



# Learning Communities

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**Number 21 – November 2017**

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## Editorial

**Dr John Williams**

*University of Canberra, Australia*

This *special edition* showcases a selection of academic papers from the 30<sup>th</sup> Australian Council for Health, Physical Education and Recreation (ACHPER) International Conference that was held at the University of Canberra in January 2017. This conference is the most recent in a history of ACHPER international conferences spanning more than half a century that have provided professional learning for health and physical education (HPE) teachers, sports coaches, outdoor educators, health practitioners and associated professionals. The 30<sup>th</sup> International Conference involved 225 presenters from Australia and overseas delivering over 230 presentations. The papers presented here reflect the diverse interests and expertise of the presenters who contributed to what has been widely recognised as a most successful conference.

The contributors to this *special edition* addressed the conference theme of *Participation in an Active and Healthy Life: Valuing the Participant Voice* as well as one or more of the six conference sub themes. The first five of these sub-themes align to the propositions of the Australian Curriculum for Health and Physical Education (AC:HPE): Focus on educative purposes; Take a strengths-based approach; Value movement; Develop health literacy and Include a critical enquiry approach. In addition, a final sub-theme was included at this conference which was: Sport and recreational pedagogies. This sub-theme is important, since sport has historically been the vehicle through which many physical education (PE) outcomes have been taught. I would like to take this opportunity to thank the Australian and international reviewers for their contribution to this *special edition*. Without their involvement it would not have been possible to have produced this collection or to the high standard presented.

In focusing on *Participation in an Active and Healthy Life: Valuing the Participant Voice* the authors included here have highlighted the benefits of Australians, and Australian children in particular, engaging in moderate to vigorous movement on a daily basis. The authors have also emphasised the importance of children considering this activity and their overall personal health according to positive understandings. By perceiving movement and health in this way, children can be taught in a meaningful and evidence based way to be active and healthy across their lifetime. The topics covered in the papers show how Australian children can be taught using the latest and most innovative evidence based approaches to be active, while at the same time increasing their knowledge and understanding about what being healthy means. Such teaching also includes informing our students about what community assistance exists for supporting their health. Importantly, such health literacy also teaches students to evaluate this support and to look beyond what is presented at face value. The focus on the conference theme and sub-themes is timely given the recent introduction of the AC:HPE and the need for HPE teachers to receive high quality, research informed teaching material resources. The papers included here go some way in helping those teachers meet the demands of our new, exciting and innovative curriculum. Papers are summarised below according to the six sub-themes.

### *Focus on educative purposes*

Through their focus on educative purpose, Hyndman and Papatraianou report on how GoPro technology can be used to make the learning experiences of pre-service HPE teachers more authentic. The authors show how this kind of technology can contribute to the simulation of learning in PE and assist teacher educators in providing quality experiences for their students. The second paper by Bradford and Hickson is a Canadian perspective on how primary students perceive their teachers of PE according to what they wear. In taking this approach the authors provide unique insight into the significance of what teachers of PE wear, through listening to the voices of the children being taught. Students in their study described effective role model teachers of PE in terms of what they wore. Their findings offer important information about how students view their teachers and whether they regard them as being serious about their job or not.

### *Take a strengths-based approach*

Williams and Bamblett discuss how Aboriginal and Torres Strait Islander students are typically portrayed by HPE teachers according to deficit understandings and the need for these students to instead be viewed according to positive aspects of their culture. The authors use figurational sociology as the theoretical framework for their study which includes what Indigenous students had to say about their school experiences of PE. This work is useful for helping teachers incorporate a strengths-based approach in their PE lessons when teaching Indigenous perspectives in PE. The next paper in this section switches to a health focus. Barwood collected data from teachers of health and found that many were unqualified and unprepared to deliver this subject. This finding is significant given the central importance of this subject in developing the health and wellbeing of school children. The health focus continues in the next paper with Hyndman drawing attention to the fact that PE teaching in Australian schools regularly occurs in extreme heat. In writing about this topic, Hyndman proposes a five stage action plan that teachers can adopt to help their students continue to learn in PE even when it is uncomfortably hot. The subsequent paper in this section returns to PE, with McNeil, Lante and Pill focusing on pre-service student attitudes to teaching school aged students with a disability. The authors carried out an extensive review of journal articles and concluded that more work needs to be done to improve pre-service student teacher efficacy in teaching students with a disability. The final paper in this section by Fane, is about a novel approach using emoji as a way for young children to report on their own wellbeing. Fane argues that emoji can be used as a way for young children to be perceived according to strengths-based perspectives rather than according to deficit understandings through the communication of their own points of view. By facilitating the communication of student ideas through emoji, Fane enables the voices of the children in her study to be heard.

### *Value movement*

The first paper in this section by Baldock and Pill is a literature review about contemporary and developing pedagogies for teaching PE. The authors found from reviewing 57 sources that Game Based approaches and the Sport Education curriculum and instruction model were promoted and that personal and social development was often cited as an outcome for PE teaching in schools. These findings are useful for HPE teachers as evidence based approaches for teaching PE within the scope of the AC:HPE. The second and final paper in this section is by Williams which is about perceived obstacles that HPE teachers raised in relation to teaching Indigenous perspectives in PE. Williams found from interviewing teachers at three high schools that the barriers reported were not unique to Indigenous content within

PE. Instead these perceived obstacles applied to PE teaching generally. Williams concludes that those teachers can overcome what they consider as obstructions through purposefully using an identified quality and widely available teaching resource.

#### *Include a critical enquiry approach*

In this section Bevan and Fane examine how a critical enquiry approach can be used to support the participation of adolescent girls in traditionally masculinised sports (TMS) within the AC:HPE. The authors found through examining the experiences of girls playing several TMS that a critical enquiry approach as a key idea within the AC:HPE may help overcome barriers that they encounter. In doing this the authors provide a useful example of the benefits of listening to the participant voice.

#### *Develop health literacy*

Stapinski et al highlight the need for those teaching about alcohol and drugs to use evidence based resources and report that many teachers use material that is not informed by research. The authors introduce the reader to the *Positive Choices* portal which is an online teaching resource developed in consultation with a wide range of stakeholders including parents, teachers and students. It is encouraging to see a resource that has taken into account the voice of the students as part of its development. *Positive Choices* has been very well received by students and teachers alike since its launch in December 2015. The next and final paper in this section by Atkins, focuses on health literacy and is about teaching primary school students to critically examine what health, and being healthy means. This New Zealand study describes an innovative intervention called *Healthy Homework* which draws attention to how children develop understanding about health and healthy bodies through formal and informal learning. Atkins argues that health discourses present amongst children are reproduced through their voices. This is an important observation for teachers because of the capacity for both accurate and inaccurate messages concerning health to be transmitted by children.

#### *Sport and recreational pedagogies*

The final paper in this *special edition* by Magias, Ridley and Pill is about the central positioning of physical activity as the means by which many PE outcomes are taught. The authors provide justification for pedometer step guidelines as a cost effective method to teach and monitor physical activity within PE. The findings presented in this paper are important because they provide teachers with an effective and economic way in which to monitor levels of physical activity amongst children.

In conclusion, it is hoped that the reader enjoys the papers included which reflect the high standard of presentations at the 30<sup>th</sup> ACHPER International Conference. For teachers in particular, the range of topics addressed will add value to future lessons. The theme of *Participation in an Active and Healthy Life: Valuing the Participant Voice* is an important reminder that we, as teachers, need to take into account what our students have to say about our subject area. Sadly, their voice is often ignored or not listened to at all. Finally, this collection of papers has also served to illustrate that the participant voice goes beyond that of the child to include the breadth of participants involved in being active and healthy that includes pre-service teachers, parents, health professionals and other stakeholders.





## The technological integration of a simulation pedagogical approach for physical education: The GoPro PE trial 1.0

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**Keywords:** technology, physical education, simulation, pedagogy, pre-service, online, TPACK

### Abstract

Teacher Education programs have a unique and important role to play in assisting pre-service teachers (PSTs) to deliver developmentally-appropriate physical education (PE) classes. Despite this important role, the 'physical' nature of PE classes and the growing externally-focused environment of online tertiary education programs can make it challenging to provide access to real-life practical PE learning experiences for PSTs. One possible solution to this is facilitating simulated on-campus learning experiences to those online. A form of technology that has emerged within educational contexts that has the potential to simulate PE learning and address a number of key learning areas is GoPro video recording devices. To date, there is little investigation of the potential of simulating PE practical learning processes via GoPro video technology. The aim of this paper is to report on teacher field note observations and reflections underpinned by a Technological Pedagogical and Content Knowledge (TPACK) framework. It was revealed that the suitability of GoPro technology was enforced by its portable nature and the ability of the camera to capture point-of-view vision. It is vital for teacher training programs to enhance PST 'readiness' by providing simulated experiences from PE practical classes to ensure graduate standards are met.

### Introduction

The effective preparation of physical education (PE) teachers in our modern society is vital. The readiness of our future PE teachers within the overall subject of Health and Physical Education (HPE) continues to be evaluated as the training methods, tools and delivery to facilitate PE teaching preparation continues to evolve (McMahon & Dinan-Thompson, 2014). Yet questions still remain as to how technology can be integrated within PE teaching in a pedagogically appropriate manner (Juniu, 2011). In 1998, Shulman reported that teachers should have the ability to demonstrate content knowledge via pedagogical methods that are adaptable to the learning profiles of students irrespective of the educational setting (for example, practical classes on basketball courts). Due to the practical nature of PE often being taught away from structured, seated classrooms, it is important that PE teachers consider technology integration that can be applied beyond the confines of a classroom to capture and enhance student engagement (Juniu, 2011). Pre-service teachers (PSTs) must develop the appropriate pedagogical knowledge and subsequent application of a variety of teaching skills to use in practical contexts that often differ from other teaching disciplines (Hyndman, 2017).

The expectation to prepare Physical Education Teacher Education (PETE) PSTs for innovative teaching practices is reflected in the Tertiary Education Ministry Advisory Group (TEMAG) recommendations and Australian Institute for Teaching and School Leadership (AITSL) standards. The recent Australian TEMAG recommendations emphasise the application of innovative technology, facilitating methods to enhance ‘classroom readiness’ and ‘classroom delivery’ of PSTs (TEMAG, 2015). Additionally, the AITSL graduate teacher standards describe the importance of administering a range of teaching strategies and engaging in professional learning, especially relating to the use of innovative technology (AITSL, 2011). Yet in the United States, it has been reported that the use of technology within PETE programs has not been effectively implemented (Leight & Bechtel, 2010). Guidelines for teacher education preparation continues to involve the use of technology despite the occurrences of lackluster facilitation of technology to engage PETE PSTs. With this in mind, there is a significant need to consider emerging forms of technology and how innovative uses of technology can be integrated into teaching practices (Casey, Goodyear & Armour, 2016). Therefore, this paper applies a technology integration framework as a guide for PE teachers and PETE programs to consider the facilitation of GoPro video capturing technology to simulate practical PE experiences.

## Method

### *Technology integration framework*

Learning activities should consider the needs of PSTs, the type of content and type of setting (Niess, 2005). By identifying learning objectives and activities educators need to also consider the integration of technology into their pedagogical practices (Harris & Hofer, 2009). The application of a framework for teaching with technology is important to guide and support teachers’ delivery. The framework proposed in this study is the ‘Technological Pedagogical and Content Knowledge’ (TPACK) framework (Koehler & Mishra, 2008). The TPACK framework is grounded in the relationship between teachers’ understanding of content, pedagogy, and technology and how these interconnect with one another to produce effective teaching (Koehler, Mishra & Cain, 2013). The TPACK framework is relatively new, yet has been a catalyst in influencing a range of teacher education practices and development. In the present study, the TPACK framework underpinned a series of questions that aim to support the planning and development of learning activities that incorporate technology (Juniu, 2011). The TPACK technology integration questions to guide teachers are outlined in Table 1.

**Table 1.** *Technological Pedagogical and Content Knowledge (TPACK)’ framework guiding questions for technology integration*

<b>TPACK Stage 1 - Content</b>
<ul style="list-style-type: none"> <li>• What are the desired learning outcomes/curricular objectives for the content being taught that you plan to target with technology?</li> </ul>
<b>TPACK Stage 2 - Pedagogy</b>
<ul style="list-style-type: none"> <li>• What pedagogies/teaching strategies are being used?</li> </ul>
<b>TPACK Stage 3 - Technology</b>
<ul style="list-style-type: none"> <li>• What digital technologies are being used in teaching and learning?</li> <li>• What digital technologies are pedagogically appropriate?</li> <li>• What are the functions, affordances and constraints?</li> </ul>
<b>TPACK Stage 4 - Is It Effective?</b>
<ul style="list-style-type: none"> <li>• How effectively does the technology integration enhance or support the pedagogical strategies being used?</li> <li>• How does the technology integration improve or detract from the teaching and learning experience?</li> <li>• How do the PSTs understand the concepts in the technology-enhanced learning activity?</li> </ul>

*Teacher field note observations and reflections*

During the process of implementing the technology, descriptive qualitative accounts were documented by the researchers via field observations (Bogdan & Biklen, 1998; Morse, 1994). Protocol considerations of using the technology as a teaching tool were documented in the field observations according to visual (what was seen), auditory (what was heard), experiential (what was experienced and engaged in) and cognitive considerations (what was thought of) (Bogdan & Biklen, 1998; Morse, 1994).

**Results and discussion**

*TPACK Framework Stage 1 - Content*

The aim of the PETE unit being facilitated was for the PSTs to explore the content and pedagogy of HPE specifically for children from pre-school to primary levels. The unit focused on developing PST understanding and application of teaching practices relating to the development of movement, physical activity and health awareness. Curricular content and the development of hands-on learning experiences in HPE were also explored.

The outcomes of the PETE unit were for the PSTs to:

1. Apply the Australian Curriculum: HPE (AC:HPE) (ACARA, 2016), and the Early Years Learning Framework (DEEWR, 2009) to the construction of learning experiences in HPE;
2. Evaluate strategies for creating an effective learning climate for HPE instruction;
3. Compare and critically reflect on teaching and learning practices in HPE;

4. Identify, retrieve and evaluate relevant information from traditional and web-based sources;
5. Respect and accommodate diversity and recognise ethical issues in teaching and learning of HPE.

### *TPACK Stage 2 - Pedagogy*

There were a number of PE pedagogical models applied within the introductory unit's practical content for the PSTs to learn how to design and enact the AC: HPE (ACARA, 2016) for future student accomplishment of curriculum achievement standards (see TPACK Stage 1). Models based practice has been seen as a 'blueprint' to design and enact learning within PE to tightly align with content and outcomes, in order to address the educational value of PE (Kirk, 2013). The first and main pedagogical model utilised within the unit was the Game Sense approach (Pill, 2016) which was suited to providing insight to PSTs of the tactical, technical and sport skill learning intentions of the AC: HPE (ACARA, 2016). The model provided a context for physical activity problem solving and guided exploration of game problems (Pill, Harvey & Hyndman, 2017). The PSTs were encouraged to think deeply about meaningful, high intensity game situations within a student-centred context that differed from more traditional directive and drill-based PE. Games were based around striking/fielding (hockey, cricket), invasion (tag games, soccer), net/wall (tennis, badminton) and target-based (lawn bowls, ten pin bowling). The games were used to question PSTs in order to shape, focus and make visible player learning by facilitating understanding of what to do in the context of play, how to do it and how to execute game solutions through the use of guided and open-ended questions (Pill, 2013). The CHANGE-IT formula (Coaching; How Scoring Occurs; Area or Dimension; Number of players; Game rules, Equipment; Inclusion for learning needs & Time of the game (Schembri, 2005)) was regularly applied to modify the game constraints to create playing conditions that "focus attention on specific technical or tactical game understanding" (Pill, 2013, p. 9).

A second pedagogical model utilised was the Sport Education Model (Siedentop, Hastie, & Van der Mars, 2012) which has been described as the most theoretically and pedagogically developed across all models based practice (Kirk, 2013). The Sport Education Model was used within this introductory PE unit largely for the selected sport of Badminton to develop PSTs' understanding of sport tactics, techniques, traditions, roles, teamwork and rules. The use of pedagogical styles such as task (station) based delivery via tabloids around fundamental movement skills and tasks were also enacted. Moreover, the PSTs were introduced to a host of partner/peer based movement challenges and more general physical activity movement problems to solve throughout the unit (for example, creating movement sequences, activities using modified equipment, communication challenges and no equipment).

### *TPACK Framework Stage 3 - Technology*

*What digital technologies are being used in teaching and learning?*

A method that has been used to re-enact strong interactions that occur within teaching is simulation pedagogy. Within teaching and learning experiences, simulations have been described as facilitating teaching and learning experiences that reflect the characteristics of life-like experiences and moments (Murray, Grant, Howarth, & Leigh, 2008). Simulations are characterised by providing an environment that is created which develops a person's interaction with real experiences (Bell, Kanar, & Kozlowski, 2008), subsequently improving the uptake of skills being taught and learning objectives (Cook & Swift, 2006; Lane, 1995). Previously, simulation teaching pedagogy has been applied within university systems via methods such

as 'SecondLife', 'Voki' and 'Electronic Gaming'. 'Voki' has been used to simulate an instructor and instructions via a talking on-screen avatar (Anderson, Page, & Wendorf, 2013). 'SecondLife' was developed as a virtual setting in which students can connect, socialise, learn and create through a process of free text and voice chat (Warburton, 2009). The most relevant form of simulated teaching pedagogy to the discipline of PE has been Electronic Gaming (the use of games to solve complex learning situations) (Liu, Cheng, & Huang, 2011).

Electronic methods of learning have been described as having strong potential for practical PE delivery (Papastergiou, 2009). Simulated vision of tennis, football, basketball, and soccer within sport video games, have served as an instructional resource for providing PE PSTs with opportunities to participate in a virtual environment (Kim & Hyungil, 2007). More recently in practical PE, an emerging form of technology delivery has emerged known as 'exergames' which consists of interacting with digital game components through the process of physical activity involvement (Lieberman, 2006). 'Exergames' have provided a platform for PSTs to participate in dancing (via dance pads) cycling (via bike ergometers) and other sports through the use of tracking cameras and motion sensors (capturing golf, soccer, tennis, archery, basketball & other sporting movements) (Lieberman, 2006). This electronic shift has evolved from more historic forms of electronic devices such as joysticks, keyboards and a computer mouse (Lieberman, 2006). These forms of electronic avenues for PE teaching have had some evidence of student improvement in PE engagement and participation in the past (Lieberman, 2006; Papastergiou, 2009).

Despite such electronic platforms enhancing the learning experiences of university PSTs across disciplines such as science and medical education (Cardoso et al., 2012; Frøyland, Remmen, Mork, Ødegaard, & Christiansen, 2015; Kelly, Lyng, McGrath, & Cannon, 2009; Kindt, 2011; Metcalfe, Jonas-Dwyer, Saunders, & Dugmore, 2015; Roshier et al., 2011), facilitating simulated teaching experiences that resemble more 'life-like' and 'actual' practical learning experiences in PE has often been overlooked. The practical nature of the PE discipline (Hyndman & Pill, 2017) and reduced access for externally based PSTs (for example, in regional and remote locations) justifies the use of simulated pedagogical methods to enhance practical PE classes for this particular cohort.

#### *Video capture to promote simulated learning experiences for pre-service teachers*

The use of high quality video footage as educational resources for teaching has resulted in many benefits to students by connecting theory to practice, promoting critical reflection, increasing learner engagement and fostering deeper learning (Lau & Roeser, 2002; Lynch, McNamara, & Seery, 2012; Roshier, Foster, & Jones, 2011). Ensuring that recorded content captures key learning processes and connecting with students on more than one occasion through replay can provide strong opportunities for students to direct their own learning experiences (Kelly et al., 2009). Video footage from practical classes can also ensure students can interact with learning at their desired time, location and pace (Kelly et al., 2009). The potential to view correct procedures around role modelling, demonstrations, skill execution and peer interactions in PE can follow the learning delivery of other professions such as medicine (Hibbert et al., 2013). Additionally, the anxiety of undertaking performances and demonstrations on the spot can be reduced by introducing practical techniques and skills in the comfort of students' own settings (Cardoso et al., 2012). Capturing video of practical experiences and delivering this via mobile technology has the potential to provide useful learning experiences through the facilitation of a diverse range of learning content that is easily accessible and encompasses online convenience (Cardoso et al., 2012; Hibbert et al., 2013; Kelly et al., 2009; Lynch et al., 2012; Roshier et al., 2011).

### *TPACK Framework Stage 3 - Technology*

#### *What digital technologies are pedagogically appropriate?*

The 'practical' nature of PE is reflected in its title. Australia's teacher education programs have an important responsibility in ensuring PSTs learn to facilitate PE classes that are developmentally appropriate, and ensure that content is delivered efficiently and they are able to manage practical classes effectively (Hyndman, 2014; Hyndman & Pill, 2016). The preparation of PE teachers needs to be optimised to ensure PSTs can overcome barriers such as impaired confidence to delivering safe, well structured, well planned and managed PE lessons (DeCorby, Halas, Dixon, Wintrup, & Janzen, 2005; Morgan & Hansen, 2008; Hyndman, 2017). With an emerging externally-focused teacher preparation environment, the practical nature of PE classes (especially in university systems) reinforces the importance of enacting life-like PE practical experiences for those learning online (McMahon & Dinan-Thompson, 2014). Universities need to consider a range of avenues to ensure PSTs are 'teacher ready' and can effectively deliver the AC:HPE (McMahon & Dinan-Thompson, 2014).

The introduction of mobile (portable) video technology has resulted in increased abilities to record more action-packed practical and sporting moments (Chalfen, 2014; Skiba, 2014). By wearing video technology with 'point-of-view' angles, video can record practical activities in which the audience feels part of the action taking place (Chalfen, 2014). The potential of mobile video devices to have a positive impact on the delivery of PSTs' learning online is therefore powerful. Mobile video devices can be utilised to portray interactions and skills through the point-of-view of those facilitating learning processes (for example, teachers and lecturers) (Lynch et al., 2012). With online delivery in university systems continuing to emerge, the prospect of better capturing learning of a practical nature could develop into a strong desire for those wanting to connect with more life-like learning experiences from the comfort and convenience of their electronic devices (Lynch et al., 2012; McAllister, Searl, & Davis, 2013).

Despite the emergence of electronic gaming within university courses to facilitate simulated learning experiences (Kron, Gjerde, Sen, & Fetters, 2010), the application of mobile video to capture learning for online PSTs within practical PE can improve teaching readiness. Although research into the use of mobile video footage in practical PE has been limited to one study in the United States (Baghurst, 2016), to our knowledge, there has been little empirical investigation into the potential of trialing GoPro technology to simulate practical PE experiences. Therefore, there is a need to explore the potential of GoPro integration for online learners of PE within an Australian teacher education program.

### *TPACK Framework Stage 3 - Technology*

#### *What are the functions, affordances and constraints of GoPro technology?*

In contrast to more historic uses of digital video footage for enacting and recording key moments, GoPro technology (Figure 1) is innovatively designed to capture 'action packed' practical footage. The GoPro technology is attached to the body, equipment or vehicle and can record point-of-view high definition vision (Wellard, 2015). Wearable video technology has been revealed to encompass strong prospects for investigating social settings (Chalfen, 2014). The emergence of GoPro technology by capturing action experiences ensures there is potential to record a wide variety of kinaesthetic, sensory and cognitive experiences (Wellard, 2015). The GoPro video technology is also built to buffer substantial forces as illustrated by being used to video Felix Baumgartner's 18,000 mile high 'Space Jump' (Redbull, 2012). The match-boxed sized technology can provide those that are externally enrolled in PE learning experiences point-of-view vision.

**Figure 1.** The GoPro Hero+ camera proposed for the PE teaching simulation



*TPACK Framework Stage 4 - Is it effective?*

*How effectively does the technology integration enhance or support the pedagogical strategies being used?*

At the beginning of the semester, PSTs learning PE via on-campus mode were invited, and consented to GoPro technology recordings being utilised to engage those enrolled online. The footage was then uploaded to a privately linked YouTube page (100% consent/response rate). The intention of using the GoPro technology to record PE practical teaching and learning experiences via point-of-view audiovisual footage was outlined to the PSTs to simulate the classes.

The GoPro was used to capture key practical view-points from the perspective of the PSTs and the lecturer. Capturing the practical learning from multiple view-points allowed external PSTs to experience the audiovisual elements similar to the on-campus PSTs. The point-of-view video recorded how different activities were delivered across a range of sports/games (for example, invasion, target, striking, net/wall), and how different pedagogical approaches (for example, sport education, game sense, tabloids, cooperative learning) were implemented. The GoPro footage was also able to capture key learning points for those who were absent from on-campus learning.

The video footage was housed on YouTube so that the vision could be repeatedly streamed to allow PSTs to revisit their learning and reflect and critique their physical skills. Key elements that can enhance classroom readiness were also captured during the on-campus video recording which enabled the PSTs to engage with more broader concepts of teacher readiness including classroom management, lesson planning, scaffolding, positioning and lesson transitions.

*TPACK Framework Stage 4 - Is it effective?*

*How does the technology integration improve or detract from the teaching and learning experience?*

Despite the benefits of the GoPro, key issues for consideration arose. The GoPro technology did have a presence during the practical activities as the PSTs were aware of the device picking up not just learning, but other behaviours. Early in the teaching session there was an element of intrusiveness that had to be overcome. This was noted as both positive (attempting tasks with more vigour), yet also a negative (avoiding the wearer and not wanting to join the



wearer's group during some activities). It was evident that the PSTs became more accepting to the innovation over time, once the benefits of increased engagement and better connection of the practical footage for external learners became evident. The technology was also in tune with the group's digital worlds.

Given that capturing the practical PE class footage via GoPro technology was a trial, there were a number of areas that will need to be considered for future use. Key considerations include the need to capture all angles of vision and ensure sound is recorded in a way that prevents shakiness when wearing the GoPro. In order to improve the teaching and learning experience, it will be important to consider whether administrative support is required for downloading, editing and uploading the point-of-view vision for PSTs. It was noted that over the duration of the semester, there was a drop off in the number of PSTs accessing/streaming the GoPro video footage which could be related to the burden of busy assessment periods.

In order to capture the vision, consent from PSTs also needs to be obtained prior to the beginning of practical sessions to ensure that the wearing of the GoPro is voluntary and all PSTs are comfortable with the recording of the activities. Early preparation of the recordings is also important to gauge lighting, sound, camera angles and other audio-visual settings as many PE contexts vary (especially in size).

Other considerations to ensure that the GoPro technology can be utilised to improve the teaching and learning experience in practical PE includes having a memory card for video storage, determining how much video to capture (for example, just key moments or entire lessons, muting inappropriate on-campus conversations), storage of video capture (and upload to learning platforms or YouTube), the possibility of microphones for large outdoor PE spaces, regular monitoring of battery life to ensure recording of crucial practical experiences are not lost and the preparation of appropriate editing software (for example, Apple iMovie). Other considerations include the types of 'mounting' equipment to body parts such as chest straps (less impact on hair, less tilting, less sweat impact) when compared to head mounting straps.

#### *TPACK Framework Stage 4 - Is it effective?*

*How do the pre-service teachers understand the concepts in the technology-enhanced learning activity?*

Although the next phase of GoPro technology integration research is to assess PSTs' understanding of concepts from technology-enhanced learning via survey tools or focus group discussion, the field note observations have determined that the intentions of on-campus classes could be captured and transferred to those learning PE content via external modes. It was evident that those learning externally could take part in a virtual class experience with point-of-view vision of what was happening within practical classes to improve teacher readiness and assessment preparation.

#### **Synthesis**

The facilitation of the GoPro technology to capture practical on-campus PE classes was able to ensure the technology facilitated PSTs' understanding of concepts related to the Australian Institute for Teaching and School Leadership (AITSL) standards:

- 'Assess, provide feedback and report on student learning' (for example, the PSTs were able to gain understanding into methods of delivering feedback during practical PE, develop insight into assessment methods that will be applied during practical PE; Professional Practice, Standard 5; AITSL, 2011);

- ‘Create and maintain supportive and safe learning environments’ (for example, PSTs were able to gain understanding of types of behaviour management strategies, important safety components to apply during practical PE activities and inclusive strategies in practical PE; Professional Practice, Standard 4; AITSL, 2011);
- ‘Plan for and implement effective teaching and learning’ (for example, understanding strategies to structure, plan and sequence practical PE, strategies to set learning objectives, how to facilitate effective classroom communication via management/safety/teaching cues, use of whistle, positioning, use of voice; Professional Practice, Standard 3; AITSL, 2011); and
- ‘Know the content and how to teach it’ (for example, PSTs were able to learn practical PE teaching strategies, how to implement a diverse range of pedagogical strategies, connect PE activities to the AC: HPE (ACARA, 2016), understand assessment methods to apply within practical PE classes, learn how to trial the GoPro technology simulation teaching experience and how to organise content; Professional Knowledge, Standard 2; AITSL, 2011).

### **Summary, conclusions and implications**

The TPACK framework provides a guide to the process of integrating GoPro technology within teacher education programs to simulate practical experiences. Findings from this GoPro integration pilot reveal valuable understandings for teacher education providers of the potential benefits and misgivings for implementing GoPro technology to simulate practical PE experiences for on-campus PSTs and external learners. It was revealed that there is a need to move beyond more traditional digital methods to innovatively engage PSTs’ learning of PE online via the use of the emerging mobile technology of GoPro. The suitability of GoPro technology was enforced by its portable nature and the ability of the camera to capture point-of-view vision through a process of simulation pedagogy. The field note observations within the integration trial, underpinned by the TPACK framework, revealed that the GoPro technology could be beneficial for PSTs to re-visit, critique and reflect upon practical PE learning experiences and work to close the gap between on-campus and online learning delivery for external students. A number of considerations relating to storage, consent, editing, uploading, preparations and the use of chest mounting straps are also important implications for this research. It is vital for university programs to enhance PST ‘readiness’ by providing PSTs with simulated experiences from PE practical classes in a way that allows them to meet the AITSL graduate standards of assessing, managing and planning irrespective of their mode of study.

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## Symbolism of clothing: The relationship between teacher clothing and children's perceptions in primary school physical education

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**Keywords:** physical education, elementary school children, teacher clothing, symbolism, role modeling, perceived teaching effectiveness

### Abstract

Teachers of physical education (PE) have the responsibility to develop and teach programs that physically educate primary school children. How teachers achieve this aim is a critical consideration. Issues such as planning, delivery, and evaluation are constant themes of consideration; however, other areas of *preparedness* such as personal presentation are not often investigated. The purpose of this research study was to determine whether a primary school teacher's choice of clothing in PE impacted children's perceptions toward that teacher and the PE lesson. Primary school-aged children from six northern Alberta, Canada schools participated in the study. Quantitative data was collected through the use of a specifically-designed Mannequin Clothing Assessment Questionnaire (MCAQ); while focus group interviews were employed to collect qualitative data. Both quantitative and qualitative data illustrated that teacher clothing is perceived by children to be important in PE lessons. Running shoes, athletic-style pants, and a golf shirt were perceived to be the most effective clothing choices for the ability to demonstrate, role modeling, safety, comfort, and mobility when teaching PE. This information may prove to be beneficial to the literature on effective teaching, teacher as a role model, and the symbolism of teacher clothing.

### Introduction

Primary school physical education (PE) programs should provide breadth, variety, and educational experiences that help develop the *whole child* (Hickson, 2003). As each subject area can contribute unique strengths to educational programs, all subject areas must be taught effectively. In particular, research indicates that PE can positively affect child development (Fishburne, 2005; Pangrazi & Beighle, 2010; Physical and Health Education Canada, 2016). Children experience several benefits from quality PE programs such as: higher levels of self-efficacy; greater academic performance; less disruptive behaviour; less anxiety (Medina, 2008); improved physical skills (Rink, 2004; 2003); health benefits (Dauenhauer & Keating, 2011); and leadership opportunities (Lieberman, Arndt, & Daggett, 2007; Martinek & Schilling, 2003).

In light of this understanding, it is essential that children are exposed to PE environments that promote teaching and learning (Hickson, 2003). Such environments would consist of well-planned lessons with effective lesson delivery (Fishburne, 2005; Rink, 2006), proper assessment techniques (Metzler, 2005; Pangrazi & Beighle, 2010), and developmentally appropriate activities (Fishburne, 2005; Gleddie, Hickson, & Bradford, in press). PE environments that



promote learning such as providing opportunities to acquire knowledge, skills, and attitudes to choose healthy active lifestyles are often referred to as ‘quality learning’ environments (Cherubini, 2009; Hickson, 2003).

In order for teachers of PE to develop quality learning environments, various teaching considerations are required. Although issues such as planning (Fishburne, 2005; LaBillois & Lagacé-Séguin, 2010), lesson delivery (Bradford & Hickson, 2014; Fishburne, 2005), and evaluation of learning (Metzler, 2005; Pangrazi & Beighle, 2010) are constant themes of consideration, other areas of preparedness such as personal presentation have received little investigation. As the role modeling of teachers (for example, behaviours, actions, appearance) can stimulate child development (Arthur, 2011), what a primary school teacher chooses to wear whilst teaching PE may be perceived by children as part of a teacher’s role modeling.

## Literature review

### *Effective teaching in PE*

Teacher effectiveness occurs when intended learning outcomes are achieved (Rink, 2003; Yilmaz, 2011). Teachers of PE are effective when they are well organised; have established routines; manage learning environments; follow developmentally appropriate programs; and assess for learning (Rink & Hall, 2008). Effective teaching of PE results in the development of knowledge, skills, and attitudes to live healthy active lifestyles (Gleddie et al., in press; Pangrazi & Beighle, 2013).

### *Teacher as a role model in PE*

Social cognitive theory (Bandura, 1986) is a framework for understanding, predicting, and changing human behaviour (Hall, 2012). Bandura (1986) contended that human behaviour is a complex interaction involving personal factors, the environment, and behaviour. From this theoretical perspective, it is evident that both teachers and their students are influenced by the interplay of behavioural, personal, and environmental influences. Hall (2012) suggested that there is consensus among investigators that the validity of social cognitive theory is strong and that it has been used and successfully applied in the PE domain. Therefore, stemming from Bandura’s (1986) social cognitive theory, role modeling is a fundamental mode of communication for teaching and learning (Cardinal, 2001). Enthusiastic teachers toward children’s learning create positive learning environments, and are commonly defined by the use of eye contact, facial expression, vocalisation, gesturing and movement throughout the learning environment (Vidourek, King, Bernard, Murnan, & Nabors, 2011).

Teacher actions seem to be as important as the material being presented (Pangrazi & Beighle, 2010). In light of this understanding, teachers of PE naturally become role models for children (Whitley, Sage, & Butcher, 1988). Although attitudes and actions are often considered when discussing role modeling, the *symbolism of clothing* has not received great attention in PE. Therefore, the issue of teacher clothing and its influence on children’s perceptions of the teacher is worthy of consideration.

### *Symbolism of teacher clothing in PE*

What a person chooses to wear is a powerful communicator (Damhorst, Miller-Spillman, & Michelman, 2005; Roach, 1997). Whether accurate or not, perceptions about a person based on clothing serve as a source of information (Molloy, 1975; Roach, 1997). Although there

is research indicating the effect of school uniform on student activity choice (for example, Norrish, Farrington, Bulsara, & Hands, 2012), minimal research has considered teacher clothing in PE. A teacher's appearance is essentially a non-verbal form of communication which influences the validity of verbal communication (Underwood, Kenner, & McCune, 2002). Therefore, teachers should consider their clothing choice to gain a level of respect (Freeburg & Workman, 2010). Even if a teacher's clothing is not intended to communicate, its interpretation as a function of individual choice give it communicative relevance (Hickson & Stacks, 1993).

In PE, where effective teachers teach by moving (Metzler, 2005; Rink & Hall, 2008), teacher clothing must support the learning environment. Teachers often face challenges on a daily basis to ensure that they are being effective in the delivery of their lessons (Roach, 1997). Therefore, it is logical for them to obtain every technique, advantage, and situational control method that may enhance their teaching effectiveness. Hence, teacher clothing may influence children's affect for the teacher, student mood, and perceptions that learning activities are important (Hickson & Bradford, 2012; Roach, 1997).

### *Perception formation toward teachers of PE*

Our environmental conception is created on sensory perception (Huumo, 2010). Perception is to inform us about the objects and events in our immediate environment that can intelligently guide our behaviour (Blake & Sekuler, 2006). Every activity (for example, reading, eating, talking, exercising) is strongly influenced by what one sees, hears, feels, touches, smells, and tastes (Blake & Sekuler, 2006), and forming a perception involves all human senses (Rock, 1983; Rookes & Willson, 2000). This notion provides a strong argument for the knowledge of whether a teacher's choice of clothing can impact children's perceptions toward that teacher.

This study, therefore, was guided by two questions: *What is the nature of the relationship between the PE teacher as a role model and the symbolism of clothing? and How are children's perceptions toward the PE teacher influenced by the teacher's choice of clothing in PE lessons?*

## **Methodology**

### *Ethical considerations*

The research study was conducted as approved by the University Research Ethics Board at University of Alberta in Canada. The main ethical considerations were participants' informed consent, confidentiality, and anonymity.

Specifically, discussions were held at the school district level to identify possible schools and gain consent to approach school administration. After gaining this consent, school principal permission was obtained to approach staff members and students concerning their possible participation in the study. Teachers that expressed a willingness to have their students participate in the study facilitated the distribution of an information letter and consent form to the homes of their students. The information letter outlined the study's purpose and procedures, participant obligations and responsibilities, confidentiality, and the right for withdrawal at any time without penalty or prejudice. Only the students with signed consent forms participated in the study.

Consent forms and all other data documents were kept in a confidential and secure manner as per University Research Ethics Board policies. Names of participants were not placed on any data gathering documents. When necessary, documents were assigned a number in order to record any difference of opinion and thought between participants. At all times, care was taken to ensure that all participants were treated in a manner that was respectful of their rights and personal dignity.

### *Phase 1: Quantitative phase*

Data were obtained from 389 children ranging from Grade 1 through to Grade 6 at six primary schools in northern Alberta, Canada through the use of a Mannequin Clothing Assessment Questionnaire (MCAQ). As this questionnaire was specifically created for this research, a pilot study was conducted to ensure that it could be used appropriately with primary school children. The MCAQ included 28 mannequin images depicting teachers wearing different clothing (see Appendix A for a list of clothing combinations on the MCAQ). Participants were asked if they perceived the teacher to be a 'really good,' 'good,' 'okay,' 'not so good,' or 'really not good' teacher of PE (see Figure 1). With each mannequin, participants were able to write why they chose their response.

**Figure 1.** MCAQ summative response scale



Descriptive statistics were employed to identify general trends and create a depth of understanding. Inferences were made regarding mean differences and order of descending means related to each mannequin. Participant comments provided a limited amount of qualitative data, which were utilised to help develop questions for Phase 2.

### *Phase 2: Qualitative phase*

Focus group interviews (FGIs) were conducted with a total of 19 students at two Phase 1 schools. At each school, three FGIs were conducted in groupings of Grades 1 and 2, 3 and 4, as well as 5 and 6 students. The grade-level groupings were chosen to align with developmental levels of child development (Fishburne, 2005), thereby creating a conducive discussion-based environment. An FGI Protocol was developed to discuss the trends identified from the MCAQ data and to address the research question.

Participants responded to open-ended questions and drew a teacher of PE. Drawings helped generate further discussion and clarification. FGIs were recorded and transcribed for content analysis. NVivo 10 data management computer program software was used to identify common terms and statements, while the coding categorisation process was conducted by the researcher and an assistant. Constant comparative analysis was used (Creswell, 2012; Mertens, 2014) to assist in the development of categories and sub-categories and emerging themes were then identified and used to organise the data and identify findings (David & Sutton, 2004).

## **Results and discussion**

### *Phase 1: MCAQ analysis*

Participants rated each mannequin according to clothing and perceived capability to teach PE. After calculating the means from the summative response scale, the 28 mannequins were ordered by descending means (see Table 1). Notably, the highest 16 means were mannequins

wearing ‘running shoes’ (M = 4.24-2.87) and the lowest 12 were mannequins wearing ‘dress shoes’ (M = 2.86-1.68). With regard to lower body clothing, mannequins wearing ‘sweat pants’ or ‘khaki pants’ received higher means (M = 4.24-3.73) than mannequins wearing ‘dress pants’ and ‘skirts’ (M = 3.69- 2.87). Further, mannequins wearing running shoes with sweat pants or khaki pants received means ranging from 4.24 to 3.73. Additionally, mannequins wearing dress shoes with sweat pants or khaki pants received means ranging from 2.86 to 2.42. Whereas, mannequins wearing dress shoes with dress pants received the lowest means ranging from 2.41 to 1.68. With upper body clothing, mannequins wearing ‘golf shirts’ received the highest means. Also, similar to the lower body clothing, mannequins wearing running shoes with sweat pants or khaki pants received higher means when also wearing golf shirts.

**Table 1.** *Mannequins\* in order of descending means*



\* mannequins #1-14 depict male teachers of PE

\* mannequins #15-28 depict female teachers of PE

The participants identified that the most appropriate clothing choices for teaching PE were running shoes, sweat pants or khaki pants, and golf shirts. Conversely, dress shoes were perceived to be the least appropriate clothing choice. This was further supported by participants who chose to write comments on their MCAQ. Although comments were not extensive, five particular themes were identified and supported through such comments as:

- **Ability to Demonstrate:** *“He won’t show you exactly what he wants you to do,”* and *“Then the teacher can move around and they can help you more.”*
- **Comfort:** *“He will be sweating,”* and *“I like the t-shirt because she could start to sweat.”*
- **Mobility:** *“You can’t run in the dress shirt and dress pants,”* and *“You can move around better in khaki pants than in a skirt.”*
- **Role Modeling:** *“I feel that she doesn’t want to teach gym,”* and *“This is the kind of teacher I want teaching me in gym class.”*
- **Safety:** *“He will fall and choke,”* and *“Slip or fall in high-heels.”*

#### *Phase 2: Focus Group Interviews (FGIs)*

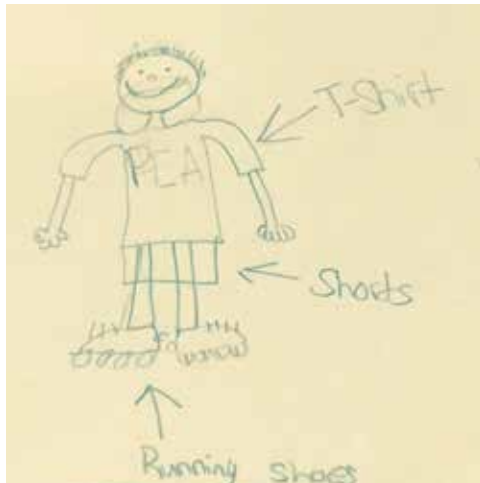
With support from Table 1 and participant comments on the MCAQ, questions for FGIs were established and a coding tree was developed during the analysis stage. Findings from participant perceptions were identified and categorised in order to answer the research question.

The data suggested that the relationship is multifaceted and extensive. Support of a relationship existing between teacher as a role model and the symbolism of clothing was found in participant comments. For example, a Grade 4 female stated, *“I think gym teachers are supposed to be a role model because if you’re going to be a gym teacher, you’re supposed to show them how to do it..., and if you’re not showing them what to do, what are they going to learn?”* Comments such as *“He can’t be a good role model because he looks like he is going to a wedding.”*, *“He is dressed like a waitress.”*, and *“Looks really unready!”* further illustrated the role model theme. Whereas, contrary comments included *“This is the kind of teacher I want teaching me in gym class.”*, *“Really Ready!”*, and *“...because it’s proper gym clothing.”*

When explaining the existence of a relationship between teachers as role models and teacher clothing, a Grade 6 male rated Mannequin 1 by stating, *“...really not good, because he’s wearing like a dress shirt and tie, dress pants and dress shoes, ... it looks like he’s going to a party ...”* In a similar manner, a Grade 5 male stated Mannequin 1 is, *“... wearing dress stuff and it’s mainly meant for like going out to like a party or something.”* He added, *“So, you’re not really active, you’re just like, like standing around talking and stuff.”* While supporting his perceptions toward Mannequin 1, he then added, *“...He could sit on the sidelines pretty easily because you’re not prepared for like teaching kids what they’re supposed to do.”*

Participant drawings of teachers of PE helped to further attest to a relationship between teachers as role models and the symbolism of teacher clothing. For example, participants referred to the importance of role modeling when explaining their drawings. A Grade 1 female referred to her teacher as a role model in relation to clothing choices by stating, *“I drew all the stuff that you should be wearing ... running shoes, a t-shirt and shorts.”*

**Figure 2.** Participant drawing of a teacher of PE



**Figure 3.** Participant Drawing of a teacher of PE



The findings from the MCAQ and FGIs suggested that teachers of PE must view themselves as role models. This finding supports the work of Dean, Adams, and Comeau (2005) who stated that role modeling is an important issue for those teaching PE, and the findings support the literature that states that positive, competent modeling by teachers has a significant impact on school children. The impact on the learning environment when teachers of PE are perceived as role models was illustrated by participant comments such as:

- **Perceptions toward the Teacher.** “He wouldn’t run fast with dress shoes,”, “He can’t really run in the shoes,”, “Golf shirt would be easy to move your arms,”, and “He can have more mobility with a golf shirt.”

Professional attire enhances attributes of teachers (Gordon, 2010). This was evident when participants perceived teachers wearing inappropriate clothing to lack caring toward the teaching of PE. For example:

- **Perceptions toward PE.** “Then the teacher could teach me better,”, “Because if he’s not comfortable, he might make mistakes ... on the stuff that he’s teaching us,”, “... because if they can’t move, then you won’t be able to learn,”, and while referring to an ineffective PE learning environment, a Grade 6 male stated, “We had a substitute. And that day she came in, she had her dress on and stuff, and she just said “go play with the basketballs,” and she sat on the bench and watched us.”

