated TIG into curriculum. Increased respect and attitude for the ATSI culture. ATSI students were very proud of their own culture and games and this increased their confidence.
	5	10	Good to have a subliminal embedding of Indigenous perspectives Allowed for deeper understanding of cultural issues through games and they helped to understand the non-competitive idea of why cooperation was important.

Dimension	School	Teacher	Statement
Self-efficacy	1	1	Different levels of challenge helped students to improve their technique and they were really proud of their efforts Students want to participate in TIG. Weak students are also wanted to participate in TIG. Great inclusion value for students. Students with no chance at all now have a chance. Games are entertaining and enjoyable.
	1	2	The improvements in their social interaction and their skill and co-ordination helps their health and well-being This has increased for the non-sporty kids. Increased the sporty kids respect for others abilities.
	2	3	Shy kids who have never been interested in physical activity now take part and communicate with others in the class. Games were fun and the laughter was infectious Self-efficacy increased especially for the kids with negative attitudes. They looked forward to TIG and were really involved and started to laugh at themselves.
	2	4	TIG has helped to build self-esteem, fitness and friendships TIG Increased confidence especially in the uncoordinated kids who would not have participated in other games. Encouraged kids to change their aggressive style, and developed more empathy for weaker ones.
	3	5	TIG has helped with students social and emotional learning Students loved it and felt great and happy after playing TIG. Especially weaker students who really felt they had something to contribute to the success of the games. Students loved playing TIG and cheered each other on. They always returned happy and smiling and had lots of fun playing TIG. They didn't care if they won, just that they had fun playing.
	4	6	There is a high Indigenous population and the Indigenous kids were very interested in TIG and it helped them to get involved with others. Students felt good about themselves after the games and they enjoyed playing them.
	4	7	TIG has helped student develop empathy for others Gave students better social skills at lunch times. The variety of games allowed different kids to shine. Increased the idea of group success and everyone found a game that they particularly liked.
	4	8	Gave students better social skills at lunch times. The variety of games allowed different kids to shine. Increased the idea of group success and everyone found a game that they particularly liked.
	5	9	The increase in physical activity increased confidence of students. They were begging to go out and play TIG. The ATSI students who were normally quite withdrawn really got involved in TIG and this carried over into their class work.
	5	10	The non-competitive philosophy stopped weaker kids from shying away from TIG. They were more willing to participate and have a go, they wanted to do it, not because they had to do it. The different context provided a different attitude in the kids. All students had a go and were eager to do so due to the non-competitive nature of the games. The kids felt like they were not letting anyone down.

Dimension	School	Teacher	Statement
Future plans	1	1	We will continue to play TIG because they are excellent Will use this and develop further resources to integrate TIG into other KLAs and with other year groups. We will look at applying for grants for further equipment too.
	1	2	We will make a commitment on the daily timetable to play TIG Continue with teaching TIG. Expand TIG through the school and teach other staff more games. Apply for more funding for games equipment. Allows for a non-tokenistic approach to embedding Indigenous perspectives and for increasing physical activity.
	2	3	We will use TIG to construct units of work Definitely repeat this in future years.
	2	4	School timetabled TIG with a school wide program Continue with it next year. We will conduct TIG awareness on pupil free days next year and share it with staff at staff meetings. Wrote a science unit of work which related directly to TIG. This involved picking a game and acknowledging history and origins and rules and had to self-reflect as to why they enjoyed this so much.
	3	5	Trying to relate to IPs. Mini murries has developed from this where Indigenous pre prep come along and play TIG. Continue this in future years. HPE teacher used TIG to improve their fundamental motor skills.
	4	6	Set aside specific time in the day for TIG
	4	7	Find out what games the local Indigenous community might know of or have played in the past Mentoring year groups to play TIG. My students are teaching TIG to younger "buddies" in lower year groups in a timetabled activity session.
	4	8	Give students ownership of the games by allowing them to create variations for games. Integrating them more fully into the curriculum. Expanding across age groups. Kids running TIG themselves at lunchtimes.
	5	9	Linking Indigenous students to games from the areas they are from Resourcing has been a major factor contributing to the success of TIG. The students are teaching younger students so that it is sustainable and that it runs across age groups.
	5	10	Students teach the staff the games so they too can play them with their students Would like to implement TIG at lunch times with other age groups. There is a school commitment to developing TIG across school community.

