

# Declining levels of PHYSICAL EDUCATION

**TEACHER EDUCATION & DEVELOPMENT | RESEARCH ARTICLE**

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## TEACHER EDUCATION & DEVELOPMENT | RESEARCH ARTICLE

# Taking the “physical” out of physical education

Wayne Usher<sup>1\*</sup>, Richard Keegan<sup>2</sup> and Allan Edwards<sup>2</sup>

**Abstract:** Australian youth (5–17) are exhibiting the most alarming statistics surrounding poor physical activity (PA) levels and increasing correlating chronic disease trends (i.e. obesity). With schools well positioned to address such concerns, this study aimed to determine the type, frequency and intensity levels of PA being undertaken by children during their physical education (PE) classes (Queensland, Australia). A cross-sectional descriptive study design was adopted, using a mixed methods approach across 10 primary schools (grades 1–5), with the purpose of determining if in fact there are appropriate PA levels undertaken and implemented by PE teachers, for school-aged students. Observation of 30 students was used to assess PE class practice with Primary Outcome Variables collected from *Student Activity*, *Lesson Context* and *Teacher Interaction*. Further questionnaires were administered to students ( $n = 80$ ), PE specialists ( $n = 10$ ) and principals ( $n = 10$ ). Whilst this study specifically addresses the importance of correctly structured PE lessons, further attention is directed towards identifying the impact appropriately structured PA levels have on students’ wider social and emotional well-being. Schools are encouraged to prioritise the importance of PA at a school level, for example, through re-engaging key stakeholders to ensure the delivery methods meet national and international PA guidelines.

**Subjects:** Education; Physical Education Studies; Primary Physical Education

**Keywords:** physical activity; physical education; fitness; chronic disease; physical education teachers



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### ABOUT THE AUTHORS

The authors are experts in the fields of: The psychology of healthy lifestyles; physical literacy; youth development through sport; physical activity for health, physical education; sport psychology; exercise psychology; applied practice in sport psychology, sport; psychology; motivation; confidence; goal setting; coaching elite athletes. They are on a number of boards and committees associate with physical literacy, education and sport. Between them, they have practical experiences that span across primary, secondary and higher educational settings. Research interests include school and community health, physical education, modern classroom practices and curriculum development/implementation.

### PUBLIC INTEREST STATEMENT

Despite comprehensive national health promotion campaigns and policy implementation, Australians, of all ages, are recorded as being increasingly physically inactive and undertake lower than the recommended guidelines for daily physical activity (PA). Surprisingly, Australian youth (5–17) are exhibiting the most alarming statistics surrounding poor PA levels. Given that, on average, children and adolescents spend approximately half of their waking hours in school during the school year, arguably schools play an important role in shaping children’s early exposure and experience of physical education (PE) and PA. Therefore, this study will establish reliable baselines on students’ PA levels demonstrated in school-based PE delivery modes, lesson context and how teachers/principals promotion of PA and fitness. Currently PE, attempts are failing to meet international guidelines associated with appropriate PA levels. This research adds to the growing body of international literature by providing potential strategies and recommendations for improving school.

## 1. Introduction

### 1.1. *The declining nature of physical activity*

Positive physical activity (PA) habits, developed early in life, can lead to ongoing healthy behaviours and increased general well-being, which have been shown to track throughout a lifetime (Australian Institute of Health and Welfare [AIHW], 2012). What is more, daily moderate<sup>1</sup> to vigorous<sup>2</sup> PA is key to reducing the risk of obesity, Type 2 diabetes, cardiovascular disease, and building and maintaining a strong musculoskeletal system (Active Healthy Kids Australia, 2014).

However, despite comprehensive national health promotion campaigns and policy implementation, Australians, of all ages, are recorded as being increasingly physically inactive and undertake lower than the recommended guidelines for daily physical PA (Active Healthy Kids Australia, 2014). Surprisingly, Australian youth (5–17) are exhibiting the most alarming statistics surrounding poor PA levels, leading to increasing levels of obesity (Active Healthy Kids Australia, 2014). Notably, Australian PA guidelines indicate that children aged 5–17 years should undertake at least 60 min of moderate to vigorous PA every day, with a maximum of two hours screen-based activity for entertainment/non-educational purposes a day.

National PA guidelines have been developed for Australia's youth (Active Healthy Kids Australia, 2014). These guidelines are supported by a rigorous evidence review process that maintains the positive relationship between regular PA (intensity, frequency, type) and positive health outcome indicators, in contrary to the relationship between sedentary behaviour/sitting time and negative health outcome indicators. With this said, and given that, on average, children and adolescents spend approximately half of their waking hours in school during the year (Fox, Cooper, & McKenna, 2004), arguably schools play an important role in shaping children's early exposure and experience of PE and PA.