#### *The importance of teacher clothing choice*

It is clear that a relationship exists between the teacher as a role model and the symbolism of clothing, and children’s perceptions toward the teacher and PE are influenced by teacher choice of clothing. Participants consistently pointed toward the importance of wearing running shoes, sweat pants/khaki pants/shorts with a golf shirt; a teacher that is mobile, comfortable, and able to demonstrate in the learning environment.

This lends itself to the literature. In order to demonstrate motor skills, teachers must consider the appropriateness of their clothing for physical activity (Fishburne, 2005), and when teachers of PE demonstrate motor skills and display enthusiasm throughout lessons, they

can help children reach higher levels of motivation (Vidourek et al., 2011). Similarly, Workman and Freeburg (2009) contended that wearing appropriate clothing is a sign of responding to situational demands. The data does indicate that clothing choice must be part of a teacher's repertoire.

#### *The impact of teacher clothing on the learning environment*

This study has helped develop a deeper understanding of how teacher clothing choice in PE can impact children's perceptions toward the quality of learning experiences. With regard to the type of clothing being worn, a Grade 1 female explained that a teacher would likely be a 'not so good' teacher of PE, "Because if he's not comfortable, he might make mistakes on the stuff that he's teaching us." Statements such as this indicate that clothing choice can impact how children perceive the learning environment.

Clothing choices such as, running shoes, sweat pants and a golf shirt were perceived as being appropriate clothing for a teacher of PE to be wearing. Although practicality of clothing choice is important (Roach, 1997), participants also identified such qualities as caring for the subject area, ready to teach, and able to participate. Whereas teachers, when wearing inappropriate clothing such as dress shoes, dress pants, and a dress shirt, were perceived as being unable to demonstrate skills (for example, jumping), unsafe, and not caring about the subject area.

In light of this, teachers of PE need to understand that if they wish to create a learning environment that children perceive as supporting their learning, they need to wear clothing that is appropriate for physical activity. The demonstration of movement skills is critical for a teacher of PE, which is reiterated through participant data. When discussing Mannequin 1, a Grade 6 female wrote, "They won't be able to show you how to do it." If a teacher is unable to demonstrate the skills being learned by children, the learning experiences will not be as effective as compared to a teacher who is able to demonstrate. Teacher clothing has been identified, through this study, as a major reason for being able or unable to demonstrate skills in PE which can be tied to role modeling.

It is important to recognise that primary school teachers, including relief teachers, may not have time to always change into clothing such as sweat pants or a golf shirt during their school day. For example, teachers not only are responsible for their teaching, but are also involved in extracurricular programming and activities, formal and informal meetings with parents, teachers, and students, and many other school-related responsibilities. This results in little 'down time' for teachers. However, the data has indicated that the simple change of dress shoes into running shoes can positively influence the perceptions of the children toward the teacher, the subject area, and the learning environment. Research endeavours regarding PE that have considered effective learning environments have focused on issues such as planning, assessment, and delivery methods (Metzler, 2005; Rink & Hall, 2008). However, in this study, participants consistently communicated that teacher clothing can assist in the effectiveness of PE teaching.

#### *Teacher credibility as perceived by children*

The data indicated that the participants perceived the clothing worn by teachers of PE as important and adds to the research conducted by Hickson and Bradford (2012). Participant comments indicated that the credibility of the teacher is questioned. For example, when referring to Mannequin 15, a Grade 6 male stated, "This shows that the teacher does not care...", while a Grade 4 male contended, "It's looks like she's going to a wedding."

What a teacher chooses to wear whilst teaching PE is a powerful communicator to the children (Damhorst et al., 2005). If a teacher is preparing to teach PE wearing inappropriate clothing, a non-verbal message is being sent to the children that the teacher may not care for PE and may not be able to teach the skills that are to be learned. When this occurs, the teacher is communicating to the children that PE is simply a time for 'not learning.' This finding adds to the 'busy, happy, good' literature of Placek (1983) and Hickson and Fishburne (2005).

Limitations of this study included: the inability to acknowledge and/or measure all potential variables (for example, participants' background knowledge); the limited number of school sites; the lack of randomisation; and the inability to include all potential clothing items and colours on the MCAQ.

### Synthesis

Although it has been noted that teachers of PE have the responsibility to develop and teach programs that physically educate children (Hickson & Fishburne, 2005), the findings from this study may have added to the PE research literature concerning effective teaching, teacher as a role model, and the symbolism of teacher clothing. As previously stated, issues such as planning, lesson delivery (Bradford & Hickson, 2014; Mawer, 1995; Rink, 2006), and the evaluation of learning (Metzler, 2005; Pangrazi & Beighle, 2010) have been constant themes of consideration and thought, but an area of *teacher preparedness* such as teacher clothing has not been investigated to the same degree (Hickson & Bradford, 2012). This study provided another thought for teachers when considering their practice and, specifically, their clothing choice.

This study helped develop the understanding of teacher clothing. Although a teacher of PE can prepare by developing thorough lesson plans and effective assessment techniques (Metzler, 2005; Pangrazi & Beighle, 2010), if that teacher chooses to wear inappropriate clothing while teaching, the teacher may well be perceived as being not skilful, uncaring, and unsafe toward the subject area. If teachers wish to create conducive learning environments, they must consider more than planning and assessment. The importance of demonstrating and role modeling has been supported throughout the literature. The demonstration of fundamental movement skills has been perceived to be one of the most powerful forms of communicating to children in PE (Bradford, Hickson, & Evaniew, 2014; Volger, 2003). Wearing appropriate clothing to be able to do so, therefore, is critical.

In light of this information, teachers should find ways and the time to ensure that they wear appropriate clothing when teaching PE. After all, if teacher clothing choices can assist in children's learning, does it not seem worth the effort?

### Summary, conclusions and implications

Providing conducive learning environments is a critical aim for all teachers. The findings from this study present a number of points that either confirm the research literature or are worthy of consideration for further research. A relationship was found between teacher clothing in PE and participant perceptions toward the teacher and PE. Hence, this information of the impact that clothing can have on a child's perception of a PE teacher should be disseminated widely across the school system. Such discussion could be incorporated into effective teaching understanding. For example, teachers need to understand the importance their choice of clothing has on the impact of their PE program. With school administrative support, discussing strategies for finding the time to change into appropriate clothing for PE classes during the school day would start this important conversation. It is also apparent that the participants



held strong views about clothing being worn by teachers of PE. Therefore, it is suggested that teachers listen to the voices of those children that they teach. Encouraging children to share their thoughts would enable teachers to gather valuable information as to what impacts a child's learning and influences their choice of engaging in lifelong physical activity.

Although trends were found for primary school children's perceptions toward teacher clothing in PE, it must be noted that this study appears to be the first of its kind. The review of related literature found no other work that has explored whether or not teacher clothing impacts children's perceptions in PE. Therefore, ideas, implications, and future research questions must be shared for future thoughts and discussion. It is important that we continue to investigate the different variables that can impact PE teaching and learning. This is important in order to ensure that children are provided with conducive PE learning experiences.

Conducting future research to further investigate these findings may serve to create a better and more thorough understanding of the behavioural, personal, and environmental factors (Bandura, 1986) that can influence effective teaching of PE. Although this study identified some important findings, these findings are only the beginning of our understanding of teacher clothing and how it impacts school children's perceptions towards their teachers and PE.

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## APPENDIX A

### Clothing Combinations on the MCAQ

Mannequin 1: Collared, Long Sleeve Dress Shirt; Tie; Dress Pants; Dress Shoes

Mannequin 2: Collared, Long Sleeve Dress Shirt; Tie; Dress Pants; Running Shoes

Mannequin 3: Short Sleeve Golf Shirt; Dress Pants; Dress Shoes

Mannequin 4: Short Sleeve Golf Shirt; Dress Pants; Running Shoes

Mannequin 5: Long Sleeve Sweat Shirt; Dress Pants; Running Shoes

Mannequin 6: Long Sleeve Sweat Shirt; Dress Pants; Dress Shoes

Mannequin 7: Long Sleeve Shirt; Khaki Pants; Dress Shoes

Mannequin 8: Long Sleeve Shirt; Khaki Pants; Running Shoes

Mannequin 9: Short Sleeve Golf Shirt; Khaki Pants; Dress Shoes

Mannequin 10: Short Sleeve Golf Shirt; Khaki Pants; Running Shoes

Mannequin 11: Long Sleeve Sweat Shirt; Khaki Pants; Running Shoes

Mannequin 12: Long Sleeve Sweat Shirt; Khaki Pants; Dress Shoes

Mannequin 13: Long Sleeve Sweat Shirt; Sweat Pants; Running Shoes

Mannequin 14: Short Sleeve Golf Shirt; Sweat Pants; Running Shoes

Mannequin 15: Short Sleeve Blouse; Skirt; Dress Shoes

Mannequin 16: Short Sleeve Blouse; Skirt; Running Shoes

Mannequin 17: Short Sleeve Golf Shirt; Dress Pants; Running Shoes

Mannequin 18: Short Sleeve Golf Shirt; Dress Pants; Dress Shoes

Mannequin 19: Long Sleeve Sweat Shirt; Dress Pants; Dress Shoes

Mannequin 20: Long Sleeve Sweat Shirt; Dress Pants; Running Shoes

Mannequin 21: Long Sleeve Light Shirt; Khaki Pants; Running Shoes

Mannequin 22: Long Sleeve Light Shirt; Khaki Pants; Dress Shoes

Mannequin 23: Short Sleeve Golf Shirt; Khaki Pants; Dress Shoes

Mannequin 24: Short Sleeve Golf Shirt; Khaki Pants; Running Shoes

Mannequin 25: Long Sleeve Sweat Shirt; Khaki Pants; Dress Shoes

Mannequin 26: Long Sleeve Sweat Shirt; Khaki Pants; Running Shoes

Mannequin 27: Long Sleeve Sweat Shirt; Sweat Pants; Running Shoes

Mannequin 28: Short Sleeve Golf Shirt; Sweat Pants; Running Shoes

## Deficit discourses of Indigenous high school students in physical education and school sport and the benefit of a strengths based alternative

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**Keywords:** Indigenous, deficit discourses, figurational sociology, physical education, sport

### Abstract

This paper reports the positive aspects of participation in physical education (PE) and school sport by Indigenous students as part of the wider findings of a doctoral study carried out at three Australian Capital Territory (ACT) government secondary schools. Data was collected from Indigenous students using group interviews and figurational sociology was used to interpret the findings. Central to figurational sociology are long-term processes and power relationships and it is contended that deficit understandings are inextricably linked to these kinds of relationships between individuals and groups. In particular, the research drew upon the figurational concepts of established and outsider theory (Elias & Scotson, 1994). This study found that Indigenous students were predominantly portrayed according to deficit understandings in both PE and in school sport. This research is important because it connects with a key idea of the Australian Curriculum Health and Physical Education (AC HPE) (ACARA, 2015). This key idea being a ‘strengths based approach’. The paper concludes by identifying opportunities for Indigenous perspectives to be included in the AC HPE according to a strengths based perspective and also highlights related topics for future research. This paper is particularly relevant to primary and high school educators.

### Introduction

The purpose of this research is to demonstrate how perspectives of Indigenous students at three government high schools in the Australian Capital Territory (ACT) can inform Physical Education (PE) curricula and school sport utilising a ‘strengths based approach’ (ACARA, 2015). Such an approach is used to inform the AC HPE (ACARA, 2015) and acknowledges that all students have personal resources that they can utilise in meeting the achievement standards of this curriculum. In contrast to this key idea, Aboriginal and Torres Strait Islander peoples have historically been portrayed by non-Indigenous Australians according to deficit understandings (Nakata, 2007). Indeed, a consistent framing of Aboriginal identity as deficient is established across different sites of representation (Fforde et. al., 2013). Sport and PE as two of the more significant sites of representation of Aborigines make significant contributions to the discourse of deficit. The story in sport is that Aborigines are athletic and disadvantaged. Over-representation in certain sports proves disadvantage and confirms Aboriginal identity in deficit terms. Pre-service HPE teachers not surprisingly hold images of Aborigines as athletic and disadvantaged. They consistently use deficit words such as problem, disadvantage, impoverished, unhealthy, bad, welfare, dependant, fragmented, violent and even uncivilised to describe Aborigines (Bamblett, 2016). This firmly places Aborigines as an out-group in comparison to the pre-service teachers. An out-group offering little of value.

It is stated in the AC HPE that “the curriculum recognises that students have varying levels of access to personal and community resources depending on a variety of contextual factors that will impact on their decisions and behaviours” (ACARA, 2015). It is these personal and community resources of Indigenous students that this paper is most concerned with and how these have the capacity to benefit all Australians. Such a possible benefit relates to the purposes of the Melbourne Declaration on Educational Goals for Young Australians (MCEETYA, 2008) in making education more relevant for all Australians. The aim of this paper is to draw attention to the assets that the Indigenous student participants in this research possessed and illustrate how these can help all students experience PE and School Sport (PESS) in more meaningful ways. The research question for this study being how can the ideas of the Indigenous student participants and Indigenous knowledge generally be used to add value to contemporary PESS provision?

### Literature review

During the mid-1950s a form of PE emerged termed ‘PE-as-sport-techniques’ with a skills based approach to games and sports being a primary focus (Kirk, 2010). According to Kirk (2010), PE teachers teach ‘PE-as-sport-techniques’ by repetition of practices that are abstract or modified versions of related sports. Rarely are sports taught in their entirety or holistically other than sometimes at the end of a topic or unit of work. Within this model of PE, instruction frequently does not progress beyond an introductory level with similar content repeated over and over again (Kirk, 2010). This form of PE is dated and has not adapted to global societal change (Kirk, 2010). As such, it is limited in its relevance through being restrictive and because of its Eurocentric focus, where content that is primarily British or American is almost exclusively taught (Fitzpatrick, 2009). At the individual teacher level, this kind of PE aligns well with the personal biographies of PE teachers and in particular their strong associations with sport (Green, 2000; McKay, Gore & Kirk, 1990).

At the same time that ‘PE-as-sport-techniques’ became popular in many industrialised nations, the multi-activity curriculum also emerged, comprising individual physical activities or sports taught separately as short units of work (Drummond & Pill, 2011). In common with ‘PE-as-sport-techniques’, the multi-activity curriculum has persisted and is the leading framework for teaching PE in most developed countries including Australia (Capel & Blair, 2007; Drummond & Pill, 2011; Tinning, 2005). This popularity is despite the multi-activity model being recognised almost 30 years ago as not allowing students enough time to develop content knowledge and skills before moving from one activity to another (O’Connor, 2006). Other limitations of the multi-activity approach are that students can be excluded because of ability, or gender and content is often poorly related to the full versions of the games and sports that occur outside of school (Hastie, 2003; O’Connor, 2006; Tinning, 2010).

The development and writing of any curriculum is biased, because the values of writers and others of influence tends to be what is most highly valued (Dinan-Thompson, 2009; Ennis, 2003; Penney & Glover, 1998; Wright 1996). In other words, curriculum writers have relative power (Elias, 1978) in deciding what is, and what is not included, as well as what becomes privileged knowledge. According to Ennis (2003), in constructing PE curricula, writers choose what knowledge is most important for students to learn and this content comprises privileged and marginalised knowledge (Macdonald & Tinning, 1995; Tinning, 2004). Privileged knowledge includes science-based content such as ‘motor skills’, ‘biomechanics’ and ‘exercise physiology’, as well as ‘fitness’, and ‘team sports’ with marginalised knowledge being dance and ethnic perspectives including Indigenous games and sports (Tinning, 2004). Similar to curriculum writers teachers also have relative power (Elias, 1978) through being able to have some autonomy over what they teach. It was found in the wider research that this study draws from, that explicitly teaching Indigenous content has been a stated requirement

in PE curricula or generic educational policy documents at each of the three schools since the mid-1990s (Williams, 2016a). However, Aboriginal and Torres Strait Island games were found to be rarely or never taught in PE at each school (Williams, 2016b).

## Method

Figurational sociology was used to inform the research design and as the theoretical framework to understand the findings. Fundamental to figurational sociology is the concept of the figuration which contends that all people exist in interdependent relationships and have varying degrees of power according to the nature of the different associations that they are part of (Elias, 1978). These relationships are subject to planned and unplanned processes that occur over time. Within the overarching doctorate research the figuration that was examined was the interdependent people and processes that are involved in providing PESS at the three schools. In this paper, our focus is on the Indigenous students as part of this figuration. However, it is noted that these students do not exist in isolation within the figuration but are inextricably linked by relational ties to other 'key players' within this PESS figuration such as principals, executive HPE teachers, classroom HPE teachers and Indigenous Education Officers (IEOs). The non-Indigenous 'key players' in the wider research were found to have a monopoly share of the power resource within the figuration (Williams, 2016b).

Before data collection, ethics approval was obtained from University of Canberra Human Ethics in Research Committee and the ACT Education and Training Directorate. Data was then collected using semi-structured individual and group interviews at each of the three schools with all participants giving signed consent for their involvement. Transcripts were made for each of the interviews and recurring themes were identified and coded that related to a 'strengths based approach'. To protect student anonymity and confidentiality each of the three schools is identified in the following section using the letters 'A,' 'B' and 'C'.

## Results and discussion

Many of the students liked PE. Most commonly it meant 'fun and enjoyment' and it provided opportunities for playing sports and hanging out with friends. 'Being outside' was another popular reason why the students liked PE along with being active, health and fitness, skill development, teamwork, and competition. The following responses were typical of many of the students:

*... like just having a lot of fun... just playing games with your mates... mucking around... just sharpening your skills (student 2C).*

*It's fun... a lot of outdoor sports. I kind of enjoy being outdoors instead of being stuck in a class all day... (student 5C).*

*Yeah, it's good to get out and... stay healthy and fit and... play games with like your mates and that and... build like... characteristics about life and that... team skills... (student 5B).*

In many respects, these responses about why the students liked PE reflected the official contemporary and historical discourse for PE contained in documents that were examined as part of the wider study. In school and system level curricula documents, school prospectuses, Year books and websites, PE as well as being fun had the purpose of encouraging students to be active while developing their skills and fitness (Williams, 2016a). When asked if there was



anything that they would change in PE several students across the three sites thought that existing content in PE was often repetitive.

*Yeah, I wouldn't change much but... I reckon... it would be better to have like more variety of... different like activities and that for PE. Because like... with my teacher we pretty much just do the same unit... and it gets kind of boring and that... and yeah (student 4B).*

Similarly, in the context of more Indigenous content being taught in PE, student 9A commented:

*It would be much more interesting... than a lot of the subjects (topics in PE) we do, which we do... since... like kindergarten.*

The mention of repetitiveness of content reflects the shortcomings of the 'PE-as-sport-techniques' model raised by Kirk (2010). Some of the HPE teachers interviewed at the three schools as part of the wider study spoke about how there was 'no space' in the existing program to include Indigenous content (Williams, 2016b). The above student comments suggest that there is indeed space for this provision. In addition, those student remarks are also in contrast to responses at a national level to the *Draft Shape of the Australian Curriculum: Health and Physical Education Consultation Report* (ACARA, 2012) where teachers similarly said there was no room for additional content because of an already crowded curriculum. Those 'reasons' we contend are unjustified and instead represent cohesion by an established group in resisting infiltration by an outsider group (Elias & Scotson, 1994).

According to Elias and Scotson (1994), established groups are people who share common values, beliefs, practices and behaviours characterised by longevity who tend to have a large share of power resources within figurations. Conversely, outsider groups have some shared beliefs as well differing values, beliefs, practices and behaviours and tend to possess a much smaller share of the power resource. In the PESS figuration studied, HPE teachers can be considered as an established group because they have common values such as their predisposition to sport and Western sport in particular (Williams, 2016a). In addition HPE teachers tended to teach 'PE-as-sport-techniques' (Kirk, 2010) using predominantly Western games and sports that had remained largely unchanged in the histories of each respective school (Williams, 2016a). Further, all of the HPE teachers were non-Indigenous and had attended teacher education at a local university where Indigenous content had not been included in PE teacher education (Williams, 2016b). We argue therefore that Indigenous content was considered as marginalised content by those teachers (Macdonald & Tinning, 1995; Tinning, 2004). It was something that they had rarely been exposed to, particularly in a PESS context. The Indigenous students are considered an outsider group in the PESS figuration, on account of their Indiogeneity and because they had limited power to influence the figuration. This lack of power was also a consequence of the Indigenous students' status as students, who by virtue of their position as children in a school have limited decision making power. Further, some of these students did not even know that there were games from their own culture (Williams, 2016b).

The students commented that Indigenous content was rarely included in PE. At School C, some Indigenous games and sports were taught but predominantly by an IEO who was not a teacher but instead a teacher support member of staff. The students were asked whether they thought Indigenous content should be included more often at school and within PE in particular. Most of the students across the three schools thought that there should indeed be more traditional Indigenous games or Indigenous culture in PE.

*Yeah... I reckon it would be a good experience for... non-Indigenous kids plus as well as the Indigenous kids. Just to get back to their roots and stuff... just something different than all these other... games that we can learn (Student 1B).*

*Yes... I think it would be fun if we did it and it would be really good for other kids to... see different cultures (Student 6B).*

*Well I'd like some more traditional games in PE. It would just be fun just to... like show other teachers and... so they can show their classes... or... other people so they can... like tell their friends... so that... the sport can get out... and let everybody know... like there is a game... like there is traditional games. There are traditional games like... Indigenous. So there's only two games that I know... if we could get that out that would be pretty cool... because we could play schools against schools like we did last year (student 2C).*

What these student points of view illustrate is that those students would welcome their wider community resources being a substantive part of the PE curricula at their schools. By HPE teachers and school authorities realising their suggestions, they would it is contended, facilitate a 'strengths based approach' (ACARA, 2015). It is possible for some of these students that PE would have more significance for them by having more connection with their culture (ACT DET, 2006). However, one student was indifferent to increased Indigenous content in PE although they thought that it would still be a good idea.

*Well... I don't really mind actually if it's in there or not... but I reckon... it would be good... just to find out more about our games and that because that... was the first game I've played (unspecified Aboriginal game)... it was a traditional game. Yeah... it was pretty fun playing it (student 4B).*

The students were asked why there should be more Indigenous content in PESS.

*Cos it'll... show... more of the culture around... the school (student 3A).*

*So everyone can like... know... like... something different instead of just the normal games like soccer, and whatever (student 4A).*

The students were invited to consider how they thought other students might respond to this 'new' content.

*They might think it's... different (student 4A).*

Through Indigenous content in PE perhaps appealing to the wider student population it may help them to become active and informed citizens of the future through greater appreciation of Indigenous culture (MCEETYA, 2008). Student 4A also thought that HPE teachers should teach these games with help from Indigenous people in the community. The students were asked how it would make them feel, having Indigenous content in PE?

*I'd feel... more like I'd want to do it... I guess (student 2A).*

*I'd feel like... 'a million dollars'. Just so free... like... I don't know... I'd just feel more connected... but that's... just me (student 5A).*

*I reckon it would make me feel excited and... like... I don't know... I'd just be a little 'cheeky person' cos I'd know how to play the game and others would be just learning... So that's kind of... an advantage to me so I'd just be the 'smart arse'... to them (laughs) (student 1B).*

*I think it would be more fun, more interesting (student 6B).*

*We'd have more fun in class and be proud (student 1C).*

*Just a... change... in games because usually they're all the same... and if it goes on with different games that... non-Indigenous people don't know... then they might have fun as well as doing all the other games' (student 5C).*

These responses show the potential for Indigenous content in PE, enabling PE and therefore school generally, to have greater significance (ACT DET, 2006) for some Indigenous students. Student 3A remarked that his school had entered the ACT Secondary School Sports Association Buroinjin competition, Buroinjin being a traditional Aboriginal ball/tag game (Australian Sports Commission, 2009) and that they had won. Student 3A was asked how that made him feel, that they had won.

*Yeah, very... very good (student 3A).*

The students who had played Indigenous games and sports as part of PESS were asked how participating in these activities had made them feel.

*Yeah it was... I was pretty proud that they came up with a game like that (student 4B).*

*I wish I did do like more... stuff to do with our culture. Like, at my last High School they did... do like... sports... Indigenous sports and stuff (student 2A).*

The students were asked why they thought that Indigenous games tended to be taught infrequently, if at all in PE at their schools:

*Probably... some teachers don't want to teach it... some teachers do. Some teachers just don't have the respect of the Aboriginal person (student 1C).*

*Like I guess they've (HPE teachers) never... known the games... like... they've never known the games like Aboriginal people. Indigenous people have more knowledge than other peoples' games and stuff. I guess they've just kept it to themselves (student 2C).*

*I'm not... entirely sure. I reckon they should... have some... Indigenous games. Most of them can be fun... and... teach all the non-Indigenous people that... we play those sort of games (student 5C).*

These responses are insightful to some of the reasons why HPE teachers at the three schools rarely, if at all, taught Indigenous perspectives in PE. The response by student 1C about some teachers not wanting to teach Aboriginal and Torres Strait Islander perspectives in PE was consistent with what was reported in the wider doctoral research. Apathy and resistance to

teaching these perspectives in common with what has been reported nationally (see ACARA, 2012) was evident in the HPE teacher interview transcripts at each school (Williams, 2016b). The comments by student 2C about HPE teachers not knowing about Aboriginal games is also consistent with what the HPE teachers said at their interviews (Williams, 2016b). The final response by Student 5C seems a fitting way to end this section because it highlights issues of social justice and equity (ACARA, 2015; MCEETYA, 2008) and that Indigenous games have a rightful place in *The Australian curriculum health and physical education* (ACARA, 2015).

### Synthesis

In this paper it has been shown that Indigenous students at the three ACT government high schools believed that Aboriginal and Torres Strait Island games and sports should be included in a more substantive way in PESS. Students spoke about how much of the content taught in PE failed to acknowledge their culture and also suggested that contrary to the beliefs of their HPE teachers, there was 'space' for Indigenous mention in PE. Although direction to teach Aboriginal and Torres Strait Islander perspectives has been explicit in ACT government education system level generic documentation or school level PE curricula since the mid-1990s, there was little evidence in the wider research that such content was taught (Williams, 2016b). This slippage serves to illustrate the relative power that HPE teachers hold as an established group (Elias & Scotson, 1994) by having autonomy in deciding what they teach and do not teach. There was a sense that the Indigenous students while welcoming a shift to include their culture within PE had limited power to progress such change. This limited influence we argue is characteristic of the status of these Indigenous students as an outsider group that is representative of Aboriginal and Torres Strait Islander people more widely in society.

### Summary, conclusions and implications

This research has highlighted the inequity of PESS provision at three government high schools in the ACT where Aboriginal and Torres Strait Island content is marginalised. The paper draws upon wider research that found that Indigenous students experienced PESS in racialised ways and were subject to broader stereotypical typecasting (Williams, 2016c). Deeper explanation about why HPE teachers did not teach Indigenous games and sport was reported from the overall doctoral research (see Williams, 2016b). However, this paper has a different focus that views the recently launched Australian curriculum health and physical education (ACARA, 2015) as an opportunity for Indigenous culture to be embraced as a 'strengths based approach' (ACARA, 2015). Nevertheless, for such a shift to happen the authors argue that a multi-faceted approach is required. Such an approach requires pre-service and in-service HPE teachers to reconsider the meaning of PESS and to ask themselves whether what we do in PESS is socially just. Perhaps what are difficult or controversial issues for some Australian HPE teachers have to be raised and possibly confronting discussion needs to take place. We contend that by having frank and open conversation at forums such as the ACT Australian Council for Health, Physical Education and Recreation 2016 Conference that the figuration described here can begin to change. Further, the Aboriginal and Torres Strait Islander Elected Body <http://atsieb.com.au/> who give Indigenous Canberraians a voice, the United Nggunawal Elders Council, local universities and schools also have a role to play in helping to include Indigenous content more meaningfully in PESS.

There is also a need for further research. What has been discussed is one aspect of a 'strengths based approach' (ACARA, 2015). However, there are other ways in which Indigenous students in PESS can be viewed according to this approach. For example, research has already

been carried out into how Aboriginal people continue their culture through Western sport and sports competitions or tournaments (Bamblett, 2011; Godwell, 1997; Norman, 2006). Genuine and meaningful inclusion of Indigenous perspectives in PESS has a much greater importance beyond the Australian curriculum health and physical education (ACARA, 2015). Embracing the traditional games and sports of Indigenous peoples in Australian schools is a step towards reconciliation. In summary, the ideas of the Indigenous students and wider knowledge of Australian Indigenous peoples can add value to contemporary PE programs in Australian schools. At the same time, this inclusion can address long term issues concerning the repetitive nature of present day PE provision. It is our intention that delegates will consider the ideas put forward in this paper and in the accompanying presentation to reflect upon their own practice and make changes to their own pedagogical practice as necessary.

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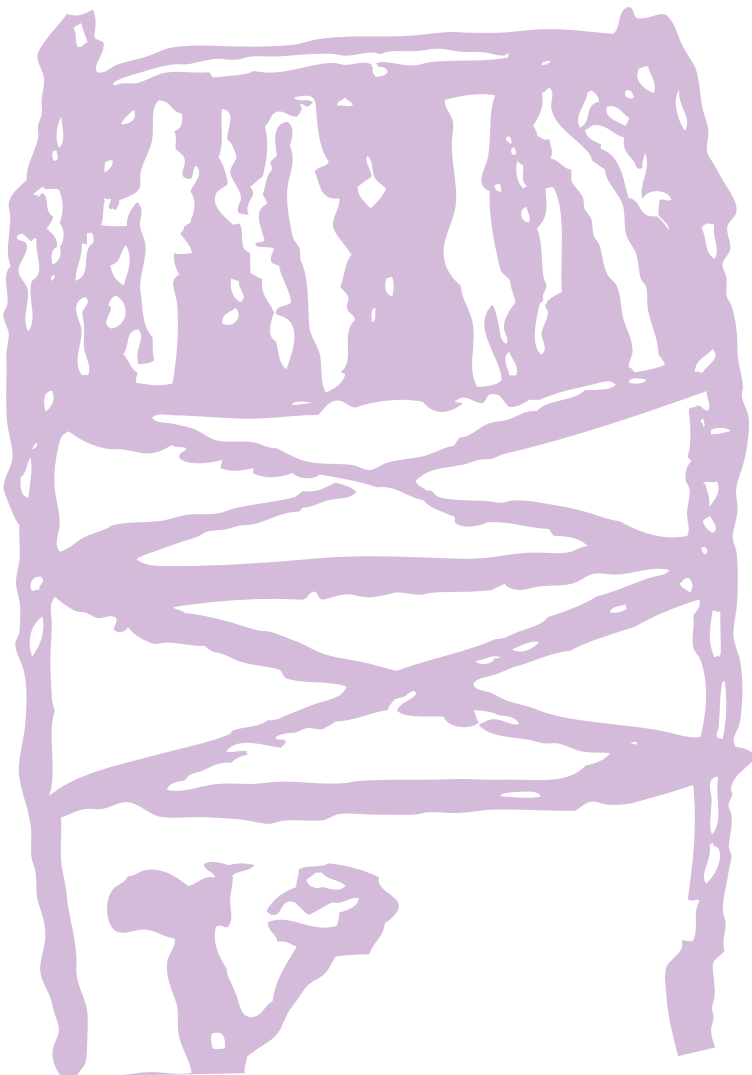
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## Rumination, realignment and reflection: Who is really teaching health education in secondary schools?

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**Keywords:** health education, teacher education institutions. HPE, secondary education, pre-service teachers

### Abstract

In Western Australia (WA), health education (HE) is timetabled as a separate, discipline-based subject belonging to the health and physical education (HPE) learning area. Globally, this subject is identified as a key site to support and strengthen the health and wellbeing of children and young people. In WA, teachers from outside-of-the-field of HPE are commonly used to deliver HE. This situation is not exclusive to HE nor to WA, and in some circles is referred to as education's dirty little secret. This mixed-methods study critically examined the role of the teacher in the delivery of HE with the purpose of continuing previous WA-based research and responding to a gap in data with regard to the qualifications of the teachers. The study obtained questionnaire responses from 75 teachers delivering HE in 49 different lower secondary government schools across the state with nine teachers interviewed after the first round of quantitative data collection to provide contextualised information of the WA setting. The study found that half of the teachers delivering HE were unprepared to do so.

### Introduction

Effective Health Education (HE) delivery in Australian schools is needed to contribute to the health and wellbeing of young Australians. Meanwhile, effective delivery in HE is characterised by quantity and quality, relying on a triangulated tension between policy, context and teacher preparedness to teach (Barwood, 2015a). Therefore, to survive and ultimately thrive amidst the dichotomy between theory and practice, HE in Australian schools must address challenges in teacher preparations and the particular ways in which it is defined by schools and teachers. Moreover, to make a meaningful difference in the lives of young Australians, HE must embrace the vertices of tension and develop ways to stimulate symbiosis.

This paper focuses on the preparation of a particular group of teachers who delivered HE in lower secondary government schools in WA in 2012. It stems from a mixed methods study (Barwood, 2015a) that sought to further previous but now dated WA research (Shilton, McBride, Cameron, & Hall, 1995), which like other similar international studies investigated issues pertaining to teachers delivering HE without confirming the qualifications of these teachers through data (Barwood, 2015b; Barwood, Cunningham, & Penney, 2017). In accepting the possibility of a gap in data, the study critically examined the qualifications and training of 75 teachers delivering HE with intent to develop more valuable spaces to support health learning in secondary schools. The study found that nearly half of the teachers delivering HE were categorised as unprepared to deliver the subject based on their undergraduate and

graduate qualifications and training, whilst noting that teacher competence and confidence post qualification was somewhat dependent on attitude to teach the subject.

In light of data, this paper centres on developments, post-study, pertaining to the course structure of HPE pre-service teacher education at a particular WA-based university. It reports on progress to address and realign the university's perspective of pre-service teacher preparations in HPE. At the same time, this paper returns to data generated in the mixed method study to spotlight the incidence of 'out-of-field' teaching in the delivery of HE. In so doing, it aims to promote and renew open dialogue between schools, teacher education institutions and professional organisations such as the Australian Council for Health, Physical Education and Recreation as a means to support quality in HE delivery. This paper acknowledges that HE is variously delivered and offers suggestions for professional learning that could assist teachers to deliver effective HE in Australian schools.

## Background

In Australia, schools as locators of formative dilemmas orchestrate the particular version of HE that is delivered, whilst teachers as enactors of State and Territorial curricula engender the meanings and ways in which children and young people are taught for and about health. Universities as mediators of curricula and practice, and in acknowledgment of educational settings prepare pre-service teachers with the knowledge, understandings and skills to effectively deliver HE in schools variously positioned. Simultaneously, universities recognise, acknowledge and ratify the Australian Professional Standards for Teachers through their course structures and learning opportunities (Australian Institute for Teaching and School Leadership, 2011a).

In 2012, most secondary schools in WA paired Physical Education (PE) with HE to present a holistic understanding of HPE, with Outdoor Education (OE) offered as an elective subject (Barwood, 2015a; Barwood, Cunningham, & Penney, 2017). This representation is similar to other states and territories in Australia including: Australian Capital Territory, Northern Territory, Queensland, South Australia and Victoria, but differs slightly to the states of Tasmania and New South Wales (Barwood, 2015a; Leahy, Burrows, McCuaig, Wright, & Penney, 2016). This combination of PE and HE has a somewhat longstanding tradition in WA with McBride, Midford and Cameron (1999) reporting that it was established with the introduction of the Curriculum Framework in 1998 (Western Australia Curriculum Council). In 2017, this combination will be continued via the formal implementation of the WA P-10 Syllabus for HPE (School Curriculum and Standards Authority, 2015), which legitimises the WA re-contextualisation of the endorsed Australian Curriculum for HPE (Australian Curriculum, 2015).

In 2012, four of the five teacher education institutions in WA effectively prepared pre-service teachers to deliver HPE in WA schools (Barwood, 2015a). The remaining university permitted enrolled students to graduate with a limited experience of HPE at variance to the preferred conceptualisation of HPE in WA and/or Australian schools. More particularly, through their unit selections, students in the course could preclude critical aspects of the HPE learning area resulting in an educational perspective that privileged PE and/or OE over HE.

In 2016, the perspective remains incongruent with the holistic approach articulated in contemporary HPE (Australian Curriculum, 2015); pre-dating the earlier mentioned Curriculum Framework in WA (Education Department of Western Australia, 1986, 1987a, 1987b; Western Australia Curriculum Council, 1998). Some teachers refer to this perspective as a 'bug bear of the WA system' as the majority of pre-service HPE teachers in WA stemmed from this one university (Barwood, 2015a).

### *Teacher preparation*

Research suggests that teacher preparation is critical in supporting quality education (Australian Institute for Teaching and School Leadership, 2011b; Hattie, 2003, 2005, 2009) and from the perspective of HE rich international and national research agrees, citing issues with teacher comfort, confidence and competence as impacting what is and what is not taught in the name of HE (Begoray et al., 2009; Evans, Davies, & Wright, 2004; Fetro, 2010; Kann et al., 2001; Paakkari, Tynjala, & Kannas, 2010; Sinkinson, 2011; Smith & Philpot, 2011; Tinning, 2000, 2004). Equally, research concedes that teacher preparation has significant implications for the ways in which young people come to know health knowledge, primarily because HE is more vulnerable than other subjects to the diversity of personal perspectives. Burrows and Wright (2004) encouraged teachers, through their pedagogical choices, to “dissect, disrupt and perhaps transform student thinking about what constitutes and contributes to well-being and health” (p. 203) because as more recently explored by Leahy et al. (2016), teaching and learning that positions health within an individualistic perspective of personal responsibility is problematic.

With regard to teacher preparation for HE two groups of teachers are clearly identified, those who could be classified as inadequately prepared to teach the subject and those who could be classified as unprepared to teach. Harris and Leggett (2013) reported that teachers in England and Wales could be classified as inadequately prepared because HE was not included in their pre-service training. Paakkari et al. (2010) from the context of Finland, cited incidences of teachers of “home economics, biology, citizenship education and psychology delivering health education” (p. 917). They considered that it was difficult to know whether these teachers were delivering “all the critical aspects of teaching health education” (Paakkari et al., 2010, p. 917). McConney and Price (2009) in referring to unprepared teachers used the term ‘out-of-field’ to define them. They explain that ‘out-of-field’ teaching is a way for school administrators to “top-up” the timetable of a teacher (p. 89), and found that the incidence of this practise was much higher in the lower secondary years. Notably, McConney and Price reported that teachers timetabled to deliver Information Technology were the most significant group who lacked training at 46 per cent and more likely to be comprised from ‘out-of-field’ teachers.

From a more local perspective, WA researcher Daube (2011) criticised HE teacher preparations whilst another WA based research (Western Australia Education and Health Standing Committee, 2011) pointed more directly to the shortcomings in the course design for teacher preparations at WA universities (Barwood, Cunningham, & Penney, 2017). Swabey, Castleton and Penney (2010) on researching the perceptions of beginning HPE teachers in Tasmania found that the key concern for these teachers was “practical pedagogical knowledge” (p. 34) and that is, knowing the content and how to teach it.

Irrefutably, teacher preparedness to deliver HE remains a global issue, with a raft of scholarship documenting how preparedness can impact student engagement with the broader meanings of health (Begoray et al., 2009; Burrows & Wright, 2004; Fetro, 2010; Harris & Leggett, 2013; Kann et al., 2001; Leahy et al., 2016; Lohrmann, 2011; Mayer, Smith, & McDermott, 2011; Paakkari et al., 2010; Sinkinson, 2011; Smith & Philpot, 2011). Drawing on the study’s insights, this paper now details the methodology used for the study whilst exploring some challenges and opportunities to support teachers who deliver HE in secondary schools to develop meaningful and valuable spaces for health learning.

### **Method**

Utilising mixed-methods methodology, the study collected quantitative data from 75 teachers in an online and paper survey and qualitative data from nine teachers who participated in

semi-structured interviews. Analysis of the survey data was performed using SPSS (21) with descriptive statistics calculated. Analysis of qualitative data was performed using Artichoke computer software (Fetherston, 2011) as it was specifically designed for handling qualitative data in educational settings.

Analysis of the survey data determined the extent to which 49 lower secondary government schools in WA timetabled HPE teachers and 'out-of-field' teachers to deliver HE. Analysis of the interview data revealed the perspectives of a group of HE teachers and was combined with the quantitative data to produce contextual insight into the representation and delivery of HE in particular WA schools.

Ethical approval for the study was attained through Edith Cowan University and the Department of Education in WA. A review of historical and current developments in HPE curricula across Australia along with the course structures of WA universities that prepare HPE teachers for secondary schools, determined the extent to which HPE pre-service teachers in some WA secondary schools were prepared to deliver HE.

## Results and discussion

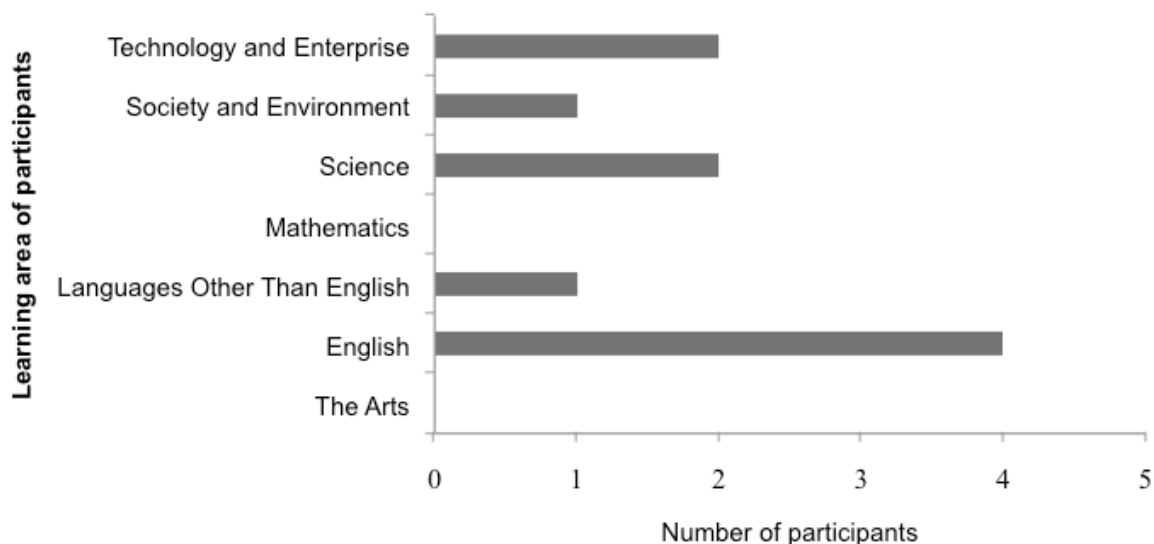
### *Age and gender*

Of the 75 participants, 37 were male, 36 were female and two participants identified with the 'other' category. The majority (33%) of the participants were aged between 40 and 49 years, with the number of male participants declining thereafter according to age. Female participants did not show the same age distribution but declined between 30 and 39 years, and again after 50 years. The number of female participants aged between 20 and 29 years were comparable to that of female participants aged between 40 and 49 years.

### *Participants' main learning area*

Sixty-five participants (86%) identified the main learning area in which they taught as HPE, whilst 10 (14%) participants identified learning areas other than HPE (Figure1). The literature (McConney & Price, 2009), referred to this group of teachers as 'out-of-field' teachers, whilst the participants in the study referred to them as 'filler teachers'.

**Figure1.** Participants whose main learning area is other than HPE.



The largest grouping of the participants who were 'out-of-field' HE teachers (four) stated English as the main learning area, with the Mathematics and the Arts having no participants. As evidenced by the interview participants' statements, it is possible that teachers of Mathematics and the Arts at that time were in short supply in WA government schools, with those who taught these subjects having no extra time to deliver HE. Further, the participants reported that HPE teachers with a teaching minor such as Mathematics or the Arts were often used to fill perceived teacher shortages, which in turn impacted their availability to deliver HE.

When interviewed, the nine participants consistently complained about the use of 'out-of-field' teachers delivering HE in their schools and reported teachers such as French, Science, Society and Environment and the school librarian as timetabled to deliver the subject. They cited these teachers feeling uncomfortable and lacking confidence, ignoring and/or refusing to deliver the subject's essential content, using a didactic mode of delivery, disregarding the subject's skill-based approach, and losing valuable resources. One participant was infuriated by an 'out-of-field' teacher, claiming that he refused to teach the subject even though she had written out every lesson plan for him. Another participant felt that 'out-of-field' teachers struggled with the way in which contemporary HE was taught and referred to learning experiences that explored, "self management skills and interpersonal skills" as problematic for these teachers. Another believed that 'out-of-field' teachers had a very "different framework in mind of how to teach" and that this framework did not include participatory activities.

The survey participants when given the opportunity for extended comment also complained about issues pertaining to timetabling and staffing that impacted the delivery of HE. Of the 36 written responses, the most frequent response (50%) related to the use of teachers outside of HPE delivering HE. One teacher exemplified the participant responses by commenting that "health education has been often 'farmed out' to whoever is under loaded outside the PE faculty [HPE], which at times, has not been in the best interests of the students."

Although 'out-of-field' teaching is not an uncommon practice in schools across Australia, the 46.7 per cent of teachers in the study who were deemed to be either unqualified or without training in HE is high in comparison to incidences reported in other subjects (du Plessis, Gillies, & Carroll, 2014; Goos, 2013; McConney & Price, 2009).

#### *Participants' formal teaching qualification*

Following the questions pertaining to age, gender and main learning area taught, the participants were asked to identify with a category of teaching qualification. Of the 65 participants who stated HPE as their main learning area, Table 1 shows that 58 of the 65 teachers (89%) have formal teaching qualifications in HPE, and seven (11%) have no formal teaching qualification in HPE. At the same time, Table 1 shows that 18 (28%) of the 65 participants, despite having a formal qualification in HPE, stated that the qualification was without HE training.