Appendix 17
University of Southern Queensland Ethics Approval

TOOWOOMBA QUEENSLAND 4350 CRICOS: QLD 00244B NSW 02225M

AUSTRALIA

TELEPHONE +61 7 4631 2300

www.usq.edu.au

OFFICE OF RESEARCH AND HIGHER DEGREES
William Farmer
Ethics Officer
PHONE (07) 4631 2690 | FAX (07) 4631 1995
EMAIL ethics@usq.edu.au

Tuesday, 20 January 2015

Sharon Louth
Faculty of Education
USQ Fraser Coast Campus

Dear Sharon

The USQ Fast Track Human Research Ethics Committee (FTHREC) assessed your application and agreed that your proposal meets the requirements of the *National Statement on Ethical Conduct in Human Research (2007)*. Your project has been endorsed and full ethics approval granted.

Project Title	Birrbam Gambay: An investigation of the impact of traditional indigenous games on primary school students.
Approval no.	H10REA238
Expiry date	31/12/2013
FTHREC Decision	**Approved as submitted**

The standard conditions of this approval are:

(a) conduct the project strictly in accordance with the proposal submitted and granted ethics approval, including any amendments made to the proposal required by the HREC
(b) advise (email: ethics@usq.edu.au) immediately of any complaints or other issues in relation to the project which may warrant review of the ethical approval of the project
(c) make submission for approval of amendments to the approved project before implementing such changes
(d) provide a 'progress report' for every year of approval
(e) provide a 'final report' when the project is complete
(f) advise in writing if the project has been discontinued.

For (c) to (e) proformas are available on the USQ ethics website:
http://www.usq.edu.au/research/ethicsbio/human

Please note that failure to comply with the conditions of approval and the *National Statement* may result in withdrawal of approval for the project.

You may now commence your project. I wish you all the best for the conduct of the project.

William Farmer
Ethics Officer
Office of Research and Higher Degrees

Appendix 18
Brisbane Catholic Education Ethics Approval

Catholic Education
Archdiocese of Brisbane

A11.071 LE:pp ref: 2010/112
17 November 2010

Ms Sharon Louth
PO Box 910
Hervey Bay QLD 4655

Dear Ms Louth

Thank you for your application regarding permission to approach Brisbane Catholic Education schools to conduct your research on *'Birrbam Gambay: An investigation of the impact of traditional indigenous games on primary schools students'*. Permission is granted to approach the schools listed below:

- Star of the Sea School, Torquay
- Xavier Catholic College, Hervey Bay

I would ask you to contact the principals of the respective schools seeking their involvement in the project.

Please note that participation in your study is at the discretion of each of the principals.

If you have any further queries, please contact me on (07) 3033 7427.

Yours sincerely

Mrs Lisa Eastment
Research Coordinator
Catholic Education
Archdiocese of Brisbane

ALL CORRESPONDENCE:

Brisbane Catholic Education
GPO Box 1201
Brisbane QLD 4001
Phone: (07) 3033 7000
Fax: (07) 3844 5101
www.bne.catholic.edu.au
ABN 49 991 006 857

OFFICE LOCATIONS:

Dutton Park
243 Gladstone Road
Phone: (07) 3033 7000

West End
199 Montague Road
Phone: (07) 3033 7000

North Lakes
12 Endeavour Blvd
Phone: (07) 3490 1700

Springwood
5-7 Laurinda Crescent
Phone: (07) 3440 7900

Fr Bernard O'Shea Inservice Centre, Wilston
19 Lovedale St
Phone: (07) 3033 7111

Ngutana-Lui Aboriginal and Torres Strait Islander Cultural Studies Centre, Inala
100 Lilac St
Phone: (07) 3033 7200