### 1.2. *The importance of physical literacy*

Australian research gives rise to concerns that high levels of physical inactivity in the Australian community may be further exacerbated by poor fundamental movement skills in Australian children. Physical literacy (PL) is the foundation of physical skills that children need to possess or develop in order to receive the inherent benefits of taking part in PA for lifelong enjoyment and success. Importantly, PL is a concept that is becoming a significant springboard from which both PE and PA leverage off, and, in its purest sense, is viewed as a vehicle for promoting robust PE in schools. From an Australian context, many primary schools promote PL as part of their PE programme and the general curriculum. However, PL, and its intrinsic value throughout PE is perhaps misunderstood, or in a state of decline, with many key stakeholders, who confess to be advocates of PE, not prompting the components which make for a physically literate student.

Contemporary research goes to reinforce historical accounts which maintain the proportion of children who displayed mastery of each fundamental movement skill (run, vertical jump, catch, strike, kick and overhand throw) did not exceed 40% (Booth, Macaskill, & McLellan, 1997). What is more, the implementation of correctly structured PE classes promotes many of the foundational skills necessary for developing PL amongst children. Similarly, it is well documented that improved levels of PL amongst youth have many other significant outcomes, such as self-concept, childhood obesity and heightened academic performance (Fox, 2010). Examples of existing programmes which address PL have been operating throughout Canada, the UK and US. Each programme “operationalise PL as the early development of fundamental motor skills and exposure to sport” (Fox, 2010). However, Keegan, Keegan, Daley, Ordway, and Edwards (2013) maintain that Australia has an increasing gap when it comes to designing programmes which reflects the full range of PL components, and consequently supporting more benefits for Australian children. Given the increasing levels of physical inactivity amongst Australian youth and the intrinsic nexus between PA, PL, PE and youth health, it would seem reasonable that such a research project was undertaken.

This research will investigate if PE classes are ensuring that children are adequately undertaking appropriate levels of PA (moderate to vigorous) and that school infrastructure, priorities and expertise are conducive to promoting and maintaining high levels of quality PA amongst youth. Therefore, the aim of this study was to establish reliable quantitative and qualitative baselines on students' PA levels demonstrated in school-based PE delivery modes, lesson context (LC) and how teachers and principals interact regarding the promotion of PA within a class and general school context. Lastly, this research concludes by highlighting how an integrated interaction throughout PE classes can facilitate lifelong learning and heighten PL in students.

## 2. Method

### 2.1. Participants

Ten primary schools were randomly chosen from across the region (Queensland, Australia). There are two objectives to this study, these being: (1) to obtain quantitative data on student PA levels, the LC in which they occur and how teachers interact regarding promoting PA and fitness during school-based PE lessons and (2) to collect qualitative data examining students', specialist PE teachers' and school principals' attitudes towards the implementation of primary school-based PE lessons. There were three target participant groups, which included: (1) school-aged students (grades 1–5 [PA observational –  $n = 30$ , survey –  $n = 80$ ]), (2) specialist PE teachers (survey –  $n = 10$ ) and (3) principals (survey –  $n = 10$ ). Selection criterion consisted of participating PE lessons to be: (1) delivered from a primary school, (2) led by a specialist PE teacher and (3) lessons were conducted on an oval or undercover area. In an effort to minimise bias and maintain confidentiality, schools and PE lessons were randomly selected and teachers given limited notice and all participants' personal and school details were kept anonymous.

### 2.2. Study design

A cross sectional, descriptive study design, employing a mixed method (qualitative and quantitative) approach was used to establish PA intensity, frequency and attitudes regarding the implementation of PE from a variety of stakeholders. The main quantitative instrument was the “System for Observing Fitness Instruction Time” (SOFIT) (McKenzie, 2002). This instrument measured three Primary Outcome Variables (POV), with these being: (1) *Student Activity*—(a) lying down, (b) sitting, (c) standing, (d) walking and (e) moderate/vigorous, (2) *LC*—(a) management, (b) knowledge, (c) fitness, (d) skill, (e) game play and (f) other, finally (3) *Teacher Interaction*—(a) no promotion, (b) promotes fitness outside class and (c) promotes fitness in class. To heighten internal and external validity and reliability levels, 6 research assistants were trained as observers in SOFIT. Research assistances were given guidance as to how to differentiate between student activity (SA) levels, with specific attention given to what constitutes “moderate” and “vigorous” activity levels. Reliability checks included: (1) 4 h of practical and theoretical training pertaining to data collection methods (SOFIT), (2) reaching ‘gold standard’ training in field practice and (3) ensuring two observers independently coded the same student/s in the same PE lesson.