**Table 1.** Participants' learning area and formal teaching qualification

<b>Formal teaching qualification</b>	<b>Learning Area</b>	
	<b>HPE</b>	<b>Other than HPE</b>
HPE qualification with HE	40	0
HPE qualification without HE	18	1
Non-HPE qualification with HE minor	0	1
Non-HPE qualification without HE minor	1	1
Post-graduate degree in health-related studies	1	1
Other	5	6
<b>Total</b>	<b>65</b>	<b>10</b>

Collectively, the interview participants did not favour having the HPE teacher who was without HE training to deliver HE as they perceived these teachers were lacking sociocultural understandings to explore the myriad of ways in which to think about health. They felt that these teachers were 'thrown in' to deliver HE at the deep end and they complained that these teachers avoided content, did very little planning, lacked passion, left things to the last minute and felt uncomfortable with the subject. One participant explained: "they see themselves as 'phys-edders' and not 'health-edders' and it is not their learning area as such." Whilst other participants complained about the impact of pre-service teachers without HE training on practicum in their schools, one participant stipulated that the choice of university in WA affected the delivery of HE in a pre-service teacher's classroom.

Nationally and internationally, a raft of critique explores teacher preparations in HPE, identifying teacher education institutions as the key site to unpack the bundles of knowledge that constitute contemporary HPE (Evans et al., 2004; Swabey et al., 2010; Tinning, 2000, 2004). Cliff (2007) explains that HE is grounded in a constructivist view of health, whilst PE in its entirety, does not reflect a social view of health. Cliff, along with researchers like Tinning (2014) implore universities to disrupt narrow understandings of HPE to allow more inclusive HPE teacher identities to emerge.

## Challenges and opportunities

### *University course design*

In 2016, the author of this paper received a grant from the university in which she is currently employed, to support the development of a new course for the university's pre-service secondary HPE teachers. This development aimed to align the proposed course with the preferred and holistic perspective of HPE articulated in the WA P-10 Syllabus for HPE and the endorsed AC: HPE (Australian Curriculum, 2015; School Curriculum and Standards Authority, 2015). This development includes the critical examination of the university's current course, along with the course structures and unit inclusions at other universities that prepare HPE pre-service secondary teachers in WA and Australia.

In addition to the review, this development will explore the perspectives of curriculum leaders of HPE in WA schools through semi-structured interviews held with a sample of Heads of the HPE learning area (HOLAs). This development will gather contextual understandings of workplace

needs and uncover some of the challenges and opportunities for graduate teachers in these schools. This development seeks to promote continuous open dialogue between schools and the university, with annual conversations to review progress and promote reflective practice.

Understandings from the review will be combined with the perspectives of the HOLAs to develop a contemporary and reflective course that prepares pre-service secondary HPE teachers to advance the effective delivery of the full scope of educational outcomes for HPE, whilst promoting skills that will help them navigate the variously positioned secondary schools across WA.

### *Professional learning*

'Out-of-field' teaching is not exclusive to HE nor to WA and in regard to HE, it is no longer education's "dirty little secret" as claimed by Ingersol in 2003 (cited in McConney & Price, 2009, p. 88). In fact, it is prolific in the subject of HE in WA secondary schools and largely a consequence of contextual and administrative constraints and contingencies (Barwood, 2015a).

At the same time, specific professional learning that supports 'out-of-field' teachers to deliver HE effectively, which unpacks the theory and practice underpinning health curriculum, does not exist in WA. This is despite the incidence of 'out-of-field' teaching within the subject being greater than other subjects in secondary schools (du Plessis et al., 2014; Goos, 2013; McConney & Price, 2009; Sharplin, 2014). Professional learning is available to these teachers but it primarily focuses on content knowledge rather than policy and curriculum understandings.

Accordingly, appropriate professional learning is critically needed to help 'out-of-field' teachers to unpack the curriculum, and to explore the tenets, philosophies, ideologies and pedagogies that are within. Professional learning is needed that dissects and disrupts individualism in health learning and promotes inclusive practice and embraces diversity. In brief, professional learning is needed to help 'out-of-field' teachers build the capacity to sympathetically intervene, facilitate and educate in a HE classroom. However, and aside from promoting meaningful and valuable spaces for health learning, professional learning is needed for these teachers to enhance teacher comfort, confidence and competence and importantly in Australia, so that they can achieve within the context of HE the Australian Professional Standards for Teachers (Australian Institute for Teaching and School Leadership, 2011a).

### **Final words**

The author acknowledges that course review and redesign in teacher education institutions is by no means easy, nor is it a 'quick fix' but more so, it is a continual work in progress. She acknowledges that her efforts in this paper do not offer new direction or re-imagine HE delivery but that, they recognise the gaps in our understandings and shed some new light on opportunities for change. Like Leahy et al. (2016), the author agrees that "more research, conversations and sharing" (p. 145) is needed, but unlike Leahy et al (2016), she would like to firmly reposition the spotlight to clearly illuminate HE practice. In refocusing some of our research efforts toward generating more empirically-based understandings of our practice, then the relationship between policy, context and teacher preparedness to teach HE can be better understood.



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## 'Heat-Smart' schools during physical education (PE) activities: Developing a policy to protect students from extreme heat

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**Keywords:** physical education, physical activity, policy, heat, hydration, social-ecological model, leximancer, schools

### **Abstract**

National and state surveys of school sun protection policies and practices demonstrate that being a member of a SunSmart Program improves sun protection practices in primary schools, often lead by Health and Physical Education (HPE) teachers. Australia's major Sunsmart program implemented in primary schools has largely focused on limiting children's exposure to ultraviolet radiation (UVR) to reduce the risk of developing skin cancer later in life. Yet another major hazard during outdoor physical education activities is the impact of extreme heat on school students. With physical education (PE) often occurring in hot environments and involving higher intensities (and heart rates), exposure to heat influences are raised. This research reports on a social-ecological model (SEM) review and text mining analysis of key heat protection policies and practices for the development of a five stage Heat Smart action plan in schools. The five stage action plan of Heat Smart strategies can be used to counteract extreme heat exposure during PE and ensure school students continue to meet key national physical activity and curricular objectives.

### **Introduction**

It has been demonstrated from state and national evaluation surveys that being involved in Cancer Council's SunSmart Program can enhance sun protective practices (hats, sunscreen, shade & sunglasses) across Australian primary school settings (Sharplin, Smith & Roth, 2013). Yet another potential weather risk to primary school students is exposure to extreme heat, especially within the 'outdoor discipline' of physical education (PE). Although there are guidelines and 'tips' for a number of Australian states from organisations such as Sports Medicine Australia (SMA) and the Cancer Council itself (an emphasis on skin cancer prevention) around the protection of students from heat-related influences in schools, broader investigation into heat protective practices in schools is warranted. Exposure to extreme heat can negatively influence students in alternative ways via cardiovascular, thermoregulation, discomfort, cognitive and hydration impairments (McArdle, Katch & Katch, 2006; Tattersson, Hahn, Martini & Febbraio, 2000; Nadel, Cafarelli, Roberts & Wenger, 1979; González-Alonso et al., 1999). If exposure to extreme heat is left untreated or protected, this can lead to severe heat illness, rashes, cramps, exhaustion and heat stroke (Bergeron, McLeod & Coyle, 2007; Cooper, Ferrara & Broglio, 2006; Glazer, 2005; Howe & Boden, 2007). Health and Physical Education (HPE) teachers are the most likely staff within education settings to encourage and administer weather protective practices and programs (Sharplin, Smith & Roth, 2013) due to the outdoor nature of the discipline. As students can have reduced physical activity

levels above just 22 degrees (Remmers et al., 2017), ensuring school students are adequately protected from extreme heat during PE has the potential to be a key strategy to improve students' physical activity engagement. In Australia there is a distinct need to consider a range of physical activity participation strategies with just 19% of students meeting the national physical activity guidelines (Active Healthy Kids Australia, 2016).

### Literature review

In the United States, emergency department admissions over a decade between 1997 and 2006 revealed that children were the most reported age group to hospital with exertional heat influence, largely from physical activity and sport participation (Nelson, Collins, Comstock & Mckenzie, 2011). Statistics from Japan's Sporting Council have also revealed that accidental death due to heat stroke has occurred on 133 occasions during school hours between 1975 and 2009 from sports such as rugby, baseball, football, kendo, judo, mountaineering and track and field (Hatori, 2013). Previously, it was recognised that students were much more likely to be negatively influenced by the heat than adults due to different physiological make-up with larger surface-to-body heat absorbing ratio, less ability to sweat and a higher level of metabolic heat production. Although recent findings have contrasted children's susceptibility to heat, deeming such assertions as inconclusive (Somboonwong, Sanguanrungrasirikul & Pitayanon, 2012). The increased prevalence and susceptibility of students to illness from heat exposure can be attributed to more behavioural influences, including not receiving adequate hydration during physical activity participation (Decher et al., 2008). It has been reported that students often reach dehydration in hot climates by not hydrating effectively (Somboonwong et al., 2012) and students who are not hydrated suffer from impaired concentration, cognition and ability to remember content (Benton & Burgess, 2009). With PE often occurring in hot environments and involving higher intensity (and heart rates), an exposure to heat influences in schools is raised (Doecke, 1992; Somboonwong et al., 2012).

In 1992, Doecke reported that the incidence of heat illness across 17 Australian secondary schools in a tropical climate (for example, sun burn, headache, nausea, dehydration) spiked during the humid, wet season months between October (build up to monsoonal weather) and March (end of the monsoon season). Climates of extreme heat can result in students appearing 'listless' or 'restless', complain about the heat/humidity and voice negative feelings about physical activity throughout a school year (Doecke, 1992). It has also been established that temperatures above 20-24 degrees Celsius and humidity levels beyond 50% significantly impair student learning (Earthman, 2002). Moreover, higher temperatures can slow the acquisition and retention of information received by individuals (Batra & Garg, 2005). This level of heat exposure is further reinforced by a mandatory requirement in many jurisdictions of at least 100-150 minutes of PE each week (Education & Training Victoria, 2017; Department of Education Western Australia, 2013; Education & Training ACT, 2017) for Australian students to learn in, through and about movement (Arnold, 1979). The risks associated with extreme heat and heat illness are further confounded with predictions of an increased occurrence of heat illness from global warming (Bunyavanich, Landrigan, McMichael & Epstein, 2003; Solomon, 2007), especially for those that participate in outdoor PE within tropical climates and during summer heat wave events. A crowded curriculum, geographical location and timetabling considerations can leave exposure to extreme heat during allocated PE time unavoidable (Doecke, 1992).

Students have reported having lower enjoyment for school physical activities in hot conditions (Hyndman & Chancellor, 2015) and during hotter months across a school year (Hyndman, Chancellor & Lester, 2015; Hyndman, 2017). Another major concern for PE is that SMA (2007-2011) advises that physical activities need to be postponed or cancelled when the 'wet bulb

globe index' (a combination of temperature & humidity readings) reaches a level of 30 and above. Shannon and colleagues (2009) discovered that in tropical areas such as Darwin, the average wet globe bulb temperature (WGBT) exceeds 30 all year round, which would suggest from the SMA index that no physical activity should be undertaken in such climates (other than swimming). With over one million Australians living in the tropical climate of Northern Australia (Australian Government, 2015) and no formal heat protection policy for Australian schools, a national school-based 'Heat Smart' program based upon strategies identified within the present study can be highly beneficial. The aim of this research is to therefore review and identify key heat protection practices for the development of a Heat Smart action plan for schools to increase and protect students' engagement in PE activities during extreme heat.

## Methods

### *Social-ecological model framework*

Given the complex nature of a school setting, the social-ecological model (SEM) framework was employed within this paper as a guide to the multiple levels within school environments that can be understood and addressed to develop and enforce heat protection policies, especially for physical educators that are often based outdoors. Addressing multiple levels of an environment via a SEM can then provide sustainable change via policy to improve school heat protection, similarly to school sun protection practices (Reeder, Jopson & Gray, 2012). Identifying supportive strategies to counteract extreme heat exposure can ensure school students continue to meet key national physical activity and PE curriculum objectives. This research is underpinned by a SEM analysis of key heat protection policies and practices that can be used by programs in schools to increase students' engagement during outdoor PE activities during periods of extreme heat.

The SEM framework can be used to provide a theoretical framework to analyse, explore and understand the multiple factors that can be influenced by heat at the intrapersonal (individual), interpersonal (social), physical environment and policy levels (Wattchow et al., 2015). The SEM framework is described as a 'personal-environment' fit by providing an understanding of the multiple levels of influence that can affect behaviour and is used to broadly analyse educational problems in a given setting (O'Connor, Alfrey, & Payne, 2012; Wattchow et al., 2015). The SEM framework allows the broad influences on a particular behaviour (for example, heat protection) to be comprehensively understood in order to develop and implement more effective program solutions that address each of the levels of influence for lasting behavioural effects (O'Connor et al., 2012; Wattchow et al., 2015). To ensure existing and potential strategies for heat protection could be identified, a review was conducted of heat protection implementation, investigations, reports and/or guidelines relating to heat influences in schools.

As many of the guidelines were organisation based (for example, governments, education departments, sporting organisations; Tables 1-4) and non-academic peer reviewed reports, a general web search was conducted through the Google search engine platform. Key words were developed from initial exploratory work for Northern Territory schools (Hyndman, 2015) that included 'heat guidelines for students', 'heat policies in schools', 'heat recommendations in schools', 'heat influences on students' physical activity', 'influence of heat in schools', 'influence of heat on school sport'; and 'extreme heat in schools.' The inclusion criteria for the study was for the selected report to be either academic-based (thesis or peer reviewed journal article), a sporting organisation, government organisation, education organisation, health organisation or an environmental organisation. Additionally, the reports also had to include dialogue on heat protective strategies within the context of schools. The multiple layers of heat

protection policies, recommendations and practices that were identified were then screened according to a SEM framework. Recommendations and practices were screened at the following SEM levels (Jeanes, Magee & O'Connor, 2014):

- *Individual SEM level:* If the recommendation included biological, physiological, genetic and psychological components. Other individual SEM framework components include motives, attitudes, intentions and beliefs;
- *Social SEM level:* If the recommendation comprised of socio-cultural factors that interact with individuals to impact on behaviour. Social SEM level contextual factors include family, friends, organisations, teachers, students and coaches. Within schools, teachers are constantly interacting with students, other staff and parents from day to day;
- *Physical environment SEM level:* If the recommendation related to products and structures within an environment that can increase or decreased the desired behaviours (for example, heat protection). Physical environmental features are often divided into both built environmental features and natural environmental features that can influence individuals; and
- *Policy SEM level:* If the recommendation related to policies, laws and regulations that can impact on individuals'.

Each of the reports then underwent a Leximancer text mining analyses to determine major themes emerging from the literature collected.

#### *Leximancer*

The Leximancer text mining software uniquely extracts and illustrates weighted term classification between key words and develops concept maps that display the rate at which concepts and significantly related terms appear close to each other within the text. Leximancer is for text mining major themes through a process of spatial and relational analyses to reveal the relevance of the semantic networks from the literature. The software can be used to determine the relationship between concepts and the occurrences of concepts how related terms from the documents appeared close together within the text (Pill, Harvey & Hyndman, 2017; Hyndman & Pill, 2017). The findings from the text mining of the school heat policy reports, guidelines and investigations were analysed manually to confirm the themes from the original literature. This process ensured that the research process could be enriched and to enhance the data interpretation.

## **Results and discussion**

### *Individual level social-ecological model components that could be considered for a 'Heat Smart' school policy program*

The findings across the school heat policy reports, guidelines and investigations at the individual level included components of knowledge, information, awareness of intensities, nutritional considerations, communications methods, hydration and sleep considerations (Table 1).

**Table 1.** A guide to individual level strategies that could be considered in a potential Heat Smart Schools Program (including state and national sources).

<b>Individual level component</b>	<b>Source</b>
<ul style="list-style-type: none"> <li>• Access to information resources</li> </ul>	<ul style="list-style-type: none"> <li>• SMA, 2007-2011</li> </ul>
<ul style="list-style-type: none"> <li>• Acquire adequate fitness and acclimatisation</li> </ul>	<ul style="list-style-type: none"> <li>• SMA, 2007-2011; Education Queensland, 2016; Hatori, 2013</li> </ul>
<ul style="list-style-type: none"> <li>• Adjust and be flexible with activity intensity in hot conditions</li> </ul>	<ul style="list-style-type: none"> <li>• SMA, 2007-2011</li> </ul>
<ul style="list-style-type: none"> <li>• Avoid caffeinated drinks</li> </ul>	<ul style="list-style-type: none"> <li>• Climate Council, 2015</li> </ul>
<ul style="list-style-type: none"> <li>• Consider ages and gender of participants</li> </ul>	<ul style="list-style-type: none"> <li>• Education Queensland, 2016</li> </ul>
<ul style="list-style-type: none"> <li>• Diverse communication methods (e.g. text messages, newsletter, websites, social media) relating to heat illness prevention</li> </ul>	<ul style="list-style-type: none"> <li>• SMA, 2007-2011</li> </ul>
<ul style="list-style-type: none"> <li>• Eat balanced meals regularly with good protein and vitamins</li> </ul>	<ul style="list-style-type: none"> <li>• Hatori, 2013</li> </ul>
<ul style="list-style-type: none"> <li>• Increase the amount of rest in hot conditions</li> </ul>	<ul style="list-style-type: none"> <li>• Climate Council, 2015</li> </ul>
<ul style="list-style-type: none"> <li>• Professional development on heat influences</li> </ul>	<ul style="list-style-type: none"> <li>• Doecke, 1992</li> </ul>
<ul style="list-style-type: none"> <li>• Stay hydrated</li> </ul>	<ul style="list-style-type: none"> <li>• Australian Education Union, 2014; SMA, 2007-2011</li> </ul>
<ul style="list-style-type: none"> <li>• Sufficient sleep when recovering from the heat</li> </ul>	<ul style="list-style-type: none"> <li>• Hatori, 2013</li> </ul>



*Social level social-ecological model components that could be considered for a 'Heat Smart' school policy program*

The findings within the present study revealed there was an emphasis on roles relating to the heat, parental preparation of heat protection mechanisms, staff mentoring and leadership around heat protection (Table 2).

**Table 2.** A guide to social level strategies that could be considered in a potential HeatSmart Schools Program (including state and national sources).

<b>Social level component</b>	<b>Source</b>
<ul style="list-style-type: none"> <li>• Allocate responsibilities according to heat guidelines</li> </ul>	<ul style="list-style-type: none"> <li>• SMA, 2007-2011</li> </ul>
<ul style="list-style-type: none"> <li>• Consider who is participating beyond students and staff in outdoor physical activity events e.g. officials, coaches, sports trainers, spectators</li> </ul>	<ul style="list-style-type: none"> <li>• SMA, 2007-2011</li> </ul>
<ul style="list-style-type: none"> <li>• Consideration for parents to freeze water for cooled water provision for students</li> </ul>	<ul style="list-style-type: none"> <li>• NSW Government, 2016</li> </ul>
<ul style="list-style-type: none"> <li>• Encourage others to drink adequate amounts of water</li> </ul>	<ul style="list-style-type: none"> <li>• Climate Council, 2015</li> </ul>
<ul style="list-style-type: none"> <li>• Heat preparation guidance letters to parents, students and staff prior to expected hotter temperatures</li> </ul>	<ul style="list-style-type: none"> <li>• Australian Education Union, 2014</li> </ul>
<ul style="list-style-type: none"> <li>• Mentoring other staff on the facilitation of outdoor physical activities in the heat</li> </ul>	<ul style="list-style-type: none"> <li>• Doecke, 1992</li> </ul>
<ul style="list-style-type: none"> <li>• Parental education to ensure child has water bottle for hydration</li> </ul>	<ul style="list-style-type: none"> <li>• NSW Government Education, 2016</li> </ul>

*Physical environment level social-ecological model components that could be considered for a 'Heat Smart' school policy program*

Within the present study it was revealed that physical environment components that could protect against the heat were based around shade, ventilation, hydration access/techniques and temperature/hydration monitoring (Table 3).

**Table 3.** A guide to physical environment level strategies that could be considered in a potential HeatSmart Schools Program (including state and national sources).

<b>Physical environment level component</b>	<b>Source</b>
<ul style="list-style-type: none"> <li>• Access more shaded areas</li> </ul>	<ul style="list-style-type: none"> <li>• Australian Education Union, 2014; SMA, 2007-2011; NSW Government, 2016; SA Government, 2016</li> </ul>
<ul style="list-style-type: none"> <li>• Avoid surfaces that exhibit radiant heat that include concrete, black asphalt or black rubberised synthetic surfaces which can intensify hot conditions</li> </ul>	<ul style="list-style-type: none"> <li>• Doecke, 1992; SMA, 2007-2011</li> </ul>
<ul style="list-style-type: none"> <li>• Hydration programs</li> </ul>	<ul style="list-style-type: none"> <li>• Somboonwong, et al., 2012</li> </ul>
<ul style="list-style-type: none"> <li>• Increasing amount of drinking taps/ fountains</li> </ul>	<ul style="list-style-type: none"> <li>• Australian Education Union, 2014</li> </ul>
<ul style="list-style-type: none"> <li>• Programs to develop more naturally shaded areas</li> </ul>	<ul style="list-style-type: none"> <li>• Doecke 1992; Hatori, 2013</li> </ul>
<ul style="list-style-type: none"> <li>• Providing access to air conditioned facilities</li> </ul>	<ul style="list-style-type: none"> <li>• Doecke, 1992; NSW Government, 2016; Australian Education Union, 2014</li> </ul>
<ul style="list-style-type: none"> <li>• Providing more ventilated activity areas during PE</li> </ul>	<ul style="list-style-type: none"> <li>• Doecke, 1992; Hatori, 2013; Australian Education Union, 2014; SMA, 2007-2011</li> </ul>
<ul style="list-style-type: none"> <li>• Schools to provide access to cooled/ iced water facilities*</li> </ul>	<ul style="list-style-type: none"> <li>• Hatori, 2013</li> </ul>
<ul style="list-style-type: none"> <li>• Use of electrolytes in drinks</li> </ul>	<ul style="list-style-type: none"> <li>• SMA, 2007-2011</li> </ul>
<ul style="list-style-type: none"> <li>• Use of fans, water sprays or other devices</li> </ul>	<ul style="list-style-type: none"> <li>• Doecke, 1992; NSW Government, 2016; Australian Education Union, 2014; SMA, 2007-2011</li> </ul>
<ul style="list-style-type: none"> <li>• Use of heat illness chart to guide planning of outdoor physical activities</li> </ul>	<ul style="list-style-type: none"> <li>• Hatori, 2013; SMA, 2007-2011</li> </ul>
<ul style="list-style-type: none"> <li>• Use of urine charts to check for dehydration</li> </ul>	<ul style="list-style-type: none"> <li>• NSW Department of Health, 2017</li> </ul>
<ul style="list-style-type: none"> <li>• Use temperature gauges in class</li> </ul>	<ul style="list-style-type: none"> <li>• Shannon, Stewart &amp; Stewart, 2009; Australian Education Union, 2014</li> </ul>
<ul style="list-style-type: none"> <li>• Wet sponging during activities</li> </ul>	<ul style="list-style-type: none"> <li>• Hatori, 2013; Hockey Australia, 2016; SMA, 2007-2011</li> </ul>

\* Reported as the most significant strategy to cool 'core' body temperature in sporting athletes.

*Policy level social-ecological model components that could be considered for a 'Heat Smart' school policy program*

It was revealed in the present study that timing of physical activity, clothing considerations, heat protection monitoring and communication procedures and emergency/illness procedures were key heat protective mechanisms to be considered at the policy SEM level of influence.

**Table 4.** A guide to policy level strategies that could be considered in a potential HeatSmart Schools Program.

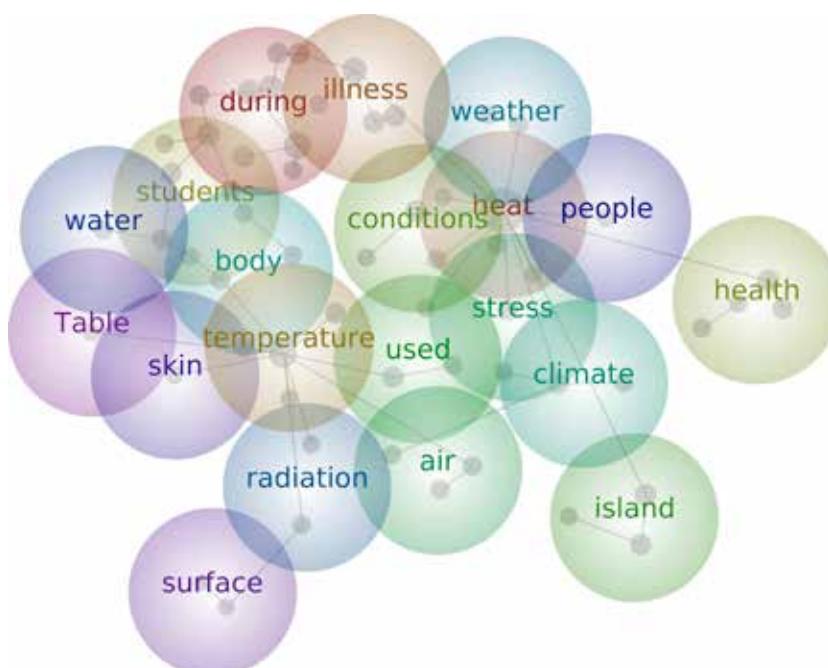
<b>Physical environment level component</b>	<b>Source</b>
• Activities at the end of the year require shade	• Doecke, 1992; NT Department of Education, 2016
• Cancellation of activities when it is too hot	• South Australian Government, 2016; Education Queensland, 2016; SMA, 2007-2011
• Clothing should allow easy evaporation of sweat	• Education & Training ACT, 2017; NT Department of Education, 2016; SMA, 2007-2011
• Clothing and hat sun protection	• SMA, 2007-2011; Australian Education Union, 2014
• Develop and create a heat management plan	• Australian Education Union, 2014
• Fundraising programs to raise money for a more heat protective environment during hot weather	• Doecke, 1992
• Guidelines should cater to geographical location	• SMA, 2007-2011
• Hats and clothing should be made from protective/reflective materials	• SMA, 2007-2011
• Heat warning systems	• World Health Organisation (WHO), 2003; Australian Education Union, 2014
• Modifying school uniforms in hot weather	• Australian Education Union, 2014; SMA, 2007-2011
• Monitoring timetabling allocations and length of PE classes	• Australian Education Union, 2014; NSW Government, 2016
• Outdoor activities should be scheduled around the 11am to 3pm heat risk period	• Doecke, 1992; NSW Government, 2016; NT Department of Education, 2016
• Postponing activities when it is too hot	• Hatori, 2013; NT Department of Education, 2016; Australian Education Union, 2014; SMA, 2007-2011; NSW Government, 2016
• Prepare a communication strategy for the school community	• SMA, 2007-2011

<i>Physical environment level component</i>	<i>Source</i>
<ul style="list-style-type: none"> <li>Referring to SMA sporting guidelines during extreme heat</li> </ul>	<ul style="list-style-type: none"> <li>NT Department of Education, 2016; South Australian Government, 2016</li> </ul>
<ul style="list-style-type: none"> <li>Review shade structures</li> </ul>	<ul style="list-style-type: none"> <li>Education Queensland, 2016; Australian Education Union, 2014: SMA, 2007-2011</li> </ul>
<ul style="list-style-type: none"> <li>Rotating air conditioning access for classes</li> </ul>	<ul style="list-style-type: none"> <li>NSW Government, 2016; Australian Education Union, 2014</li> </ul>
<ul style="list-style-type: none"> <li>Seeking insight from the Bureau of Meteorology relating to local weather conditions</li> </ul>	<ul style="list-style-type: none"> <li>SMA, 2007-2011</li> </ul>
<ul style="list-style-type: none"> <li>Sports carnivals/sports days should be conducted where shade is available</li> </ul>	<ul style="list-style-type: none"> <li>Doecke, 1992; NT Department of Education, 2016</li> </ul>
<ul style="list-style-type: none"> <li>When ill, avoid exercising in hot conditions</li> </ul>	<ul style="list-style-type: none"> <li>SMA, 2007-2011</li> </ul>

*Leximancer text mining themes from the heat influence literature*

Key themes that emerged from the Leximancer text mining analyses at the individual SEM level included illness, health, skin, stress and body. At the social level, there were little themes other than 'students' and 'people' identified. Yet from the Leximancer text mining analyses at the physical environment SEM level from the heat literature, guidelines were weather, conditions, climate, heat, air, temperature (could also be physical body temperature), radiation, island, water and surface. There were no policy level themes identified from the literature, although many of the themes identified at the other levels (especially physical environment) could inform policy according to climatic conditions (Figure 1).

**Figure 1.** Key themes from Leximancer text mining of heat policy documents and investigations.



It is clear that there are many strategies that could be utilised for heat protection during PE. This is the first published Australian investigation to the author's knowledge to explore the different potential strategies, guidelines and policies relating to students' heat protection in the school environment for PE. This paper emphasises the number of different sources and organisations advocating for heat protection, yet it also notes a lack of uniformity. The most commonly utilised school heat policy report relating to heat protection has been SMA's hot weather guidelines (2007-2011) (which includes heat illness, beat the heat and SmartPlay strategies). In contrast to the national unity and success of the Cancer Council's 'Sunsmart' policies in schools (Sharplin, Smith & Roth, 2013; Dudley et al., 2015), there is variance across heat policy reports, guidelines and investigations. The findings emphasise the importance of developing a unified Heat Smart program for Australian schools relating to heat protection. This study provides insight into the multiple levels of influence and themes to develop a Heat Smart action plan for this crucial and often overlooked area of school health.

The most comprehensive guides and tips for schools within the study were revealed to come from SMA's resources (SMA, 2007-2011). Yet it should be acknowledged that the SMA resource is intended for widespread organisations such as state and national sporting bodies, sporting assemblies, government authorities, clubs, physical activity groups, associations, leagues, recreation centres, event organisers, fitness providers and of course schools (SMA, 2007-2011). Given the success of the 'school-based' Sunsmart program, this suggests that there is room for a more school-specific heat protection program, especially given that students spend the majority of their time within school environments for PE, recess time, after school and sporting excursions. Moreover, the skills learnt during school PE are largely transferred to such sporting and community contexts (Australian Government, 2009). The SEM findings from the literature demonstrate that there are a host of heat protective considerations at the individual level (knowledge, information access, awareness, nutrition, sleep, communication & hydration), social level (roles and responsibilities, home-based preparation, mentoring & staff leadership), physical environment level (shade, ventilation, hydration access/techniques & monitoring of conditions) and policy SEM influences (timing, clothing, monitoring of conditions and various protective procedures according to illness and emergency). The findings create a broad understanding of the heat influences on students and teachers within school PE, demonstrates the many influences that could be detrimental to health and provides a multi-level guide to develop a heat protection program/policy.

Hydration considerations continue to be a big concern for student learning and physical activity participation and some of the strategies revealed in the study were based around electrolytes, preparation of drinks, increasing drinking taps, cooled water, hydration programs and fluid reminders during activities. The brain has been described as becoming impaired under 'conditions of thirst' at the neuropsychological level and can result in the impaired sense of touch, motor control, planning behaviour, impaired emotions, decision making and auditory processing (Benton & Burgess, 2009). Students' sweat rate can be a useful guide to hydration and teachers should ensure students have access to frequent drinks breaks, activity-to-rest ratios and continued access to shaded or ventilated areas (if present). With the emergence of cooling clothing materials to enhance sporting performance (Webster, Hollan, Sleivert, Laing & Niven, 2005), there is also scope for strategies around the modified school uniforms such as ice vests and material that provide elements of thermal comfort. A previous study by Norrish and colleagues (2012) revealed that modifying school uniforms to be more suitable for physical activities can have an impact on physical activity participation. The consideration of uniform modification in a national Heat Smart program is therefore warranted.

Physical education is vital for students to develop physical activity habits across the lifespan (Telama, 2009). The main concern from the impact of heat is that if PE classes are held in intense

heat, students may become vulnerable to heat injury and impaired learning (Somboonwong, et al., 2012). Therefore, when preparing a quality PE program, the quantity and intensity of the physical activities needs to be taken into consideration. As Shannon and colleagues (2009, p.272) note;

*“Ill informed decisions may be detrimental to students, staff and other relevant stakeholders in two ways:*

- 1. The loss of time to be physically active due to cancellation of activities during moderate to high risk conditions when the activities could safely occur with appropriate modifications and provisions; and*
- 2. Placing the health and safety of students, staff and other stakeholders at risk by continuing to run an activity, as previously scheduled, during extreme risk conditions.”*

### **Synthesis**

From the review of various heat-protection implementations, investigations, reports and/or guidelines in schools, five key action areas from the research based around the Ottawa Charter for Health Promotion (World Health Organisation, 1986) have been developed of what a national school heat policy can encompass. These include:

#### *Action Area 1: School policy*

- Adopt flexible scheduling of outdoor activities according to the heat conditions by duration/intensity. Start earlier or later in the day when the heat is less intense and ensure children have more rest breaks. The school should have alternative venues to modify and relocate activities during extreme heat when temperatures exceed 30 degrees and humidity levels exceed 60%.
- Schools should consider modifying uniforms to combine UV protection with cooling fabrics and ice vests to reduce body temperatures and “thermal stresses” during extreme heat.
- Schools need to be set up to deal with incidences of heat illness and emergencies and to encourage regular rotations to shaded/cooler areas. This includes developing communication procedures (text, internet, email, social media) to notify staff and students of high-risk heat conditions.

#### *Action Area 2: Environment*

- Ensure extra shade from both man-made structures (tents, sails and umbrellas) and natural features such as trees to provide cooler environments for outdoor activities during extreme heat.
- Use large industrial fans and ensure indoor spaces have open doors/windows or air-conditioning access during activities, especially during rest periods.
- Provide more water fountains, cooled water facilities and electrolytes for fluid retention and regularly monitor outdoor weather conditions. Ice and water spray bottles could also be used as cooling aids.
- Display heat guidelines and charts in prominent locations in the school for reminders about hydration and feelings according to the temperature.

### *Action Area 3: Training*

- Develop personal skills so staff and students know how and where to access heat protective strategies in the school. This includes maintaining adequate nutrition, keeping food safe (at lower temperatures to prevent being spoiled), gaining adequate sleep and monitoring hydration practices and fluid loss.
- Develop communication methods within schools relating to heat illness and where to access support or facilities through a developed heat-protective resource map and guide. Train staff how to detect heat illness in others and to treat, mentor, role-model and protect others.

### *Action Area 4: Prevention*

- Teachers to take into account medical characteristics of students, age, fitness and level of acclimatisation when undertaking activities in hot conditions. Regularly monitor any students or staff who appear distressed from the heat.
- Implement heat-protective policy according to relevant Australian Curriculum content of “being healthy safe and active”, demonstrate heat-protective behaviours for safety, and identify actions, plan and promote heat strategies to develop health, safety and wellbeing.

### *Action Area 5: Community*

- Notify parents about school heat conditions and ask them to provide their children with cooled water and modified uniforms during heatwaves. Also give parents an insight into the school procedures in place to protect the students from the heat.
- Include information on the school’s heat-protective procedures in school newsletters. Parents can use this beyond the classroom. Schools should gain feedback from the community on strategies and ideas for further protection of staff and students during heatwaves.
- Put on events to help raise funds for heat-protective facilities in schools. Include parents to have different heat-protective roles and responsibilities during outdoor school events.

## **Summary, conclusions and implications**

As the climate continues to warm via global warming with increased frequency of extreme weather and heat wave events (Bunyavich et al., 2003; Solomon, 2007), temperatures are projected to rise substantially and more protective strategies will be required according to a heat-health burden. This paper importantly outlines a host of protective strategies for another major outdoor health influence on students. The SEM framework provides an important guide to understand the key influences that could be addressed in a proposed ‘Heat Smart’ program. The paper reports on an inconsistency in heat protection messages and information for schools and PE teachers practicing outdoors. The findings suggest that the development of the proposed five Heat Smart program key action areas is warranted for building (1) *healthy school policy* (flexible scheduling of activities, uniform adaption); (2) *heat supportive environments* (shade provisions, hydration strategies, development of heat protective guidelines and charts); (3) *heat protective community action* (development of communicative methods to parents such as social media, provision of preparatory information to parents, feedback from the community on strategies); (4) *heat protective community skills* (skill development on accessing heat protective resources; monitoring hydration skills; nutritional considerations;); and (5) a

*focus on the prevention of heat illness (monitoring of staff & students; aligning with curricular content). Advocating for policy change for a heat protection program is vital for developing and maintaining physical activity participation levels and the learning of students during PE activities. As Shannon and colleagues (2009, p.276) state, "School staff must understand the mechanisms of escalating risk and be supported to undertake action to reduce the level of risk through appropriate policies, procedures, resources and action plans."*



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## A review of the literature on inclusive pedagogy in physical education 2005-2015

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### Abstract

Inclusive Education (IE) has been an important aspect of the Australian education system for several decades (Armstrong, Armstrong & Barton, 2009). Students with disabilities (SWD) have a right to IE (Disability and Discrimination Act [DDA], 1992) and their development requires support, facilitation and the skill set from teachers to provide meaningful participation across all areas of the curriculum. However, there is limited information in Australia on how pre-service Physical Education (PE) teachers feel about their own ability to deliver inclusive pedagogy to SWD.

This paper uses a thematic approach derived from Wallhead and O'Sullivan (2005) to examine 22 peer-reviewed journal articles. The aim was to determine themes which can contribute to understanding the attitudes of pre-service PE teachers and their self-efficacy to design and enact inclusive pedagogy for SWD. Four themes and their implications emerged from the literature, these included; (a) measurements to examine attitudes of pre-service PE teachers, (b) exploring pre-service PE teacher's self-efficacy; (c) the effects of pre-service PE teachers' practicum experiences; and (d) investigating the hands-on opportunities in Physical Education Teacher Education (PETE) programs.

This review highlights inclusive pedagogy is inconsistently practiced at a pre-service level thereby affecting how pre-service PE teachers think when working with SWD. Subsequently, inconsistent practice requires PETE programs to review how inclusive pedagogy is incorporated into student learning outcomes for pre-service PE teachers to develop knowledge and practice for inclusion and, if it adequately prepares them to teach SWD.

Research (Hodge & Elliot, 2013; Mangope, Mannathoko & Kuyini, 2013; Pedersen, Cooley & Hernandez, 2014) indicates inclusive pedagogy requires ongoing development at a pre-service level in order to increase the self-efficacy of pre-service teachers to provide meaningful opportunities for SWD in PE. From this review, the authors have identified there is a need to explore Australian pre-service PE teachers and their self-efficacy to design and enact inclusive pedagogy. Subsequently, further study needs to explore inclusive pedagogy in PE on a state-wide basis and how it can become embedded throughout an entire PETE program.

## Introduction

In the Australian educational context Physical Education (PE) is part of the learning area called Health and Physical Education (HPE), comprising the subject Health Education and Physical Education. In this paper, the term PE will be used to refer specifically to the subject called Physical Education, which in the Australian HPE Curriculum covers the student achievement standards of the Movement and Physical Activity strand (Australian Curriculum, Assessment and Reporting Authority [ACARA], 2015). Physical Education (PE) (rather than HPE) will also be preferred in the paper as PE is the common term used in the literature informing this paper.

Physical Education (PE) for students with disabilities (SWD) is important for age-appropriate motor skill development, encouraging social skills and supporting health literacy to enable positive health outcomes (Bailey, 2005; Obrusníková, Válková & Block, 2003; Ouellette-Kuntz, 2005). In a report by the Ministerial Advisory Committee to the South Australian Minister for Education and Child Development (Government of South Australia, 2010), it was reported people with a disability in South Australia were below the national average for physical activity levels among people with a disability. In particular, findings indicated SWD engaged in more sedentary and obesity related behaviours in their lifestyles (Government of South Australia, 2010). This has detrimental effects to the health and wellbeing of SWD and highlights the importance to focus on Inclusive Education (IE) in PE to promote and encourage physical activity.

Inclusive Education (IE) can be defined as education that is non-discriminatory and involves all students in a community (Ballard, 1997). Ballard (1997) also emphasises IE means 'students having equal rights to access the culturally valued curriculum of their society as full-timed valued members of age-appropriate mainstream classes... irrespective of their differences' (p. 244). In Australia, IE is a human right which is underpinned by the Disability and Discrimination Act (DDA) (1992) and the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD) (United Nations, 2006). Inclusive Education (IE) reflects the Social Model of Disability (Oliver, 1983) by implementing dynamic and adaptable environments where teachers can support all SWD and the diversity of their learning by creating equitable access and opportunities to participate in PE. As the prevalence of disability is increasing in the number of SWD attending mainstream schools (Australian Institute of Health and Welfare [AIHW], 2008) there is a greater need for teachers to be equipped to provide support, and be supported, to facilitate students' learning in their PE class (Government of South Australia, 2010).

The Disability Standards for Education (Australian Government, 2005) were created under the DDA to ensure SWD were given fair access to participate as fully as possible in all aspects of education. Although the Disability Standards provide a framework for participation, the Australian Curriculum provides support for all students to access the same content. A commitment to adopting inclusive pedagogy is highlighted in the HPE Australian Curriculum through the key ideas Take a strengths-based approach and Focus on educative purposes (ACARA, 2015). The key ideas recognise that students have various abilities and there is value in understanding their strengths when delivering inclusive pedagogy to enable SWD to achieve positive health behaviours in PE (AIHW, 2008; Government of South Australia, 2010). The DDA (1992), UNCRPD (United Nations, 2006) and the HPE Australian Curriculum (ACARA, 2015) are crucial in shaping opportunities for SWD, however this does not necessarily result in the application of inclusive pedagogy in practice. Inclusive pedagogy refers to promoting IE ensuring practice is based on the use of diverse teaching strategies (Corbett, 2001). Research highlights that pre-service PE teachers struggle with knowing how to teach SWD and the self-efficacy to enact inclusive pedagogy (Hodge & Elliot, 2013; Mangope, Mannathoko & Kuyini, 2013; Pedersen, Cooley & Hernandez, 2014). From this research, the authors identify PE teachers' pedagogy to facilitate outcomes for a range of students is falling short upon the

delivery of their teaching. The importance of acknowledging previous research (Hodge & Elliot, 2013; Mangope et al., 2013; Pedersen et al., 2014) is to ensure the learning and development of pre-service teachers in Physical Education Teacher Education (PETE) programs reflects their ability to achieve the Professional Standards for Teaching (Australian Institute for Teaching and School Leadership [AITSL], 2011) in Australia. By ensuring quality learning and development, opportunities will ultimately be provided for pre-service PE teachers to engage in best practice for inclusive pedagogy. It is anticipated that this will in turn deliver meaningful opportunities to SWD in PE.

In this review, the authors identified that the impact of teachers' attitudes on the successful inclusion of SWD in PE is a dominant area of research in recent literature (Di Nardo, Kudláček, Tafuri & Sklenaříková, 2014; Hodge & Elliot, 2013; Mangope, Mannathoko & Kuyini, 2013; Pedersen, Cooley & Hernandez, 2014; Tindall, MacDonald, Carroll & Moody, 2015). Intentions are influenced by a person's attitude toward their behaviour which Ajzen (1991) recognises through the Theory of Planned Behaviour (ToPB). By understanding the attitudes of pre-service PE teachers, together with their perceived subjective norms from society and control of their behaviour, intentions to teach SWD can be predicted (Ajzen, 1991).

In understanding the intention and behaviours of pre-service PE teachers towards teaching SWD, this review intends to explore the literature on inclusive pedagogy in PE using a thematic approach. The objective of this review is to highlight the key themes and their implications that emerge from the literature that will contribute to enabling better learning outcomes for pre-service PE teachers and their inclusive pedagogy in South Australia.

## Method

In searching for peer-reviewed journal articles on inclusive pedagogy in PE, the authors used open coding for initial identification of similarities. An inclusion criteria was also pre-determined by the authors to allow a focus on pre-service PE teachers. The journal articles were to contain one or more of the following criteria; (1) instruments and measures used to obtain pre-service PE teachers' attitudes towards teaching SWD (2) results of pre-service PE teachers participating in Adapted Physical Education (APE) topics at university, and (3) reports on the self-efficacy of pre-service PE teachers towards teaching or working with SWD. The following codes were used to identify literature on pre-service PE teachers and their attitudes towards working with SWD; 'physical education teachers', 'attitudes towards disability', 'self-efficacy', 'disability', 'inclusive pedagogy', 'preservice teachers' and 'physical education'. These terms were chosen in order to identify literature according to the inclusion criteria set by the authors. The strategy involved finding articles in the English language between January 2005 and December 2015 to locate relevant literature across three databases ERIC (ProQuest), SCOPUS and Web of Science. Articles located through database searching together with journal articles obtained through citations within these articles were screened by reviewing the titles and abstracts against the inclusion criteria. For articles where abstracts were not available to view, the full-text was retrieved to determine if it reflected the inclusion criteria.

Despite previous literature reviews on inclusion in PE (Block & Obrusnikova, 2007; Qi & Ha, 2012) examining a broad overview of the construction and implementation of inclusive practice, to the best of our knowledge there are no reviews specific to inclusive pedagogy among pre-service PE teachers from 2005-2015. Therefore, studies which focused on perspectives from existing PE teachers and perspectives from students with and without disabilities were not included in this review. Additionally, professional development materials for existing PE teachers and books and doctoral dissertations on inclusive pedagogy in PE were also not included for the purpose of this review.



## Results and discussion

### *Outline of the studies*

Twenty three peer-reviewed journal articles on inclusive pedagogy in PE were found. One article was not available to review due to unobtainable access to the full-text, therefore 22 articles were analysed in this review.

The majority of studies were conducted in the USA (n=9) with remaining studies dispersed across other regions; Europe (n=5), Asia (n=5), Australia (n=2) and Africa (n=1). One study (Oh et al., 2010) was undertaken over three countries China, Korea and America and has been recorded under the Asian region.