Appendix 19
Education Queensland Ethics Approval

Queensland Government

29 November 2010

Mrs Sharon Louth
University of Southern Queensland
PO Box 910
Pialba Qld 4655

Department of
Education and Training

Dear Mrs Louth

Thank you for your application seeking approval to conduct research titled *"Birrbam Gambay: An investigation of the impact of Traditional Indigenous Games on primary school students"* in Queensland State schools. I wish to advise that your application has been approved.

You can approach principals of the schools nominated in your application and invite them to participate in your research project, and as detailed in the department's *Research Guidelines*:

- You need to obtain consent from the relevant principals before your research project can commence.
- Principals have the right to decline participation if they consider that the research will cause undue disruption to educational programs in their schools.
- Principals have the right to monitor any research activities conducted in their facilities and can withdraw their support at any time.

This approval has been granted on the basis of the information you have provided in your research proposal and is subject to the conditions detailed below.

- Any changes required by your institution's ethics committee must be submitted to the Department of Education and Training for consideration before you proceed.
- Any variations to the research proposal as originally submitted data collection or additional research undertaken with the data, or publication based on the data beyond what is normally associated with academic studies will require the submission of a new application.
- Perusal of and adherence to the department's standard *Terms and Conditions of Approval to Conduct Research* in departmental sites is required as outlined in the document available at http://education.qld.gov.au/corporate/research/terms_conditions.pdf
- As part of these terms and conditions, at the conclusion of your study you are required to provide this Office and principals of participating schools with a summary of your research results and any associated published papers or materials in hard copy. You are also requested to submit the documents in electronic format, or provide a link to an online location if possible, to research.stratpol@deta.qld.gov.au. **Failure to provide a report on your research will preclude you from undertaking any future research in Queensland State schools.**

Education House
30 Mary Street Brisbane 4000
PO Box 15033 City East
Queensland 4002 Australia
Telephone 131 304
Website www.deta.qld.gov.au
ABN 76 337 613 647

Please note that this letter constitutes approval to invite principals to participate in the research project as outlined in your research application. This approval does not constitute ethics approval or support for the general and commercial use of an intervention or curriculum program, software program or other enterprise that you may be evaluating as part of your research.

Should you require further information on the research application process, please feel free to contact Dr Chris Diamond, Principal Research Officer, Strategic Policy and Research on (07) 3237 0417. Please quote the file number 550/27/1013 in future correspondence.

I wish your study every success.

Yours sincerely

John F. Dungan

Dr John Dungan
Director
Strategic Research
Strategic Policy and Research
Trim ref: 10/320581

Appendix 20
Participant Information Statement

The University of Southern Queensland

Participant Information Sheet

TO: Principals and Teachers

Full Project Title: Birrbam Gambay: An investigation of traditional indigenous games programs.

Principal Researcher: Sharon Louth

Associate Researcher: Associate Professor Romina Jamieson-Proctor

Associate Researcher: Dr. Patrick O'Brien

I teach at USQ Fraser Coast Campus in the Faculty of Education, and have begun a postgraduate degree in the Doctor of Philosophy program. I would like to invite you to take part in this research project.

You are invited to participate in this research project because it has a regional community focus and your school is an integral part of the Fraser Coast community. The study is aimed towards Year 5 students and their teachers in schools across the Fraser Coast. The project also draws on government initiatives which your school supports.

Please read this Plain Language Statement carefully. Its purpose is to explain to you as openly and clearly as possible all the procedures involved so that you can make a fully informed decision as to whether you are going to participate. Feel free to ask questions about any information in the document.

Once you understand what the project is about and if you agree to take part in it, it is asked that you sign the Consent Form. By signing the Consent Form, you indicate that you understand the information and that you give your consent to participate in the research project.