### 2.3. Data collection

Data were collected throughout October 2013–April 2014 from participating schools. Data were further analysed throughout 2014 and 2015. SOFIT was used to collect the POV by using direct observations of 30 PE lessons from across the participating region. Observations of POV were recorded every 20 s by being paced by a synchronised alarm. SOFIT data were collected and recorded by the number of minutes spent on each of the POV during three intervals (identified as— $t1$ – $t3$ ). SA levels were collected by observing the proportion of time spent in “lying down” through to “moderate/vigorous” PA levels. LC and teacher interaction variables were the proportion of time spent in the identified POV categories.

Additional qualitative data were collected via three separate paper-based questionnaires, administered to students, specialist PE teachers and principals. The aim of the questionnaires was used to establish attitudes towards the implementation of school-based PE lesson and PA levels.

Questionnaires utilised a variety of data collection techniques such as Likert scales, open-ended questions, point ordinal ranking and semantic differential scales.

#### **2.4. Data analysis**

Quantitative data analysis was undertaken using Statistical Package for the Social Sciences (SPSS) (PASW18). Initial data preparation involved the development of one integrated SPSS file to incorporate all responses from the final surveys. The quantitative analysis techniques employed in this study included descriptive statistics, *t*-test and Chi square. Additionally, analysis of variance (ANOVA) and *post hoc* tests were undertaken to obtain additional information on the findings. Descriptive statistics were used to summarise the responses identified by the research objective. The frequencies analyses (descriptive statistics) were used to provide a profile of respondents by characteristics (e.g. gender, age, grade etc.). ANOVA tests were then undertaken to assess significance for the between-groups variables (e.g. grade levels and game play). Statistically significant differences were reported to outline what measures have shown more pronounced differences.

Qualitative data analysis was undertaken using the software tool Leximancer Crowd Tag. Content analysis was carried out on the data collected from particular responses to the questionnaire; from here themes and concepts were identified. Direct quotes from participants' have been used to substantiate and highlight major findings. Qualitative data analysis procedures provided an important tool to understand hidden information, build a profile of participants and link data-sets. Therefore, the qualitative data analysis was generally used to obtain a greater level of understanding of what students, PE specialists and principals regard as effective implementation of PE classes. This, in turn, underpinned some of the quantitative findings identified earlier in the study. Ethics was obtained via Griffith University (Protocol Number GU Ref No: EDN/87/13/HREC) and from the Department of Education, Training and Employment (September, 2013).

### **3. Results**

#### **3.1. Quantitative—SOFIT and primary outcome variables**

##### **3.1.1. Participant details**

Of the student participants ( $n = 30$ ), slightly more than half (54%) of the classes observed were in the early primary school years, with 23% in Grade 1 and 31% in Grade 2. The remaining 46% were drawn from the middle primary school years, with 15% in Grade 3, 8% in Grade 4 and 23% in Grade 5. SOFIT codes of POV were achieved by participants being observed on three different occasions (identified as  $t1-t3$ ) throughout the PE lessons.

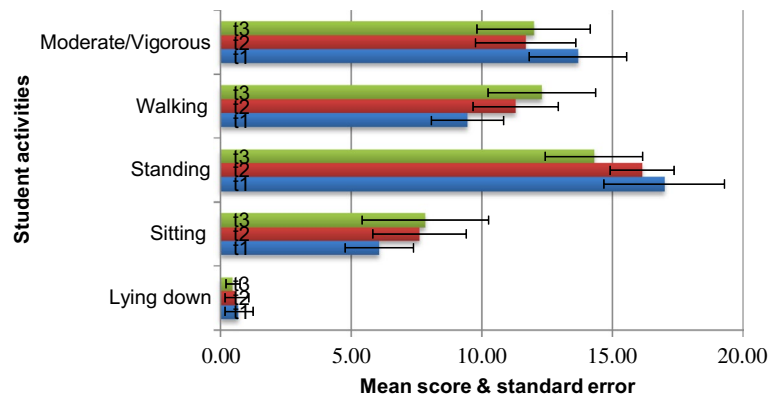
##### **3.1.2. Student activity**

The SA used five categories (lying down, sitting, standing, walking and moderate/vigorous). Figure 1 illustrates the frequency of sitting and walking increased across the three observation points. In contrast, the frequency of instances of lying down and standing decreased across the three observation points. In addition, the frequency of activity which can be classified as moderate/vigorous decreased to a lower level after the first observation ( $t1$ ).