Examination of the literature identified two main categories of studies. The first category includes studies designed to examine the attitudes of pre-service PE teachers towards working with students with disabilities (SWD). Although each of these studies measured the attitudes of pre-service PE teachers, the studies measured a number of different determinants of attitudes. These included;

- Evaluating the impact of coursework and teacher training in PE and/or Adapted Physical Education (APE) (Apache & Rizzo, 2005; Coates, 2012; Di Nardo et al., 2014; Pedersen, Cooley & Hernandez, 2014; Perlman & Piletic, 2012; Schoffstall & Ackerman, 2007).
- Evaluating the impact of pre-service PE teacher's practicum experiences (Lieberman & Wilson, 2005; Rust & Sinelnikov, 2010; Tindall, MacDonald, Carroll & Moody, 2015).
- Personal variables (for example; previous experiences, age, gender) contributing to teaching SWD (Duchane et al., 2008; Hutzler et al., 2005; Oh et al., 2010).
- Current knowledge and perceptions about teaching SWD (Hodge & Elliot, 2013; Mousouli, Kokaridas, Angelopoulou-Sakadami & Aristotelous, 2009).
- Investigating attitudes to predict the intention to teach SWD (Martin & Kudlacek, 2010), and
- Exploring attitudes towards teaching PE to students with various disability types (Mangope, Mannathoko & Kuyini, 2013)

The second category includes studies designed to create and validate instruments used to measure attitudes of pre-service teachers (Block, Hutzler, Barak & Klavina, 2013; Hodge, Sato, Mukoyama & Kozub, 2013). Within both of these studies, attitudes were also measured following validation of the tool. A small number of studies (n=3) were unique in their purpose and could not be classed in either of the two main categories. The purpose of these studies were to examine self-efficacy (Vickerman & Coates, 2009), anxiety levels (Everhart, 2009), and identifying attitudes using visual information (Fethi, 2015). The authors adapted Wallhead and O'Sullivan's (2005) approach to review the 22 peer-reviewed journal articles. Results of the analysis are illustrated in table 1 and have been organised by study purpose, participants and setting, data collection methods, analysis, results and further recommendations. To help inform the authors of how to enable better learning outcomes for pre-service PE teachers and their inclusive pedagogy an additional category (further recommendations) was included. A review of this category helped the authors to identify areas of research requiring exploration.

**Table 1.** Overview of reviewed journal articles for inclusive pedagogy in PE 2005-2015

<b>Study:</b>	<b>Apache &amp; Rizzo (2005)</b>
<b>Study purpose</b>	Measure the attitudes of PE majors towards teaching SWD in regular classrooms
<b>Participants and setting</b>	91 PE majors One year disability infusion program USA
<b>Data collection methods</b>	Pre and post test using The Physical Educator's Attitude Toward Teaching Individuals with Disabilities III (PEATID III) scale (Rizzo, 1993)
<b>Analysis</b>	Means and standard deviations of pre and post test Three dimensions of attitudes were assessed 1. Perceptions of outcomes teaching SWD 2. Perception of effects on student learning 3. Perception of need for more academic preparation
<b>Results</b>	<b>Dimension 1:</b> No significant change <b>Dimension 2:</b> Significant change: students with learning disabilities and mild-moderate impairments between tests <b>Dimension 3:</b> No significant change, however reported significant difference in self-reported competence
<b>Further recommendations</b>	
<b>Study:</b>	<b>Hutzler et al. (2005)</b>
<b>Study purpose</b>	Investigate personal variables in PE students when teaching SWD in regular classrooms
<b>Participants and setting</b>	153 from two major teacher colleges Israel
<b>Data collection methods</b>	The Attitudes Towards Including students with a disability in PE lessons (ATIPE) questionnaire (Shechtman, 1991). The Self-Efficacy in teaching PE under inclusive conditions (SEIPE) self-developed based on Bandura's (1997) constructions for self-efficacy questionnaires
<b>Analysis</b>	Factor analysis with oblique VARIMAX rotations for ATIPE One-way ANOVA with post hoc tests for SEIPE Correlations established between attitudes and self-efficacy variables
<b>Results</b>	<ul style="list-style-type: none"> <li>The study confirms the hypothesis- self-efficacy related to attitudes towards including SWD in PE.</li> <li>The instrument used suggests a three-fold factorial attitude concept <ul style="list-style-type: none"> <li>- Two threat scales; to the teacher and to the class</li> <li>- One opportunities scale</li> </ul> </li> </ul>
<b>Further recommendations</b>	<ul style="list-style-type: none"> <li>Include simulations into introductory teacher courses</li> <li>Increase amount of guided training for inclusion type contexts</li> <li>Foster teaching resources</li> </ul>

<b>Study:</b>	<b>Lieberman &amp; Wilson (2005)</b>
<i>Study purpose</i>	Determine if attitudes of pre-service teachers would change after an intensive practicum
<i>Participants and setting</i>	27 PE majors, APE majors, fitness/wellness candidates 8 Universities One week intensive sports camp practicum for children with visual impairments USA
<i>Data collection methods</i>	Pre and post survey containing statements measured against a Likert scale
<i>Analysis</i>	Comparing responses pre and post practicum
<i>Results</i>	<ul style="list-style-type: none"> <li>• Overall yes had positive changes to attitude</li> </ul>
<i>Further recommendations</i>	<ul style="list-style-type: none"> <li>• Set up practicum experiences inclusive of children with visual impairments</li> <li>• Bring in students with visual impairments to class to raise awareness</li> </ul>

<b>Study:</b>	<b>Gursel (2007)</b>
<i>Study purpose</i>	Compare the attitudes of PE majors and other sport majors regarding individuals with physical disabilities
<i>Participants and setting</i>	81 (PE majors- study group and other sport majors- control group) 14 week APE course 2 Universities Turkey
<i>Data collection methods</i>	The Attitude Towards Disability Persons (ATDP) scale, Form O (Yuker et al., 1970)
<i>Analysis</i>	ANCOVA used to examine differences
<i>Results</i>	<ul style="list-style-type: none"> <li>• Positive changes in attitude found in PE major participants compared to other sport majors after a combination of class work and personal contact</li> <li>• Attitudes can be more positively influenced through APE courses</li> </ul>
<i>Further recommendations</i>	

<b>Study:</b>	<b>Schoffstall et al. (2007)</b>
<i>Study purpose</i>	Examine the effects of an APE course on attitudes of future PE teachers towards SWD
<i>Participants and setting</i>	108 APE students Faith-based university USA
<i>Data collection methods</i>	The Physical Educator's Attitude Toward Teaching Individuals with Disabilities III (PEATID III) scale (Rizzo, 1993) Short answer questions also delivered to available respondents
<i>Analysis</i>	ANCOVA used to examine differences in pre and post test scores
<i>Results</i>	<ul style="list-style-type: none"> <li>• Attitudinal scores significantly improved pre-test to post-test</li> <li>• When ToPB is applied, it made participants feel APE made them more prepared and believed it positively influence their view of SWD.</li> </ul>
<i>Further recommendations</i>	

<b>Study:</b>	<b>Duchane et al. (2008)</b>
<b>Study purpose</b>	Examine the attitude of students in undergraduate PETE programs towards teaching SWD
<b>Participants and setting</b>	183 PE majors Two colleges USA
<b>Data collection methods</b>	The Attitude Towards Disability Persons (ATDP) scale (Yuker et al., 1970). Revised
<b>Analysis</b>	One-shot survey design with a series of t-tests
<b>Results</b>	<ul style="list-style-type: none"> <li>• A pre-service teachers gender, previous experience with individuals with disabilities and academic preparation are factors that relate to attitude</li> </ul>
<b>Further recommendations</b>	<ul style="list-style-type: none"> <li>• Reassess curriculum and determine what information is important</li> <li>• Key questions when evaluating: <i>'Are the courses provided relevant to inclusive classrooms that exist?'</i> and <i>'What do our students need in order to feel competent?'</i> (p. 19)</li> </ul>

<b>Study:</b>	<b>Everhart (2009)</b>
<b>Study purpose</b>	Preliminary look at PE majors and their anxiety when teaching students with and without disabilities
<b>Participants and setting</b>	6 senior PE majors Enrolled in APE course One university USA
<b>Data collection methods</b>	Pre-teaching interviews, questionnaires, heart rate analysis (worn when teaching students with and without disabilities)
<b>Analysis</b>	Heart rate graphical trends to assess anxiety levels
<b>Results</b>	<ul style="list-style-type: none"> <li>• Dominant perspective= apprehensive however looked forward to teaching SWD</li> <li>• Anxiety related to unfamiliarly</li> </ul>
<b>Further recommendations</b>	<ul style="list-style-type: none"> <li>• Other curriculum models and instructional strategies should be investigated to determine ways to alleviate anxiety and prepare pre-service PE teachers better</li> </ul>

<b>Study:</b>	<b>Mousouli et al. (2009)</b>
<b>Study purpose</b>	Explore knowledge and attitudes of PE students towards SWD
<b>Participants and setting</b>	140 first-fourth year PE students One university Greece
<b>Data collection methods</b>	Questionnaire
<b>Analysis</b>	SPSS 10 for descriptive analysis results
<b>Results</b>	<ul style="list-style-type: none"> <li>• The acceptance of SWD in regular schools considered moderate</li> </ul>
<b>Further recommendations</b>	<ul style="list-style-type: none"> <li>• A wider range of information about people with disability and their needs can lead to an increased acceptance of children SWD in regular schools</li> </ul>

<b>Study:</b>	<b>Vickerman &amp; Coates (2009)</b>
<b>Study purpose</b>	Examine the perspectives of trainee teachers in relation to their perceived readiness to include SWD
<b>Participants and setting</b>	202 final year trainee PE teachers 5 PE training providers England
<b>Data collection methods</b>	Questionnaire
<b>Analysis</b>	Stage one and two questionnaires- SPSS 14. Open-ended responses using protocol analysis
<b>Results</b>	<ul style="list-style-type: none"> <li>• 43% of trainee teacher respondents indicated they weren't adequately prepared</li> </ul>
<b>Further recommendations</b>	<ul style="list-style-type: none"> <li>• Further research needs to link '<i>teaching, learning and differentiation</i>' (p. 151) directly to SWD</li> <li>• Training should be inclusive for the duration of a course</li> <li>• More practical training than theoretical preferable as it provides preparation for teaching a SWD</li> </ul>

<b>Study:</b>	<b>Oh et al. (2010)</b>
<b>Study purpose</b>	Examine pre-service teacher-related variables associated with ToPB towards students labelled ADHD in regular classes
<b>Participants and setting</b>	213 pre-service teachers across Universities in China, Korea, USA
<b>Data collection methods</b>	Physical Educators' Intention toward Teaching Individuals with Disabilities II Preservice Survey (PEITID-II-PS). (Ajzen, 2002)
<b>Analysis</b>	Descriptive statistics for means and standard deviation of items and ToPB measures One-way ANOVA to examine gender differences
<b>Results</b>	<ul style="list-style-type: none"> <li>• Previous experience and perceived competence had significant positive influence on intentions and perceived behavioural control</li> <li>• Behavioural beliefs are predicted by prior teaching experience, age, and special education coursework</li> <li>• Teacher-related variables influence attitudinal beliefs of pre-service PE teachers</li> </ul>
<b>Further recommendations</b>	<ul style="list-style-type: none"> <li>• The findings provide additional evidence for a need to change the culture of PETE programs at college and universities</li> </ul>

<b>Study:</b>	<b>Rust &amp; Sinelnikov (2010)</b>
<b>Study purpose</b>	Explore pre-service PE teacher perceptions of teaching SWD and professional preparation
<b>Participants and setting</b>	1 pre-service teacher Self-contained environment during a 7 week student teaching practicum USA
<b>Data collection methods</b>	Case study: Formal and informal interviews, direct observation, reports
<b>Analysis</b>	Thematic analysis to identify common themes
<b>Results</b>	<ul style="list-style-type: none"> <li>Participant acknowledges understanding of disabilities however the knowledge of how to teach SWD crucial</li> <li>Participant had low expectations to begin but was alleviated by the end of the practicum</li> <li>Participant highlighted importance of language and finding other ways to describe techniques/give cues/feedback</li> </ul>
<b>Further recommendations</b>	<ul style="list-style-type: none"> <li>PETE programs need to make any field experiences as genuine as possible</li> </ul>
<b>Study:</b>	<b>Martin &amp; Kudlacek (2010)</b>
<b>Study purpose</b>	Investigate and describe the attitudes of pre-service PE teachers attempting to predict their intentions to include students with physical disabilities
<b>Participants and setting</b>	230 First and fourth year Primary and PE courses Australia
<b>Data collection methods</b>	The Attitudes Towards Individuals with Physical Disabilities in Physical Education (ATIPDPE) instrument (Kudláček et al., 2002). Revised
<b>Analysis</b>	One-way ANOVA SPSS 13
<b>Results</b>	<ul style="list-style-type: none"> <li>Overall, participants held positive attitudes towards including students with physical disabilities</li> <li>Year level produces no significant difference</li> </ul>
<b>Further recommendations</b>	<ul style="list-style-type: none"> <li>Incorporate education relating to inclusion in more core topics throughout a course</li> <li>Ongoing research needs to occur to provide valuable feedback to teaching institutions</li> <li>Explore differences among students who have/ have not completed topics related to teaching SWD</li> <li>Pre and post study at the beginning and end of students university careers</li> <li>Necessary to complete similar research throughout a number of locations throughout Australia</li> </ul>

<b>Study:</b>	<b>Coates (2012)</b>
<i>Study purpose</i>	Examine the training student PE teachers receive in relation to teaching in inclusive environments and how well it prepares them to teach confidently
<i>Participants and setting</i>	112 trainee secondary PE teachers One university England
<i>Data collection methods</i>	Case study: Semi-structured questionnaire
<i>Analysis</i>	SPSS 17 (closed questions) Thematic analysis using NVivo (open questions)
<i>Results</i>	<ul style="list-style-type: none"> <li>• The inclusion training received was felt to be ineffective</li> <li>• A more hands-on approach and activity specific training necessary</li> </ul>
<i>Further recommendations</i>	<ul style="list-style-type: none"> <li>• An inclusion philosophy should be embedded to all areas of teaching training curriculum</li> <li>• By having this approach it may develop confident PE teachers inclusive of SWD</li> </ul>
<b>Study:</b>	<b>Perlman &amp; Piletic (2012)</b>
<i>Study purpose</i>	Investigate the influence of an APE course on PETE students and their ability to design and implement instruction
<i>Participants and setting</i>	46 Pre-service PE teachers enrolled in of two PETE programs USA
<i>Data collection methods</i>	Qualitative case study approach: Scenario responses, teacher reflections and peer observations
<i>Analysis</i>	Verbatim transcription across all three measures utilising the constant-comparative method
<i>Results</i>	<ul style="list-style-type: none"> <li>• PETE students indicated the use of feedback, task variation and teaching to the students' needs were key in providing motivational instruction</li> </ul>
<i>Further recommendations</i>	<ul style="list-style-type: none"> <li>• There is a need for a combination of theory based and practical application courses infusing authentic field based experiences</li> <li>• For quality experiences, PETE students may benefit from common theme that can be reinforces throughout the entire teacher development program</li> </ul>

<b>Study:</b>	<b>Block et al. (2013)</b>
<i>Study purpose</i>	Create and analyse properties of a survey instrument the SE-PETE-D
<i>Participants and setting</i>	486 PETE majors USA
<i>Data collection methods</i>	Self-Efficacy of Physical Education Teacher Education majors towards children with Disabilities (SE-PETE-D) (Block et al., 2013) comprised of three disability-specific scales (Intellectual disability, physical disability and visual impairment)
<i>Analysis</i>	Exploratory factor analysis and Confirmatory factor analysis
<i>Results</i>	A variety of factors across all three scales provided empirical evidence for what PETE students perceive as expertise domains to be inclusive of SWD in regular classes: <ul style="list-style-type: none"> <li>- Instructing peers to assist SWD</li> <li>- Coping with specific adaption requirements</li> <li>- Assuring the safety of SWD</li> <li>- Adapting instruction to keep SWD on task</li> </ul>
<i>Further recommendations</i>	<ul style="list-style-type: none"> <li>• A need for qualitative studies to understand the reasons behind self-efficacy of PETE students, specific to their majors</li> </ul>
<b>Study:</b>	<b>Hodge &amp; Elliot (2013)</b>
<i>Study purpose</i>	Analyse the beliefs about inclusion and teaching SWD
<i>Participants and setting</i>	177 PE majors and other sport majors Minority-serving institutes USA
<i>Data collection methods</i>	Physical Educators' Judgments about Inclusion (PEJI) survey (Hodge et al., 2002)
<i>Analysis</i>	ANOVA test
<i>Results</i>	<ul style="list-style-type: none"> <li>• Most participants believed they needed more and better training to acquire knowledge and skills before feeling confident to teach SWD</li> </ul>
<i>Further recommendations</i>	<ul style="list-style-type: none"> <li>• There is a need for better preparation for PE majors</li> <li>• APE content coupled with practicum experiences is requisite to teachers becoming more accepting of teaching SWD</li> </ul>



<b>Study:</b>	<b>Hodge et al. (2013)</b>
<i>Study purpose</i>	Assess the validity and reliability of PEJI and Analyse PETE majors judgements as a function of their gender and past experiences
<i>Participants and setting</i>	531 undergraduate PETE students One university Japan
<i>Data collection methods</i>	Physical Educators' Judgments about Inclusion (PEJI) survey (Hodge et al., 2002)
<i>Analysis</i>	A series of one-way ANOVA tests
<i>Results</i>	<ul style="list-style-type: none"> <li>• Most students yet to teach SWD but had developed positive or negative preliminary judgements about teaching SWD</li> </ul>
<i>Further recommendations</i>	<ul style="list-style-type: none"> <li>• A need to examine the longstanding assumption that beliefs (judgements) influence PE teachers actual teaching behaviour</li> <li>• Needs to be collected from future and current PE teachers in teaching SWD</li> </ul>

<b>Study:</b>	<b>Mangope et al. (2013)</b>
<i>Study purpose</i>	Identify the attitudes of PE teachers toward the inclusion of students with varying types of disability into their general education classrooms
<i>Participants and setting</i>	96 PE student teachers One university Botswana
<i>Data collection methods</i>	Attitude toward the inclusion of individuals with disabilities (ATIES) scale (Wilczenski, 1995)
<i>Analysis</i>	Factor analysis
<i>Results</i>	<ul style="list-style-type: none"> <li>• Overall the teachers held moderately positive attitudes towards IE</li> <li>• Concerns included; teacher skills, time pressures, resources and the negative impact on students without disabilities</li> </ul>
<i>Further recommendations</i>	<ul style="list-style-type: none"> <li>• Student teachers have the content to learn to teach however, knowing how to teach SWD is valuable to making learning more meaningful and enjoyable</li> </ul>

<b>Study:</b>	<b>Di Nardo et al. (2014)</b>
<i>Study purpose</i>	Examine the effects of an APE course on the attitudes of pre-service PE teachers towards students with a physical disability
<i>Participants and setting</i>	125 PE students in first and third year PETE courses One university Italy
<i>Data collection methods</i>	The Attitudes Towards Individuals with Physical Disabilities in Physical Education (ATIPDPE) instrument  (Kudláček et al., 2002).
<i>Analysis</i>	SPSS 17
<i>Results</i>	<ul style="list-style-type: none"> <li>• No significant differences between overall attitudes in all year levels</li> <li>• The intention toward inclusion increased with more education</li> </ul>
<i>Further recommendations</i>	<ul style="list-style-type: none"> <li>• Explore the differences among pre-service teachers who have/have not completed a course relating to teaching SWD</li> </ul>

<b>Study:</b>	<b>Pedersen et al. (2014)</b>
<b>Study purpose</b>	Examine the effect of teaching training on pre-service PE teachers' intention to include SWD in general PE classes
<b>Participants and setting</b>	56 Third or fourth year students Two universities Australia
<b>Data collection methods</b>	Physical Educators' Intention toward Teaching Individuals with Disabilities (PEITID) survey (Rizzo, 1993)
<b>Analysis</b>	SPSS
<b>Results</b>	<ul style="list-style-type: none"> <li>• Both university groups in general had favourable attitudes towards teaching SWD</li> <li>• The University group who received more training had more favourable beliefs, attitudes and intentions</li> <li>• The main point of difference was the practicum with SWD, therefore to improve intention towards teaching SWD, more practicum experience is reflective of what students will experience in their teaching careers and is needed</li> </ul>
<b>Further recommendations</b>	<ul style="list-style-type: none"> <li>• A need to identify which aspect of pre-service teacher training provides the biggest effect</li> <li>• Compared to USA, there are no mandated units of work associated with APE for Australian PETE programs in any registration board guidelines</li> <li>• A need for more comprehensive research in Australia</li> </ul>
<b>Study:</b>	<b>Fethi (2015)</b>
<b>Study purpose</b>	Identify the attitudes of PE teacher candidates towards SWD using visual information
<b>Participants and setting</b>	33 One university Turkey
<b>Data collection methods</b>	The Attitude Towards Disability Persons (ATDP) scale, Form O (Yuker et al., 1970)
<b>Analysis</b>	Before and after the display of a short movie, evaluated using paired sample t-test
<b>Results</b>	<ul style="list-style-type: none"> <li>• A change in attitudes did not happen before or after the visual briefing, however PE teacher candidates did not have a negative attitude either</li> </ul>
<b>Further recommendations</b>	

<b>Study:</b>	<b>Tindall et al. (2015)</b>
<b>Study purpose</b>	Examine how the attitudes and perceptions of pre-service PE teachers change as result of a semester long practicum with SWD
<b>Participants and setting</b>	64 Third year PE students 10 week APA program Ireland
<b>Data collection methods</b>	Written pieces: Pre-program expectations, weekly reflective blogs and a final written reflection
<b>Analysis</b>	Selective coding using NVivo
<b>Results</b>	<ul style="list-style-type: none"> <li>• Attitude and perceptions improved through participating in the training experience; lectures and an immediate and prolonged practicum experience</li> </ul>
<b>Further recommendations</b>	<ul style="list-style-type: none"> <li>• Further examination on themes of comfort, confidence, expectations, understanding and observation as a means to inform other PETE programs</li> </ul>

The authors identified four themes from the literature. Findings related to each theme are discussed below.

#### *Measurements to examine attitudes of pre-service PE teachers*

Research on teacher's attitudes in PE is recognised by Mangope et al. (2013) as an important consideration for the successful inclusion of students with disabilities (SWD). Fethi (2015) identifies attitudes are not innate but achieved through education and therefore can change. Furthermore, Ajzen (1991) recognises by understanding attitudes, intentions to perform a behaviour can be predicted and can result in additional changes. As illustrated in table 1, fifteen (68%) of the studies used a validated instrument to measure the attitudes of their participants. Among these fifteen studies there were eight validated instruments recorded to measure the attitudes of pre-service PE teachers. The tools used had the purpose of; evaluating attitudes based upon working with specific disability types (ATIPDPE) (Kudláček, Válková, Sherrill, Myers & French, 2002) and differences in thinking affecting behaviour including; attitudes (PEATID III) (Rizzo, 1993), (ATIPE) (Shechtman, 1991), (ATDP) (Yuker, Block & Young, 1970), (ATIES) (Wilczenski, 1995), intentions (PEITID-II-PS) (Ajzen, 2002), self-efficacy (SE-PETE-D) (Block et al., 2013) and judgements (PEJI) (Hodge, Murata & Kozub, 2002).

Six of the journal articles reviewed used Theory of Planned Behaviour (ToPB) to evaluate attitudes of pre-service PE teachers. Theory of Planned Behaviour (ToPB) puts forward a notion derived from the Theory of Reasoned Action (Fishbein, 1967) recognising that the best prediction of behaviour is identifying the intention which can result in attitudinal changes (Ajzen, 1991). When applied to pre-service PE teachers it examines the relationship between their attitudes towards working with SWD and how it affects their teaching. The studies using ToPB utilised belief statements or vignettes to evaluate the attitudes of participants using a Likert scale. An example of how researchers have constructed their instruments utilising the ToPB's determinants of intentions can be seen in Di Nardo et al.'s (2014) study. Di Nardo et al. (2014) utilised the Attitudes Towards Individuals with Physical Disabilities in Physical Education (ATIPDPE) instrument in ToPB to link the beliefs of pre-service PE teachers towards students with a physical disability and their behaviours to teach. All six studies utilising ToPB used the same determinants. An example of the ToPB determinants in Di Nardo et al.'s (2014) study include;

- a. Examining pre-service PE teachers' attitudes towards teaching SWD (the behaviour). The researchers presented positive belief statements when including students with physical disabilities in their class and the benefits of this to examine their attitudes towards teaching.
- b. Subjective norms. The impact of social pressure also predicts behaviours. This was presented through statements such as 'most people...think I should...' (p. 217) to examine normative beliefs of participants; and
- c. Perceived behavioural control. Perception can also be measured to gain insight into pre-service PE teachers ease or difficulty to teach and was presented in this study through statements such as 'if I wanted to I would be able to...' (p. 217).

By studies utilising ToPB it enables use of a validated approach to examine the relationship between attitudes of pre-service PE teachers and their behaviour to teach SWD. The use of a validated approach enables an accurate process of measurement to gain an outcome. When using the ToPB model, it was identified in the work of Schoffstall et al. (2007), that when ToPB was applied to examine participants' attitudes it indicated students who participated in an Adapted Physical Education (APE) program reported having positive views of SWD. Therefore, this positively influenced their behaviours to teach. The authors of this review identify it is important to recognise the beliefs of pre-service PE teachers as their intentions correlate to the meaningful opportunities presented to SWD in PE.

Additional forms of measurement to examine attitudes of pre-service PE teachers are seen in table 1. Examples of these include; a questionnaire (Coates, 2012; Mousouli et al., 2009; Vickerman & Coates, 2009) or a pre and post survey (Lieberman & Wilson, 2005). Further studies use a combination of approaches to achieve their outcome. Rust and Sinelnikov (2010) used informal and formal interviews with practical observation notes and critical incident reports. Similarly, Everhart (2009) also conducted interviews prior to teaching however this was in conjunction with measuring the heart rate of participants when teaching students with and without disabilities. Reflection was another measure used by Pearlman and Piletic (2012). Reflection was used in combination with scenario responses and peer observations to capture attitudinal changes. Tindall et al. (2015) also incorporated reflection into their study as a final practicum measure. However, this was in combination with written accounts of pre-practicum expectations and weekly blogs.

No matter the instrument used to measure pre-service PE teachers' attitudes towards teaching SWD, it was found that pre-service PE teachers held positive intentions about SWD and reported changes in attitude and competence towards teaching SWD in PE (Apache & Rizzo, 2005; Di Nardo et al., 2014; Gursel, 2007; Lieberman & Wilson, 2005; Mangope et al., 2013; Martin & Kudlacek, 2010; Oh et al., 2010; Pedersen et al., 2014; Schoffstall et al., 2007; Tindall et al., 2015). The factors influencing these findings range from; previous experience with people living with disability and perceived competence (Oh et al., 2010), education presented through coursework (Apache & Rizzo, 2005; Di Nardo et al., 2014; Gursel, 2007; Martin & Kudlacek, 2010; Mangope et al., 2013; Pedersen et al., 2014; Schoffstall et al., 2007) and contact with people living with disability in a PE practicum (Lieberman & Wilson, 2005; Tindall et al., 2015). On examination of table 1 it is seen that despite the positive intentions of pre-service PE teachers they have limited self-efficacy to translate knowledge and experiences into designing and enacting inclusive pedagogy for SWD. Within the reviewed studies, it was highlighted that attitudes of pre-service teachers were measured to evaluate the impact of coursework pre, during and/or post delivery in inclusive pedagogy (Apache & Rizzo, 2005; Coates, 2012; Di Nardo et al., 2014; Gursel, 2007; Pedersen et al., 2014; Perlman & Piletic 2012; Schoffstall et al., 2007). Through analysing table 1 it became evident there was inadequate training at a pre-service level which meant teachers did not feel confident in their pedagogy when working with students with disabilities (SWD).

Pre-service PE teachers indicated they needed added and improved content on inclusion in PE to acquire appropriate knowledge and skills in order to teach SWD (Hodge & Elliot, 2013; Mangope et al., 2013; Pedersen et al., 2014). This is illustrated in the study by Mangope et al. (2013) which reported that pre-service PE teachers who held moderately positive attitudes still had concerns in their teaching skills and the available resources to support their teaching of SWD. Similarly, Hodge and Elliot (2013) report that participants needed more skills to learn how to teach SWD before feeling confident to teach. The significance of training is further highlighted by Pedersen et al. (2014) who found from comparing two university cohorts, the group who received more training had more favourable beliefs towards SWD. There is still a need to identify which aspect of pre-service training provides the greatest effect. This will in turn enable more effective training experiences and development of knowledge for pre-service students (Pedersen et al., 2014).

After reviewing the literature, the authors acknowledge that it is challenging for PE teachers to accommodate and modify their pedagogy for SWD. Hodge and Elliot (2013) conclude that how PE teachers enact their pedagogy is a reason why SWD may not experience success in PE. Therefore, there is a need to develop inclusive pedagogy in coursework for pre-service PE teachers. The authors believe this may alleviate many of the fears pre-service PE teachers may have towards working with SWD. This may in turn assist pre-service PE teachers to more fully consider how they could be more inclusive of SWD in PE.

#### *Exploring the self-efficacy of pre-service PE teachers*

As noted by Hodge and Elliot (2013), pre-service PE teachers have fear and apprehension about their skills and knowledge to teach SWD. Researchers have attempted to explore pre-service PE teachers' self-efficacy to examine how this impacts the development of their inclusive pedagogy to teach SWD. Self-efficacy has been explored by Block et al. (2013) who surveyed approximately 500 PETE students. Using results from the validated survey Self-Efficacy of Physical Education Teacher Education majors towards children with Disabilities (SE-PETE-D), Block et al. (2013) argued that to understand the factors which contribute to the self-efficacy of pre-service PE teachers, self-efficacy should be further investigated within different cohorts enrolled in PETE programs. For example, pre-service PE teachers undertaking streams such as Adapted Physical Education (APE) or students' involved in any PE practicum experience. This is supported by Pedersen et al. (2014) who compared two university cohorts using the Physical Educators' Intention toward Teaching Individuals with Disabilities (PEITID) survey (Rizzo, 1993). They found the group which had more exposure to practicums had more favourable beliefs to teaching SWD.

Despite differences in approaches between Pedersen et al.'s (2014) and Block et al.'s (2013) studies both concluded that there is no definitive results on pre-service PE teacher's self-efficacy. However, what Block et al. (2013) and Pedersen et al. (2014) suggest is the need to explore if practicum experiences helps PETE majors (students) develop skills and self-efficacy towards teaching SWD in a general PE class. This exploration can positively influence pre-service PE teacher's intentions and development of pedagogy to teach SWD which will have an encouraging effect on the delivery of the PE Australian curriculum (ACARA, 2015) to SWD.

#### *The effects of pre-service PE teachers' practicum experiences*

Within the reviewed studies, it was identified a number of journal articles examined the impact of practicum experiences on pre-service PE teachers attitudes towards working with students with disabilities (SWD). Block et al. (2013) describes there is a need to evaluate practicum experiences to understand the factors contributing to self-efficacy of pre-service PE teachers. Rust and Sinelnikov's (2010) case study, involving one participant, explored the perceptions of

pre-service PE teachers after they had taught SWD during a seven week teaching practicum. Findings from formal and informal interviews, direct observation and reports from the participant highlighted they had an understanding of disabilities, however upon reflection the participant emphasised that having knowledge around how to teach SWD is crucial for successful inclusion (Rust and Sinelnikov's, 2010). Similarly, Liberman and Wilson's (2005) study aimed to determine if attitudes of pre-service PE teachers would change after an intensive one week practicum specifically working with children with visual impairments. Likert scale responses were compared pre and post the practicum. It was found that pre-service PE teachers had positive changes in their attitude (Liberman & Wilson, 2005). Likewise, Tindall et al. (2015) conducted a semester-long examination of written pieces (pre-program expectations, weekly blogs, final reflection) by third year PE students to examine how their attitudes changed as a result of a practicum with SWD. It found through students exposure to lectures encompassing inclusive pedagogy and experiences with SWD their attitudes improved towards teaching SWD (Tindall et al., 2015).

From these studies, it was found pre-service PE teachers had positive changes in their attitudes due to exposure to coursework on inclusive pedagogy combined with the opportunity to enact this with SWD through practicum experiences. More practicum experiences are reflective of what pre-service PE teachers will experience in their careers and is therefore needed (Pedersen et al., 2014). However, the authors believe the studies evaluating the impact of the practicum experience on attitudes of pre-service PE teachers has highlighted a gap in the literature. The practicum experiences identified involve teaching SWD however it is not implemented in an environment with students with and without disabilities, corresponding with Inclusive Education (IE). Most importantly, this can link to the low self-efficacy of pre-service PE teachers to translate knowledge and experiences gained from practicum experiences into designing and enacting inclusive pedagogy for SWD in general PE .

#### *Investigating hands-on opportunities in Physical Education Teacher Education (PETE) programs*

Within Australia, there are no mandated units of work associated with Adapted Physical Education (APE) for PETE programs in any registration board guidelines (Pedersen et al., 2014). A number of studies highlight the importance of a hands-on approach when learning to teach SWD as it allows students to apply theoretical knowledge in an authentic field based experience (Apache & Rizzo, 2005; Coates, 2012; Di Nardo et al., 2014; Gursel, 2007; Pedersen et al., 2014; Perlman & Piletic, 2012; Schoffstall et al., 2007).

Among the studies evaluating the impact of coursework, it was found a hands-on approach conducted through APE courses created opportunities for pre-service PE teachers to develop their pedagogy towards working with SWD (Di Nardo et al., 2014; Everhart, 2009; Gursel, 2007; Perlman & Piletic, 2012; Schoffstall et al., 2007). Not surprisingly, the overall findings from these studies found that more education was beneficial for developing inclusive pedagogy (Gursel, 2007) and made pre-service teachers feel more prepared when instructing SWD (Schoffstall et al., 2007). Even so, Di Nardo et al. (2014) expresses a need to explore the differences among those who have or have not completed a course related to teaching SWD and how this affects their practice. In turn, this may provide further evidence for PETE programs to consider their curriculum and how it provides hands-on opportunities to enact inclusive pedagogy for SWD in PE (Pedersen et al., 2014).

## Conclusion

This review examined literature from 2005-2015 encompassing studies about pre-service Physical Education (PE) teachers and their attitudes towards working with students with disabilities (SWD). Studies within this review were examined using a thematic approach and highlighted key themes and their implications. Key themes identified for discussion included; (a) measurements to examine attitudes of pre-service PE teachers, (b) exploring pre-service PE teacher's self-efficacy; (c) the effects of pre-service PE teachers' practicum experiences; and (d) investigating the hands-on opportunities in Physical Education Teacher Education (PETE) programs. Themes discussed in this review contribute to enabling better learning outcomes for pre-service PE teachers in developing inclusive pedagogy when working with SWD in PE.

From the review, the authors have identified a need to review current PETE programs to explore the curriculum and if and how inclusive pedagogy is incorporated into student learning outcomes. It is important to examine the opportunities presented in PETE programs to determine if they are adequate in preparing pre-service PE teachers to provide opportunities in PE for SWD (Perlman & Piletic, 2012). Furthermore, Pedersen et al. (2014) argue that a comprehensive PETE program is warranted in Australian universities. Pedersen et al. (2014) believe that this should include an APE topic where it will have a positive impact on pre-service PE students' pedagogy. It was evident from the records identified in database searches that Australia has limited research in the area of pre-service PE teachers and their attitudes towards working with SWD. To the authors' knowledge, Martin and Kudlacek's (2010) study from a New South Wales University, and the examination by Pedersen et al. (2014) across two universities in Tasmania and Victoria are the only studies in Australia concerning pre-service PE teachers and their attitudes towards working with SWD. Thus, this review supports a further exploration of Australian pre-service PE teachers and their self-efficacy to design and enact inclusive pedagogy. Subsequently, this study needs to explore inclusive pedagogy in physical education on a state-wide basis and how it can become embedded throughout an entire PETE program.

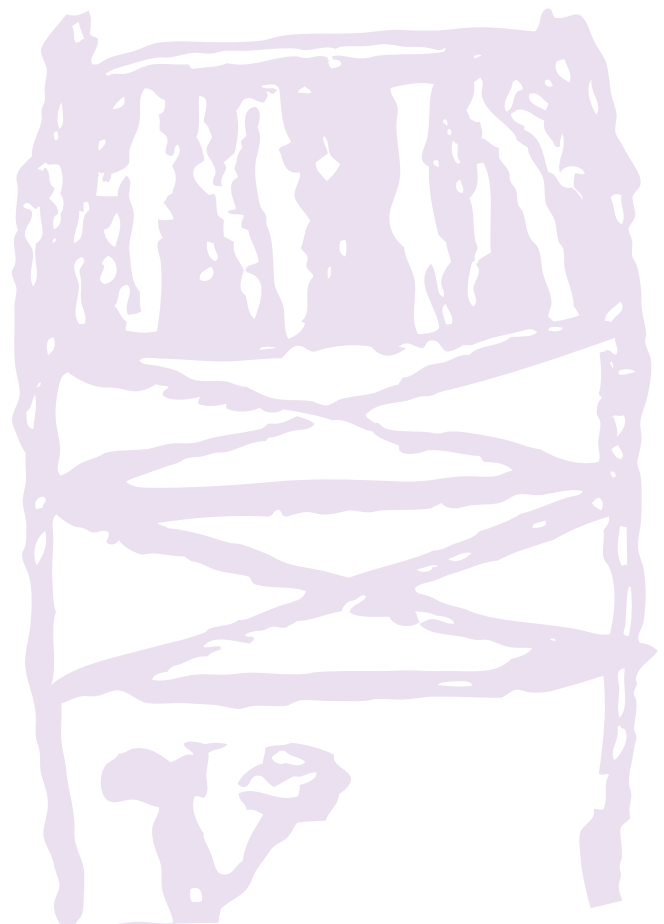
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## Using emoji as a tool to support child wellbeing from a strengths-based approach

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**Keywords:** emoji, children, child wellbeing, strength-based approach, child-centred research

### Abstract

The assessment, measurement, and support of child wellbeing has garnered a substantive amount of research due to its widespread acceptance as the foundation of healthy development and future health and wellbeing. Despite this sustained interest, current understandings have derived almost exclusively from adult conceptualisations of wellbeing, contributing to the implicit and explicit exclusion of children's voices in child wellbeing research, policy, and practice. This has resulted in a fundamentally deficit view of children in relation to their health and wellbeing, where child health and wellbeing are benchmarked along developmental trajectories relating largely to skills and school readiness. Despite the pervasiveness of developmental perspectives of health and wellbeing in childhood, however, both national curricula, the Early Years Learning Framework (birth-to-five years of age) and the Australian Curriculum: Health and Physical Education learning area (AC:HPE) (foundation to year 10) (Australian Curriculum Assessment and Reporting Authority, 2013) highlight the need for children to be active and engaged participants in their own and others' wellbeing, and position children as beings who bring with them personal, relational, and community strengths and assets. This paper reports on a study that used emoji as a child-centred method for eliciting young children's (n=78) perspectives of their own wellbeing. The findings of the study suggest that a range of young children are able to articulate their own understandings and experiences of wellbeing using emoji, and the value of this tool as a strengths-based approach for meeting curricular outcomes and supporting child wellbeing. This paper provides a rationale for the use of child-centred tools to re-position child wellbeing from a deficit to a strengths-based approach through the facilitation of children's exploration and communication of their own understandings and experiences of wellbeing.

### Introduction

Increasingly, for young children, defined internationally generally as birth-to-eight (Copple & Bredekamp, 2009), the concept of wellbeing has been operationalised to identify areas of need and risk in order to support the healthy development and wellbeing of young children (Fane, MacDougall, Redmond, Jovanovic, & Ward, 2016). This construction of child wellbeing has led to the pervasive use of standardised assessments and large scale quantitative measures derived by adults, for young children, which have greatly informed knowledge, practice, and policy relating to child wellbeing. However, their almost exclusive use has implicitly and explicitly positioned and reinforced the idea of young children as having too limited "cognitive, language skills, and attention spans" (Hymel, LeMare, & McKee, 2011, p. 270) to participate in the construction of knowledge surrounding child wellbeing. Yet, despite the continued exclusion of young children's

voices and understandings of wellbeing within child research, there continues to be growing recognition of the need to reframe children's role within current conceptualisations of child wellbeing (Ballet, Biggeri, & Comim, 2011; Biggeri & Santi, 2012; Fattore, Mason, & Watson, 2009; Fegter & Richter 2014; Mashford-Scott, Church, & Tayler, 2012).

The reframing of children's role within research and educational contexts requires recognising children as active citizens who, as enshrined in the United Nations Convention on the Rights of the Child (United Nations, 1989, p. 14) and stated in the guiding principles (United Nations International Children's Emergency Fund (UNICEF), 2014), "have the right to say what they think should happen and have their opinions taken into account...[and] seek, receive and impart information and ideas of all kinds...either orally, in writing, in print, in the form of art, or through any other media of the child's choice" (retrieved from: [http://www.unicef.org/crc/index\\_30177.html](http://www.unicef.org/crc/index_30177.html)). However, if young children's views, understandings, and opinions are to be sought and listened to, tools and approaches which acknowledge and allow opportunities for the elicitation of children's understandings and experience are required. In this way strengths-based approaches and tools that position children as knowledgeable and capable contributors to knowledge are essential in redressing their continued exclusion from our knowledge of children and childhood.

This paper reports on a research project which sought to investigate young children's understandings and experiences of wellbeing. The research project stems from the findings of a systematic review of young children's wellbeing during the transition to school (Fane et al., 2016), in which a key identified finding was that current conceptualisations of young children's wellbeing are almost exclusively derived from adult perspectives. To redress the exclusion of young children's voices in current constructions of child wellbeing, this study piloted the use of emoji as a strengths-based, child-centred research method to elicit young children's views and understandings of their own wellbeing. Emoji were determined to offer significant value to the growing suite of tools for constructing young children as co-researchers within child-centred and participatory research paradigms (Fane, MacDougall, Redmond, Jovanovic, & Gibbs, 2016). This paper reports on the findings of the study in relation to the potential of emoji to support young children's engagement with both national curricula and to support their wellbeing within education and care contexts. The discussion centres on how emoji can be used within a strengths-based approach as a tool in research, classroom, and educational settings for supporting young children's current and future wellbeing, and to increase our knowledge of child wellbeing through the inclusion of children's perspectives.

### **Literature review**

The use of visual research methods within child research may be seen to simply mimic activities children may do in the home or early childhood education and care settings (for example drawing, photography, using clay). However, there is a tradition of visual methods from the sub-discipline of visual sociology; the study of visible domains in social life, including the visual languages and sign systems through which we communicate (Emmison & Smith, 2000). One of the core tenets of visual sociology asserts that the habitual activities of social life reveal what may be hidden or taken for granted in the inner mechanisms of ordinary life (Knowles & Sweetman, 2004). As technology and media become an increasing part of young children's everyday experiences and environments, they offer a potentially fruitful avenue for examination of how methodology can react or respond to technological and social change.

Visual research has a strong link with technology and new technologies can contribute to and inform our knowledge about social worlds and actors (Cipriani & Del Re, 2012). Emerging technologies have the potential to produce "new, innovative, reflexive, and theoretically

informed” research (Pink, 2003, p.191), through its ability to accommodate different audiences and purposes. However, purposeful selection of visual materials requires careful attention to the visual material’s likely impact on the intended audience (Jewitt & Van Leeuwen, 2001). Exploration and engagement with technologies and digital literacies are becoming increasingly common-place in early education and care and school environments. These types of literacies, known as multiliteracies (Cope & Kalantzis, 2009), offer fertile grounds for new visual methods for research with young children. The concept of multiliteracies extends traditional concepts of reading, writing, speaking, and listening to include symbols, icons, logos and multiple sign systems such as video clips (Department of Education and Children’s Services, 2006). Contemporary sign symbols found in electronic and digital mediums may be relatively new, but their roles and use in conveying knowledge is indeed the oldest form of literacy (Chandler, 2007). The increased focus on multiliteracies and technology within curricula and designs for learning in early childhood education (Marsh, 2005) supports the use of emoji as a research method for engaging young children in how they understand and make meaning of their world. In this way, emoji offers both a practical and insightful approach to eliciting young children’s voices in childhood research.

## **Method**

### *Participants*

Participants were 78 children (49 boys and 29 girls) aged 3-to-5 years across eight early learning and long day care centres in metropolitan Adelaide, South Australia. The eight centres were chosen to represent a theoretical sample of the diversity of South Australian early childhood education and care services for preschool aged children in relation to socio-economic status (Australian Government Commonwealth Grants Commission, 2012), and site type (standalone long day care centre or integrated long day care centre and primary school).

### *Ethics*

Ethical research with young children is facilitated by a multi-step procedure for ensuring that both the research design and protocols are suitable, reasonable, and prioritise the safety and security of child participants. This four step process included ethics clearance from the researcher’s university ethics committee, permission from centre directors, parental/guardian consent, and children’s assent.

### *Procedure*

The research design endeavoured to create sensitivity and proximity to build mutual trust and respect through repeated interactions with all child participants during multiple site visits. The final visit, and the focus of this paper, entailed the use of emoji as a visual research method in 13 focus groups across eight early learning and care services. All focus groups were audio-recorded and detailed field notes were recorded by the researcher at the end of each interview.