1. Purpose of Research

The purpose of this project is to create a professional development resource package to assist teachers to facilitate and promote physical activity, inclusiveness, self-confidence, self-esteem, cooperation, teamwork and cultural awareness by embedding Traditional Indigenous Games through an integrated curriculum. The research will go towards a Doctor of Philosophy postgraduate degree.

Current concerns over children's health with respect to the amount of time children spend taking part in physical activity have led to responses from various levels of government to encourage healthy lifestyles and physical activity through initiatives within and outside of schools. Participation in sport addresses physical activity levels, but through the very nature of competitive sport, is not inclusive of the whole population. Health and Physical Education as a key learning area in the curriculum, should be inclusive, but does draw on sports and games models of education, which are competitive and encourage survival of the fittest, as opposed to survival of the group. The negative impact this approach has on a child's self-esteem and their resultant perception and willingness to participate in HPE and sport needs to be addressed if we are to promote health and physical activity to our children. Australia's Indigenous people played many traditional games that were by nature cooperative, and acted to prepare children for life within their cooperative society. These games were researched and collected by Dr. Ken Edwards with support from the Australian Sports Commission and compiled to produce the "Yulunga"(2008) resource. The intervention project will occur within Fraser Coast and be trialled in five primary schools, targeting year 5 classes, and compared to five control schools and their year five classes, with similar demographics.

2. Procedures

Participation in this project will involve

- Participating in professional development sessions prior to, during and post test phase.

- Initial PD sessions will be conducted over two days.
- Teachers of year 5 classes will be asked to complete pre and post-trial electronic surveys which will take up to 15 mins to complete.
- Teachers of year 5 classes will also be interviewed pre and post-trial which will take up to 30 mins and these will be audio recorded.
- Teachers will use class teaching time allocated to “smart moves” to teach Traditional Indigenous Games to their students over 2 terms.
- Year 5 students will be asked to complete pre and post-trial electronic surveys which will take up to 15 mins to complete.
- Year 5 students will participate in TIG during their normal classroom lessons. Students will complete a reflections scale after a selection of these.
- The research will be monitored via email communications with participant teachers and the principal researcher, and supplemented with fortnightly support and resource meetings.
- The study will promote a holistic strategy that addresses the health and well-being of both teachers and students in schools. The project will provide support and professional development to teachers by creating a multimedia resource package so that they can facilitate participation in physical activity for their students, enhance the confidence and self-esteem of their students, promote cooperation and team work amongst their students, and embed indigenous perspectives into their classroom. The project will enable children to enjoy being physically active, enhance their perceptions of "self", and have a greater understanding, appreciation and engagement of Indigenous culture.
- Playing Traditional Indigenous Games will involve physical activity hence can involve collisions, slips, trips and falls, which are the normal risks associated with and Health and Physical Education lessons. Normal precautions will be adopted to minimise such risks. I anticipate a positive experience that will be enjoyed by all.
- Benefits of enjoyment, participation in physical activity and social cohesion to enhance health and well-being outweigh minor risk of collision, slips, trips and falls, as is currently seen in practice within schools in Health and Physical Education lessons.

3. Confidentiality

The data from the surveys will be collected electronically and stored in password protected computer files. Data collected manually, via surveys (if no internet access is available) and interviews (including transcripts and audio files) will be stored in a locked filing cabinet. Data will be destroyed after the mandatory 5 yr term on completion of the study.

All data collected from surveys and interviews are confidential. Neither individuals nor schools will be identified. If any participants wish not to be included in the photos this can be done.

In any publication, information will be provided in such a way that you cannot be identified. Talent release forms will be used prior to collecting photos.

Voluntary Participation

Participation is entirely voluntary. **If you do not wish to take part you are not obliged to.** If you decide to take part and later change your mind, you are free to withdraw from the project at any stage. Any information already obtained from you will be removed and your data withdrawn.

Your decision whether to take part or not to take part, or to take part and then withdraw, will not affect your ***relationship with*** the University of Southern Queensland.