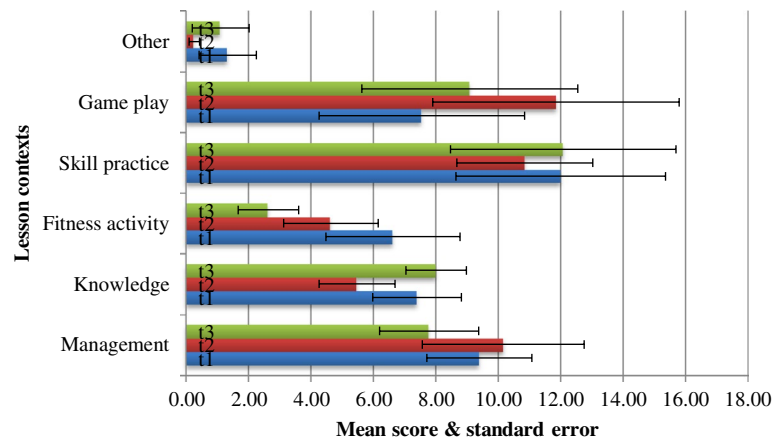
##### **3.1.3. Lesson context**

The LC used six categories (management, knowledge, fitness activity, skill practice, game play and other). Figure 2 highlights fitness activity as being at its highest during the first observation ( $t1$ ). Whereas class management and game play was observed mostly in the second observation ( $t2$ ). Finally, knowledge and skill practice was found to be at its peak in the last observation ( $t3$ ). Follow-up testing with a series of repeated measures ANOVAs found a significant effect across occasions for fitness activity when compared to the much lower significance in the first and second observations.

**Figure 1. Mean levels of five SA variables observed on three occasions.**



**Figure 2. Mean levels of six LCs as observed on three occasions.**



In addition to finding significant effects for levels of fitness activity, Table 1 also highlights significant effects for between group variables and grade levels for game playing.

As indicated in Table 2, the level of game playing was significantly higher in Grade 5 compared to previous grades. This may indicate a level of mastery in conjunction with development and practice.

### 3.1.4. Teacher involvement

The teacher involvement (TI) used three categories (promotes PA/fitness in class, promotes PA/fitness outside of class, and does not promote PA/fitness). As illustrated in Figure 3, the frequency of promotions in class decreased across the three occasions. In the case of promotions outside class, the frequency decreased on t2 and rebounded on t3. In the case of no promotions, this reached a maximum on t2.

### 3.2. Qualitative data—students’ attitudinal questionnaire results

Follow-up data collection surveys were completed by a total of 80 students, of which a slight majority were boys (51.2%,  $n = 41$ ). The two largest subsets of students were ten years old (31%) and six

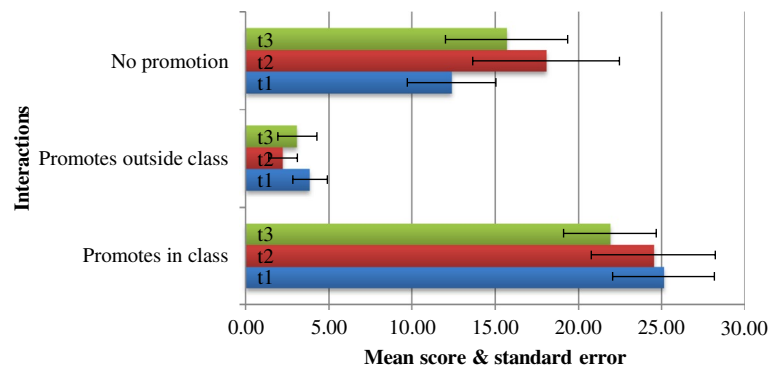
**Table 1. Univariate between-groups outcome for grade in relation to game playing**

Source	Type III SS	df	MS	F	Sig.
Grade	3,528.438	4	882.110	4.459	0.035
Error	1,582.639	8	197.830		

**Table 2. Estimated marginal means for game playing by grade level**

Grade	Mean	Std. error	95%CI-	95%CI+
Grade 1	5.78	4.688	-5.034	16.589
Grade 2	4.25	4.060	-5.113	13.613
Grade 3	4.50	5.742	-8.741	17.741
Grade 4	0.00	8.121	-18.726	18.726
Grade 5	26.67	4.688	15.855	37.478

**Figure 3. Mean levels of three teacher–student interactions as observed on three occasions.**



years old (25%). In contrast, less than 10% of the students were five (4%) or eight (5%) years old. The two largest subsets of students were in Grade 5 (42%), Grade 1 (32%) respectively.

### 3.2.1. Students' responses

Participants were asked to rate how much they liked PE at school on an 11-point ordinal scale, anchored by, "I really don't like PE" (1), "Sometimes PE is OK" (6), and "I always really like PE" (11). Given the sparse frequencies of responses except for 11 (I always really like PE), responses were collapsed as follows: I don't like PE (1–5), Sometimes PE is OK (6–10) and I always really like PE (11). Data collected indicated that almost 75% of the students responded that they always liked PE. In contrast, only 2% responded that they don't like PE.

Participants were asked a further question: "How often do you do PE at school?" This response was measured on a scale that extended from Never to Every Day (5 days per week). Data collected indicated that 75% of the students reported they did PE one day per week, with 22% reported they did PE two per week, and only 3% reported they did PE three days per week.