Emoji a type of graphic symbol, originating from Japan, which express concepts and ideas pervasively used in mobile communication and social media (Novak, Smailović, Sluban, & Mozetič, 2015), were used as the sole data collection tool. Emoji are the descendent of the emoticon, a shorthand form of a facial expression created using a standard keyboard, for example :-). Rather than keyboard shorthand, an emoji is an ideogram which can be used to represent a facial expression, but has been more widely co-opted to represent feelings, gestures, objects, animals, food and drink and activities (Novak et al., 2015). Emoji were

modified for use with young children by enlarging them to 10cm by 10cm, cutting them out individually, and laminating them so they could be manipulated by children. The researcher began by giving child participants five different emoji representing feelings through facial expressions (emoji 1-5 in Figure 1). Children were first asked to identify the feeling or emotion being portrayed by the five faces. Next, children were asked to pick one of the emoji, and tell a story about why someone might feel that way. After the participants had shared all the ideas they wanted with the researcher, the researcher gave each focus group 13 other emoji pictures, chosen to represent common objects, environments, activities, or iconography that young children would be familiar with (emoji 6-18 in Figure 2). Once the participants had the opportunity to explore the new emoji, they were asked to choose one and tell a story about it. The researcher engaged with every child's response throughout the focus group, asking clarifying questions if the response was not understood by the researcher, and repeating the child's idea or story back to ensure the researcher had correctly understood.

**Figure 1.** *Emoji used in child focus groups.*



### Analysis

A directed content analysis, an approach to qualitative content analysis deriving from relevant theory or research findings within the greater literature of the phenomena under study, was employed (Hsieh & Shannon, 2005). During this initial coding phase, data that could not be coded using one of the predetermined codes were identified with a descriptive code to be analysed later, to determine if it represents a new category, or subcategory of an existing code (Hsieh & Shannon, 2005). Data which did not fit within these existing six codes and identified with descriptive codes were then re-analysed and coded in a secondary round. This secondary round resulted in the further refinement of the descriptive codes into two additional categories.

The findings section reports on the ways in which the use of emoji in an educational context served as a strengths-based approach to supporting young children in exploring, sharing, and in some cases defending their own understandings of health and wellbeing. The discussion section will relate these findings to the two national curricula and why the use of innovative tools to engage student's in strengths-based approaches to child wellbeing are essential to the work of teachers and schools.

## Results

### *Eliciting children's voices and understandings*

When given the five facial emoji (emoji 1-5 in Figure 1) and the verbal prompt “can you tell me what feelings you see?” at the beginning of the focus groups, the children generated twenty-four different feelings, emotions, and ideas (see Figure 2). Figure 2 illustrates the range of responses of what feelings were generated by the children in response to emoji 1 through 5. Of particular interest was the volume and diversity of responses for the straight-mouthed emoji (i.e. emoji 5) that children shared. This emoji (i.e. emoji 5) also generated the most discussion between participants, and in four focus groups, generated disagreements and negotiations between children as to what feeling was being depicted. For example, the following excerpts from two separate focus groups highlights how children interpreted emoji differently and communicated their understandings to the researcher.

### *Focus Group 2*

**Researcher:** [talking to Maisy<sup>1</sup> who is holding the straight-mouth emoji] What is that feeling?

**Maisy:** Frustrated

**Researcher:** Oh frustrated, that's an interesting idea

**Violet:** No! That's bored!

**Researcher:** [speaking to the Violet] There are perhaps a lot of different emotions it could be, do you want to tell me a bored story in a minute? Right now I want to hear about Maisy's frustrated story. [turns to Maisy] When might you feel frustrated?

**Maisy:** When my friend got sick

**Researcher:** If your friend was sick. That would be frustrating. That's a really good idea, thank you. [turns to Violet] Violet did you want to tell me a story about feeling bored?

**Violet:** It's angry because, I changed my mind cause.... that boy pushed him, pushed him over

**Researcher:** Oh, somebody pushed someone, and that would make you feel angry?

**Violet:** Yes

### *Focus Group 3*

**Researcher:** Does anyone have any ideas for what this feeling is? [holding up the straight-faced emoji]

**Tom:** Um straight

**Researcher:** The mouth is a straight mouth? Yes? [Tom nods], but how are they feeling?

**David:** Angry

**Researcher:** Maybe angry? That's a good idea.

**Tom:** No! Not angry! Because, because it hasn't got a sad face, look, upside down is a happy face [pointing to the emoji to indicate that the angry face has a downturned mouth and the happy face has an upturned mouth]

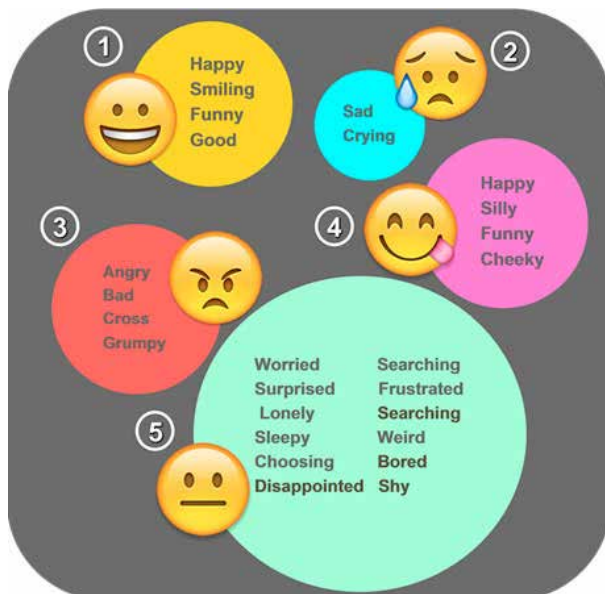
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1. Pseudonyms are used to protect participant identity



In addition to generating the most discussion and disagreement, the straight-mouthed emoji (i.e. emoji 5) generated three to six times more feeling ideas than emoji 1 through 4 (see Figure 2). This suggests that while all the emoji allowed children opportunities to interpret the internal and external narratives of the symbols in a variety of ways with little adult/researcher input, the increased ambiguity of the symbol resulted in a greater amount of ideas, disagreement, and negotiations generated.

**Figure 2.** Ideas generated by three- to five-year-old child participants using emoji as a visual research method.



### *Supporting English as an additional language or dialect (EALD) speakers*

All 78 children who participated in the focus groups were willing to pick up emoji of their choice at the researcher's request. The vast majority of children readily gave verbal responses to the researcher prompts or engaged in conversation and discussion with their peers about the emoji and the feelings and stories being shared. Instead of, or in addition to using verbal language, children used a variety of communication techniques including body language, noises/sounds, matching pictures together, and pairing pictures with their friends/peers. For children who were cautious about participating verbally, or had limited spoken English language abilities, the emoji offered a variety of ways for children to engage in the research process once they felt comfortable or had the language/vocabulary to express their ideas. The excerpt below is an example of how Ling, an EALD speaker, negotiated her participation in the research process using the emoji and a variety of non-verbal and verbal responses.

#### Focus Group 6

**Researcher:** Can everyone pick up an emoji? [all children in the focus group select an emoji] Ling, which one did you pick? Which feeling is that?

**Emilio:** Angry! Angry!

**Ling:** [no verbal response]

**Researcher:** That's an interesting idea Emilio. [speaking to Ling] Could this be an angry face? [Ling nods]

**Multiple voices:** Angry!

**Researcher:** Ling do you have a story you'd like to share about why someone might feel angry?

**Oscar:** Cause someone called him silly

**Researcher:** Oh that's a good idea Oscar, but I'm wondering is Ling has an idea. Do you have a story you'd like to share? [Ling doesn't respond]. Should I come back and ask after? [Ling nods] Thanks Ling, I'll come back to you later to see if you want to share any ideas.

**[Later on in the focus group]**

**Researcher:** Who else would like to share an idea or story? Ling, would you like to tell me about the one you're holding?

**Ling:** Heart, that's heart [emoji 8]

**Researcher:** A heart. Thanks Ling. Would you like to tell me a story about the heart or how it might make someone feel?

**Ling:** [shakes head]

**Researcher:** Thanks Ling

Ling was eager to select an emoji and share her choice with her friends. She also readily responded to questions using non-verbal cues in the beginning of the focus group. The emoji offered a variety of ways for her to participate and share her ideas and feelings with her peers and the researcher without the need to communicate verbally in English. As EALD speakers commonly experience being excluded from the research process (Frayne, Burns, Hardt, Rosen, & Moskowitz, 1996), children, who already as a group have been largely excluded from research, (Chaplin, 1994; Harrison, 2004; Klerfelt, 2007), who are EALD speakers are likely to be even further silenced. Later on in the focus group, however, after watching and listening to her peers respond, Ling did respond verbally to identify the emoji she had chosen. Ling was visibly proud of her verbal contribution to the group, and when another child chose the same emoji afterwards she indicated that they were the same while repeating "that's heart". The emoji were used in a variety of ways by Ling and other children to convey children's ideas and the images' importance to them, presenting opportunities for children to engage in the research process in the ways they wanted and/or were able to.

*Supporting children with special needs*

Several children seemed challenged by the concept of telling a story about a feeling, especially for the more ambiguous emoji, often waiting to let another child go first to tell a story about a particular emoji and use the previous example to build upon. Marcus, a child with special needs, actively participated from the beginning of the focus group, however, when prompted to tell a story, would instead re-identify the emoji he had chosen. While recent years have seen an increasing involvement of young children with special needs within childhood research, they have often been relegated to, or have occupied passive roles, with their participation being largely tokenistic (Gray & Winter, 2011; Shier, 2001). Marcus' engagement with the emoji, however, was far from passive. Despite the initial challenges for Marcus in moving past description to storytelling, by the end of the focus group Marcus was able to communicate an example of how he might feel and offer a significant insight into how he conceptualises feeling well.

Focus Group 9

**Researcher:** Great ideas, everyone. Marcus, can you tell me a story about this one? Why somebody might feel happy or silly?

**Marcus:** Silly

**Researcher:** Can you tell me a story about why someone might feel silly?

**Marcus:** There's a silly one and an angry

**Researcher:** Interesting ideas, they're showing different feelings. Thanks Marcus, I really appreciate your ideas.

**Marcus:** I want this one [referring to emoji Number 4]

**Researcher:** You'd like to hold that one?

**Marcus:** Yeah

**Researcher:** Ok, you hold onto that one, and I'll come back to you to see if you'd like to tell me a story about that feeling.

**[Later on in the focus group]**

**Researcher:** Reid, can you tell me a story about feeling sad?

**Reid:** This week

**Researcher:** Did you feel sad this week? Can you tell me what made you feel sad?

**Marcus:** I've been sad

**Lee:** A creature bite you

**Researcher:** Lots of interesting ideas...[interrupted by Marcus]

**Marcus:** I've been sad!

**Researcher:** I want to hear your ideas in a minute Marcus, but I'd like to let Reid finish his story? Reid when did you feel sad?

**Reid:** Someone hit me

**Researcher:** You would feel sad if someone hit you? That would make me feel sad too, thanks for sharing Reid. Marcus, did you want to tell me your story about when you felt sad?

**Marcus:** I missing my mum

**Researcher:** [didn't quite understand what Marcus said] When you were with your mum?

**Marcus:** I tell me mum

**Researcher:** You would tell your mum if you are feeling sad? That's an excellent idea. What would your mum do if you tell her you're feeling sad?

**Marcus:** And gives me medicine

**Researcher:** She gives you medicine? If you are sick?

**Marcus:** Yes

During the focus group children were prompted on a number of occasions to pick an emoji, describe their choice and tell a story. The extract above shows how this supported Marcus to move from a simple description of the emoji to connecting his own experiences and feelings through storytelling. In this way, the repeated, yet open-ended nature of the emoji and the focus group procedure allowed opportunities for participation for children who were easily able to communicate their ideas and stories verbally, and children who required further support and modelling from peers.

## Discussion

Through analysis of the data, it is clear that the use of emoji in educational contexts strongly supported young children in exploring and expressing their understandings of wellbeing. A key reason for this is due to the open ended nature of the use of emoji symbols, which allowed opportunities for young children to construct meaning and share their understandings with their peers, educators and researcher without concern for identifying the 'correct' answer, or sharing what they thought the researcher was asking of them. The use of open ended tools not only supported participant's engagement through the use of child led/initiated learning, a key tenant of early childhood education programs in Australian and internationally (Thomas, Warren, & deVries, 2011; Wood, 2009), but also aligns with the aims and key strategies of both national curricula in regards to the use of strengths-based approaches which "affirm that all students and their communities have particular strengths and resources that can be nurtured" (Australian Curriculum Assessment and Reporting Authority, 2013, retrieved from: <http://www.australiancurriculum.edu.au/health-and-physical-education/key-ideas>) and are highlighted as a key strategy for supporting child health and wellbeing.

The Early Years Learning Framework (Australian Government Department of Education, 2009) outlines the key practices which underpin good pedagogical practice in early childhood. One of these practices, entitled 'Responsiveness to children', requires educators to "value and build on children's strengths, skills, and knowledge...[including] children's expertise, cultural traditions, and ways of knowing" (Australian Government Department of Education, 2009, p. 14). Similar language is found in the AC:HPE (Australian Curriculum Assessment and Reporting Authority, 2013) where five interrelated propositions shape both the content and pedagogies underlying the curricular document.

The use of emoji as a tool to engage young children in developing their understanding and communication of key curricular concepts like safety, relationships, and feelings stem from a strengths-based approach because they offer children opportunities to communicate their understandings without having to start from adult conceptualisations of these concepts. This imbues children with affirmation of their understandings as distinct from that of adults and that these understandings are valued. As a shared goal of both curricular frameworks is the use of a strengths-based approach to support child health and wellbeing, emoji offer a tool that works across contexts for children of varying ages and would allow for continued engagement with key concepts, offering a flexible system for children to communicate feelings and needs to peers and teacher/educators. While this paper reports on the use of emoji within a research study, its applicability to early years learning contexts and schools is clear when mapped across both curricula. The continued focus on child led/ initiated learning provides a strong rationale for the use of emoji to move understandings of child wellbeing from a deficit to a strengths-based approach.

## Conclusion

Findings of this study highlight the potential of emoji for supporting children in engaging with both national curricula from a strengths-based approach, alongside supporting their overall wellbeing. As child wellbeing continues to be framed in largely deficit terms from adult perspectives, there is a significant need to redress young children's exclusion from present constructions to broaden current knowledge and understanding of child wellbeing. In addition, and of key importance, is also how using a strengths-based approach to child wellbeing can also support the work of teachers/educators and schools/early learning and care environments in creating learning environments supportive of child wellbeing that value children's knowledge and input. The open-ended nature of emoji not only supports a strengths-based approach, but also offers a high level of flexibility for its use across educational contexts, and ages and abilities of children. The use of child-centred visual materials, underpinned by a strengths-based approach to defining, engaging with, and supporting child wellbeing, offers not only new and innovative approaches to meeting curricular outcomes, but also in re-defining current constructions of child wellbeing which impact significantly on the early childhood and education sectors and the work of teachers and educators.

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## What are physical education teachers being told about how to teach sport? An exploratory analysis of sport teaching in physical education

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**Keywords:** sport, teaching, physical education, pedagogy, models

### Abstract

This literature review investigated current and emerging pedagogical directions indicated to physical education (PE) teachers in the research literature. The search strategy used the Google Scholar database to initiate the scan, and then extended into other databases as well as the reference lists of published papers to locate relevant studies. Criteria for inclusion of papers for this review included: 1. Published in English between 2000 to December 2015; 2. Original research published in either peer reviewed journals or text books; 3. Addresses the delivery of sport and PE within both Australian and international school aged children and young people; 4. Papers or book chapters that addressed theoretical underpinnings and concepts of delivering sport and PE. The search identified 57 papers or chapters for inclusion. The major findings of the analysis were: 1. Game Based approaches (such as Game Sense (Australia), TGfU (United Kingdom) and Tactical Games (North America) to learning in PE technical and tactical dimensions of skilled performance in game play are promoted; 2. The Sport Education curriculum and instruction model is well researched and validated as a design to provide authentic, educationally rich sport experiences for students in the context of school PE; and 3. Personal and social development is an often-cited outcome of quality PE teaching in schools. Researchers have supported the use of a “tool kit” of instructional strategies to achieve student learning outcomes in PE (Pill, 2011).

### Introduction

We acknowledge the place of sport in physical education (PE) is contested, and it is not universally agreed that sport in PE is good for, or engages, all children. However, sport has also been described as ‘pivotal’ (Green, 2000) and integral (Bailey & Kirk, 2009) to PE. Laker (2002) argues that in broad terms “sport, in the educational guises of PE and school sport, has a major role to play in the education of young people” (p. 6), legitimating the existence of PE in schools (Laker, 2003). Kirk (2006) also makes a strong case for the inclusion of sport in school PE as play, games and sports at their best are conceived as intrinsically good things, among the most important and serious of human activities and hence they are an important part of the school curriculum. Internationally, games and sport are recognised as one of the most important elements of the PE curriculum, representing the “prime source of content and key contexts for teaching and learning” (Lopez, Jordan, Penney & Chandler, 2009, p. 47). Recently, Drummond & Pill (2011) argued for a curriculum vision for sport in PE that moves



class participation beyond narrow technical and elite perspectives of sport participation to one which is more inclusive and understanding of broader sociological issues. They view sport in Australia as a significant cultural practice which demands a place within the PE curriculum. The authors agree with Brooker and MacDonald (1993) that sport within PE should assist PE as an educational process in order to promote, engage and facilitate sport participation within school, and beyond.

Remaining true to Arnold's (1979) definition of learning in PE and the Arnoldian conceptualisation of PE influencing Australian (Australian Council for Health, Physical Education and Recreation, 2008) and international (Brown & Penney, 2012; Kirk, 1988) theorising and developments relating to the form and content of PE curricula, Drummond and Pill (2011) suggest that sport teaching and learning in PE is considered a context for:

- Learning in sport – this includes sport skill acquisition;
- Learning about sport – recognising that sport is structured in certain ways to bring about particular outcomes; and
- Learning through sport – understanding the embodied experience of sport to learn about a range of matters.

Pill (2008) frames these three dimensions as sport literacy. He suggests that sport literacy is potentially both a praxis and curriculum scaffold for sport curriculum design and enactment. He makes this claim because it expands the construction of 'ability' in PE typically viewed in PE as a singular capacity centred on technical constructions of motor development. It does this by framing sport using the three types of movement learning that Arnold (1979) indicated as forming the distinctiveness of PE.

Confronting the norms of the traditional PE method that still remains the status quo in many school PE settings will play a pivotal role in educating through sport in areas of personal and social skill development, physical activity and participation, and the health of individuals and communities (Pill, 2015). We agree with Gimenez, Valenzuela and Casey (2010) that if teachers are being asked to change their practices then this should be informed by research evidence of comparative studies so that they can diversify their practice with understanding.

This literature review investigated current and emerging pedagogical directions indicated to PE teachers in the research literature. For many years, literature has supported the use of a "tool kit" of instructional strategies to achieve student learning outcomes in PE (Pill, 2011). For example, Mosston's Spectrum of Teaching Approaches (Mosston, 1966; Mosston & Ashworth, 2008) is an example of one of these enduring ideas. More recently, however, scholarly and research literature has been promoting models based practice (MBP), particularly as a means for implementing student-centred approaches to learning (Casey, 2014; Hastie & Casey, 2014). Metzler (2011) describes pedagogical models as blueprints for PE teaching, learning and assessment where each model has distinctive teaching and learning objectives. Casey (2014) suggested that while MBP has begun to help PE teachers to change and develop their pedagogies and curriculum we still do not fully understand the impact of changing to a MBP. Furthermore, advocates of MBP practice need to explore the pedagogical and curricular ramifications on teachers of the long-term adoption of a MBP. However, not all scholars are in agreement with the concept and associated calls for fidelity to models by MBP advocates, with some arguing PE teachers are pragmatic interpreters of theory. Therefore, calls for model fidelity are inherently flawed (Stolz & Pill, 2014).

As this report is detailing the current and emerging effective pedagogical practices that PE teachers and student teachers are learning and practicing it is useful to define the scope of the term 'pedagogy'. Tinning (2008) notes that the term, 'pedagogy' has widespread use in

the fields of PE and sports coaching and is now established as an academic sub-discipline. While the term pedagogy has seen increased use in the English-speaking world the increased usage has not led to a coherent or shared understanding of what the term means. Tinning (2008) therefore argues for a notion of pedagogy that is generative in enabling teachers to think about the process of knowledge (re)production across the many sub-disciplines of kinesiology, including, but not limited to, sport pedagogy. It is this broader view of pedagogy that this literature review will use.

## Method

Adopting similar methodology to Wallhead and O'Sullivan (2005) and Stolz and Pill (2014) to search the electronic database a combination of 'keywords' and 'search terms' were used. The initial search began using Google Scholar. These 'key words' and 'search terms' had been formulated by the authors of this literature review as we considered they directly addressed the topic under consideration – sport teaching in PE. The 'keywords' and 'search terms' used are summarised in Table 1.

**Table 1.** Search terms for the literature review

Sport pedagogy in physical education
Sport teaching in physical education
Skill acquisition in physical education
Game performance assessment
Authentic assessment sport
Authentic assessment sport in physical education
Skill teaching in physical education
Motor learning and physical education
Fundamental sport skills and physical education
Physical education pedagogy
Contemporary developments in game teaching and
Cooperative learning model in physical education

The criteria for inclusion of papers for this review were:

- Contemporary: Published in English between 2000 to 2015;
- Original: Research published in either peer reviewed journals or edited text books; and
- Research addresses the pedagogical delivery of sport and PE.

The exclusion criteria consisted of; 1. Research on sport programs rather than the pedagogy or curriculum approach of delivery; 2. Papers that compare pedagogical approaches across countries, and 3. Papers essentially repeating the findings already published. Where possible, existing research summaries and systematic reviews were used in order to manage most effectively the large body of literature pertaining to sport teaching in PE. The literature used in the following comparative analysis is summarised in Tables 2-4.

## Results and discussion

The exploratory analysis of the literature presented in Tables 2-4 revealed three categories of publication. The first category of publication consisted of game-based models for sport and sport related games teaching (Table 2) focussed on the intent to teach game competency. The publications explored the tenets of the model or compared a game-based model to a more 'traditional' PE Method (Metzler, 2011), which Kirk (2010) has described as sport taught as sport techniques. Game based models use a classification system of games composing four categories based on common tactical elements called principles of play (Hopper & Bell, 2001). This is why Metzler (2011) called game-based models 'tactical' models in his MBP framework. Since 2010 the following pedagogical approaches have been identified with game centred or game based approaches: Teaching Games for Understanding (TGfU), Play Practice, Game Sense, Tactical Games approach, Games Concept approach, Tactical Games Model, Tactical Decision Learning model, Ball Schulle and Invasion Games Competence model. (Teaching Games for Understanding (TGfU) Special Interest Group, 2016). This category of publications also considered assessment of sport in PE. The literature is suggesting game performance assessment procedures for 'authentic' assessment of ability or competency. Richard, Godbout & Grèhaigne (2000), Pill (2008), Roberts and Fairclough (2012) and Mitchell, Oslin and Griffin (2013) have explained that valid tools are available for the assessment of students' participation in sport related games. Literature suggests students from Grade 5 are capable of using game observation tools with a moderate to good level of precision and inter-observer reliability, and that as the grade level increases their assessments become more accurate and reliable (Richard et al, 2000).

While the literature is unclear to the technical skill acquisition advantages of game-based compared to a more traditional directive practice style the evidence suggests young people enjoy sport taught using a game-based model. Students are reported to be more highly likely to participate and remain participating in sport and physical activity across the life span when these approaches are used.

**Table 2.** Game-based models for sport and sport related games teaching

<b>Publication</b>	<b>Title</b>	<b>Findings</b>
Richard, J. F., Godbout, P., & Grèhaigne, J. F. (2000). <i>Research Quarterly for Exercise and Sport</i> , 71(1), 85-91.	Students' precision and interobserver reliability of performance assessment in team sports	Demonstrated that students at the Grade 5-8 levels are capable of using the Team Sport Assessment Procedure (TSAP) with a moderate to good level of precision and interobserver reliability, this being more so as the grade level increases.
Mandigo, J. L., & Holt, N.L. (2000). <i>Physical and Health Education Journal</i> , 66(3), 14-19.	The inclusion of optimal challenge in teaching games for understanding	The construct of optimal challenge is introduced utilising the TGFU framework.
Hopper, T., & Bell, R. (2001). <i>CAHPERD</i> , 66(4), 14-19.	Games classification system: Teaching strategic understanding and tactical awareness	The Tactical Awareness Components to Increase Cognition (T.A.C.T.I.C.) framework with the principles of play for games offers a systematic way to teach the tactical complexity of games in the net/wall, territory, target and batting/fielding game categories.

<b>Publication</b>	<b>Title</b>	<b>Findings</b>
Austin, B., Haynes, J., & Miller, J. (2004). Paper Presented at the Australian Association for Research in Education Conference Melbourne, Victoria. December, 2004.	Using a game sense approach for improving fundamental movement skills	<p>Post-test results showed overall improvements in the level of mastery performance of the kick.</p> <p>Implications of this research include the teaching strategies employed to increase fundamental motor skill proficiency.</p> <p>High levels of motivation and interest in the PE lessons were noted.</p> <p>The authors also noted that “although the techniques approach to skill development may be more focused (and familiar) in terms of students knowing what the teacher wants – the sustained interest and cognitive stimulation of the problem solving/Games sense approach to learning has been highlighted in this project.</p>
Kirk, D. (2006) <i>Quest</i> , 58(2), 255-264,	Sport Education, Critical Pedagogy, and Learning Theory: Toward an Intrinsic Justification for PE and Youth Sport	School PE is well placed to take up the challenge of sustaining sport as a moral practice and that the pedagogical tools already exist to do this in the form of a critical pedagogy.
Chow, J. Y., Davids, K., Button, C., Shuttleworth, R., Renshaw, I. & Araújo, D. (2007). <i>Review of Educational Research</i> . 77(3), 251–278	The Role of Nonlinear Pedagogy in Physical Education	Proposed using key conceptual components from a dynamical systems perspective to lay the foundations for the development of a conceptual model for nonlinear pedagogy, providing a theoretical framework to further examine motor learning issues in pedagogy and PE.
Pill, S. (2008). Paper presented at the Flinders University ‘Play to Educate’ - Sport in Education Conference, January 21 <sup>st</sup> 2008.	Involving students in the assessment of game performance in physical education.	Authentic game and sport play assessment in PE is viewed as the process of collecting data, interpreting data, and using data to create knowledge and further develop learning. Procedures, such as the TSAP and Game Performance Assessment Instrument (GPAI), when embedded in the teaching-learning process, do more than provide evidence for summative assessment. The procedures provide for both valid and reliable assessments that continuously inform teaching and learning. The GPAI and TSAP are examples of authentic PE game assessment as they facilitate learning as well as provide for the collection of evidence of learning having occurred.
Farrow, D. & Reid, M. (2010). <i>Journal of Sports Sciences</i> , 28(7), 723-732	The effect of equipment scaling on the skill acquisition of beginning tennis players	The modified ball/scaled court intervention group rated their experience significantly happier than the standardised adult group. There is a stronger learning effect generated by court scaling relative to the influence of ball type.

<b>Publication</b>	<b>Title</b>	<b>Findings</b>
Pill, S. (2011) PHENex Journal, 3(1)	Seizing the moment: Can <i>game sense</i> further inform sport teaching in Australian physical education	The National Curriculum is an opportunity to shape sporting experiences as educative through quality curriculum and teaching as provided through a Game Sense approach.  The author notes that teachers across Australia strive for deep learning through high quality teaching-learning processes in all areas of the curriculum. The case is made that <i>Game Sense</i> can be the model to deliver this for the sport component of the Australian Curriculum for Health and PE.
Roberts, S. & Fairclough, S. (2012). European Physical Education Review, 18(1) 97–113.	A five-stage process for the development and validation of a systematic observation instrument: The system for observing the teaching of games in physical education (SOTG-PE)	The SOTG-PE is a valid observation system for recording activity, lesson context and teacher interactions during various PE games lessons from the invasion, net/wall and the striking and fielding categories.
Harvey, S., & Jarrett, K. (2013). Physical Education and Sport Pedagogy, 19:3, 278-300.	A review of the game-centred approaches to teaching and coaching literature since 2006	GCA pedagogies are of significant importance as they have the potential to promote change within current adult-centric cultures of youth sport and encourage engagement in physical activity over the life course. The authors recommend that GCA research undergo continued expansion.
Light, R. (2013) Game Sense: pedagogy for performance, participation and enjoyment. Routledge.	Ch2- The development of Game sense  Ch5 - Game Sense Pedagogy	Game based approaches to sports coaching and PE teaching have included:  <ul style="list-style-type: none"> <li>• Teaching games for Understanding</li> <li>• Game Sense (a less structured approach compared with TGfU)</li> </ul> To adopt this approach to teaching requires a significant change in pedagogy and the role of the teacher.
Light, R., Curry, C., & Mooney, A. (2014). Game Sense as a model for delivering quality teaching in physical education. Asia-Pacific Journal of Health, Sport and Physical Education, 5(1), 67-81.	Game Sense as a model for delivering quality teaching in physical education	PE teachers using the Game Sense approach will be able to provide high-quality learning experiences for students and make a start toward making PE a valuable educational experience in schools.
Stolz, S. & Pill S. (2014). European Physical Education Review. 20(1), 36–71.	Teaching games and sport for understanding: Exploring and reconsidering its relevance in physical education	If TGfU is to have improved relevance for teachers of PE more of an emphasis needs to be placed on the creation of standard characteristics of pedagogy that drive this practice within curricula.

<b>Publication</b>	<b>Title</b>	<b>Findings</b>
Drummond, M. & Pill, S. (2011). Ch 11 In Georgakis, S. & Russell, K. (Eds.), Youth sport in Australia, p165-178. Sydney University Press	The role of physical education in promoting sport participation in school and beyond	Argues for a curriculum vision for sport in PE that moves class participation beyond narrow technical and elite perspectives of sport participation to one which is more inclusive and understanding of broader sociological issues. Proposes sport literacy for education in, through and about sport.
Light, R. (2014). Ch 2 p.29-39. In Contemporary developments in game teaching. Routledge.	Positive pedagogy for physical education and sport: Game Sense as an example	The positive nature of games based approaches can support learning and make it flourish. Through this approach, learning to learn along with social learning make it more likely that students will transfer their understanding into other aspects of life.
Light, R. L. & Harvey, S. (2015). Sport, Education and Society, Published online 04 Mar 2015	Positive Pedagogy for sport coaching	Using game-based models, like Teaching Games for Understanding, Game Sense, Play Practice and the Tactical-Decision Learning Model makes it more likely to transfer dialogue, reflection and purposeful social interaction into life off the court or sports field than models narrowly focussed on improving sport technique and fitness.

The second category of publication dealt with the Sport Education (SE) model (Table 3). In Australia, SE originated in 1995 from a trial by Edith Cowan University's Sport and Physical Activity Research Centre (SPARC) and the Western Australian Ministries of Education, Sport and Recreation that was commissioned by the Australian Sports Commission's then AUSSIE SPORT National Unit. SE is a curriculum and instruction model designed to provide authentic, educationally rich sport experiences for students in the context of school PE (Siedentop, Hastie & van der Mars, 2011). It has six basic features:

1. Seasons of sport;
2. Affiliation to a team;
3. Formal competition within the season;
4. Culminating events to conclude the season;
5. Record keeping to track achievement and enable recognition of team and individual accomplishments; and
6. Festivity to celebrate team and individual achievement.

Kirk (2004) noted that internationally public discussions about PE are often framed through approaches to elite sport or talent identification. He suggests that SE is one model that is a better alternative to the elite sport model 'talent identification'. He sees that SE enables the retention of sport in PE in a way that emphasises desirable ethical and educational outcomes. The model has been successfully applied beyond team games to athletics (Hastie, Calderon, Rolim & Guarino, 2013).

Literature in this group also considered hybrids of SE with other models to enhance the micro-pedagogy of the SE model. For example, Alexander and Penney (2005) develop SE features within a game-based model to amplify the focus on game competency development. This led

to a new relationship between SE and TGfU they called the 'Clinic-Game Day' model. Ennis (1999) described the Sport for Peace approach entwined with the SE model structures that included additional foci of:

- Conflict negotiation
- Self and social responsibility; and
- Care and concern for others

Similarly, Hastie and Buchanan (2000) described the development of a hybrid model- Empowering Sport, which combined some distinguished features of SE (e.g. formal competition and the persisting team) together with facilitating personal responsibility from Teaching Personal and Social; Responsibility through Physical Activity (TPSR) to present a model of game play which demonstrated a particularly constructivist learning style. They found that some of the features of TPSR strengthened the foundation of SE, but a hybrid model (Empowering Sport) needed to be developed. This hybrid model presented a powerful triangle of goals: sport skill competence, social responsibility, and personal empowerment. Despite the positive results stemming from hybrid models such as Empowering Sport, follow-up studies specifically using these developments have not occurred and the original SE model continues to occupy the majority of scholarly and research literature informing PE teachers intentions to educate in, through and about sport.

**Table 3.** *Sport education in PE model*

<b>Publication</b>	<b>Title</b>	<b>Findings</b>
Hastie, P. A. & Buchanan, A. M. (2000). <i>Research Quarterly for Exercise and Sport</i> , 71(1), 25-35	Teaching Responsibility through sport education: Prospects of a coalition	Some of the features of TPSR strengthened the foundation of SE, but due to the need to introduce new tasks and problems for students, a hybrid model (Empowering Sport) was developed. This hybrid, with a predominately ecological integration perspective, presents a curriculum model that allows for achievement within a powerful triangle of goals-sport skill competence, social responsibility, and personal empowerment.
Browne, T., Carlson, T., & Hastie, A. (2004). <i>European Physical Education Review</i> , 10(2), 199-214.	A comparison of rugby seasons presented in traditional and sport education formats	Students reported that they enjoyed the unit, regardless of the teaching approach adopted and they believed that they experienced improvement in skills, especially those in SE. Furthermore, no student expressed the belief that the 'season' or unit was too long.  The students in SE reported that they enjoyed the greater autonomy and organisation duties within the SE model, but the students in the Traditional Group felt that their group was not capable of the autonomy given to SE.
Kirk, D. (2004). <i>Physical Education and Sport Pedagogy</i> , 9(2), 185-195.	Framing quality physical education: the elite sport model or sport education?	SE is one model that is a better alternative to the elite sport model. SE enables the retention of sport in PE in a way that emphasises desirable ethical and educational outcomes.

<b>Publication</b>	<b>Title</b>	<b>Findings</b>
Hastie, P. (2005). In <i>Critical Inquiry and Problem Solving in Physical Education</i> . Routledge.	Ch 5 Problem-solving in teaching sports	SE fits within a contemporary constructivist theory of learning. Learning in SE should increase student's interest and personal ownership of new knowledge and responsibilities. SE also promotes critical inquiry where they not only are required to solve problems but also examine the consequences of their decisions. SE is thus a student centred model.
Parker, M. B. & Matthew Curtner-Smith, M. (2005). <i>Physical Education and Sport Pedagogy</i> , 10(1), 1-18.	Health-related fitness in sport education and multi-activity teaching	Results indicated that pupils in the multi-activity (MA) unit spent slightly more than the recommended 50% of lesson time in moderate to vigorous physical activity (MVPA) while the pupils in the SE unit did not approach this level. The authentic and 'situated' nature of SE appears to lead to a trade-off situation.
Wallhead, T. & O'Sullivan, M. (2005). <i>Physical Education and Sport Pedagogy</i> , 10(2), 181-210.	Sport Education: physical education for the new millennium?	SE research indicates the model has the potential to promote more positive cultural dimensions of sport and offer a challenge to the exclusionary aspects of much of institutionalised sport.
Alexander, K. & Penney, K. (2005). <i>Physical Education and Sport Pedagogy</i> , 10(3), 287-301.	Teaching under the influence: Feeding games for understanding into the sport education development-refinement cycle.	A new relationship between SE and TGfU within what was called the 'Clinic-Game Day' (CGD) model.
Kirk, D. (2006). <i>Quest</i> , 58(2), 255-264.	Sport education, critical pedagogy, and learning theory: Toward an Intrinsic justification for physical education and youth sport	School PE is well placed to take up the challenge of sustaining sport as a moral practice and that the pedagogical tools already exist to do this in the form of a critical pedagogy.
Mohr, D. J., Townsend, J. S & Pritchard, T. (2006). <i>The Physical Educator</i> , 18-29.	Rethinking middle school physical education: Combining lifetime leisure activities and sport education to encourage physical activity	SE and Life-time Leisure Activity are proposed as solutions to address the pedagogical problem for middle school PE. Both require a shift in thinking about what is taught (content) and how content is taught (instructional methods).
Brock, S. J. & Hastie, P.A. (2007). <i>ACHPER Healthy Lifestyles Journal</i> , 54(1), 11-15.	Students' conceptions of fair play in sport education	If students only perceive success as winning, then teachers are simply perpetuating an elite sports model, rather than the goals of fair play and equitable participation as espoused for SE.



<b>Publication</b>	<b>Title</b>	<b>Findings</b>
Hastie, P., de Ojeda, D. M., Caldero'n Luquin, A. (2011). Physical Education and Sport Pedagogy, 6(2), 103-132.	The development of skill and knowledge during a sport education season of track and field athletics	SE classes outperformed the traditional classes in both technique and skill execution. Only the SE group made significant improvements in content knowledge.
Rui Araújo, R., Mesquita, I. & Hastie, P. A. (2014). Journal of Sports Science and Medicine, 13, 846-858.	Review of the status of learning in research on sport education: Future research and practice	Consideration should also be given to the use of hybrid SE in order to provide a more complete understanding of the teaching and learning process and its complexity.
Harvey, S., Kirk, D. & O'Donovan T. M. (2014). Sport, Education and Society, 19(1), 41-62.	Sport education as a pedagogical application for ethical development in physical education and youth sport	If sport is to provide young people with an education in ethical conduct, it must be designed explicitly and intentionally to do so. Pedagogical elements for ethical development are presented: (1) ethical contracts; (2) sports panels; (3) modified games; and (4) awards and rewards.

The third category of publication dealt with personal and social development in PE using sport as the context for this development. In this category there was some overlap with the SE literature. For example, Harvey, Kirk and O'Donovan (2014) explained that the SE model can be a context for character development if designed deliberately for this intention. They suggested that four pedagogical applications within SE be considered by PE teachers, youth sport practitioners and administrators to promote ethical development: 1. ethical contracts; 2. sports panels; 3. modified games; and 4. awards and rewards systems.

Personal and social development is an often-cited outcome of a quality PE program in schools (Kirk, 2010). With growing media attention on elite athletes and their behaviours and the media positioning childhood and youth in a polarised manner as being either dangerous or in danger (Prout & Hallett, 2003) then school (and sporting clubs) are often required to respond in ways that are practical and appropriate. Curricula response in Australian schools inevitably view the Health and PE Learning Area as the place where these values, skills and abilities are best learnt (Ministerial Council on Education, Employment, Training and Youth Affairs, 2008). Other examples of sport-based programs for personal and social skill learning include the Sports United to Promote Education and Recreation program (Danish, 2002) and Hokowhitu Program (Heke, 2001).

**Table 4.** Sport as a tool for personal and social skill teaching and learning in PE

<b>Publication</b>	<b>Title</b>	<b>Findings</b>
Theodoulides, A. & Armour, K.M. (2001). European Physical Education Review, (1), 5-23.	Personal, social and moral development through team games: some critical questions.	Little empirical evidence exists to support team games being a vehicle for children's personal, social and moral development in PE. It is argued that clearer conceptual definitions and critical debate within the PE profession are needed in order to determine the role of team games in promoting pupils' personal, social and moral education.

<b>Publication</b>	<b>Title</b>	<b>Findings</b>
Danish, S., Forneris, T., Hodge, K., & Heke, I. (2004). <i>World Leisure Journal</i> , 46(3), 38-49.	Enhancing youth development through sport	Sport is more than physical activity. To realise these outcomes educators and coaches need to: 1. develop skills in instructional design and program development and evaluation; and 2. must reach more adolescents with these programs and encourage school-based and after-school based programs to adopt Sport-Based Life Skills Programs, such as - Teaching Personal & Social Responsibility through Physical Activity (Harrison 1995); Sports United to Promote Education and Recreation (Danish 2002) and the Hokowhitu Program (Heke, 2001).
Quay, J. & Peters, J. (2008). <i>Journal of Curriculum Studies</i> , 40(5), 601–626.	Skills, strategies, sport, and social responsibility: reconnecting physical education.	Bringing together the five models of Teaching Personal & Social Responsibility through Physical Activity, Creating and Developing Games, SE in PE Program, Teaching Games for Understanding and Fundamental Movement Skills this program suggests a connection can be made with children's lives beyond the PE lesson.
Harrison, D. (2011). 3rd Edition, Human Kinetics.	Teaching personal and social responsibility through physical activity	Introduce and provide an array of materials to support the implementation of the Teaching Personal and Social; Responsibility through Physical Activity (TPSR) model as a proven effective in school-based PE program.

An emerging field of discussion revealed in the literature scan was that of Physical Literacy. Lundvall (2015) provided a synthesis of the literature in the field of Physical Literacy since 2000. The potential for Physical Literacy to positively re-brand and revitalise PE was suggested, however, in some jurisdictions the concept had been misrepresented as a synonym for fundamental movement skill teaching or sport skill teaching. It is recognised that the concept of Physical Literacy is contested with questions raised about multiple definitions and empirical support for the assertions associated with the concept. We suggest the current debate about Physical Literacy is an extension of the ongoing challenge for PE to move beyond what Dyson, Griffin & Hastie (2004) described as ‘superficial engagement’ with matters of pedagogy to move towards better informed practice that ‘powers up’ sport teaching in PE. Recently, Physical Literacy seems to have been re-imagined away from its origins as a philosophy (Whitehead, 2001) and a potential outcome of PE (Sprake and Walker, 2015) to a pedagogical proposition and model for PE in search of a supportive pedagogical argument and structure (Kirk, 2013).

## Conclusion

The major findings of the comparative analysis were:

1. Game Based approaches (such as Game Sense (Australia)) to learning in PE technical and tactical dimensions of skilled performance in game play are promoted in preference to direct instruction or practice based models;
2. The SE curriculum and instruction model is well researched and validated as a design to provide authentic, educationally rich sport experiences for students in the context of school PE; and

3. Personal and social development is an often-cited outcome of quality PE teaching in schools and to be achieved needs to be a deliberate pedagogical focus of the PE teacher.

The relevance of contemporary pedagogies through MBP based approaches like the game-based model (such as the Australian Game Sense approach), SE and TPSR are encouraging innovation away from the more historically common directive practice style of the 'traditional' PE method. With respect to game-based models, the literature is challenging educators to use pedagogical approaches that have been shown to enhance learner engagement compared to a more traditional directive style framing sport as sport techniques when teaching for game competency. To fully deliver on the Arnoldian idea of PE as education in, through and about movement using sport as the educative vehicle, the SE model has been shown to be a curriculum model through which those three educative pillars can be enacted. Directly linking sport teaching and learning in PE through this Arnoldian concept, Sport Literacy (Drummond & Pill, 2011; Pill, 2015) has been specifically described as a curriculum concept for the valuing of learning in, through and about sport in PE. Sport literacy is potentially both a praxis and curriculum scaffold for sport curriculum design and enactment in PE.

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## Embedding Indigenous content in Australian physical education - perceived obstacles by health and physical education teachers

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### Abstract

This paper is about teacher perceptions of Indigenous content in Physical Education (PE). The research question being: What obstacles if any do Health and Physical Education (HPE) teachers experience in including Indigenous mention in PE? Individual and group interviews were used to collect data from executive and classroom HPE teachers as well as Indigenous Education Officers (IEOs) at three government high schools in the Australian Capital Territory (ACT). Figurational sociology was used to interpret the findings drawing upon the notion of relative power (Elias, 1998) in particular. Busy roles, limited resources and a shortage of time were given as reasons why teachers rarely taught Indigenous content. Those teachers reported that they required professional learning to meet what they considered to be a new requirement (to include Indigenous mention) in their lessons. Teacher perceptions of obstacles meant that the cultural richness of Aboriginal and Torres Strait Islander peoples was excluded in their teaching. Such an omission thereby limits the cultural and historical knowledge base that underpins the key idea of 'value movement' in the Australian Curriculum Health and Physical Education (AC HPE) (ACARA, 2015). Given the nature of the findings this article is relevant to primary, middle and senior years.

### Introduction

The purpose of this paper is to explore possible constraints experienced by Health and Physical Education (HPE) teachers in teaching Indigenous content in Physical Education (PE). In the broader Doctoral research that this study draws from, which was about how Indigenous students encounter PE, it was found that Aboriginal and Torres Strait Island perspectives were rarely taught in PE at the three schools investigated (Williams, 2016a). The silence of these perspectives is despite a requirement since the mid-1990s in Australian Capital Territory (ACT) government system level generic documentation or PE curricula to teach Indigenous perspectives (Williams, 2016b).

This paper investigates a PE figuration that comprises the PE programs, HPE teachers and Indigenous Education Officers (IEOs) at three government high schools in the ACT. The term figuration, or configuration, is used to describe relationships between individuals and processes with long-term processes in particular being important (Elias, 1978). Within the context of PE both small and large scale figurations exist. Small scale figurations are evident in every school and comprise networks of individuals that include the principal, HPE teachers, students and parents for example. Figurations like this have been shaped by tradition, differing and often competing discourses, policy and curricula as long-term processes (Williams, 2016b).



An example of a figuration on a global scale is the idea of 'traditional PE' (Green, 1998). This version of PE, common in most Western countries, is characterised by a prevalence of team games and an accompanying skills based pedagogical approach. The concept of the figuration also asserts that human relationships are interdependent and characterised by power differentials (Elias, 1978). In other words, people within any given relationship have differing amounts of social power which is held and exercised relatively. The notion of relative power holds that no individual or group of people has absolute power (Elias, 1998). Instead of power being something that one person possesses and another does not, Elias (1998) instead considers power to exist as a balance in all human relationships. However, power balances are subject to change in the same way that figurations themselves alter over time on account of the intended and unintended consequences of people (Elias, 1978). Power relationships are important in PE and are evident in curriculum development for example. Historically PE curricula have been shaped through power struggles between writers and other stakeholders who have vested interests in what constitutes PE (Wright, 1996).