Before you make your decision, a member of the research team will be available to answer any questions you have about the research project. You can ask for any information you want. Sign the Consent Form only after you have had a chance to ask your questions and have received satisfactory answers.

If you decide to withdraw from this project, please notify a member of the research team.

4. Queries or Concerns

Should you have any queries regarding the progress or conduct of this research, you can contact the principal researcher:

Sharon Louth
Faculty of Education
University of Southern Queensland
PO Box 910
Hervey Bay QUEENSLAND 4655

Telephone: 4194 3107
Mobile: 0402 240 200
Email:***louths@usq.edu.au***

If you have any ethical concerns with how the research is being conducted or any queries about your rights as a participant please feel free to contact the University of Southern Queensland Ethics Officer on the following details.

Ethics and Research Integrity Officer
Office of Research and Higher Degrees
University of Southern Queensland
West Street, Toowoomba 4350
Ph: +61 7 4631 2690
Email: ***ethics@usq.edu.au***

Appendix 21
Participant Consent Form

The University of Southern Queensland

Consent Form

TO: Parents and Students

Full Project Title: Birrbam Gambay: An investigation of traditional indigenous games programs.

Principal Researcher: Sharon Louth

Associate Researchers: Associate Professor Romina Jamieson-Proctor

Dr. Patrick O'Brien

- I have read the Participant Information Sheet and the nature and purpose of the research project has been explained to me. I understand and agree to take part.
- I understand the purpose of the research project and my involvement in it.
- I understand that I may withdraw from the research project at any stage and that this will not affect my status now or in the future.
- I understand that while information gained during the study may be published, I will not be identified and my personal results will remain confidential.
- I understand that I will be videotaped / photographed during the study.
- I understand that photographs and videotapes from the study will be used in a professional development package within schools and published with research findings.

Name of participant…….....

Signed……**Date**…….

Name of parent…….....

Signed……**Date**…….

If you have any ethical concerns with how the research is being conducted or any queries about your rights as a participant please feel free to contact the University of Southern Queensland Ethics Officer on the following details.

Ethics and Research Integrity Officer
Office of Research and Higher Degrees
University of Southern Queensland
West Street, Toowoomba 4350
Ph: +61 7 4631 2690
Email: ***ethics@usq.edu.au***

Appendix 22
University of Southern Queensland Talent Release Form

TALENT RELEASE

Job Number

□ PHOTOGRAPHY □ AUDIO □ VIDEO

EVENT or PROJECT:

Permission is hereby given to The University of Southern Queensland (USQ) to take photographs, vision and or audio of me, archive works, make copies of works, sell the same, and publish the work in any form, in whole or in part, and distribute by any medium including, but not limited to, print media, Internet, CD-Rom, other multi-media uses or graphic representation, vision or audio.

Permission is given for The University of Southern Queensland to use my photograph, record vision and/or sound of me for:

a. the production of resources/programs that will assist USQ in its educational mission,

b. promoting and advertising resource materials, productions, activities that would assist USQ with further educational and promotional requirements,

c. the promotion of the USQ its courses, programs, services and activities; and

d. any commercial distribution of the resulting educational or promotional products/resources.

The University of Southern Queensland undertakes not to use material in any way that would cause embarrassment or misrepresent the intent of my participation. USQ is not obliged to make use of the material. The University of Southern Queensland understands that I own the intellectual property rights of sound or music created by my and this release form is not meant to transfer my ownership or copyright.

Name *(Please Print)*

Address:

Telephone:

It is understood that no fee or payment will be provided for giving this permission and any claim for remuneration, residuals, royalties or any other payment in respect of usage by USQ is waived.

Participant's

Signature: _____ _____ Date: _____

[print name] [signature]

[NB: If Participant is under 16 years of age the Parent/Guardian must sign on behalf of the Participant]

Parent/Guardian: _____ _____ Date: _____

[Circle which is applicable] [print name] [signature]

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The University of Southern Queensland ● Toowoomba • Queensland • 4350
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