Participants were then requested to respond to a question that asked them to rate: (1) how much of their PE lesson they spent getting out of breath, (2) how much of it they spent getting ready and (3) how much of it they spent being told what to do. All responses (Table 3) were on a five-point Likert scale (None = 1, A little bit = 2, About half = 3, Most of it = 4, All of it = 5). On average, student responses to all three questions fell into the a little bit (2) for question 3 and about half (3) for question 4 and 5.

Participants were then asked to rank the eight curriculum areas (Table 4) in order, from those most liked to those least liked. Initial ranking was from 1 to 8 with 1 as most favoured. To simplify reporting, these rankings were reversed so that ranking of 8 represents most favoured and 1 the least favoured. As indicated in Table 5, participants ranked HPE ( $M = 6.19$ ) and Arts ( $M = 5.15$ ) as the top two favourite curriculum areas, and Society & the Environment ( $M = 2.83$ ) plus LOTE ( $M = 3.34$ ) as the two least favourite curriculum areas.



**Table 3. Descriptive statistics for PE lesson detail items**

Statistics	N	Mean	SD	Skew	Kurtosis	Min	Max
Q3: How much of your PE do you spend getting out of breath	80	2.74	0.91	0.011	-0.718	1	5
Q4: How much of your PE lesson do you spend getting ready	80	2.33	0.89	1.565	2.724	1	5
Q5: How much your PE lesson do you spend being told what to do	80	2.83	1.01	0.499	-0.526	1	5

**Table 4. Descriptive statistics for curriculum area rankings (ordered by mean score)**

Statistics	N	Mean	SD	Skew	Kurtosis	Min	Max
Society and the environment	80	2.83	1.474	0.310	-0.951	1	8
LOTE	80	3.34	2.105	0.518	-0.735	1	8
Science	80	4.00	2.050	0.063	-1.088	1	8
English	80	4.58	2.073	0.039	-1.082	1	8
ICT	80	4.93	1.888	-0.329	-0.970	1	8
Maths	80	4.98	2.355	-0.345	-1.152	1	8
Arts	80	5.15	2.135	-0.385	-1.119	1	8
HPE	80	6.19	2.344	-1.060	-0.266	1	8

**Table 5. Descriptive statistics for three opinions of PE (ordered by magnitude of mean)**

Statistics	N	Mean	SD	Skew	Kurtosis	Min	Max
PE as valuable vs. not at all valuable	10	1.1	0.316	3.162	10.000	1	2
PE as interesting vs. boring	10	1.2	0.422	1.779	1.406	1	2
PE as simple vs. complex	10	3.6	0.966	-2.662	7.194	1	4

### 3.3. Physical education teachers' attitudinal questionnaire

Of the 10 participants, 70% were males, and all but two were in the 26–45-year-old age group (two were in the 46–55-year-old age group). Seven of the ten teachers report more than 10 years of service as a PE specialist teacher.

#### 3.3.1. PE teachers' responses

The 10 participants were asked to indicate their opinion of teaching PE on three distinct five-point semantic differential scales, these being: (1) that extended from interesting to teach too boring to teach, (2) that extended from simple to teach too complex to teach and (3) that extended from valuable to not at all valuable. As indicated in Table 5, these teachers were most likely to rate PE as valuable and interesting, with nine of the ten teachers rating PE as valuable (1) and eight of the ten teachers rating PE as interesting to teach (1). Teachers were also likely to rate PE as complex, but not as strongly, with an average score for the 10 teachers just beyond the point of indifference.

Teachers were asked to rate 11 statements about children and PA on a scale extending from true (1) to false (5). As indicated in Table 6, whilst teachers rated these statements as true rather than false, they were most likely to do so for, "it is important for children to develop fundamental motor



skills if they are to continue with PA as an adult”. They were least likely to do so for, “the school environment plays a major role in amount of PA a child may have each day”.

### 3.4. Principals’ attitudinal questionnaire

#### 3.4.1. Open-ended questions—leximancer

Thesaurus edited prior to further analysis by merging concepts such as teacher and staff, sport and sports, minutes, thirty and time, activity and activities, class and classes, teacher and staff. Other concepts such as curriculum and development excluded because on inspection, these lacked close connections with other concepts. As indicated in Table 7, participants were most likely to use concepts such as PE, staff and sports. They were least likely to use concepts such as active, additional or demands.

#### 3.4.2. Principals’ responses

Participants identified a number of important recommendations to heightening PA in class-based PE lesson. Leximancer analysis identified three main themes: (1) staff, (2) sport and (3) taught (teaching).

The theme of *staff* was associated with such strategies as: (1) extra coaches and assistants to PE teachers, (2) more than one PE teacher in schools, (3) PE teacher to determine the time allocated to lessons, (4) class teacher also doing lessons for inter-house sports, (5) value in playing sport promoted, (6) class teachers viewing PE as more of a break, (7) more PE specialist teachers and (8) all teachers need to be able to plan and implement PE based lessons.