According to figurational sociology, figurations can be recreated for research purposes using three levels: macro, micro and sociogenesis (Baur & Ernst, 2011). While the idea of using multiple levels is common to other theoretical frameworks used in investigating social issues in PE (Penney & Evans, 2005) it is the sociogenesis level that makes figurational sociology distinctive (Baur & Ernst, 2011). The sociogenesis level of a figuration represents its connection to the past. This temporal dimension is important because how PE/HPE teachers teach PE is inextricably linked to the past through long-term processes (Green, 2000a). Further, how PE is taught is influenced by a teacher's individual and social habitus (Green, 2000b; Williams, 2016a). Individual habitus, sometimes referred to as 'second nature' or 'personality make-up' (Mennell & Goudsblom, 1998) describes aspects of personality that become deeply engrained in one's self which are learned in social situations as opposed to being innate within the individual. Although people possess an individual habitus they also have a social habitus (Elias, 1998; Mennell, 1994) through taking on behavioural characteristics typical of the people that form part of their social group. The concept of habitus is important to this research, because it is possible that HPE teacher perceptions of constraints in teaching Indigenous content are connected to their habitus. It is argued in the following literature review that HPE teachers develop a social habitus by being members of HPE faculties and departments that are established groups (Elias & Scotson, 1994). Established groups are collections of people who have shared values, beliefs, behaviour and practices formed over time and who tend to have a relatively high share of the power resource (Elias, 1998; Elias & Scotson, 1994) in the figurations that they are part of.

### Literature review

In contemporary Australia, HPE teachers typically deliver technocratic PE (McKay, Gore & Kirk, 1990; Meldrum & Peters, 2012) while being 'time poor' from an increasingly widening curriculum (Morgan & Hansen, 2008; Tinning, 2000). Technocratic PE emphasises the teaching of skills based content, or 'PE-as-sport-techniques' (Kirk, 2010) typically using modified team sports. Along with fitness and aspects of sports science, technocratic PE constitutes what Tinning (2004) refers to as privileged knowledge in PE. Conversely, marginalised knowledge (Tinning, 2004) in PE includes Dance and ethnicities. The latter term is used to describe any inclusion of Aboriginal and Torres Strait Island movement forms. The words 'any inclusion' are used here, because apart from the Northern Territory, there has historically been an absence of Indigenous perspectives in state and territory HPE curricula (Fitzpatrick, 2009). Technocratic 'PE-as-sport-techniques' (Kirk, 2010) can be considered a long-term process as it typifies the nature of PE in Australia for more than half a century. A further characteristic of Australian

Technocratic PE is that it is Eurocentric, meaning that it favours Western knowledge with the viewpoints of other cultures largely discounted (Fitzpatrick, 2009). This enduring version of PE also tends to be repetitive and rarely progresses beyond the teaching of introductory knowledge and skill development (Kirk, 2010).

Pre-service HPE teachers in Australia having predominantly experienced Eurocentric technocratic PE throughout their own schooling tend to hold particular values, beliefs and expectations about what constitutes PE. For example, Tinning (2004) argues that these students often expect program content to reinforce their deep-seated interest and love of sport. This pre-disposition to sport is similar to what Green (2000a) found in his English study where PE teachers expressed a love for sport that was deeply engrained within their individual habitus. In the Australian pre-service HPE teacher context, when student teachers are taught marginalised content they are faced with the prospect of “becoming someone they *don't* [author's emphasis] want to become” (Tinning, 2004, p. 245) because such knowledge is often alien to their technocratic pre-conceptions about what PE means. Indeed, McKay, et al., (1990) comment that most PE degree students graduate with beliefs about PE that have been largely unaffected by PETE. Contemporarily PETE is more accurately termed HPETE in Australia because of the addition of Health to the PE subject area in the early 1990s (Dinan-Thompson, 2006). Similarly, more recently, Currie (2014) commenting about HPE notes that “...most teachers have completed extensive training and preparation in performance studies and a range of practical physical activities and sports...” (pp. x–xi). Currie's observations demonstrate that the privileging of technocratic approaches continues to be part of a long-term process in HPETE. The literature also shows that university staff who design HPETE programs are constrained to offer PE specific units that have minimal delivery time allocated to them (Callcott, Miller & Wilson-Gahan, 2015). This kind of limitation serves to further reduce opportunities to include marginalised knowledge.

Pre-service HPE teacher predispositions, particularly those associated with sport have a tendency to be welcomed and reinforced when students commence both teaching practicums and their initial teaching appointments. Sirna, Tinning and Rossi (2008) contend that “within a community of practice certain behaviours, attitudes, and dispositions are practiced, reinforced and encouraged while others may be marginalised, dismissed or even ridiculed” (p. 287). In other words, particular behaviours are valued as part of the social habitus of HPE teachers as an established group (Elias & Scotson, 1994) within any given school HPE faculty or department. Pre-service PE/HPE teachers have been reported as seeking ways to gain acceptance by mentors and other teachers while completing practical teaching experience in schools (Keay, 2009; Sirna, et al., 2008). Expression of a common interest in Eurocentric sport was one way in which those students attempted to be included. As Elias and Scotson (1994) allude, people are often prepared to modify their beliefs in order to be admitted to a given established group figuration. In the Australian context such a compromise it is argued could be new teachers rejecting Indigenous traditional games that they may have learned as part of HPETE in order to ‘fit in’. Similarly, Green (2000b) found that theoretical or academic constructs of PE had little bearing on English in-service PE teachers. Instead these teachers held ideologies or adopted taken-for-granted practices that were related to their individual habitus and also their social habitus through interdependencies with other PE teachers.

It has been argued in this brief literature review that what teachers do in teaching PE has been shaped to a greater or lesser extent by ‘invented traditions’ (Hobsbawm, 2012) continued and upheld by PE/HPE teachers as part of a long-term process. Further, these ‘invented traditions’ (Hobsbawm, 2012) relate to PE/HPE teacher individual and social habitus.

## Method

Figurational sociology was chosen as the theoretical framework to guide the research design and to analyse the findings. Figurational theory was appealing because it considers societal issues and problems processually. Alternative process theories such as Bourdieu's (1989) theory of habitus and field could have been used instead of figurational sociology. While Bourdieu's (1989) work was appealing because it is concerned with relationships of power and social inequity, figurational sociology was chosen due to relationships and processes being particularly emphasised (Depelteau, 2013; Dunning & Hughes, 2013). Further justification for using figurational sociology is that the term habitus was used by Elias prior to its association with Bourdieu (Dunning, 2002; Dunning & Mennell, 1996; Mennell & Goudsblom, 1998; Paille, Van Heerikhuizen & Emirbayer, 2012).

A bi-cultural research design was adopted in keeping with the AIATSIS (2012) guidelines for ethical research. This approach involved the use of Indigenous Critical Friends who were IEOs or former IEOs at the three schools. The ICFs helped ensure that an Indigenous perspective was maintained throughout the study and they acted as a sounding board for cultural aspects of the research. A qualitative approach sympathetic to figurational sociology was used in this study. Although Elias used quantitative methods to some extent, he most often used qualitative approaches in his work (Dunning & Hughes, 2013). Qualitative approaches were used in this study to enable a depth of understanding to be gained from research data.

Prior to data collection, ethics permission was obtained from University of Canberra Human Ethics in Research Committee and the ACT Education and Training Directorate. Data was subsequently collected using semi-structured individual and group interviews at each of the three school sites with all participants providing signed consent for their involvement. The confidentiality and anonymity of the research participants was safeguarded throughout the research and participants were able to withdraw without consequence at any time. Individual semi-structured interviews were used for the executive HPE teachers and semi-structured group interviews for the classroom HPE teachers and the IEOs. The HPE teachers were selected as participants because their viewpoints and perspectives were central to the study. The IEOs were chosen because they might perhaps offer differing accounts of the kinds of constraints that the teachers verbalised.

Three executive HPE teachers, 17 HPE teachers and three IEOs took part in this study. All twenty teaching staff were non-Indigenous and the three IEOs were Aboriginal. There were 14 male teachers and six female teachers and all three IEOs were male. One IEO had heritage from Northern New South Wales (NSW), Southern Queensland and Central Western NSW. Another descended from the Nuenonne people of the South East coast of Tasmania (his mother's family) and the Gubbi Gubbi people of the South East coast of QLD (his father's family). The third IEO was of the Kamilaroi people.

Data was analysed using thematic analysis (Bryman, 2012) by identifying key themes that emerged in participant transcripts about perceived constraints in teaching Indigenous perspectives in PE. In order to protect the identities of the participants and the schools, the teachers and IEOs are identified in the following section by a separate number and with the letter 'A', 'B' or 'C' denoting which school they belonged to.

## Results and discussion

In analysing the findings figurational sociology was used to identify power relationships, specifically where teachers were able to demonstrate relative power. The HPE teachers mentioned a number of constraints that they said made it challenging for them to include

Indigenous perspectives in their teaching. At each of the schools the HPE executive and classroom teachers said that they had either no knowledge, or limited knowledge of Indigenous games and physical activities.

#### *Time poor*

A lack of time was a recurring theme across all three sites with regard to the day-to-day operation and work within HPE faculties. This reported lack of time is consistent with what is noted earlier in the literature review (see Morgan & Hansen, 2008; Tinning, 2000). An example of the nature of lack of time was offered at school B:

*It's about actually having that time... to step back and reflect on our actual practices and say 'yep, with this little bit of tweaking we could do this better or... we could... make sure that everyone had an opportunity to learn this'. It's just like go, go, go, status quo. This is what we've been doing. Let's just keep doing because... we don't have time really to sit back and reflect (teacher 3B).*

Executive teacher B also commented about the lack of time that HPE teachers had to make any changes to existing provision. Similarly, at School C, the executive teacher remarked:

*I'll acknowledge straight away I'm time poor. Yeah I don't give any advice on time management. I think the problem is trying to squeeze too many things in the one day. So you know... trying to do 50 things in a day instead of doing 10 things a bit more deep.*

It is argued that the pressure of time reported by these HPE teachers in delivering the established curriculum is not conducive to adding, what was regarded as 'new content' in the form of Indigenous perspectives.

#### *Resources*

There appeared to be a lack of knowledge amongst the HPE teachers about the resources that were available for teaching Indigenous games, sports and other physical activities in PE. For example, executive teacher B was unaware of the existence of the Yulunga (ASC, 2009) resource for teaching Indigenous games and in response to being informed about it said:

*So it's alright to have a 200 page document on the web... but teachers aren't going to look at it... because you know... it's not being 'delivered right to their door'... whereas in other areas we just have that knowledge I suppose... or somehow that we've developed.*

What is evident in the above comment is some notion of PE knowledge accumulating over time and being passed down as part of an ongoing and lasting process. It is also implied that privileged content (Tinning, 2004) is sufficient for teaching PE and alternative knowledge is not required. In contrast, executive teacher C knew about the Yulunga (ASC, 2009) resource:

*The IEO has sort of brought... well not just the IEO, we were aware of it before. But I would have to be honest with you that we probably could have used more... games out of that... than we probably have.*

However, similar to executive teacher B, executive teacher C thought that HPE teachers tended to not make use of resources:

*... even though there's the resource (Yulunga)... and then... how long does it sit on a shelf for... before we actually... unless someone has got the initiative... or the foresight to... keep people up to speed with it...*

Again, there was the notion in this response that 'time poor' was a reason for not including Indigenous perspectives, as well as the current knowledge stock being adequate for delivering the curriculum. None of the teachers at School A or B knew about Yulunga (ASC, 2009).

#### *Professional development*

A lack of professional learning was raised by executive and classroom HPE teachers across the three sites.

*I think probably like a professional development, or a course on it [teaching Indigenous perspectives in PE] would be ideal, before going into something like that [teaching Indigenous content in PE]. I guess really... you know you could 'wing it,' but... you really wouldn't have that basic understanding (teacher 5A).*

Similarly, executive teacher A commented:

*Okay, so fitting [Indigenous content] into the curriculum [PE]... would be no drama. But once again it's that time to be able to do the professional development... to 'up skill' us in doing that to be able to teach it... I'd like to get someone like our IEO... who's really good... to actually come in and 'in service' us which would be brilliant.*

At school C:

*... I think probably really what's needed across the whole system to be honest... is professional development. You've probably heard that before, specific professional development... to... not convince... but to... make phys ed teachers aware of the variety of activities (executive teacher C).*

Although the executive and classroom HPE teachers expressed a desire for professional learning and not withholding comments from some participants about being disinclined to utilise resources, *Yulunga* (ASC, 2009) is written for use by Indigenous and non-Indigenous HPE teachers. It is produced in lesson plan format in what can perhaps be described as Australian Sports Commission 'house style.' There are over 130 games listed that are signposted according to the school Year group/s that they are suited for. Each game uses contemporary sports equipment and is presented through text and diagrams. There are sections on how to play, rules, safety, equipment, variations and teaching points (ASC, 2009). Further, the games are organised within the resource in such a way that they correspond to a range of fundamental movement skills that teachers would be familiar with, including throw, catch, vertical jump, run, single and two-arm striking. In addition, some of the games encourage co-operative physical activity where there is no scoring involved. Therefore the need for professional development is perhaps not as necessary as the teachers suggest. A rather impassioned comment was made by one of the IEOs at their interview, mentioned later, that HPE teachers just need to learn the rules for Indigenous games and start teaching them in their classes. In other words, these

teachers need to learn the rules for Indigenous games in much the same way as they do for the approximately 40 Eurocentric sports or physical activities that are approved for teaching in the *Physical education and sport policy and implementation guidelines* (ACT DET, 2009). The idea of professional learning to be able to teach all 40 games detailed in these guidelines would be unrealistic and impractical. Further, it was suggested by this IEO that the teachers could learn Indigenous games by referring to *Yulunga* (ASC, 2009).

### *Support*

Lack of support from school management was regarded as a constraint for including Indigenous content:

*Money, resources, support from... people who need to support us. We can offer lots of things at this school... but if we're the only people who wanted it... it's not going to happen. So we've got to have people higher up the 'food chain' ready to support it... provide the time for the training which is a pressure in every school for professional development (teacher 5B).*

Within this comment there was again a sense that Indigenous content is not 'core business' or privileged knowledge (Tinning, 2004). Instead, it is something that with 'appropriate support' has the potential to be added to the curriculum. This comment is despite the requirement to include Indigenous content in PE mentioned in PE specific ACT government curricula or generic system level policy documents since the mid-1990s (Williams, 2016b). IEO C expressed similar sentiments suggesting that greater direction from education management and organisations such as ACT Secondary School Sports Association (ACT SSSA) would help:

*I think more directive from authority... to say 'you must do this'... and now with the SSSA... they're an authority here... they should be sending that authority out to every PE staff... in secondary school and say... 'you must' [the words 'you must' emphasised]... invite an IEO... or you must... implement... these games in your curriculum... Because otherwise they'll just go on... because you've got to remember teachers just write up their own lesson plans... what they want to teach.*

This response by IEO C draws attention to the relative power (Elias, 1998) that HPE teachers possess, through being able to teach the content that they value most. Indeed, content that also corresponds to their individual and social habitus (Elias, 1998; Mennell, 1994).

### *Pre-service physical education teacher education*

A common theme across all three schools stated by the HPE executive teachers and teachers, was that Indigenous content was not included in the specialist PE subjects as part of HPETE:

*It's not covered in any of the courses that we study at university and I think it should be. I mean that's where it should start. So I think our issue is that we don't have... a really big background like we do in some of our traditional sports and that's where it has to start... so that we feel comfortable in teaching it. So we'd love to teach it... but we need to have the knowledge to be able to teach it... (executive teacher A).*

Likewise, about the nature of contemporary PE at their school, executive teacher B remarked:

*Whereas in other areas we just have that knowledge I suppose... or somehow that we've developed.*

In other words, the habitus of the teachers in this study was oriented towards Eurocentric sport and the kind of technocratic PE described in the literature review. The teachers commented that the only Indigenous content that was covered during their HPETE was in a generic unit that never provided them with PE specific information:

*As far as that's concerned [Indigenous perspectives in PE] that's all good and I'm happy to include it... but as we've said... how do we include it if we've never been exposed to it? At uni we did 'Indigenous Education – What Works'... and it was the worst unit that I have done... because it was... us getting up and talking about... different cave paintings and different things... and that's fine... but the name of the unit was 'Indigenous Education What Works'... you'd think that there'd be some sort of practical application... what can we do to help Indigenous kids... learn in 'our scene' (teacher 7B).*

Similarly:

*Yeah, but it doesn't tell you anything [Indigenous Education What Works]... Like it's not helpful at all... But in terms of PE like 'chucking it' in the PE curriculum at uni, you definitely want to do something like that. Like classroom strategies and then you'd want to do the games and... even right down to the Dance... you'd have someone come in and stuff, but they [university] don't do anything like that (teacher 5C).*

IEO B, concerning HPETE remarked:

*...certainly I picked up in the schools... there's probably a fear... amongst non-Indigenous teachers... because... you know all through university they haven't learned a whole lot about all this stuff and I think they're afraid of doing these things wrong... that's why they're so reliant on us [the IEOs]... it doesn't need to be intimidating... like you come out and watch Buroinjin [an Aboriginal traditional game]... it's pretty universal... you know... Yeah and all the kids enjoy it. It's not just an Indigenous 'thing'. It's just a game that happened to be played before colonisation....*

Similarly, commenting about in-service HPE teachers IEO C mentioned with some frustration and passion:

*... teachers should teach Indigenous games same way they teach any other game... by the f'n rules that are written down in the guidelines [Yulunga, ASC, 2009]. For a teacher to teach rugby league they've got to know the rules. For a teacher to teach Aussie Rules they've got to know the rules. Cricket they've got to know the rules. So it's just pretty simple... the teachers have to learn the rules to Aboriginal games and f'n implement them in their f'n classes.*

The lack of Indigenous mention in HPETE that the HPE teachers comment about is perhaps due in part to the kinds of constraints experienced by HPETE educators discussed by Callcott, et al. (2015). In particular, decisions are made by non-HPE specialist program providers about what to include in the PE specific content of HPETE programs that typically have limited time allocation. As an Indigenous focus was only included in a single generic unit, it suggests that privileged content (Tinning, 2004) was deemed by the course providers as being more important within the PE subjects. In other words, it seems that privileged content took priority in the restricted space that was available in the HPETE program. The omission of PE specific Indigenous perspectives demonstrates the relative power (Elias, 1998) of those responsible for the program design and delivery. Also, it can be reasonably assumed that those lecturers and tutors would have had individual and social habitus that were heavily informed by Eurocentric activities, given the history of PE and school sport in Australia.

### **Synthesis**

The teachers spoke about how they *would* teach Indigenous content in PE in the future as if it was a new requirement for them to include these perspectives. The nature of this expression is perhaps understandable because the system level curriculum document that the teachers were using at the time, *Every Chance to Learn* (ACT DET, 2007) made no mention of the words Aboriginal, Torres Strait Islander or derivatives of these words or the word Indigenous in the PE related section. However, in other policy documents such as the *Aboriginal and Torres Strait Islander Strategic Plan 2010-2013* (ACT ETD, 2010) it is stated that all teachers are required to incorporate Indigenous content in their respective Key Learning Areas (KLAs).

Long-term pre-dispositions to Eurocentric sport contributed to the individual and social habitus of the teachers in this study. A lack of exposure to Indigenous content in HPETE, along with no professional learning and the absence of Indigenous mention in the PE content of *Every Chance to Learn* (ACT DET, 2007) together partly accounted for Indigenous perspectives being absent in most of the teachers' PE lessons. Further, Consistent with the literature, the HPE executive and classroom teachers worked in a busy environment with multiple demands that contributed to them being 'time poor'. Nonetheless, these teachers were still able, despite these environmental constraints, to teach privileged content that fitted with their individual and social habitus.

### **Summary, conclusions and implications**

In answering the research question, the author contends that while there were legitimate constraints preventing Indigenous content from being taught as a regular part of PE, these obstacles reflected the nature of HPE teaching more generally. In other words, the constraints that the HPE teachers spoke about were not unique to teaching Indigenous perspectives. Those teachers had to overcome the same kinds of constraints, including accepting and responding to a lack of professional learning in all aspects of HPE, in order to carry out their day-to-day teaching responsibilities. It is contended by the author that the individual and social habitus of the teachers accounted for 'policy slippage' in the kind of PE that was taught. The HPE executive and classroom teachers in this research would have only known technocratic PE in their lived memories from their childhood experiences. This lack of exposure to Indigenous content in their own schooling would have been reflected during HPETE. For these teachers, Indigenous content was alien through a lack of contact in their personal and professional lives. However, by not following directives in system level policy documents about incorporating Indigenous content in all KLAs, the HPE teachers demonstrated their relative power within the figuration.



It is contended by the author that if HPE teachers and curriculum writers as well as HPETE providers do not work towards addressing the silence of Indigenous perspectives in PE, then valuing movement as a key idea in the AC HPE (ACARA, 2015) will occur only within the context of Eurocentric knowledge. There is renewed opportunity through the AC HPE (ACARA, 2015) for Indigenous content to be meaningfully taught to all Australian children thereby addressing the equity goals of the *Melbourne Declaration on Educational Goals for Young Australians* (Ministerial Council on Education, Employment, Training and Youth Affairs, 2008). In addition, including this content in a substantive and non-tokenistic way, while adding to the existing stock of Eurocentric PE can help address concerns reported in the literature about PE being repetitive and lacking variety. However, for Indigenous perspectives to be incorporated meaningfully in PE and in HPE more broadly, a multi-faceted approach is required otherwise things are likely to remain much as they are.

Since data was collected for this paper, Indigenous content has been explicitly taught to HPE student teachers in PE specific units at the HPETE university local to where this study took place. If Indigenous content is substantively taught in primary and secondary school PE as a consequence of this PE specific teacher education, then future HPE teachers will learn Indigenous games and sport in their childhood education. These possible future childhood encounters of Indigenous content in PE are important because they could contribute to the individual habitus of future HPE teachers through Indigenous content becoming 'normalised'. As such, Indigenous content changes status by becoming privileged knowledge (Tinning, 2004) through the wider figuration of Australian PE altering in common with all figurations (Elias, 1998). In addition to changes at the HPETE level, professional learning was delivered at the Australian Council for Health, Physical Education and Recreation (ACHPER) ACT 2016 conference about teaching Indigenous perspectives in PE.

In conclusion, the author contends that Indigenous perspectives such as the kinds of games and physical activities included in *Yulunga* (ASC, 2009). This particular content can make an important contribution to 'value movement' as a key idea within the AC HPE (ACARA, 2015) by acknowledging and placing importance on activity that is not exclusively from the Eurocentric stock of knowledge. An area of further study is to investigate what else can be done to alter HPE teacher habitus so that Indigenous perspectives are genuinely accepted and embedded in the AC HPE (ACARA, 2015). As a relatively recent migrant to Australia, having moved from Scotland eight years ago at the time of writing, Indigenous games are appealing for inclusion in Australian PE content. I have used many of the games from the *Yulunga* (ASC, 2009) resource as a former HPE secondary school teacher and also in HPETE workshops more recently as a teacher educator. Further, I have found few challenges in using this resource to teach Indigenous perspectives in PE and have observed that my students, Indigenous and non-Indigenous alike, have enjoyed playing something different from what they usually do in PE.

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## Embedding a critical inquiry approach across the AC:HPE to support adolescent girls in participating in traditionally masculinised sport

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**Keywords:** critical inquiry, health and physical education, adolescent girls, traditionally masculine sports

### Abstract

Comparison rates between adolescent boys' and girls' sport involvement highlights the significant rate of adolescent girls' cessation of sport participation during their high school years. Despite adolescent girls' lower rates of participation in sport, Traditionally Masculinised Sports (TMS) have witnessed the highest uptake of female sport participation in comparison with traditionally feminised sports and gender neutral sports. With TMS becoming an increasingly popular option for women and girls' sport participation, the expansion of opportunities for women and girls to participate in TMS may offer new avenues for increasing the rate of female sport participation during adolescence. As schools are a setting in which adolescents spend a significant amount of their time, and whose curricular mandate is to engage young people in sport and physical activity, investigation into high school settings and their impact on female sport participation in TMS is timely.

This paper explores the role in which embedding a critical inquiry approach to sport and the gendered nature of sport participation across the national Australian Curriculum Health and Physical Education (AC:HPE) (Australian Curriculum Assessment and Reporting Authority, 2013) learning area may support girls' continued sport participation throughout their high school years. It reports on a study which investigated adolescent girls' (n=34) experiences of participation in the TMS of soccer, cricket, and Australian Football. Thematic analysis of the data uncovered key themes relating to the role of schools in enabling or creating barriers for female sport participation. Key themes evident within the data, such as gendered norms and expectations, opportunities for participation, and the under representation of women in TMS are discussed in relation to key ideas embedded in the AC:HPE curriculum (Australian Curriculum Assessment and Reporting Authority, 2013). The findings suggest ways in which barriers to female sport participation can be challenged using critical inquiry approaches embedded in the AC:HPE curriculum (Australian Curriculum Assessment and Reporting Authority, 2013) and the school and learning environment.

### Introduction

Adolescence is a time when a significant amount of girls drop out of sports or discontinue physical activity (Australian Bureau of Statistics (ABS), 2011; Gavin, Mcbrearty & Harvey, 2013). Schools play a critical role in enabling or disabling children and youth's sport participation

through both the culture of the school and in the choices offered for male and female sport participation (Mitchell, Gray & Inchley, 2015). While women and girls participate in a range of physical activity and sports, the rates of uptake for female adolescents into Traditionally Masculinised Sports (TMS) in Australia has currently overtaken the rates of uptake of female adolescents in physical activities and sports considered traditionally feminine and/or gender neutral (ABS, 2011). As such, TMS may offer a vehicle to continue or increase adolescent females' sport participation at a time where their participation continues to be significantly lower than that of their male peers.

Offering choices for girls to participate in TMS in schools and community athletic/sporting clubs is a key factor for supporting female adolescent sport participation (Craike, Symons & Zimmermann, 2009; Mitchell, et al., 2015). Less attention has been given to how breaking down social and cultural barriers, both real and perceived, towards girls' participation in TMS may support its continued and increased uptake. This paper reports on a study that investigated the experience of 34 adolescent females who were current participants in a TMS to better understand mechanisms and factors that were supportive, or unsupportive, of their sporting participation. The data highlighted that the role of schools and teachers featured prominently in participants' experiences, though frequently as a barrier or unsupportive factor. Despite that, while similar findings have been found in previous Australian and international studies (Eime et al., 2013; Flintoff & Scraton, 2001; Garrett, 2010), scant attention has been given to how the curriculum itself may be a tool in supporting girls in the uptake and continuation of sport and physical activity both within and outside school contexts.

A prominent feature of the national Australian Curriculum Health and Physical Education (AC:HPE) (Australian Curriculum Assessment and Reporting Authority, 2013) learning area is the inclusion of a critical inquiry approach as a key idea, an approach which seeks to give students opportunities to "critically analyse and critically evaluate contextual factors that influence decision-making, behaviours and actions, and explore inclusiveness, power inequalities, assumptions, diversity and social justice" (Australian Curriculum Assessment and Reporting Authority, 2013, retrieved from: <http://www.australiancurriculum.edu.au/health-and-physical-education/key-ideas>). While the importance of embedding critical inquiry approaches in physical and sport education is far from new (Laker, 2002; Siedentop, 1994; Tinning, 2002), the continuation of higher rates of attrition from physical education, physical activity and sport of female adolescents in comparison with their male peers reinforces the need for critical inquiry approaches to be a key strategy for student engagement within the new AC:HPE curriculum (Australian Curriculum Assessment and Reporting Authority, 2013). As the literature has identified that cultural and social factors impact significantly on adolescent sport participation (see for example Hively & El-Alayli, 2014; Slater & Tiggemann, 2010; Slater & Tiggemann, 2011), critical inquiry approaches may offer a vehicle for engaging students in critically analysing their own and other's beliefs, behaviours, and practices in relation to the ways in which sport and physical activity participation is highly gendered.

The findings of the study are discussed in relation to the rationale, aim, and key ideas of the AC:HPE (Australian Curriculum Assessment and Reporting Authority, 2013) and how critical inquiry approaches may offer avenues for challenging real and perceived barriers to female participation in TMS, both within schools and wider social settings. Challenging social and cultural norms which negatively impact on the sport and physical activity participation of children and youth is a shared aim of both the national curriculum and national/international guidelines, frameworks, and organisations relating to and involving sport. As such, capitalising on opportunities to interrupt and dismantle barriers and challenge harmful gendered social norms is essential to the work of HPE teachers and schools.

## Literature review

While the increase in female participation over the past decade has been statistically significant; males are consistently more likely to play soccer, cricket and football (ABS, 2011). There are a multitude of reasons for this discrepancy including physical, psychological, environmental, time-based, inter-personal, programming, access and opportunity barriers (Johnstone & Millar, 2012). Another important reason for this gendered discrepancy in sport participation is the way in which sport is typically embedded within the development of, and current social constructions of masculinity (Craike et al., 2009; Klomsten Marsh & Skaalvik, 2005; Velija & Malcolm, 2009). Conversely, sport, and specifically traditionally non-feminised sport, does not conform to the gender ideology of femininity, which in many ways opposes participation in sports, specifically TMS (Dodge & Lambert, 2009; Gavin et al., 2013; Leavy, Gnong & Ross, 2009).

A substantial amount of research (see Alley & Hicks, 2005; Berger, O'Reilly, Parent, Seguin & Hernandez, 2008; Cooky, 2009), has demonstrated that social constructs significantly impact the activities boys and girls and women and men choose or are able to play, and more specifically, which sports fall within the socially constructed acceptability of feminine and masculine. Leavy, Gnong and Ross argue that “women have been taught that there are social rewards for conformity to the cultural standard of femininity” (2009, p. 280). Once women conform to these social norms, the fear of non-conformity and consequences of non-conforming continues, with women and girls still living in heavily socially constructed systems (Leavy et al., 2009). Sport participation, especially in TMS, opposes the association between femininity and athleticism, and instead produces dominant understandings of these constructs as oppositional (Cronan & Scott, 2008; Ho, 2014). Shakib and Dunbar's (2002) exploration of high school basketball displayed that girls sporting teams are viewed as ‘less than’ boys, regardless of success. This reinforces traditional gendered ideology that masculinity and athleticism are naturally embedded within males, in ways in which femininity has multiple resistances (Cooky, 2009; Shakib & Dunbar, 2002). Therefore this acts as a limiting factor in female participation and continuation of sport.

The construction of femininity and athleticism, specifically in TMS, is exceptionally problematic for adolescent females as they are at a particularly vulnerable age in relation to body image, self-esteem, physical appearance and pressure to conform to gender ideologies (Bowker, Gadbois & Cornock, 2003; Russell, 2004). Self-esteem, self-efficacy and body image are related strongly to whether females feel they are conforming to their gender roles as based on gender role expectations (Horn, Newton & Evers, 2011).

The intensification of the importance of both physical appearance and popularity has been well documented in adolescence (Bowker et al., 2003; Gavin, McBrearty & Harvey, 2013; Leavy et al., 2009). This is significant for adolescent females as non-conformity to femininity can have social and psychological harmful effects. In female adolescents physical attractiveness is associated with femininity and popularity (Bowker et al., 2003; Dodge & Lambert, 2009). Additionally, there are stereotypes of females who play TMS, including stereotypes of mannishness, non-conforming behaviour and lesbianism (Berger et al., 2008; Daniels & Leaper, 2006), that do not fit within the social norms of femininity society places upon women. Carr states that adolescence is a period where there is “intensified stress on heterosexual femininity during this developmental period” (2005, p. 129). If identified as a lesbian, consequences can include homophobia and sexual rejection among other social punishments, which sustain female coercion to social norms resulting in potential low self-esteem, poor body image and low confidence (Leavy et al., 2009). This demonstrates that adolescent females may be even more vulnerable to express their disinterest in playing a TMS, as they do not want their heterosexuality questioned. For younger girls, the threat of being called a tomboy has negative connotations, due to the links between being called a tomboy, playing sport and



being homosexual (Carr, 2005; Clarke, 1998). Despite increasing acceptance, homosexuality continues to be considered in contradiction of societal norms and impacts upon personal and social perceptions of femininity (Cooky, 2009; Messner, 2002).

The benefits of girls' sporting participation during adolescence is well documented (see Camacho-Minano, La Voi & Barr-Anderson, 2011; Greenleaf, Boyer & Petrie, 2009; Messner, 2002), however there are a multitude of barriers for adolescent girls' sporting participation, especially in regards to TMS. Barriers include perceived stereotypes, conforming to gender constructs of femininity, body image, peers, other priorities such as performing well academically and working part-time, time limitations, opportunity and structural barriers in addition to curriculum-based and other school-based barriers (Craike et al., 2009; Mitchell et al., 2015; Slater & Tiggemann, 2010). This study evoked girls' experiences in relation to schools and TMS to investigate their experiences of participating in sports in which they have been traditionally excluded or discouraged from participating in.

## Method

This paper derives from a larger study that investigated the factors that impacted the participation of females aged 13 to 17 years in TMS. Data was collected via narrative-based focus groups and individual interviews which sought to elicit participant's experiences and motivation for their sporting decisions, and to identify barriers and facilitators to their participation in TMS. Participants were 34 adolescent females, aged 13-17 years from five metro Adelaide sporting clubs who played one of three TMS popular in Australia; soccer, Australian Football (footy), or cricket. A qualitative research design was employed as it can provide an "in-depth understanding" (Anyan, 2013, p. 1) of a particular phenomenon and allow for a deeper understanding of a particular experience through eliciting the experiences of a specific group of people that otherwise may be underrepresented (Frels & Onwuegbuzie, 2013). As this research explored the experiences of adolescent females playing TMS, a narrative focus allowed participants in these sports to detail their experiences in relation to the research question (Creswell, 2013). The focus groups and interviews followed a semi-structured format.

Ethics approval was obtained from the University. As participants were minors, they received parental consent, as well as providing their own assent to participate. Purposeful sampling was utilised in order to gather insight and in-depth understanding as described in Patton (2002). All interviews (eight) and focus groups (five) were audio recorded with permission, allowing the interviewer to focus on the interviewee/s and the narrative of the focus groups and individual interviews. The recordings' were transcribed verbatim, using a professional transcription service. Once the transcripts were received, the data was collated and thematically analysed. Thematic analysis and thematic networking took place to ensure that the themes from the data were unearthed, broken up and structured in regards to their significance (Attride-Stirling, 2001). Through the process of coding, specific reoccurring words, sentences or concepts emerged from the data formulating main themes (Strauss & Corbin, 2015). The focus group and interview transcripts were coded using an iterative process (Bean, Forneris & Fortier, 2015).

Analysis of the data uncovered four key themes relating to female adolescent TMS participation and their schooling experience: the gendering of sport, opportunities for participation, peer influence, and role modelling. This paper relates these four themes and key findings of the study to the AC:HPE, specifically in regards to the use of critical inquiry approaches mandated by the curriculum. It investigates how curriculum, instruction, and pedagogy may serve to challenge real and perceived barriers to women and girls TMS participation, and make school settings and school sporting culture more inclusive, diverse, and socially just spaces.

## Results

The following section reports on the four themes uncovered in the data that related to adolescent female participants' experience of being players of TMS within schools. Themes are reported in order of prevalence within the data.

### *The Gendering of sport within schooling experiences*

Participants felt strongly that sport should not be gendered in exclusionary ways.

*"I don't think any sport should be a girls or boys sport...it's just a sport"*

(Participant 02)

However, participants gave many examples of where the gendered nature of language and organisation of sport at the school level was gender exclusionary, such as one soccer focus group who agreed that

*"Trends (in school) is all the girls are doing volleyball, there's a big push for girls to do volleyball, and the boys do footy"* (Soccer Focus Group)

And a participant from a football focus group who stated

*"You don't have that much pressure, (whereas) all the guys in school play footy. For us, if you play footy its cool people say "why don't you play netball?" "Because I'd rather play footy, because that's who I am"...It always goes back to netball because netball is such a girl dominated sport"* (Australian Rules Football Focus Group 01)

Another participant remarked that the language used by teachers and coaches at school was also another aspect of how sport was gendered in exclusionary way.

*"Lot of comparison at school, 'why aren't you as good as him, you play club'"*  
(Participant 01)

and

*"Oh you play soccer, but the boys are always better', physically, it's how it works, they're bigger, stronger, faster, (there's) nothing you can do about it...(but) skill wise, (we're) pretty equal"* (Participant 01)

The use of language and its contribution to the gendering of female adolescent sport experiences has been well documented in the literature and is closely linked with negative sporting experiences and sport attrition (Hill, 2015; Mitchell et al., 2015). This has meant that while playing sport, girls often have the feeling that they are not as 'good' as boys. These feelings may stem in part from structural and funding inequalities in schools and community programs which often allow boys more experience playing sport and more opportunities to be active than girls (Slater & Tiggemann, 2010). This, combined with the use of exclusionary gender language means that female adolescents often feel less-equipped than their male counterparts, who then in turn are likely to think they are better than their female peers in their class (Mitchell et al., 2015).

Within focus groups and individual interviews, participants gave numerous examples of how the gendering of sport and negative connotations towards females who play TMS impacted their participation, enjoyment, and continuation of their sport.

*“I remember last year I didn’t even play (school soccer) because I didn’t, I didn’t want to, I didn’t want to put myself in that situation in front of the guys in my school because I was worried that I was going to be judged all that sort of thing and I’m sure I could hold my own but it’s just that sort of stereotype of what people would say if I did put myself in that situation”* (Participant 02)

*“I remember I did like a school thing and I never went back again because I was the only girl and I was ostracised in front of all these boys, I was the last one to be picked, even though I was like a better player than half of them”* (Soccer Focus Group)

While women and girls’ participation in TMS continues to increase, the above examples demonstrate that there are still a multitude of barriers including structural, socio-cultural, psycho-social factors such as negative gender stereotypes, judgement, and a lack of support (Johnstone & Millar, 2012; Slater & Tiggemann, 2010). While the participants did give examples of where they had overcome barriers, or where things had, from their perspectives, ‘gotten better’, participants desiring to play or continue to play a TMS still feel the need to conform to gender norms and social expectations. This is particularly heightened as an adolescent girl when gender expectations are already at a high-level (Bowker et al., 2003; Horn et al., 2011; Russell, 2004). The excerpt below is an example of the negative gender associations participants felt that inhibited girls’ participation in TMS

*“Some girls don’t want to play footy because they do find it a boy dominated sport, and they may be a bit of a girly girl or something and they just don’t want to go out, and if it’s raining, then slide in the mud while playing”* (Australian Rules Football Focus Group 01)

As the majority of adolescent females desire to meet the social expectations of femininity (Dodge & Lambert, 2009; Gavin et al., 2013; Leavy et al., 2009), being compared to male peers and the entrenchment of inequalities within the school and wider sporting community act as significant barriers (Dodge & Lambert, 2009). Traditional masculinity is embedded within these sports, therefore acting as a substantial barrier for female participants compared to their male peers.

#### *Opportunities for participation*

Based on the participants’ experiences, starting from Primary School and during the transition into High School, there are fewer opportunities for girls to play TMS. Participants shared experiences ranging from no opportunities to play sport, to being presented only traditionally feminine or gender neutral sporting options. In regards to their primary school experience, participants commented most often on a lack of opportunities.

*“I didn’t even think we had a girls’ soccer team until year five and six anyway in Primary School. Before then if you wanted to you had to join the boys’ team and there would only be 2 of you in an entire team of boys which is a bit intimidating at that sort of age”* (Participant 01) [sic]

*“In primary school (I) was presented with netball, softball, not soccer, soccer was a guys’ thing”* (Soccer Focus Group)

*“(We) weren’t allowed to play with the boys in year six and seven”* (Soccer Focus Group)

When it came to their secondary school experiences, a lack of girls’ teams and fellow female players were highlighted as major obstacles.

*“(I was the) only girl was put in a senior boys’ team, everyone thought I was a guy”* (Soccer Focus Group)

*“This morning I went past this board thing with two lists on it, it had the boys’ list and the girls’ list for soccer this...well the winter season and the boys’ list they had extra names not written on the list, like on the side of the paper, and on the girls there’s not one single name, and that made me feel really bad, because I really badly wanted to put my name on it”* (Soccer Focus Group)

Despite primary school being a key time when girls become involved in a TMS (ABS, 2012; Craike et al., 2009), primary school evidenced a distinct lack of opportunities for the study participants. Despite that seven out of eight of the individual interview participations started TMS participation in primary school, their schooling was not a supportive factor. While participants stated that upper primary and secondary school offered more opportunities for participation in TMS, there were still significant barriers at the school level such as the number of teams and players

*“The boys’ soccer teams have five or six teams, one for every year level, (there are) only two or three girls’ soccer teams in the entire school for girls. Netball has approximately 20 teams. (The) girls’ soccer team isn’t very good because there’s girls who have never played before”* (Participant 03)

*“At school, (we) don’t have a competitive girls’ team, it wasn’t important enough, (they) put girls in groups with friends”* (Soccer Focus Group)

Even within the increased availability of TMS in secondary schools, the soccer focus group which contained ten soccer players determined that only two of their eight schools offered soccer for girls, one of which had only a four week knockout event and the other a one day carnival.

Participants also noted that the lack of opportunity for girls to formulate a team within their school, let alone a competitive team. If there are opportunities to play a TMS, particularly in regards to soccer, participants reported that they were only offered the option of a social team, with limited competitive focus. Participants also noted that school restrictions in regards to what sports students are allowed to play also hampered their participation and enjoyment in TMS

*“If you play club sport, a lot of schools make you play that sport at school also, it’s ridiculous”* (Participant 03)

*“School makes school sport compulsory if you play club (have to put school before club)”* (Soccer Focus Group)

*Peer influence*

Adolescence is a time of significant growth and development in terms of perceptions, behaviours, attitudes and values (Bowker et al., 2003; Horn et al., 2011; Russell, 2004). The results of this study found that participants were highly influenced by their peers in relation to their participation in TMS. For example, one participant who recounted times where

*“A lot of friends join in when we kick the footy at recess and lunch, and we teach them new skills....they would otherwise just sit around....some girls do just sit and watch”* (Australian Rules Football Focus Group 01)

Participant’s experiences also often centred on how their participation in sport supported positive peer interactions at school and made them feel valued as athletes and peers. This was evidenced in a focus group discussion where one participant recounted that

*“They (boys) get taken aback when they realise that you know what you’re talking about... (you) gain heaps of respect from the guys, cause it takes a lot of courage to play footy, they appreciate it and you make more friends with them”* (Australian Rules Football Focus Group 01)

For several participants, excelling at a TMS sport was viewed as a positive at school by male and female peers alike

*“At lunchtime guy friends do (play) sport, only two girls join in, and the fact that we can actually over power most of the guys playing soccer, a lot of them are impressed by it”* (Soccer Focus Group)

*“Once you get started a lot of the boys start to respect you more, (they are) surprised at what we (girls) can do.... (You) earn a lot of respect around the community and schools”* (Participant 04)

However there were also examples of where there was peer backlash around perceived gendered norms within school settings such as

*“A lot of boys now think it’s cool (but in) year six/seven boys tease you about being a lesbian or that it’s a boys’ sport, some girls get really upset about it”* (Participant 01)

*“My friends would all tell me that soccer’s such a gay sport when I tell them I play soccer, and then when I actually beat them at it, they realise that it’s not”* (Soccer Focus Group)

The social perception of peers plays a significant role in determining what activities adolescents’ par-take in, including participating in non-feminine sports (Daniels & Leaper, 2006; Leavy et al., 2009). As per the above excerpts, it can be seen that soccer, football and cricket often have specific harmful gender stereotypes which create barriers for females uptake and continuation of these and similar TMS sports.

### *Role modelling within schools*

Role modelling is an important component of sporting participation within school settings. Participants voiced consistent comments about the lack of role models from TMS for girls in schools.

*“Female role models is a massive thing, you never see female soccer players come and talk to schools. Just seeing someone that has done that sort of thing makes you think I can do it or, and if they had the program in place to help you learn that sort of stuff” (Participant 03)*

*“Lots of netball and softball (personalities) come to the school, but you don’t get that for girls’ soccer” (Soccer Focus Group)*

While the inclusion of elite athletes in school sport programs can impact sporting opportunities and participation through role modelling (Dunn, 2015; Payne, Reynolds, Brown & Fleming, 2003; Young et al., 2015), the participants consistently noted throughout the focus groups and interviews that there was no representation of elite female athletes in TMS in schools, despite that nationally the number of elite female athletes in these sports are growing (ABS, 2015; Australian Football League Annual Report, 2015; Cricket Australia, 2016). Another aspect of role modelling mentioned by numerous participants was the lack of female coaching representation both in schools and the wider community, such as a participant who said

*“If I had a female coach when I was growing up that would have made all the impact. I have never had a female coach for soccer playing which clearly shows something. But I think that would have made a lot of impact to me if I had a female soccer player in Australia, people can do it, people can make a living out of that sort of thing” (Participant 01)*

Participants voiced their experiences of a lack of female coaches for female athletes and how this negatively impacted their TMS sporting experience. Despite the importance of same-sex coaches as role models and leaders assisting in the development of young female athletes and their perceptions, values and beliefs regarding women in power and leadership (LaVoi, 2013), participants remarked that they had no, or limited opportunities to benefit from female coaches and role models during TMS sport participation.