The theme of *sport* was associated with such strategies as: (1) increasing the number of hours set aside for sport per week, (2) opportunities for students to experience a broader range of physical activities and sports, (3) more parents being involved in inter-school sport, (4) meeting requirements of the new Australian curriculum difficult, (5) the over crowding of the curriculum gives fewer hours, (6) generalist teachers having only a minimal capacity to deliver effectively PE and coach sport and (7) parents only wanting the promotion of high-achievers in sport.

**Table 6. Descriptive statistics for 11 statements about children and physical activity (ordered by magnitude of mean)**

Statistics	N	Mean	SD	Skew	Kurtosis	Min	Max
It is important for children to develop fundamental motor skills if they are to continue with physical activity as an adult	10	1.10	0.316	3.162	10.000	1	2
Active children feel better about themselves and are more confident	10	1.20	0.422	1.779	1.406	1	2
Active children are able to concentrate better	10	1.30	0.675	2.277	4.765	1	3
A positive attitude towards PE at primary schools leads to physically active adults	10	1.40	0.699	1.658	2.045	1	3
Active children have the energy to complete the school day	10	1.60	0.843	1.001	-0.665	1	3
Active children communicate better with their peers	10	1.70	0.675	0.434	-0.283	1	3
Active children communicate better with their teachers	10	1.70	0.823	0.687	-1.043	1	3
Active children develop good social skills	10	1.70	0.823	0.687	-1.043	1	3
Active children perform better academically	10	1.90	0.994	1.085	0.914	1	4
Parents have a more important role than the school in establishing physical activity habits in children	10	1.90	1.287	1.792	3.393	1	5
Physically active children demonstrate lower levels of antisocial behaviour	10	1.90	0.738	0.166	-0.734	1	3
The school environment plays a major role in amount of physical activity a child may have each day	10	2.00	1.054	0.712	-0.450	1	4

**Table 7. Ranked concept map**

Name-Like	Count	Relevance	
PE	28	78%	<div style="width: 78%;"></div>
Parents	4	11%	<div style="width: 11%;"></div>
Word-Like	Count	Relevance	
staff	36	100%	<div style="width: 100%;"></div>
sports	25	69%	<div style="width: 69%;"></div>
time	17	47%	<div style="width: 47%;"></div>
school	17	47%	<div style="width: 47%;"></div>
physical	11	31%	<div style="width: 31%;"></div>
activities	11	31%	<div style="width: 31%;"></div>
week	11	31%	<div style="width: 31%;"></div>
classes	10	28%	<div style="width: 28%;"></div>
children	9	25%	<div style="width: 25%;"></div>
taught	9	25%	<div style="width: 25%;"></div>
students	8	22%	<div style="width: 22%;"></div>
specialist	6	17%	<div style="width: 17%;"></div>
education	6	14%	<div style="width: 14%;"></div>
lessons	6	14%	<div style="width: 14%;"></div>
demands	4	11%	<div style="width: 11%;"></div>
additional	4	08%	<div style="width: 8%;"></div>
active	4	08%	<div style="width: 8%;"></div>

The theme of *taught* (teaching) was associated with such strategies as: (1) parents need to support what is taught at sporting events, (2) generalist teachers need to have an increased influence on the way PE is taught and (3) to identify that PA increases learning.

As illustrated in Figure 4, participant responses were most likely to be encompassed by the thematic concept of staff (staff, teacher, teachers) and least likely to be encompassed by the thematic concept of taught (taught, teaching), see Table 8.

Participants were invited to comment further. Three (participants # 2, 5 and 9) chose to do so, with transcripts, as follows:

**Figure 4. Concept map with thematic circles.**



**Table 8. Thematic relevance**

Theme	Connectivity	Relevance
staff	100%	
sports	64%	
taught	14%	

**Table 9. Open ended questions about type, best and worst activities in PE**

Types of activities	Best things	Worst things
Ball games	Basketball	Being hot and thirsty
Running	Fun games	Hot weather
Basketball	Running	

With children fitness continually declining and the obesity rate of kids becoming higher physical education classes will become very important in the future

It is at times difficult to get a full 30 min of lesson time due to varied locations and commitment from class teachers. More emphasis on SMART MOVES!

Physical Education is for everyone. Teachers should have classes that cater to all levels of play and skill level.

### 3.5. Students' attitudinal questionnaire

#### 3.5.1. Students' responses

Student participants were asked a number of open-ended questions, being: (1) the type of activities done during PE, (2) the best thing about PE classes and (3) the worst thing about PE classes. In the summaries below only the most frequent responses were listed (many items only listed once or twice). The three most frequent responses for each question are listed in Table 9.

## 4. Discussion

The recent global trend of an increasing prevalence of overweight and obesity in primary school-aged children is well documented, with Australia being no exception. The government's growing concern about childhood physical inactivity and obesity has helped to create greater interest and discourse around PA and its contribution to children's health (WHO, 2014). With exercise habits commencing early in life and the development of healthy lifestyle behaviours amongst children translating into reduced risks in adulthood, quality PA at the primary school-aged level is vital (Jenkinson & Benson, 2010). Unfortunately, with the combination of the decline in fitness standards of children, inadequate pathways to accessing PA, increasing demands placed on school curriculum and the increasing prevalence of obesity levels, there is growing concern for the health of children across the world (Jenkinson & Benson, 2010).

Appropriate levels of regular PA are an important contributor to good health for youth. However, the majority of Australian young people is not meeting the daily Australian PA guidelines, with poor levels recorded for children aged 5–17 years of age (Active Healthy Kids Australia, 2014). Australian PA guidelines indicate that children aged 5–17 years should undertake at least 60 min of moderate to vigorous PA every day, with a maximum of two hours screen-based activity for entertainment/non-educational purposes a day. What is more, amongst school-aged children and adolescents, appropriate regular PA has been associated with improved school performance, a greater sense of personal responsibility and builds positive group/social participation (Australian Bureau of Statistics, 2013).

In recognition of this, National Physical Activity Guidelines have been developed for all of Australia's children and young people. These Guidelines are supported by a rigorous evidence review process that maintains the positive relationship between regular PA (including the amount, frequency, intensity and type of PA) and positive health outcome indicators in contrary to the relationship between sedentary behaviour/sitting time and negative health outcome indicators.

The decline of PA is not an isolated national (Australia) problem (Active Healthy Kids Australia, 2014; Spinks, Macpherson, Bain, & McClure, 2006), but rather has been recognised as a global phenomenon. International research indicates that 80.3% of youth are performing fewer than 60 min/day of moderate to vigorous PA (Hallal, Andersen, Bull, Guthold, & Haskell, 2012). Similarly, evidence from this study identifies a possible emerging trend as to the declining nature of PE when it comes to delivering appropriate levels of PA (type, frequency and intensity [moderate/vigorous]).

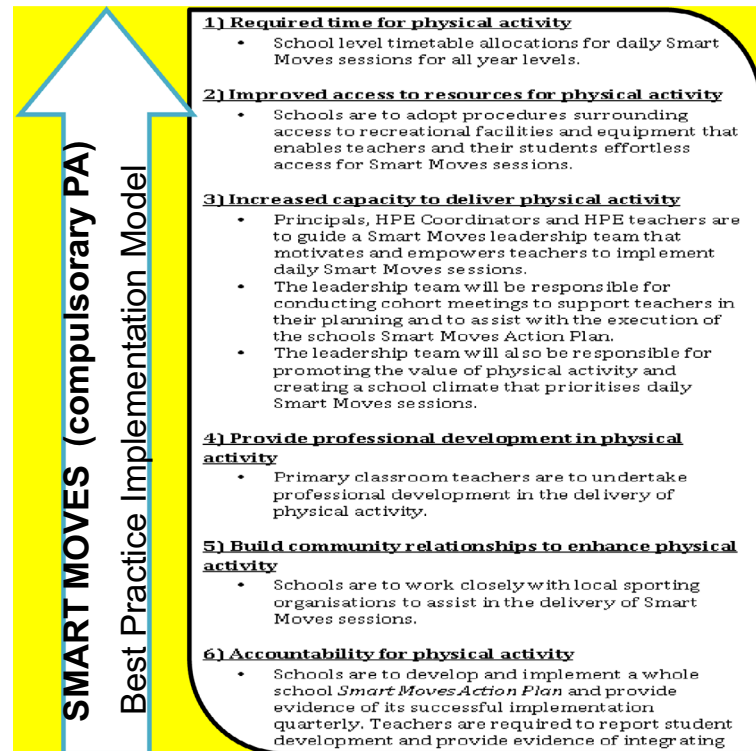
Of most significance, is POV data from this study concerning the PA observations (lying down, sitting, standing, walking, moderate/vigorous activity) and LCs (management, knowledge, fitness activity, skill practice, game play, other). Notably, it was identified that students were undertaking higher levels of low PA (sitting, standing and walking) when compared to moderate/vigorous actions throughout the PE lessons. What is more, is data that identifies high levels of class "management" and imparting "knowledge" when compared to levels of "fitness activity", "skill" and "game playing".