### **Discussion**

While sport can play an integral role in improving self-esteem, independence, leadership qualities, increased academic performance, increased self-worth and empowerment for adolescent girls (Greenleaf et al., 2009; Slater & Tiggemann, 2010; Theberge, 2003), the results of this study identified that schools and the school environment continue to limit opportunities for female participation in TMS. The results of this study show that it is of significant importance for adolescent girls to be in a supportive environment, particularly when participating in a non-gender-conforming sport. Participants shared a multitude of examples where the school environment created and/or perpetuated barriers to TMS participation, coalescing in the four themes explored within the data: the gendering of the sport experience, opportunities for participation, peer influence, and role modelling.

The inclusion of critical inquiry approaches as a key point of focus in the AC:HPE was a considered one (ACARA, 2012; Macdonald, 2013, 2014), supported by strong evidence of the value of engaging young people in thinking critically about the socially constructed nature

of our health practices, beliefs, and behaviours, and the way that these social constructions enable some and disable others in regards to health, sport, and physical activity (Alfrey & Brown, 2013; Wrench & Garrett, 2016). Throughout the four themes highlighted in the reporting of this study, gender and the impact of traditional gender roles and their construction as oppositional to adolescent female's participation in TMS was a key factor. The impact of gender stereotypes and the exclusionary gendering of sport within schools was present in the accounts of all participants when sharing their experiences of the barriers prohibiting their continuation, enjoyment, and even disclosure of their participation in TMS within school. Barriers and experiences should be of key concern for schools and HPE teachers whose mandates are to support physical activity guidelines and the current and future health of students.

The results highlighted two key areas in relation to gender and the embedment of a critical inquiry approach to the content and pedagogies consistent with the AC:HPE. The first is that if teachers and schools are to be role models in regards to sport and physical activity, and guide students in engaging meaningfully with the curriculum, teachers and schools need to engage critically and reflexively in evaluating the current sport opportunities for female students within their schooling context. This includes critical examination of the ways in which overly gendered language is used in school and classroom settings, and the use of gender as a determining factor for student participation in a range of HPE activities including guest speakers/athletes and coaching staff. The second, and of equal importance, is to engage all students in critically analysing gender roles and how gender stereotypes constrain or support people's health, sport, and physical activity participation and how this impacts on overall health and wellbeing. Given the importance adolescents place on peer acceptance (Craike et al. 2009), the need to challenge harmful social construction and exclusionary language to reduce structural and socio-cultural barriers within the school settings is essential to the goal of enabling supportive and accepting environments. As such, the HPE teacher and school have a vital role to play in engaging with the critical inquiry approaches embedded within the content and pedagogy outlined by the AC:HPE to support girls' physical education experiences (Mitchell et al., 2015), particularly in relation to exclusionary traditional gendered roles and expectations.

## Conclusion

Supportive environments such as the school community are of particular importance to assist all students in meeting the AC:HPE curriculum (Australian Curriculum Assessment and Reporting Authority, 2013), national physical activity guidelines (Australia Government Department of Health, 2014, retrieved from: <http://www.health.gov.au/internet/main/publishing.nsf/content/health-pubhlth-strateg-phys-act-guidelines#apa1317>), and in supporting students to engage in life long practices that support their health and wellbeing. As female adolescents are at particular risk of discontinuing opportunities for physical activity and sport, strategies and opportunities that are supportive of their participation are of paramount importance. As TMS have witnessed the greatest growth in female adolescent participation, women and girls' participation in TMS may offer a vehicle for addressing the current gender imbalance in adolescent sport participation. However, for this to happen, schools and teachers must engage in critical and reflective practice in relation to how schools and schooling contexts currently create barriers for female adolescent participation.

This paper outlines several ways in which engagement with the content and pedagogies embedded in the AC:HPE (Australian Curriculum Assessment and Reporting Authority, 2013) can work to support the uptake, continuation, and enjoyment of women and girls in all sports and physical activities, especially those that women and girls have been largely excluded from such as soccer, football, and cricket. Careful and deliberate use of non-gendered exclusionary

language, opportunities, time and space for students to meaningfully engage in critical inquiry of socially constructed gender norms and stereotypes will be essential points of consideration in relation to AC:HPE (Australian Curriculum Assessment and Reporting Authority, 2013). In this way, the content and pedagogical approaches informed by critical inquiry approaches can be purposefully targeted to redressing the lack of opportunities for women and girls to participate in TMS as well as sport and physical activity more broadly.

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## Empowering young people to make Positive Choices: Evidence-based resources for the prevention of alcohol and other drug use in Australian schools

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### Abstract

There is increasing evidence that drug education and prevention programs implemented in schools are effective in reducing alcohol and drug use and associated harm. Despite this, evidence-based programs are not widely implemented in schools. We describe the development and evaluation of *Positive Choices*, an online portal to improve access to, and implementation of, evidence-based drug education in Australian schools.

The portal was developed in consultation with drug and alcohol experts, as well as target users (teachers, parents and students). Research literature and drug education websites were systematically reviewed to identify resources meeting pre-specified inclusion criteria for relevance and quality. An evaluation survey was conducted with 82 teachers to clarify drug education practices and attitudes, and examine use and impact of *Positive Choices* in the first eight months post-launch of the site.

Teacher survey responses reflected a strong preference for evidence-based teaching approaches, yet evidence-based programs were implemented by less than one in four of them.

Scoping identified 114 evidence-informed resources, including a range of games, videos, and curriculum packages. Beta-testing feedback was overwhelming positive, indicating the *Positive Choices* portal was easy to navigate, relevant and useful. Teachers who used Positive Choices were more likely to consider supporting evidence when selecting a resource, reported their students were more engaged and felt more comfortable discussing drug and alcohol since using the portal.

This study indicates the *Positive Choices* portal is a valuable, free and easily accessible online database for students, parents and teachers seeking up-to-date information and evidence-based drug education resources.

## Introduction

Drug and alcohol use is common in Australia and globally, and can be associated with considerable harm at the individual and societal level. The negative impact of alcohol and other drug use is most significant among young Australians, corresponding with the typical period of onset of alcohol and other drug use. In the past year, one in three Australian teenagers aged 12-17 years drank a full serve of alcohol, one in ten put themselves at risk of short-term alcohol-related harm at least monthly, one in five were victims of an alcohol-related incident, and one in six tried cannabis (Australian Institute of Health and Welfare, 2014). The earlier a young person initiates alcohol and drug use, the greater the risk of negative outcomes including comorbid mental health problems, juvenile offending, and poorer educational outcomes, all of which negatively impact on current functioning and future life options (Grant, Stinson, & Harford, 2001; Tucker, Ellickson, Orlando, Martino, & Klein, 2005). To interrupt this trajectory, reduce harms and alleviate costs, effective prevention is critical. Secondary schools are an ideal location to equip young people with knowledge and skills that empower them to make informed and safe choices about alcohol and other drug use. Parents, and school staff are the primary sources of contact for young people seeking advice or help for drug use issues (Hampshire & Di Nicola, 2011; Sawyer et al., 2001), thus it is crucial they are equipped with accurate information and evidence-based response strategies. Given the considerable harms associated with alcohol and drug use, substantial societal benefit can be gained from even modest reductions in drug and alcohol use (Nherera & Jacklin, 2009).

A number of curriculum-based packages aimed at preventing harms relating to alcohol and other drugs have been developed for implementation in schools both in Australia and internationally. These programs have demonstrated varying degrees of effectiveness with outcomes of some programs compromised by obstacles to program implementation and dissemination, and inclusion of an abstinence-based as opposed to a harm-minimisation approach to prevention (Champion, Newton, Barrett, & Teesson, 2013; Lee, Cameron, Battams, & Roche, 2016; Teesson, Newton, & Barrett, 2012). A recent review conducted by the National Centre for Education and Training on Addiction systematically examined the effectiveness of school-based alcohol prevention approaches (Lee et al., 2016). Several important findings emerged from this review. First, the review identified three prevention programs (*Climate Schools*, *Project Alert* and *All Stars*) with good evidence of a positive effect according to the National Health and Medical Research Council (NHMRC) guidelines for assessing weight of research evidence. One of these programs, *Climate Schools*, was developed in Australia and has to date been evaluated in six randomised controlled trials across 155 Australian schools (Champion et al., 2016; Newton, Conrod, Rodriguez, & Teesson, 2014; Newton, Teesson, Vogl, & Andrews, 2010; Newton, Vogl, Teesson, & Andrews, 2009; Vogl, Newton, Champion, & Teesson, 2014). Trial results indicate that compared to health education as usual, implementation of *Climate Schools* is associated with increased student knowledge

of drug effects and risks, and reduced frequency of alcohol, cannabis and ecstasy use for up to two years following program delivery. A further four programs were identified as having some evidence of a positive effect, including another program developed in Australia, the School Health and Alcohol Harm Reduction Project (SHAHRP) (McBride, Farringdon, Midford, Meuleners, & Phillips, 2004). The systematic review also provided guidance about the common characteristics of programs that were effective. These included: i) being based on accurate information, theoretical understandings of adolescent behaviour, and supported by empirical research; ii) going beyond providing factual information, and focusing on harm minimisation and skill development; iii) providing feedback about social acceptability, and highlighting that alcohol and other drug use is not as widespread as young people might think; iv) use of interactive styles and methods, and maximising students' interest using up-to-date materials and information; and v) promoting student resilience, social connectedness, encouraging strong relationships and communication between students, parents and staff (see Lee et al., 2016 for a detailed discussion of effective components).

Despite the availability of school-based programs that are effective at increasing student's knowledge and reducing alcohol and other drug use, evidence-based programs are not widely implemented in schools (Cuijpers, 2003). For best outcomes, it is critical that teachers, school staff and parents have access to evidence-based information and strategies that equip them to respond most effectively (Kyrrestad Strøm, Adolfsen, Fossum, Kaiser, & Martinussen, 2014).

This paper describes the development of the *Positive Choices* online portal ([www.positivechoices.org.au](http://www.positivechoices.org.au)), which was developed to improve access to and implementation of evidence-based drug and alcohol information and prevention resources. The *Positive Choices* portal was developed to align with the principles of effective prevention that have been identified by systematic review of the literature (Champion et al., 2013; Foxcroft & Tsertsvadze, 2011; Lee et al., 2016; Teesson et al., 2012). *Positive Choices* seeks to address the gap in implementation of evidence-based drug education in Australian schools, and responds to a call from principals for resources to support schools in building capacity to respond to drug and alcohol issues (Australian National Council on Drugs, 2013). This paper provides an overview of the development of the *Positive Choices* resource database and portal, which was conducted in consultation with principals, teachers, and parents of young people. It also reports findings of an evaluation study among 82 school teachers and staff, which aimed to: i) clarify current sources of information, and barriers to implementation of evidence-based resources; and ii) examine the use and impact of *Positive Choices* in the first 8 months post-launch of the site.

This paper describes the development of the *Positive Choices* online portal ([www.positivechoices.org.au](http://www.positivechoices.org.au)), which was developed to improve access to and implementation of evidence-based drug and alcohol information and prevention resources. The *Positive Choices* portal was developed to align with the principles of effective prevention that have been identified by systematic review of the literature (Champion et al., 2013; Foxcroft & Tsertsvadze, 2011; Lee et al., 2016; Teesson et al., 2012). *Positive Choices* seeks to address the gap in implementation of evidence-based drug education in Australian schools, and responds to a call from principals for resources to support schools in building capacity to respond to drug and alcohol issues (Australian National Council on Drugs, 2013). This paper provides an overview of the development of the *Positive Choices* resource database and portal, which was conducted in consultation with principals, teachers, and parents of young people. It also reports findings of an evaluation study among 82 school teachers and staff, which aimed to: i) clarify current sources of information, and barriers to implementation of evidence-based resources; and ii) examine the use and impact of *Positive Choices* in the first 8 months post-launch of the site.

## Stage 1: Initial consultation and development

The Positive Choices drug prevention portal ([www.positivechoices.org.au](http://www.positivechoices.org.au)) was developed by researchers at the National Drug Research Centre ([www.ndarc.med.unsw.edu.au](http://www.ndarc.med.unsw.edu.au)) and the National Drug Research Institute ([www.ndri.curtin.edu.au](http://www.ndri.curtin.edu.au)), with funding support from the Australian Government Department of Health. This section describes the development process, which followed a co-development model (Schuler & Namioka, 1993), with target users consulted at multiple points through the development process.

## Method

Formative consultation informed development of a beta-version of the site, which was subsequently reviewed by topic area experts and the target audience. Development was overseen by an Expert Advisory Group (EAG) made up of experts in the drug and alcohol and/or education field. Approval for Stage 1 and Stage 2 of the study was obtained from the UNSW Human Research Ethics Committee (HREC12548).

### *Formative consultation*

In late 2013, focus groups were conducted with students, parents and teachers to inform content development for the online portal. Participants reviewed material providing facts about various drugs and their effects, prevention and harm minimisation strategies, and provided feedback on the language, relevance, appropriateness and usefulness of the materials (see Stapinski et al., Under Review). In January 2014, interviews were conducted with 14 teachers to inform the initial design and development of the portal, including content needs, website interface, navigation and features.

### *Development*

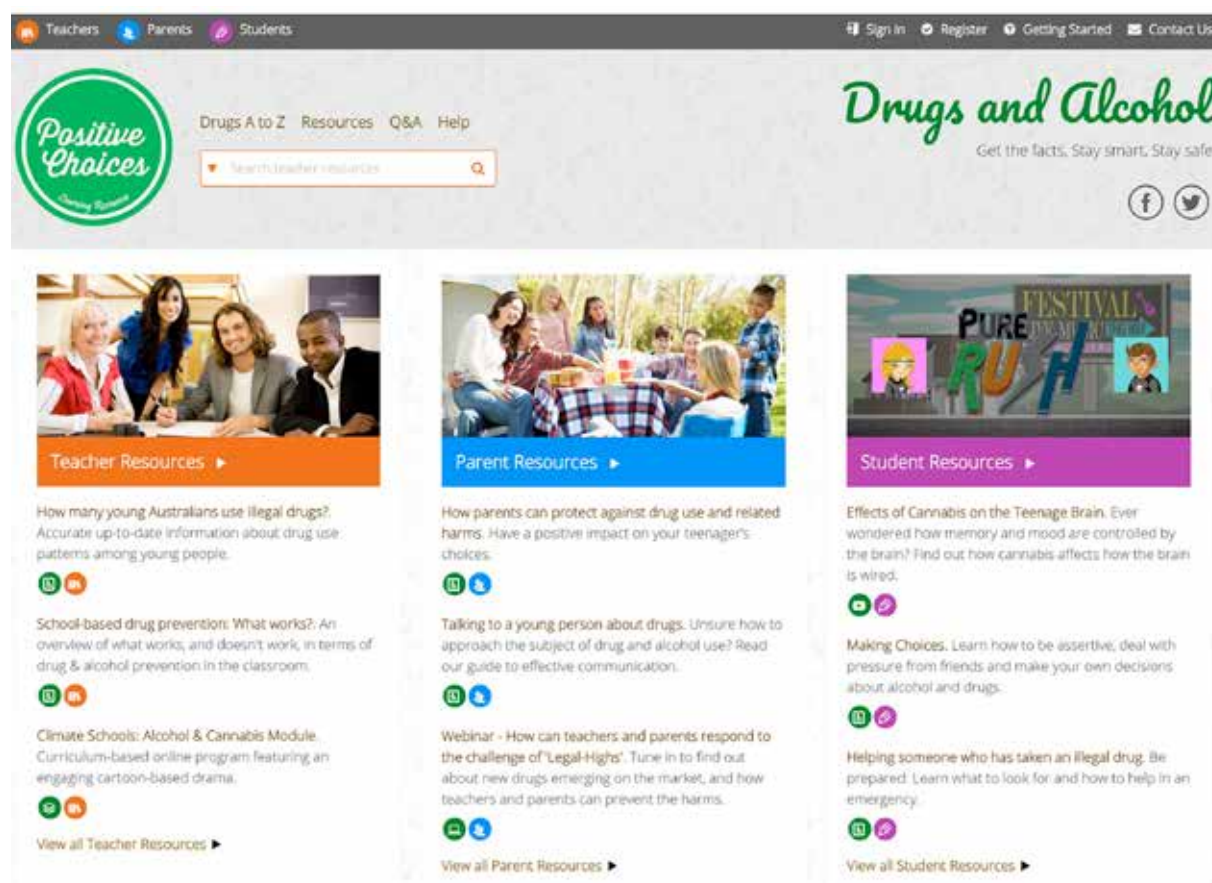
Development of the Positive Choices portal was structured with the aim of compiling evidence-based alcohol and other drug information and resources for three key user groups: teachers, parents and students (See Figure 1). Information fact pages and webinars relating to different drug types and prevention related topics were developed by topic-area experts with reference to the relevant research literature. Additional drug education and prevention resources were identified from recent systematic reviews (Champion et al., 2013; Teesson et al., 2012), and keyword searches on academic databases and general search engines. Target resources for students included videos, games, and apps, and for teachers, lesson plans and full curriculum packages spanning multiple lessons. Identified resources were reviewed against specific criteria identified in consultation with the EAG to ensure only resources of high relevance and quality were included in the resource database. General resources (i.e. videos, games, apps) were eligible for inclusion provided they: i) had an alcohol or other drug prevention focus, ii) were relevant to Australian context, and iii) were informed by evidence. For curriculum programs, an additional inclusion criterion was that the program had been tested in schools, with benefits demonstrated in at least one study published in a peer review journal<sup>1</sup>. For each resource listed in the database, an access link is provided, along with a description of the resource, information about the developers, implementation considerations including cost, benefits, and strength of evidence supporting the resource, including links to relevant supporting publications where applicable. In the case of lesson plans and curriculum programs, information and links are provided to guide alignment with the Australian National curriculum (version 7.5): Health and Physical Education (Australian

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1. For more information about how resources are selected for our site, see: [positivechoices.org.au/help/questions-and-answers/](http://positivechoices.org.au/help/questions-and-answers/)

Curriculum Assessment and Reporting Authority, 2015). Identification and review of resources was completed in September 2014. Thereafter, resource scoping, review and updating has been conducted annually to ensure the content remains up-to-date. Web development, design and optimisation were conducted in collaboration with Netfront ([www.netfront.com.au](http://www.netfront.com.au)).

**Figure 1.** Screenshot of the Positive Choices portal, with resources organised according to needs for different user groups: teachers, parents and students.



### Beta-testing and review

A beta-version of the portal was reviewed by the EAG, who provided feedback and suggestions for improvement. Beta-testing of the site was conducted with 20 teachers and 10 parents who completed a series of tasks, followed by a comprehensive online survey and phone interview. Two Sydney-based teachers also completed in-house beta-testing, which involved observation of structured and unstructured browsing. Responses to quantitative feedback items were examined by calculating summary statistics, and a thematic analysis was applied to qualitative data.



## Results

### *Formative consultation*

Consultation with 14 teachers based in New South Wales (NSW; 64%), Victoria (VIC; 14%), Tasmania (TAS; 7%), the Australian Capital Territory (ACT; 7%), or Western Australia (WA; 7%), indicated that a central access point for drug information and resources would be valuable. In particular, they noted the value of providing up-to-date information and facts, and access to a range of educational resources that could be searched and filtered according to drug type, Year level, resource type, and Australian national curriculum requirements (Australian Curriculum Assessment and Reporting Authority, 2015). To guide subsequent development, teachers provided feedback about their information needs, common questions, and how the portal could be best organised to facilitate evidence-based lesson planning.

### *Beta-testing and review*

Review of the beta-version of the Positive Choices portal by the EAG generated 72 modification suggestions, each of which was addressed in the final version. Suggested modifications included improvements to language and navigability, the provision of additional “help” information for users, and video tutorials to demonstrate use of the portal functions. The site was also reviewed and endorsed by *Principals Australia Institute* ([www.pai.edu.au](http://www.pai.edu.au)), the leading national representative body for school leaders.

The beta-version of the portal was also reviewed by 20 teachers (80% female) and 10 parents (90% female) from NSW (60%), VIC (23%), WA (10%), and the ACT (7%). While most teachers were secondary school teachers (85%), teachers from Foundation Year through to Year 12 were represented. Parents had children in secondary school (10%), primary school (30%), or both (60%). Overall, the feedback from participants was overwhelmingly positive. The majority of respondents reported they found the portal useful (93%) and would recommend it to a friend (93%). Specific feedback indicated most respondents liked the layout (87%) and graphics (77%), found the site easy to navigate (90%), and found the information well-written and easy to understand (95%). When asked to complete a series of tasks involving refining resources by several criteria (i.e. resource type, Year level), the majority of participants indicated they were able to do so with ease (82%). Participants also provided qualitative feedback (see Table 1 for common themes). Several points of revision were made in line with participant or expert feedback, these revisions are detailed elsewhere (Stapinski et al., 2015).

**Table 1.** Beta testing qualitative feedback: Common themes and example feedback

<p><b>Feedback on design and layout</b></p>	<p><i>“[The images] are tailored well to the audience. They show diversity and promote positive messages. No suggestions for improvement.”</i> — Parent #2</p> <p><i>“If the site is for young people, there needs to be images directly related to young people i.e. pictures of school aged people.”</i> – Teacher #12</p>
<p><b>Feedback on search and filtering</b></p>	<p><i>“I think the variety of resources available is a strength. The filter functions allow quick access and management of this variety.”</i> – Teacher #20</p> <p><i>“I found it incredible comprehensive and easy to navigate and search using the various selection criteria as well as scrolling down the page.”</i> – Parent #26</p>
<p><b>Feedback on content</b></p>	<p><i>“I do kind of crave a ‘feature content’ section or something on the front page. A window that could update or change occasionally that might provide stimulus to deeper investigation. Providing accessible quickly understood facts or questions, a short video clip from the content, a hook that draws the site visitor in”</i> – Teacher #20</p> <p><i>“I found it had extensive information. It addressed so many aspects of drug and alcohol usage - facts and information that I may not have thought about addressing myself.”</i> – Parent #8</p> <p><i>“I particularly liked the inclusion of the evidence base for each program and the link to peer-reviewed publications... I would also be interested in knowing how often the portal is updated... and the criteria for including a resource on the portal.”</i> – Teacher #15</p>

## Stage 2: Post-launch evaluation

### Method

The *Positive Choices* portal was launched in December 2015, and was announced by Prime Minister Malcolm Turnbull and Senator Fiona Nash, as part of the Australian Government’s drug education and prevention strategy. A post-launch evaluation was conducted, guided by the Reach, Effectiveness, Adoption, Implementation and Maintenance (RE-AIM) model, which provides a framework for evaluation based on these five domains indicating the impact and outcomes of health promotion initiatives (Glasgow, Vogt, & Boles, 1999). Two complementary strategies (described below) were used to examine outcomes in line with this framework.

#### *Site use analytics*

Google analytics is a free web analytics service that provides information to site administrators about how people are using a particular website (Crutzen, Roosjen, & Poelman, 2012). Information such as site traffic, acquisitions, demographics, and behaviour provides an objective measure of user activity that can complement other assessment strategies.

#### *Evaluation survey*

A survey was conducted between August and October 2016 to clarify current teaching practices and attitudes, and examine use and impact of *Positive Choices* in the first eight months post-launch of the site. The RE-AIM framework (Glasgow et al., 1999)/ guided the

design of the survey questions. Participants involved in drug education were recruited via the *Positive Choices* mailing list, and paid advertising on social media. All participants were asked about their teaching practices, attitudes and barriers to drug education. They also completed questions adapted from the *Nursing Educators' Evidence-Based Practice Questionnaire* (Hussein & Hussein, 2013) to assess attitudes towards evidence-based teaching. Respondents who reported they had used the *Positive Choices* portal (41%) were asked additional questions about their use of the portal. Respondents who currently taught drug education, were asked specific questions about how they selected resources for the classroom, before and after they encountered the *Positive Choices* portal (where relevant). All quantitative data was analysed using the SPSS software package. Summary statistics were obtained to examine quantitative feedback data, and chi-square tests were applied to examine differences in practices between teachers who had, versus had not used *Positive Choices*. A thematic analysis was performed to explore qualitative data.

## Results

### *Site use analytics*

As at 21<sup>st</sup> November 2016, *Positive Choices* had attracted 51,340 website visits and 327,041 page views. Of the 37,707 unique visitors, 26.5% were returning visitors. The average duration of these visits was four minutes, 33 seconds. Site visitors were predominantly located in Australia (70.2% of total visitors), but the site was also popular in the United States (13.5%), the United Kingdom (3.3%), and Russia (3.1%).

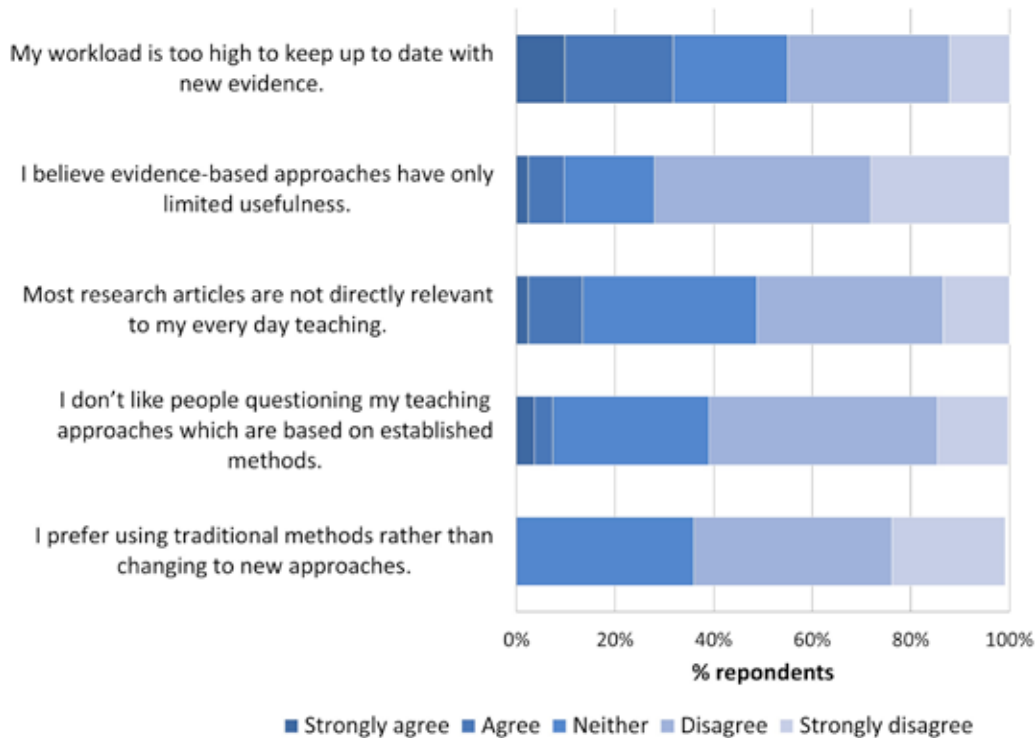
### *Evaluation survey*

The evaluation survey was completed by a total of 82 participants who were involved in drug and alcohol prevention and/or education in Australia. There were two participant sub-groups, distinguished by whether they had ( $n = 34$ ) versus had not ( $n = 48$ ) used the *Positive Choices* website on at one least occasion. Thirteen *Positive Choices* users and five teachers from the general sample were not currently teaching drug education at their school and thus answered only a subset of the questions. The age range of the sample was 18 to 65, with the majority aged between 31 and 45. They were 67% female, and were based in NSW (36%), QLD (30%), the ACT (6%), the Northern Territory (NT; 1%), South Australia (SA; 8%) Tasmania (TAS; 1%) VIC (9%) and WA (8%). The majority of respondents were based at schools in metro areas (51.1%), with some based in regional (31.8%), rural (13.6%), and remote (3.4%) areas. Respondents taught a range of subjects, most commonly Personal Development Health and Physical Education (38.6%), Social Science (27.3%), and English (23.9%).

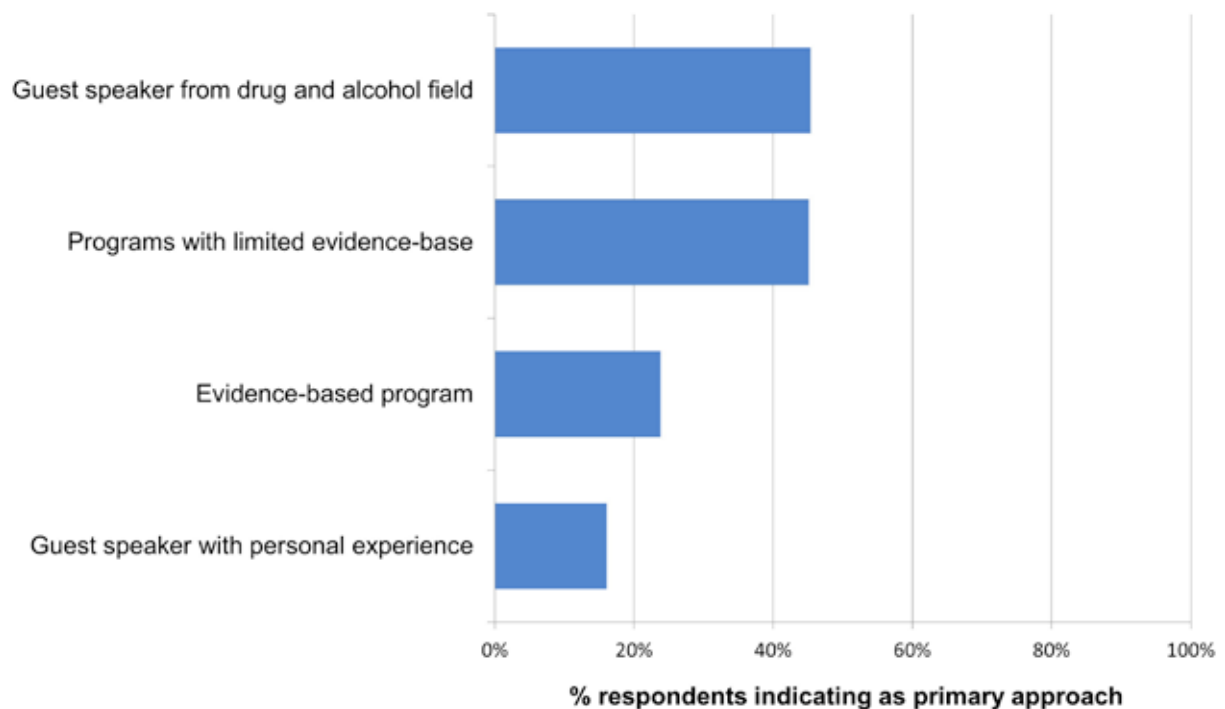
*Teaching practices, attitudes and needs.* Among all respondents ( $n = 82$ ), responses reflected a strong preference for evidence-based teaching approaches (See Figure 2). However, nearly one-third reported that their workload is too high to keep up with new evidence. It was common for teachers to go online to find information and resources for the classroom, with the majority reporting they did so weekly (22%) or more than weekly (65%). The most common sources for drug and alcohol information were government websites (69.9%) and google search (66%). When asked about drug education approach, less than one in four respondents had implemented a tested drug prevention approach with evidence of effectiveness. The most common approaches were inviting a guest speaker from the drug and alcohol field, or implementing programs that do not have a strong evidence base (see Figure 3). When implementing programs, only a minority of teachers followed implementation guidelines exactly (4.4%), with 26.8% reporting they did some reworking, 20.2% reporting lots of reworking, and

36.6% adapted the guidelines freely to suit their needs. Qualitative information was provided about the challenges in providing drug and alcohol education (see Figure 4). Typical barriers for teachers were lack of confidence, support, and time.

**Figure 2.** Attitudes towards evidence-based practice among general teacher sample

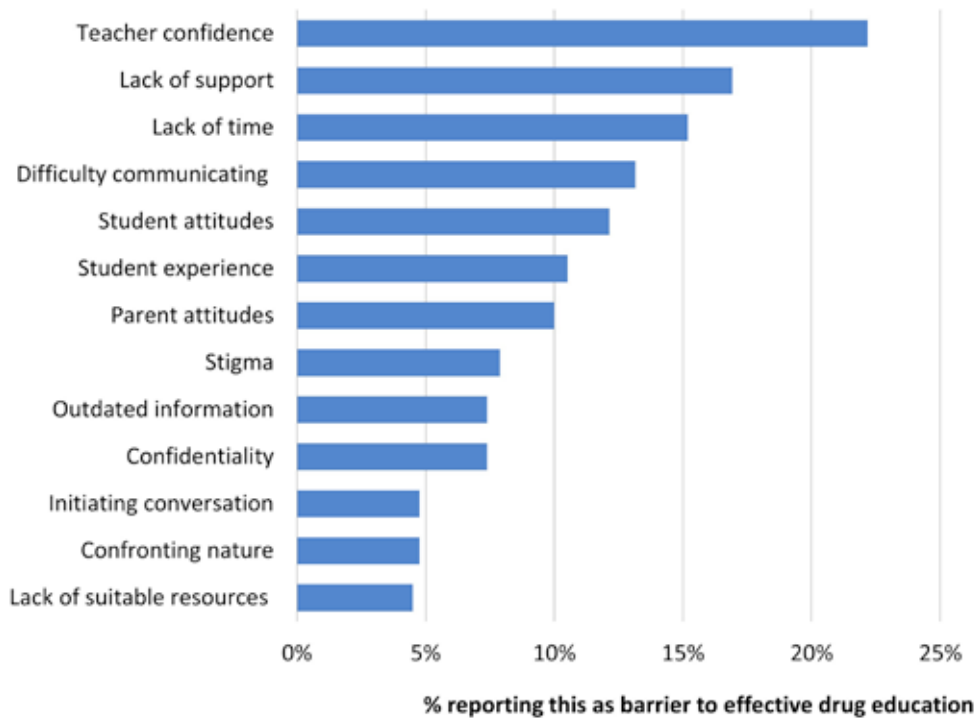


**Figure 3:** Current approaches to drug education in Australian schools



Note. 16.86% of respondents indicated N/A, 10.3% reported "unsure".

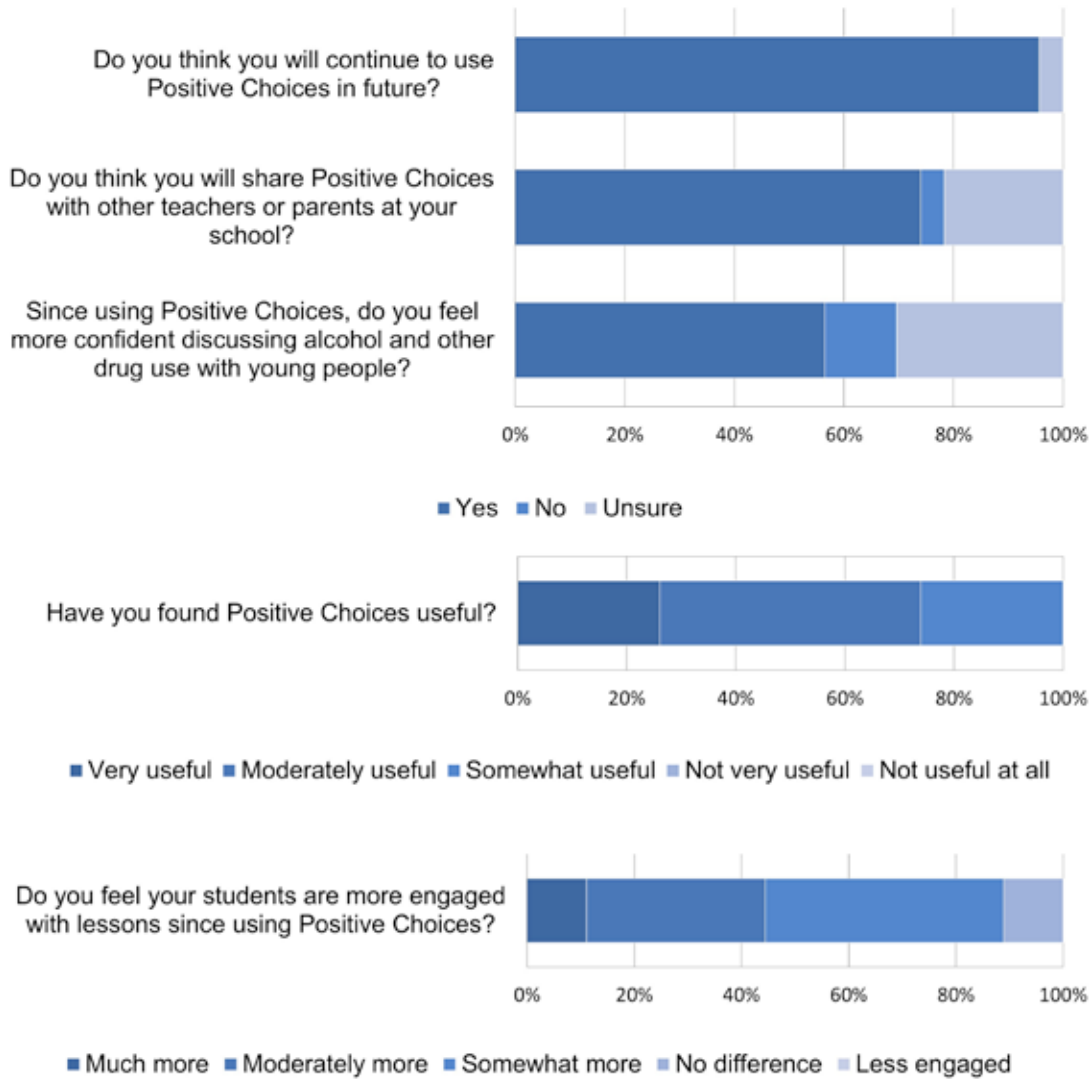
**Figure 4.** Teacher reported barriers to effective drug education (summary of qualitative responses)



\*Qualitative responses were coded into categories based on thematic analysis.

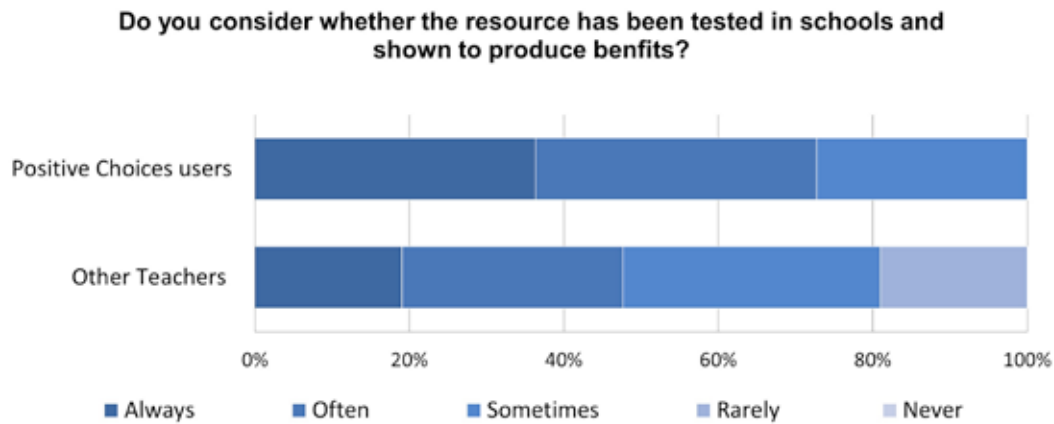
Use and impact of *Positive Choices*. Among participants who reported they had used the *Positive Choices* portal ( $n=34$ ), the majority used the site at least once per term to find information or resources (Once per term: 34.8%; Monthly 30.4%; Weekly: 8.7%). Feedback from site users indicated the vast majority found the site useful, and felt more confident discussing alcohol and other drug use with young people since using the site. The majority reported their students were more engaged since using the site, considered it likely they would continue using the site, and would recommended *Positive Choices* to others (see Figure 5). The most accessed resources on *Positive Choices* were the factsheets (access by 87.0% of teachers), games (56.6%), videos (47.8%), and brief class activities (47.8%).

**Figure 5.** Feedback among teachers who has used the Positive Choices portal.

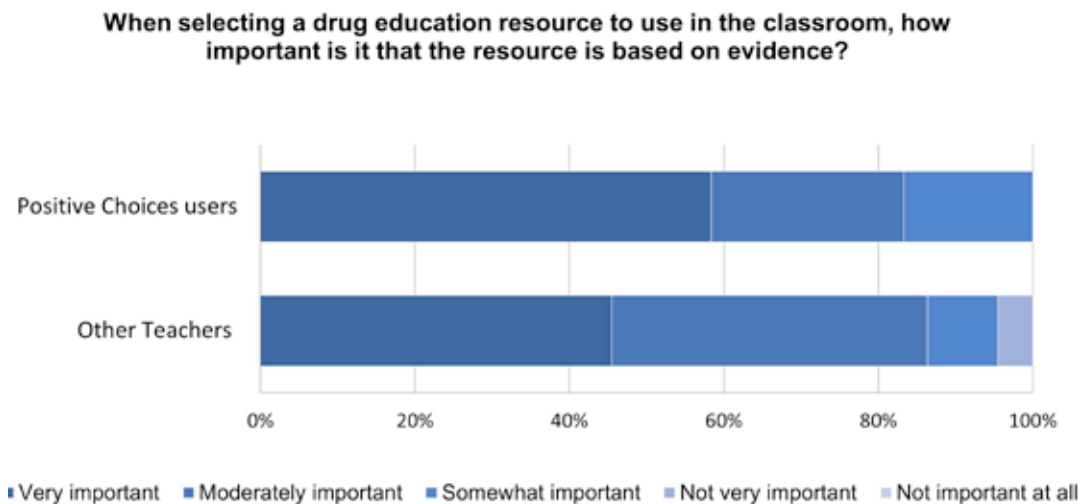


To examine the association between *Positive Choices* users and evidence-based practice, *Positive Choices* users were compared to the general teacher sample on two items assessing whether, when selecting resources, they considered the evidence-base and whether the resources had been tested in schools. Results are presented in Figure 6, and indicated *Positive Choices* users were more likely to consider whether the resource had proven benefits, although this difference was not statistical significant ( $t(31) = 1.20, p = 0.24$ ).

**Figure 6.** Evidence-based practices among Positive Choices users and general teacher sample.



Note. 16.4% of respondents reported “unsure”.



Note. 12% of respondents reported “unsure”.

## Discussion

The *Positive Choices* online portal provides access to reliable, up-to-date alcohol and other drug information and prevention resources. The site was developed using a co-development model, with formative consultation conducted initially with teachers, parents and students to guide content and site development. Following from this consultation, information fact pages and webinars relating to different drug types (including but not limited to alcohol, tobacco, cannabis, methamphetamine, ecstasy, hallucinogens, inhalants, emerging psychoactive drugs) and prevention related topics (e.g. how to respond in an emergency, effective communication) were developed for the website by topic-area experts with reference to the recent research literature. Additional drug education and prevention resources (including 13 videos, 17 games, four apps, and 19 curriculum programs) were identified through review of the research literature and drug prevention sites. Only resources meeting specific criteria for relevance, quality, and evidence-basis were listed in the resource database. A key objective of *Positive Choices* is to facilitate implementation of evidence-based drug education in Australia, by providing access to a range of curriculum packages that have been tested in schools and demonstrated to have

a positive impact. For each resource, an access link is provided, along with information about the developers, implementation considerations, benefits, and strength of evidence supporting the resource, including links to relevant supporting publications where applicable. User-specific links guide teachers, students and their parents to appropriate and relevant content, and search filters assist users to refine information according to their needs. A beta-version of the site was reviewed by teachers, parents, and drug and alcohol and/or education experts who provided feedback to guide improvements to the site. Feedback from beta-testing was overwhelming positive, indicating the site was useful, easy to navigate, and the information included in the portal was well-written and easy to understand.

*Positive Choices* was launched in December 2015, and an evaluation between August-October 2016 provided insights into teaching practices, barriers to implementation of evidence-based resources, and the use and impact of *Positive Choices* in the first eight months post-launch. Several key findings emerged. Among teachers, using the Internet to access drug information and resources was typical, and responses reflected a strong preference for evidence-based teaching approaches. Despite this, evidence-based programs were implemented by less than one in four teachers, fidelity to implementation guidelines was low, and the most common drug education approach was to invite a guest speaker on the topic of alcohol and other drugs. The most common barriers teachers faced when implementing drug education lessons were lack of confidence, support, and time. Among teachers who had used the *Positive Choices* online portal, the majority accessed the site at least once per term, reported they would continue using the site, would recommend the site to others, felt more comfortable discussing alcohol and other drug use, and felt their students were more engaged with drug education since using the site. Findings also suggested that *Positive Choices* use was associated with evidence-based practice. Teachers who had used *Positive Choices* were more likely when selecting an educational resource to consider whether the resource had demonstrated benefits compared to the general sample.

Previous research has highlighted that implementation of evidence-based drug and alcohol prevention is low (Cuijpers, 2003; Dusenbury & Falco, 1995; Ennett et al., 2003), and this is in line with our findings, where the majority of teachers implemented approaches with limited evidence, and reported a tendency to adapt resources freely to suit their needs. This research highlights the challenges when translating evidence-based approaches to practice, whereby rigid fidelity to the intended program implementation can result in a lack of adherence, yet incomplete implementation may not yield the benefits that have been demonstrated in studies (Cook & Odom, 2013). It is important to acknowledge that the feasibility of implementing evidence-based approaches is moderated by factors such as classroom context and characteristics. Therefore, allowing professionals additional flexibility in resource selection and the opportunity for teachers to plan lessons tailored for particular classroom needs with a range of appropriate evidence-based resources is key. Our study highlights that lack of support and time are primary barriers to effective drug education, a finding that is consistent with a recent survey of secondary school principals across Australia (Australian National Council on Drugs, 2013). *Positive Choices* responds to the call articulated in this report for additional resources to support schools in building capacity to respond to drug and alcohol issues.

The current findings should be considered in the context of a number of limitations. First, beta-testing and the evaluation survey were conducted within a small sample, who were recruited via convenience sampling and therefore may not be representative of Australian teachers and parents more generally. Secondly, in order to evaluate the impact of *Positive Choices*, the extent to which *Positive Choices* users considered evidence-base was compared to a general sample of teachers. *Positive Choices* users were more likely to consider evidence-base, although this finding was not statistically significant, and we note the study is likely underpowered due to



small sample size. Furthermore, our research design does not allow us to infer causation as it may be that evidence-aware teachers are more likely to seek out a website like *Positive Choices*. To assess the impact of *Positive Choices* we also asked teachers to reflect on their teaching practices before and after using *Positive Choices*. Again, this methodology is not ideal as it relies on retrospection, which can introduce biases. These limitations are common to studies of research translation, reflecting the challenges in evaluating large scale efforts to roll out evidence-based approaches (Sax Institute, 2016). These limitations notwithstanding, this study contributes significantly to the education and drug prevention field. It provides a free and easily accessible resource database that allows teachers, parents and students to access alcohol and other drug information and prevention resources that have been reviewed to ensure quality and relevance. The *Positive Choices* development and evaluation process demonstrates a number of strengths, including the use of a co-development model, whereby end users were consulted during the formative design phase, development phase, beta-testing phase, and post-launch to determine the impact of the site on key outcomes. Development of *Positive Choices* was guided by the effective principles and components identified through recent systematic review (Lee et al., 2016). Our evaluation followed an established health promotion evaluation framework (the RE-AIM model), and drew on multiple sources of information including user self-report and objective use data from google analytics.

### **Conclusion and implications**

*Positive Choices* is a drug and alcohol prevention portal ([positivechoices.org.au](http://positivechoices.org.au)) that can be freely accessed by teachers, parents and students via the Internet. The portal provides access to over 114 drug prevention resources, all of which have been developed or reviewed by drug and/or education experts, and meet the *Positive Choices* inclusion criteria for relevance, quality and evidence-based. Although developed with the goal of increasing implementation of evidence-based drug education in Australian schools, the portal appeals to a broader audience and has already been accessed by over 11,000 users internationally, with a total reach of over 37,000 users to date. Beta-testing and post-launch evaluation with teachers and parents indicate that the site is highly useful, and has positively impacted on evidence-based practice in schools.

### **Acknowledgments**

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### **Disclosures**

Maree Teesson and Nicola Newton are two of the developers of the Climate Schools Programs and are the directors of CLIMATE SCHOOLS Pty Ltd, a company that distributes Climate Schools resources.

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## Mum's Diet and children's voice in health education

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### Abstract

This paper focuses on how children develop particular understandings about health and about their bodies through formal and informal learning processes. It will discuss findings from a two year long ethnographic study undertaken in Aotearoa New Zealand that explored how primary school aged children reproduce health messages. The study drew on Shilling's (2008) notion of corporeal perfection, referring to the 'ideal body', an image that is often cultivated as acceptable with children. This paper discusses opportunities that teachers have to reinforce messages about health during and following a health intervention called Healthy Homework. Findings from this doctoral research illustrate ways in which health programmes and resources overtly and inadvertently limit understandings of what it is to be healthy and what constitutes a healthy body. The reading book *Mum's Diet* (Cowley, 1987) provides a framework for discussion on children's understanding of health and healthy bodies. The findings illustrated that understandings of health can often be re-contextualised, resulting in children's voice being a reproduction of the cultural norms afforded them through their school and home environments.

### Introduction

This paper will discuss aspects from a recent Doctoral study of primary school children and their understanding and perceptions of body pedagogies through their experience of being involved in an intervention called Healthy Homework (HH). Healthy Homework aimed to integrate a school curriculum and eight week homework programme that teaches children to be active and eat well at home, culminating in both children and parents/caregivers being encouraged to eat nutritious food and lead an active lifestyle. The term body pedagogies is used to illustrate activity undertaken by children that enhances their understanding of their own and others' bodily existence. Evans, Rich, Davies and Allwood (2008) suggest body pedagogies refers to any conscious activity by people, organisations or the state that are designed to enhance individuals' understandings of their own and others' corporeality. Corporeality can be defined as the nature of the physical body aligned to traditional norms of body size, weight and scale (Cliff & Wright, 2010; De Pian, 2012). In using the term 'body pedagogies', the author acknowledges and emphasises that body pedagogies are socially and culturally situated, in that they reflect the prevailing corporeal orientations and health-related concerns of a given time (Cliff & Wright, 2010). This paper will highlight health discourses evident amongst children and provide an insight into how these and other messages about body pedagogies are reproduced through children's voice. The reading book *Mum's Diet* (Cowley, 1987) provides a framework for this discussion.

## Method

The context for this study was a decile<sup>1</sup> three multi-cultural primary school - Tuihana School (a pseudonym) in Auckland, Aotearoa New Zealand. The study was granted full ethical approval by AUT University ethics committee (AUTECH) and as the participants were children, consent from parents as well as assent from children were sought. Tuihana School was one of the ten Auckland schools participating in the HH programme, thus access to one class of year three/four (ages 7-9) children was granted for a period of up to two years by the Principal. Three children (Tara, Richie and Sarah) were randomly chosen for in-depth study, within the participant class (Room 22) of 24 students. Criterion sampling (Patton, 2002) where I had a set of prioritised criteria was applied. To select students, I picked all the cases that met the criteria, until I had reduced it to six students who filled all criteria descriptors. I then employed random purposeful sampling (Patton, 2002), whereby I asked my supervisor and a colleague to select three subjects randomly from the six presented to them. Richie, Sarah and Tara were thus selected as in-depth participants (one boy and two girls). The majority of this class stayed together over the two year period, however, they had four different teachers over that time. At the completion of the HH programme, during the first eight weeks of year one, there was a continued focus on health education across the whole school. The focus for the first year was 'Being Healthy', with a specific topic allocated for each term. The second year focus was 'Being Human', again with a different topic taught each term. Health education was taught in a variety of ways, either through specific lessons or integrated in other subject areas such as literacy. The whole school adopted the same topic each term, with each year level developing their own lessons. For example, in the second year of my study, the focus was 'Being Human', and the term three topic for whole school was 'human attributes'. A point of difference in this Doctoral study was the move away from a quantitative data gathering study of predominantly physical evidence (biomedical) to the gathering of children's voice data about how they feel about their bodies (perfection - shape, weight, size) and what they share about what their bodies can do (competency and performance). Importantly, young people's voices are rarely heard in educational research even though they are important to the education process and directly affect it (MacPhail, Kirk & Eley, 2007). Hence the research question, "*What are the children's perceptions and experiences of their bodies and their selves within the micro-culture of a school during and after a Healthy Homework (HH) intervention?*"

The study adopted an interpretivist methodology, with the researcher engaged as a participant observer within the class and school for one day per week over a two year period. Ethnographic research was chosen because in education it enlightens the social worlds that contribute to understanding behaviour, values and meanings of children within their cultural context (Walford, 2007). Undertaking an ethnographic study was preferable because of the gradual enculturation process that ethnography entails. This setting provided a rich environment to interpret and understand how children see their bodies and their selves. Field notes were collected as the primary data source and were analysed using thematic analysis (Miles & Huberman, 1994). NVivo software was used for coding with codes generated inductively. Pseudonyms were allocated to all the participants (including in-depth students, class participants and teachers). As a participant observer, the researcher adopted the position of a 'teacher aide'<sup>2</sup> in the classroom. Field notes acknowledge the complexity of this role, early in the study.

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1. Decile ranking is used by the New Zealand Ministry of Education to determine the school community's socio-economic status. This then influences funding from the government. The lower the decile, the more government funding is available, since it is deemed that the local community would not be able to contribute as much money in areas like student fees and financial support (donations) for the school.
  2. A 'teacher aide' is an adult who supports the teacher, focusing on children's learning in the classroom. This is different to a 'parent helper' who undertakes administration tasks in the classroom.

*I found it was not easy assimilating into their world in the classroom. I had to work hard at it in the first few months, but I was rewarded when one of the in-depth participants - Tara (early in my study) forgot that I was a researcher and thought of me as a 'teacher' helping out in the classroom. (Atkins, March, 2012)*

This acceptance demonstrated that I (the researcher) was able to gain the children's trust and enabled me to witness first-hand through observation, the subjective reality of the lived experience (Walford, 2008).

## Findings

Drawing on data gathered through being a participant observer, the findings of this Doctoral study presented a focus on the following themes: a culture of health; the productive and destructive discourses that influence understanding of health and the body; message systems, and the social construction of the body. In addition, findings revealed the subtle and complex ways in which schools and schooling shape children's understandings about health, food, activity, and their own and others' bodies and behaviours. Discourses of healthism and obesity were clearly associated with and embedded in children's thinking, understanding, actions and language. The concept of being 'healthy' was seldom espoused with any critical thought, suggesting that children were not exposed consistently enough to sociocultural pedagogy, nor did they apply critical thinking often within their school environment, despite this being an intention of the New Zealand Curriculum (Ministry of Education, 2007). A sociocultural pedagogy in this context is defined as being the process of knowledge reconstruction that interacts with the social and cultural interface between students and teachers (Murphy & Ivinson, 2003). This paper will draw on message systems as a theme which influences, reinforces and re-contextualises messages about health and the reproduction of these by children.

## Discussion

### *Health discourses in education - productive and destructive?*

Health discourses are constituted as regimes of truth and can impact on the identities of students and their understandings of health, their bodies and their selves (Atkins, 2015). Children in New Zealand schools primarily learn about the physical health of the body; its structure; its needs; and how to care and look after it, so as not to become ill or unwell (Burrows, 2008). This type of knowledge, which relies on a medicalised understanding of health, is what Tasker (2004) and Culpan (2004), the principal writers of Health and Physical Education in The New Zealand Curriculum (Ministry of Education, 1999), would suggest is a biomedicalised view of health that is often embedded in traditional health and physical education (HPE) pedagogy (Drummond & Pill, 2011; Jess, Keay & Carse, 2014). Shilling (2008) suggests knowledge about body management and health practices in schools is framed against the backdrop of a normative and highly partial vision of corporeal perfection. In New Zealand schools, health education programmes are designed to meet the needs of students and are expected to be guided by The New Zealand Curriculum (Ministry of Education, 2007). However, some curriculum programmes and interventions adopt health policy and 'health practices' where particular lives are portrayed that are repeatedly constructed as both healthy and desirable for all. A snapshot of some these health practices and discourses, and the understanding of these by children, along with the use of one resource *Mum's Diet*, will be discussed in this paper.

### *Healthism and obesity discourse*

Obesity discourse is based on the assumption that overweight bodies are unhealthy and in need of weight loss (Campos, 2004; Gard, 2011; Gard & Wright, 2005). Healthism is a set of assumptions based on the belief that health is solely an individual responsibility. Kirk (1992, 2006) suggests when considering obesity and other dominant biomedical discourses that are restrictive and sometimes harmful, that unintended outcomes for learners can result. This can occur through not examining the context in which these are prevalent and through the uncritical ideological assumptions made by proponents of obesity prevention policy and practices. The impact of such discourses was evident when children in this study relayed messages about having responsibility for the size, weight and shape of their bodies. For example:

*A girl student says “I am skinny.” I respond with, “Why did you say that?” Another student (boy) said to the girl “It is not good and you are not supposed to say that.” This was followed by yet another student (girl) adding “It is not right to say that.” (Field notes, June, 2013)*

As Rich and Evans (2005) suggest, obesity and healthism discourses are interrelated. It includes the predominant concept that the body is a machine and is influenced only by physical factors (Kirk & Colquhoun, 1989). Healthism fails to recognise the social, political, historical, economic, environmental and cultural influences and effects on one's personal health (Lee & MacDonald, 2010). Both discourses (obesity and healthism) individualise responsibility for one's own health (and body shape/size) and characterise the overweight or obese as lazy, self-indulgent and greedy. As Lee and Macdonald (2010) argue, it is therefore difficult to separate the discourses of obesity from healthism. Echoing previous research conducted in New Zealand schools by Burrows (2008, 2010), and more recently by Powell and Fitzpatrick (2015), the students in Room 22 frequently used words like 'skinny', 'strong' and 'fat' in describing bodies in relation to health.

Public predisposition and promotion around an 'obesity crisis' is justified within the healthism discourse as “individuals are deemed largely responsible for their own health and for making healthy choices” (Rich & Evans, 2005, p. 352). Body Mass Index (BMI), lauded by government ministers and obesity spokespeople is used as a key to monitoring a population's health status. In children it is an insufficient means to monitor weight as symptomatic of current or potential 'health' (Evans et al., 2008). Gard (2011) suggests that BMI makes no concessions for things like bone density or muscularity. He notes that BMI classifications perpetuate biomedical perceptions for children and older people, and are culturally skewed. Children in this study were influenced by a biomedical focus on health as they were tested and measured as part of the HH programme. Subsequently, they reiterated messages about the impact that obesity and fatness can have on their families. For instance, Tara's mother in an interview stated what Tara had said regarding her father:

*“I think that you could live longer, not be obese. She has said that about her dad, saying dad should not drink so much beer and eat more vegetables and he won't have such a big guts. She's quite funny.” (Interview, Tara's parent)*

In addition, Room 22 students reiterated the sentiments expressed by Burrows (2008), in relation to children relaying obesity discourse to their parents. One teacher made the following comment:

*I had heard some comments from a couple of parents that said "oh we were in the supermarket and Kelly goes no you can't, don't buy that Mum, buy this one" and you know just little things and that's from the parents. (Interview, Teacher LL)*

Parents, as well as children, viewed health from a corporeal perspective, with understandings based on an obesity discourse. The Principal stated:

*I have heard through parents of some body and size issues that are just making their children a bit sad. Umm, and wanting to have something done about it. Umm, the parents want to help them to change their body shape. Not necessarily how they are thinking, but that they have moved straight to the physical. Oh well let's do something about that, you know. (Interview, Principal)*

## Synthesis

### Message systems

Schools are a reflection of society. Bernstein (2000) states that there are three message systems that influence a school culture and shape children's learning - curriculum, pedagogy and assessment. These message systems reproduce knowledge and influence health outcomes for children. Indeed, Bernstein (1986, cited in Kirk & Colquhoun, 1989) desired researchers to find out how institutions (in particular schools) articulate a variety of discourses through meaningful production and as selective agencies of reproduction. This construction and reproduction of social identities and cultural categories of embodiment was reflected through curricula in the name of 'health education' in the research undertaken at Tuihana School.

Discourses of healthism and obesity were associated with and embedded in children's thinking, understanding, actions and language. In this study the concept of being 'healthy' was seldom espoused with any critical thought, suggesting that children were not exposed consistently enough to sociocultural and critical pedagogy within their school environment. This was in contrast to the intention of the New Zealand Curriculum (Ministry of Education, 2007). Indeed, teachers with the best intentions promulgated popular beliefs about health, linking fitness, fatness and food as indicators of well-being. This research found that teachers continue to uncritically accept the dominant obesity and healthism discourses. This is despite findings by academics who challenge and call for teachers (such as health and physical educators) to examine their practices and curricula that reproduce social meanings for students that in turn perpetuate such negative body discourses (Alfrey & Brown, 2013; Burrows, Wright & McCormack, 2009; Cliff & Wright, 2010; Evans et al., 2008; Lee & Macdonald, 2010; McCuaig & Tinning, 2010; Quennerstedt & Ohman, 2014).

Messages about health and the body have been included in school health education and intervention programmes like HH for decades (Kirk, 2006; Tasker, 2004). Powell and Fitzpatrick (2015) suggest, however, that only in the last decade have such school interventions been so explicitly focused on children's body size and weight, using food and nutrition as their medium. Wright (2004) suggests that children connect the three "f's (fitness, fatness and food) with society's expectation on what health and body image should be. Findings in this study illustrated that Tuihana students reinforced the connections between these 'f's' and equated them to health. They did not appear to challenge assumptions about health, nor were they actively encouraged to do so by their teacher, or parents. Children participated in discussions, but in doing so they often reiterated what they thought the adults around them wanted to hear. For instance, even though children did not always like cross country running (as observed from



their body language when the teachers talked about cross country), they overtly indicated that they did like cross country running because somehow they have got the message that it is supposed to be 'good' for them.

This study found at times that this limited understanding of what it is to be healthy and what constitutes a healthy body were prevalent, with the dominant discourse of obesity and healthism being the main influence on children's learning. This learning overtly and covertly limits children's understanding and illustrates messages that are reinforced and often re-contextualised within the classroom and in the school environment. For example, when asked about being 'healthy' children responded:

*Never eat sweets and do not take drugs, eat veges (sic) and exercise, do not share food. (Richie)*

*Sarah responded with "Drinks milk, makes us strong, strong bones, not smoking, drinking water."*

*Others in the group added "Getting fit, Fitness, Reading using your brain. (Field notes, April, 2013).*

#### *Children's voice*

Children's involvement in social research can be valuable in informing policy and practice. In this study, children's voice was often a reproduction of the cultural norms afforded them. These usually came from their peers, school and home environments. Researchers explain that messages that influence our understanding of the body, food and fatness are often promulgated in the popular media (Azzarito, 2009; Evans et al., 2008; Rich, 2010). It was therefore not surprising to find the children in Room 22 espousing a 'truth' that eating good 'healthy food' and doing regular exercise will keep you healthy (free from illness) and prevent you from becoming fat. Fitness as exercise, and fitness for physical activity, were prominent in the actions of students and teachers at Tuihana School, in both structured and unstructured play. A group of students were discussing fitness:

*Richie said, "For fitness we run around the field and do star jumps." I then said "really – why?" One student responded "Because it helps your blood. It gets blood around your body to get your heart going." From this discussion Richie then said "Fitness is good and healthy. You need to stay fit". I asked "What do fit people look like?" He responds with "skinny" and another student adds to this saying "they look strong." (Field notes, June, 2013)*

This objectifying of the body as skinny or strong as Richie described above, is a corporeal entity associated with 'being healthy' and is an image that is suggested as being prevalent amongst children (Burrows, 2010; Quennerstedt, Burrows & Maivorsdotter, 2010; Wright, Burrows & Rich, 2012).

#### *Corporeal perfection and body-centred modalities*

Corporeal perfection refers to the 'ideal body', an image that is often cultivated as acceptable with children. Keeping messages about health simple is symptomatic of a number of health interventions that have been examined in primary schools both in New Zealand and in other Western countries such as Denmark, Sweden, Australia and the United Kingdom (Quennerstedt

et al., 2010; Svendsen, 2014; Webb, Quennerstedt & Ohman, 2008; Wright et al., 2012). Such interventions that use the energy-in, energy-out balance and the good-food, bad-food messages exemplify limited understanding of the discourse on obesity and childhood health. An example from one teacher (in a classroom of 7-9 year old children), while working on abstract nouns in an English lesson, said:

*“Who looks after their health in this room?” (I noted that only eight students put up their hands.) She went on to ask “Who eats lots of fish and chips for health?” (No one put up their hands.) She then responded with “Oh, I am pleased you know that!” The class continued to work and one student then said “That means lots of calories.” Another responded with “That is not good for your health.” (Field notes, 2013)*

Whilst the children were taking ownership for their understanding of health, as highlighted above, this example indicates that there is a lack of justification for making an argument for or against the judgements, either from the teacher or from the students. The subject of health education on the other hand affords one to challenge assumptions and consider social and cultural norms. In this example above, the teacher did not take up the opportunity to probe deeper or open up the conversation for further critical discussion.

Surveillance, popular statements about obesity and health and the reinforcement of repressive actions as demonstrated through some health practices, programmes and resources, reinforce the power that regulates and controls school populations (Bernstein, 2000). The reading book *Mum's Diet* (Cowley, 1987) was one such resource used in the classroom during this study. This school reader is as problematic as it sounds. It is full of weight obsession, crash dieting and body shaming. It is written by a prominent New Zealand children's author and promoted as a reader suitable for use in the junior to middle primary levels of school (6-9 year olds) in Australasia and the United States of America. Further examination of this and the children's understanding of the messages it entails, are discussed below.

#### *Reproducing cultural norms – Mum's Diet*

Children are expected to use critical thinking to view issues from perspectives outside of their own social construct (Ministry of Education, 1999, 2007). However, this requires teachers to use strategies that model, encourage and address health issues within their classroom programmes in order to develop critical thinking skills. The reading book *Mum's Diet* (Cowley, 1987) was used during the second year of the study. It was read to the children by the teacher whilst they sat on the mat, as part of a literacy lesson. The book tells the story of a family whose parents are separated (Mum, Dad and three children) and the angst that the children go through because their mother goes on a diet and has different food in her home compared to their father's home. The mother in the story states that she is too heavy and puts herself and her children on a diet of tomatoes and lettuce one day and parsley, carrots and broiled fish the next. The children would rather have their favourite meal, spaghetti. The book shows a fridge full of food at their father's house and when they tell their Dad what they have been having for dinner the previous days, he mocks the children's mother for dieting yet again. The story continues with the mother getting on the scales each morning and feeling despondent. Finally, the children come home from school to their mother's house and Mum has stopped her diet and cooked spaghetti for everyone. The children are happy and hug their 'cuddly' Mum. This book promulgates messages about weight obsession, crash dieting, body shaming and 'good' and 'bad' food. The story normalises dieting and uses language that reinforces society's obsession with body weight. For example:

*Every morning Mum got on the scales. "I'm still too fat!" she would say. "And we would always say, "No you are not, Mum. You're just right." (Cowley, 1987, p. 12).*

The storyline portrays an unhappy atmosphere when the children are at Mum's house eating healthy food, compared to Dad's where the pictures in the book depict happy faces looking at a range of food in the fridge. At the end of the book, Mum decides to ditch (stop) the diet and reverts back to normal food, making herself and everyone else, happy.

In Room 22 the focus of this literacy lesson was for the children to summarise the plot, in their own words. Interestingly almost all of the children reiterated the actions of the characters and the storyline of the book. At no stage did the teacher explore any of the health issues or concepts underpinning the storyline. When the researcher discussed the book with one of the study's in-depth participants (Richie), he failed to think critically about the messages the book was portraying, shrugging his shoulders when asked what the story was saying about food and why did he think the mother was unhappy. He did not register that there could be an expectation for mothers to have an ideal body size, nor did he comment on the types of food mentioned; instead he made reference to the actual story itself and relayed the plot as stated in the book. It was surprising that Richie had not reacted to the messages about food or diet, as over the year he had demonstrated an interest in what he was eating and in bodily awareness. For example, in one health lesson one group (that included Richie) were asked to depict a 'healthy person'. Richie and some of the other Room 22 boys reinforced strong messages about corporeality and bodily perfection by creating a picture of a male robotic body with six pack abdominals and defined muscles. In the lesson using the reader *Mum's Diet*, the teacher did not explore any of the underlying health messages inherent in the book, reinforcing to the researcher that both the teacher and Richie (and possibly other children) were accepting of the social constructs and cultural norms afforded them.

## Summary

The cultural production and reproduction of health discourses in school classrooms are a reflection of societal norms (Bernstein, 2000). At Tuihana School there was evidence through curricula, pedagogy and assessment of the normalising and accepting of social constructs of health that foster regimes of obesity and healthism. A focus on the body was reinforced when the book *Mum's Diet* (Cowley, 1987) was used in the Room 22 classroom. Invariably this and other health messages espoused by the children reinforced the concept of corporeality. Research suggests that it was difficult and complex for some of the primary generalist teachers in the study to grasp and implement multiple health concepts and broader educational policies and initiatives simultaneously (Atkins, 2015; Penney, Petrie & Fellows, 2015; Petrie, 2012). Instead, a simplistic popular health discourse such as obesity was replicated and a pedagogy of healthism was adopted. When health was integrated into other subjects, a degree of criticality was lost on some teachers. The discourses they mobilised were a result of the influence of obesity discourse, thereby providing potentially dangerous messages and repercussions for young people. Corporeal perfection and the 'ideal body' were concepts that were cultivated as being acceptable.

Learning in health related contexts enables children to develop their understanding of the factors that influence the health of individuals, groups and society (Ministry of Education, 2007). However, as discussed in this paper, children in Room 22 often just reproduced societal health messages – mainly corporeal in nature, and their teachers did not challenge the assumptions that went with some of the discourse around health. Instead, attributes of healthism and other discourses like obesity pervaded the classroom and school community, providing a reminder

that education systems need to encourage young people to adopt a critical pedagogy when considering their health and their bodies. Furthermore, by encouraging children to think critically through disrupting and dissecting the values and social connotations of traditional norms of body size, weight and scale, health education classrooms could be transformed to better reflect realistic bodies. In particular, there is a need to recognise the over-generalisation of blame on bad food, bad parenting and the responsibility on individuals for healthy living, which the obesity discourse and books like *Mum's Diet* project.

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## Pedometer step guidelines for physical education settings

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### Abstract

The role of Physical Education (PE) in Australia is multifaceted, with physical activity (PA) participation recognised as the means by which a variety of learning outcomes are achieved. There is evidence to suggest that PA accrued during PE has the potential to be health enhancing. It may also be the only opportunity for some children, especially those from low socio-economic backgrounds to accrue PA. This paper identifies criterion-referenced pedometer step guidelines as a valid, reliable, unobtrusive, and cost-effective means by which PA can be objectively quantified in PE settings. With the current state of the Health and Physical Education national curriculum area in focus, the application of pedometer step guidelines in PE settings are outlined.

### Introduction: Physical activity and the curriculum

The Australian Curriculum for Health and Physical Education (ACHPE) suggests that Physical Education (PE) should be a foundation for lifelong physical activity (PA) participation. It also recommends appreciation of the significance of PA in society locally and globally (Australian Curriculum, Assessment and Reporting Authority, 2014). Brooker and Clennet (2005) suggested that although government and public expectations of PE to realise PA participation outcomes has served to narrow the scope of health and PE, few would argue that PA participation is not inherent to Australian PE. The Australian Council for Health, Physical Education and Recreation (ACHPER) (2009) acknowledge this position in a statement that is intended to inform the development of the Australian Health and Physical Education (HPE) Curriculum:

*Contexts of physical activity and sport are therefore central to HPE (ACHPER, 2009, p. 3-4) [...] “Students should be provided with HPE learning experiences that will enable them to” (ACHPER, 2009, p. 5-6).*

Although PA participation is recognised as the means by which PE learning outcomes can be realised and that PA appreciation and participation beyond the PE setting “now and in the future” is a goal rather than PE’s primary statement of learning content, PA is intrinsic to Australian PE contextually and pedagogically.



### Physical activity in physical education

Several studies have shown that PA accrued in PE settings is associated with improved health outcomes in children and adolescents weight status (Datar & Sturm, 2004; Sollerhed & Ejlertsson, 2008; Wardle, Brodersen & Boniface, 2007) bone health (Weeks, Young & Beck, 2008) and blood pressure (Mc Murray et al., 2002). Some evidence also indicates that engagement in PE during childhood is associated with long-term positive effects on PA level, attitudes toward PA, and perceptions of barriers to PA during adulthood. Additionally, review papers have identified associations between curricular-PA or PE and academic performance. The contribution PE-based PA makes in relation to total daily PA levels or meeting Moderate to Vigorous Physical Activity (MVPA) recommendations is potentially considerable. Upper primary and lower secondary school students have been found to acquire approximately 11- 33% of daily MVPA during PE lessons (Fairclough & Stratton, 2005; Wickel & Eisenmann, 2007). In relation to total daily PA levels, children aged 11-13 years have been found to accumulate 15.6%– 23.7% (boys) and 14.9%-17.2% (girls) of total daily pedometer step counts during PE lessons 45-50 minutes in duration (Flohr, Todd & Tudor-Locke, 2006; Reed, Metzker & Phillips, 2004). Smaller step contributions (boys = 8.7%, girls = 11.4%) have been found for 30-minute PE classes among children of a similar age (boys = 8.7%, girls = 11.4%) (Tudor-Locke, Lee, Morgan, Beighle & Pangrazi, 2006). There is some indication that children who are among the least active of their peers on most school days are likely to gain greater proportional increases (+18%) in PA from school days with PE compared to children who are consistently more active (+9-13%) (Morgan, Beighle & Pangrazi, 2007). For the school day, PE has been identified as being the largest contributor of PA (as measured via pedometers) for girls (14.3%) and the second largest for boys (12.7%) behind lunchtime (Brusseau et al., 2011).

Despite the potential health, academic and lifelong engagement benefits of PA in PE settings, a specific PA duration & intensity guideline has not been recommended in Australian PE curricula, or developed by a professional organisation. Outside Australia, PA time guidelines that relate to PE settings exist. For example, United States (US) guidelines recommend that adolescents (grades 7-12) spend 50% of PE class time engaged in PA (Physical Activity Guidelines Advisory Committee, 2008). A separate guideline developed by the American Heart Association recommends that all school children and youth should engage in at least 30 minutes of MVPA during school hours (including PE class time) per day (Pate et al., 2006). Presently, no other PA time guidelines specific to PE settings have been developed.

### Measuring physical activity in physical education settings (pedometry)

A variety of PA measurement methods and instruments are used by researchers and practitioners to measure PA type, duration, intensity and frequency (Welk, 2002). Each method can be classified into a validity/reliability hierarchy containing three categories. These are criterion, objective and subjective PA measures (Sirard & Pate, 2001). Criterion measures are considered the most accurate assessment method and are often used to validate the ability of objective and subjective instruments in measuring PA (Welk, 2002). Each measure possesses strengths and limitations underpinned by its feasibility, reliability and validity in PA contexts.

Pedometry and the direct observation instrument, the System for Observing Fitness Instruction Time (SOFIT) have been used widely to measure PE-based PA for research purposes, though both measures pose limitations. For example although pedometry is cost-effective (Welk, 2002) it is unable to assess intensity, frequency, and duration of PA (Corder, Ekelund, Steele, Wareham & Brage, 2008). Conversely, while SOFIT has been proven to be valid and reliable (McClain, Abraham, Brusseau & Tudor-Locke, 2008) in measuring PE-based PA, the direct observation method itself is time intensive with regard to collecting data and training

observers (Welk, 2002). Criterion referenced pedometer steps/min scores that are associated with various levels of PA provide an objective and validated option for measuring PA in PE. Therefore, they may be helpful as a practical, valid and reliable means by which PA levels can be measured in PE settings for research purposes. They may also be used as a reference point by which the effectiveness of PE programs can be assessed in terms of their ability to engage students in PA.

Three mechanism types are available for electronic pedometers including spring-levered, those that contain a magnetic reed proximity switch and piezo-electric models. The piezo-electric mechanism has been identified as possessing superior step-counting accuracy among children, undercounting steps -0.2% - 4.2% compared to spring-levered designs which have shown accuracy discrepancies upwards of 25% (Nakae, Oshima, & Ishii, 2008). Accuracy differences are particularly pronounced at slower walking speeds, likely due to the vertical acceleration forces produced during slower speeds falling short of the 0.35g of force needed in order for steps to be registered in spring-levered models (Duncan, Schofield, Duncan, & Hinckson, 2007).

### **Pedometer steps per minute guidelines in physical education settings**

While raw pedometer step counts do not provide information on PA intensity, frequency, or duration (Corder et al., 2008) six studies have developed pedometer steps/min intervals criterion-referenced by the direct observation instrument SOFIT, that equate to spending one third to a half of PE class time engaged in MVPA. The one third guideline was adapted from the Centre for Disease Control and Prevention and the Council for Physical Education and Children (cited in Scruggs, 2007a) who stipulated that students in the United States in grades K-6 should spend a significant proportion of PE lesson time engaged in PA. The United States Department for Health and Human Services recommendation that students in grades 7-12 spend 50% of PE class time engaged in PA (US Department of Health and Human Services, 2009). For the one third MVPA criteria, similar pedometer steps/min intervals were found across four studies ranging from 60.8-65.0, mainly among primary children aged between 6.9 and 13.8 years old (Scruggs et al., 2003, Scruggs, Beveridge, Watson, & Clocksin, 2005, Scruggs 2007b, Scruggs 2013b). For spending half of PE class time engaged in MVPA as recommended by The United States Department for Health and Human Services (2009), two studies found greater steps/min ranging from 79.1-88.0 for youth aged 12.5-15.5 years (Scruggs 2007a & Scruggs, Mungen & Oh, 2010). A follow up study sought to identify optimal steps/min intervals for both 33.33% and 50% MVPA criteria from combined data sets from previous research (Scruggs, 2013b). The findings of the study indicated that it was possible for common steps/min intervals to be set for students in 1<sup>st</sup> through to 12<sup>th</sup> grade Physical Education (United States). Steps/min intervals of 59.5-61.8 and 82.5-88.1 were identified for the 33.33% and 50% MVPA criteria respectively (Scruggs, 2007a; 2007b; 2013a; 2013b; & Scruggs et al., 2010).

The present study aimed to expand upon previous research by assessing external validity of previously developed pedometer steps/min intervals and identify those most accurate for invasion sport games in lower PE grade settings. Invasion sports were considered to be land-based games that require students to maintain possession of a ball by passing, receiving and supporting (Griffin & Butler, 2005). The PE lesson context was delimited to those scheduled for 30-45 minutes, mixed gender, and involved netball gameplay. The piezo-electric New Lifestyles NL-1000 pedometer was used in this study. The NL-1000 has shown promise for research applications in being considerably more accurate in counting steps amongst youth (Nakae et al., 2008) and adults (Clemes, O'Connell, Rogan, & Griffiths, 2010) compared to

spring-levered pedometers, particularly at slower walking speeds. Because no PE specific PA guidelines exist in Australia that relate to intensity, both the 33.33% and 50% of PE class time spent in MVPA recommendations were quantified in the present study.

## Methods

A correlational explanatory/prediction design was applied. The explanatory aspect relates to determining the strength of the relationship between pedometry and time spent in MVPA correlate. The prediction aspect relates to cross-validating previously established pedometer steps/min intervals for primary and secondary school students to the present study and identifying which steps/min score best predicts lower secondary school students as meeting recommendations of spending one third to a half of PE class time engaged in MVPA.

Participants ( $n = 37$ ) were adolescent males ( $n = 15$ ) and females ( $n = 22$ ) aged between 12-14 years ( $M = 14.1$ ,  $SD = 0.6$  y.) undertaking PE at one of two South Australian independent secondary schools selected for the study. Participants were in school year levels 8 ( $n = 26$ ,  $M = 13.9$ ,  $SD = 0.4$  y) or 9 ( $n = 11$ ,  $M = 14.8$  y,  $SD = 0.5$  y).

At the time the data collection occurred, the lower secondary co-educational PE class groups were involved in an 'invasion' sport unit. To enable assessment of the effectiveness of steps/min cut points to accurately classify PA levels of boys and girls, co-educational class groups were sought as PA differences have been noted on the basis of gender in PE settings (Scruggs, 2007b). Class duration (i.e. active teaching between teacher and students) was between 25 and 27 minutes in duration. Non-probability convenience sampling was applied. Although a representative sample (with respect to potentially influencing factors such as height and weight) was not acquired, lower secondary PE students were not sampled on any specific characteristic (i.e. schools randomly allocated students into PE classes at these grade levels). Hence, pedometer steps/min scores are still likely to be valid in lower secondary PE contexts similar to that of the present study.

The direct observation instrument SOFIT was used as the PA measure for this study. The original SOFIT version requires observers to observe a single participant for 10 seconds and manually record codes that represent observations for PA behaviour, lesson context, and teacher behaviour in another 10 second interval. This version of SOFIT was adapted for the purposes of this study. Firstly, only PA behaviour data were recorded to meet study objectives. PA duration data was collected for lying, sitting, standing, walking, and vigorous PA behaviours as per the original SOFIT version (McKenzie, 2009). Walking is considered a moderate PA behaviour whilst vigorous behaviours are those that require more energy to be expelled than what would be required for ordinary walking (i.e. jogging and jumping) (McKenzie, 2009).

SOFIT was also combined with the computer program Dartfish which allowed for data on PA duration to be coded on a continuous basis via a stopwatch button system. Four video cameras were strategically positioned to video record the PE lessons. Video footage was then uploaded into the Dartfish computer program. Within Dartfish, SOFIT PA behaviour categories were allocated to a computer keyboard key (e.g. walking = # 1, vigorous PA = #2). Retrospective, continuous observation analysis allowed for total time spent in PA behaviour categories to be more accurately determined as opposed to the 10 second observe/record intervals.

Statistical analysis was performed using IBM SPSS Statistics 18.0.2. Three primary statistical tests were undertaken on collated data to address the proposed research objectives. Given the focus of this paper for practitioners, these tests and their results are synthesised into the discussion section of this paper. This study was approved by Flinders University Social and

Behavioural Research Ethics Committee in 2010. The project was given final approval following school (site) research approval. This study's narrow delimitations (i.e. lower secondary school students participating in netball games) and small sample size limits the generalisability of identified steps/min intervals. A strength of the study was the synthesis of SOFIT with a duration recording computer program (Dartfish). Specifically, duration recording allowed for observed PA behaviours to be recorded continuously rather than within 10 second observe/record intervals.

## Results and discussion

A primary objective of this study was to correlate PA measures of pedometer steps/min and directly observed MVPA. Pedometer steps/min was found to have a strong and statistically significant correlation with %MVPA time ( $r = 0.82$ ,  $p < 0.001$ ;  $n = 37$ ). This finding is consistent with previous research on the topic in which similarly high correlations ranging from  $r = 0.74 - 0.99$  ( $p \leq 0.05$ ) were identified with six of eight coefficients being  $r = 0.80$ . Physical Educators can therefore be confident in using pedometers to assess PA levels over time or compare groups of students of similar age and anthropometrical characteristics.

Known factors impacting upon pedometer accuracy, were considered in the study design which may have contributed to the strength of the relationship between pedometry and directly observed MVPA. These included the placement of pedometers at the anterior midline of the right thigh as recommended (Horvath, Taylor, Marsh, & Kriellaars, 2007) and the use of piezo-electric pedometers which have demonstrated superior step counting accuracy compared to other mechanism types. In particular, piezo-electric pedometry has demonstrated accuracy at slower gait speeds (i.e. walking) compared to those of a spring-levered design (Nakae et al., 2008). This may have been significant given that participants spent a significant amount of time in moderate activity which included light walking movements during netball gameplay (41.4%). The use of elastic waist-bands to secure pedometers in an upright position may have also helped to reduce pedometer tilt angle which may result in undercounting of steps due to the nature of the counting mechanism within pedometers (Nakae et al., 2008).

## Diagnostic efficiency of pedometer step per minute guidelines

### *Pedometer step per minute guidelines corresponding to spending one third of PE lesson time in MVPA*

An interval of 52-64 steps/min was found to correspond to spending one third of PE class time engaged in MVPA for this study. Sensitivity and specificity for 52-64 steps/min was high, ranging from 0.91-1.00 indicating a high probability of correctly classifying participant compliance and non-compliance for this MVPA criteria. This interval classified 0.91%-100% of cases correctly in relation to meeting the 33.33% MVPA criteria. A linear regression equation found a similar result at 58 steps/min to predict 33.33% MVPA time. Four previous studies identified similar steps/min intervals with 58-65 steps/min among samples ranging from  $M = 6.9-13.8$  years (Scruggs et al., 2003; 2005; 2007b) compared to  $M = 14.1$  years in the present study. Scruggs (2013b) analysed data from previous studies for the 33.33% MVPA criteria and identified 59.5-61.8 steps/min as being optimal for children in 1<sup>st</sup> to 7<sup>th</sup> grade PE (mean age for samples ranged from 6.9-13.8 years). The lower limit of the 52 steps/min found in the present study likely fell short of Scruggs' lower limit of 59.5 steps/min due to the small sample size and high compliance in meeting the 33.33% MVPA criteria.

Although the present study focused on the team-based invasion sport of netball gameplay only, the studies by Scruggs and colleagues relating to the 33.33% MVPA criteria involved a variety of activities that required a significant amount of movement that is non-bipedal in

nature. This would have increased variability relating to compliance and non-compliance with MVPA criteria (i.e. sensitivity and specificity). These activities included archery, hoola-hoop exploration, ball gymnastics, rope courses, stunts, tumbling & fitness stations (Scruggs et al., 2003; 2005).

*Pedometer step per minute guidelines corresponding to spending 50% of physical education lesson time in moderate to vigorous physical activity*

As may be expected, a greater interval in 73-76 steps/min was identified from sensitivity and specificity statistics as being diagnostically efficient in corresponding to 50% of PE class time engaged in MVPA. Linear regression produced a similar steps/min score of 72. The 73-76 steps/min interval classified 86.48% - 94.59% of participants as correctly meeting or not meeting the 50% MVPA recommendation. However, previously established steps/min scores did not align with these results. Scruggs found greater steps/min intervals for the 50% MVPA recommendation of 79-86 among participants of a similar age (12.9 – 13.8 years in Scruggs 2007a & Scruggs 2013b). A higher steps/min interval of 80-88 steps/min was found in another study among older participants (16.5 years in Scruggs et al., 2010). It is unclear what may account for the difference in steps/min intervals identified between the present study and Scruggs' research. Given the focus of the PE lessons being entirely on netball gameplay, higher steps/min scores may be expected. One possibility is that the high levels of compliance in meeting the 50% MVPA guideline (i.e. 78.4%) meant that fewer false positive classifications were made (i.e. specificity). With reduced false positive classifications, specificity values would hold a higher value at lower steps/min intervals, thus influencing the selection of optimal steps/min guidelines.

Sensitivity and specificity values for 73-76 steps/min in the present study (0.86-0.89) were lower than that achieved for 79-86 steps/min ( $\geq 93.66-98.59$ ) identified in Scruggs' 2013b study, which analysed data for the 50% MVPA criteria from previous research. Scruggs 79-86 steps/min interval classified 91.11% - 96.89% of participants correctly within the studies from which they were identified (Scruggs et al., 2007a; 2010), but only classified 48.64% - 78.37% of participants in this study correctly in meeting the 50% MVPA recommendation. This finding presents several points of interest. This difference in classification accuracy may be due to the present study focusing on netball gameplay only, whereas lesson themes in Scruggs' studies were highly diverse ranging from individual sports (i.e. archery), activities that contained a significant non-bipedal component (i.e. gymnastics, rope courses and tumbling) in addition to some invasion based team-sports (i.e. flag football, lacrosse, ultimate frisbee, and basketball). This may indicate that steps/min scores should not be applied outside the context from which they are developed (i.e. if Scruggs steps/min scores were applied to netball gameplay only, classification accuracy may be low - 48.64% - 78.37%, as indicated in the present study). Pedometer steps/min guidelines in general may be more appropriate for large scale monitoring of PA levels across multiple lessons. Future studies with sufficiently large sample sizes should be undertaken to assess the reliability of identified pedometer steps/min intervals to assess the influence PA type and lesson composition (i.e. teacher instruction, skill drills, gameplay) has on the reliability of steps/min intervals in predicting %MVPA time. For the physical educator, it may be more appropriate to have steps/min guidelines sets for activity categories (e.g. invasion sports, net/wall games, target games). Despite comparatively moderate sensitivity and specificity levels for 73-76 steps/min in this study, overall diagnostic efficiency was high with AUC = 0.90. Scruggs found greater AUC values of  $\geq 0.97$  (Scruggs, 2007a; Scruggs et al., 2010; Scruggs, 2013b) in relation to the same MVPA recommendation. For the studies that quantified 50% MVPA, mean PE lesson time was greater ( $33.2 \pm 3.01$  min, Scruggs, 2007a;  $49.69 \pm 19.77$  min in Scruggs et al., 2010;  $38.23 \pm 16.36$  min in Scruggs, 2013a) compared to the present study ( $26.3 \pm 3.5$  minutes).

The application of a piezo-electric pedometer was a strength of the present study given its superior step counting accuracy compared to spring-levered models (Nakae et al., 2008) and resilience to inaccuracy associated with pedometer tilt (Crouter, Schneider & Bassett, 2005). The application of the direct observation instrument SOFIT as the comparative measure was also a strength given its established validity against accelerometry and indirect calorimetry (Honas et al., 2008) in PE settings. Moreover, the synthesis of SOFIT with a duration recording computer program (Dartfish) meant a more rigorous approach could be taken in assessing pedometer validity. Specifically, duration recording allowed for observed PA behaviours to be recorded continuously rather than within 10 second observe/record intervals. In the latter, the assumption is made that what is seen during the observe interval characterises behaviour occurring during the record interval. Although SOFIT was designed to record data in real-time whereby observers manually record behaviours from several participants to capture group PA levels, retrospective analysis via recorded video footage was employed. This meant that each participant's PA behaviour was able to be analysed for PE lessons in their entirety, allowing for a more accurate assessment of the relationship between PA measures. Additionally, recorded video footage was reviewed at half-speed so that recorded PA behaviours could be more accurately coded with respect to duration.

### **Conclusion**

As PA is a central focal point by which learning outcomes are realised in the Australian HPE Curriculum (ACARA, 2014), the application in which pedometer may be used to assess PA levels will vary depending on the needs and structure of school PE programs.

We have suggested that a pedometer PA guideline will encourage the development of school and community based PA programs for young Australians (Trost, 2005) and PE as an opportunity for children and adolescents to accrue MPVA towards meeting this PA guideline. PA participation is not an independent objective of PE in itself but the means by which a variety of learning objectives are achieved. While PA participation is one facet of PE, for some children particularly those from low socio-economic backgrounds school PE may be the only setting in which MVPA is accrued and important generalisable movement skills developed (McKenzie, 2010).

The strong correlation between pedometer steps/min and %MVPA time in this study align with Scruggs' research to support pedometer steps/min as an accurate indicator of %MVPA time for young people in PE settings. Physical Educators can therefore be confident in using pedometer as a valid indicator of student PA levels. An interval of 52-64 was found to be diagnostically efficient in quantifying 33.33% MVPA among lower secondary PE students aged 12-14 years. This was similar to previous studies that collectively found 58-65 steps/min among youth aged 6.9-13.8 years (Scruggs et al., 2003; 2005). A steps/min interval of 73-76 corresponding to 50% MVPA did not align with previous research previously identified 79-86 among youth of a similar age and older (12.9 - 16.5 years in Scruggs 2007a; Scruggs et al., 2010 & Scruggs 2013b). The findings of this study support 55-64 but not 79-86 steps/min in quantifying 33.33% and 50% of PE lesson time, respectively as previously discussed.

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