Of particular interest, was data that identified that "game playing" was recorded as a high LC for delivering PE, with "fitness activity" being significantly lower. A possible interpretation of this data could largely be due to the introduction of contemporary approaches to teaching in PE, such as "Teaching Games for Understanding"<sup>3</sup> (TGfU). Such a PE pedagogical approach has proven to be more enjoyable for both students and teachers and one that meets the standards of the Australian Curriculum Assessment and Reporting Authority framework. Further research is encouraged that will attempt to explore how various approaches to teaching PE will foster the greatest participation by students (i.e. TGfU). Additional findings have indicated that minimal "fitness promotion" in class was evident, with low levels identified. Such findings warrant further investigation, given that past and current research which clearly links poorly constructed PE, PA and low levels of fitness are contributing factors to the onset of chronic diseases (Ferkel, 2011).

This research further identified that primary school students overwhelmingly indicated that PE classes are their favourite subject. Given the extreme, inclement weather in Queensland (Australia), further consideration needs to be given to the most positive way of implementing PE and PA; with time of day, length of classes and venues being a high priority for school policy-makers, budgetary and infrastructure considerations. What needs an appropriate response are results indicating that 75% of students maintain that they only had specialised PE once a week, as compared to those who had PE three days per week (3%). Such results correspond with qualitative data collected throughout this study, identifying the limited number of PE specialists in participating schools. Given the national PA guidelines, competing school priorities and that general primary school teachers' view PE and PA as the role of the PE specialist (Jenkinson & Benson, 2010), this level of specialised PE engagement may well prove untenable in promoting future appropriate PA levels amongst primary school aged students in Australia.

With the number of overweight or obese Australians projected to increase from about 2.5 million in 2014 to 3 million in 2020 and obesity continuing to be a significant burden on health services and social supports, and potentially constraining economic productivity (Queensland Government, 2014), further action is needed at the grass roots level. With researchers documenting that overweight children become overweight adults and that inactive children become inactive adults, the importance of teachers implementing and schools supporting effective daily PA sessions cannot be overstated (Young et al., 2007). Therefore, from such findings, this research recommends that a new orientation and re-engagement from key stakeholders (PE teachers, principals, education,

Figure 5. Whole school approach to implementing PA.



government and health departments) is justified, and that a collective rethink of contemporary and future PE and PA practices is warranted.

Of particular note, is for priority to be directed towards promoting a “whole school approach” in an attempt to implement effective levels of PA and in turn meeting national guidelines to facilitate and sustain lifelong learning in PE. Recent research by Usher and Anderton (2014) presents a possible solution by outlining a best practice model for the implementation of Smart Moves (compulsory PA) for Australian Primary Schools’ (Figure 5). This study, although focused for generalist primary teachers, it adequately provides valuable information and guidelines regarding the perceived barriers and enablers influencing the implementation of PA and supports a “whole school approach” to PA (Usher & Anderton, 2014).

### 5. Conclusion

The aim of this research was to provide a justification for the objective measurement of PA levels (moderate–vigorous), as a means to elevate the delivery of school-based PE lessons. Such an approach will assist future attempts to increase the robustness of PE implementation, improve the evaluation of PE curricula and provide important evidence needed to assist with the allocation of resources by key stakeholders. What is more, it is hoped that findings from this research will go towards heightening the teacher–practitioner’s awareness when it comes to ensuring adequate PA levels are maintained in PE lessons. It is hoped that such an approach will increase chances of achieving specific learning outcomes, expectations and improve confidence in the PE profession; ultimately leading to more physical literate, socially confident and emotionally adjusted youth.

Given the findings throughout this research, the increasing “overcrowding” of the curriculum, changing school priorities, funding constraints, changing societal leisure pursuits (i.e. technology use) (Review of the Australian Curriculum Initial Australian Government Response, 2014) and the wider youth obesity epidemic, there is an urgent need to shift current practices and mindsets associated with the delivery of effective PE in Australian schools. A recommendation and a possible way



forward, to address Australian's increasing youth obesity epidemic and low rates of PA levels, could be ameliorated through multi-sectoral actions across a number of external health, community, educational and governmental departments. What is more, it is further thought, that a closer synergy between home and the school community would prove advantageous in designing potential strategies that would go towards heightening levels of PA. It is identified that this study is an exploratory study and would benefit from a larger national research undertaking to put data into context and support findings.

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#### Notes

1. Defining moderate physical activity—Requires a moderate amount of effort and noticeably accelerates the heart rate (World Health Organisation, [WHO], 2014).
2. Defining vigorous physical activity—Requires a large amount of effort and causes rapid breathing and a substantial increase in heart rate with a noticeable high increase in heart rate (WHO, 2014).
3. The Teaching Games for Understanding approach to the teaching of sport/physical activity is a holistic model because it focuses attention on the individual and not with the subset of activity specific skills for the activity in focus. Learning the skills of the game is placed in the broader context of the game itself. The nature of the game is taught first, and the skills are added at a pace manageable by the participants (Pill (2014)—assessed 21.11.14—[www.ausport.gov.au](http://www.ausport.gov.au)).

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