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Perceived Social-Ecological Barriers of Generalist Pre-Service Teachers towards Teaching Physical Education: Findings from the GET-PE study

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Abstract: Identifying and understanding the perceptions of pre-service teachers (PSTs) is vital to informing teaching practices. The purpose of the 'Generalist Entry into Teaching Physical Education' (GET-PE) study was to investigate Australian generalist PSTs' perceptions of the barriers to teaching physical education (PE) classes. A social-ecological model framework (SEM) was uniquely applied as the conceptual framework for the GET-PE study to analyse, explore and understand the multiple levels of barriers perceived by the generalist PSTs. A myriad of SEM level barriers were perceived by the generalist PSTs (n=71) at the intrapersonal level (knowledge gaps, physical abilities, reduced confidence), interpersonal level (community influence, concentration/focus of students, inclusive teaching, misbehaviour, modelling effective practice, motivation of students), physical environment level (technology/screen time, weather) and policy levels (balancing content, professional development opportunities, recognition of PE, work-life balance). With mounting demands on schools, PSTs must continually improve preparation and readiness for teaching practical subjects such as PE. By developing multi-level SEM insight from the GET-PE study into the barriers for generalist PSTs to teaching PE, teacher education programs can reflect upon the socialisation processes for PSTs and facilitate learning environments that meet the needs of our future teachers.

Introduction

Identifying and understanding the perceptions and beliefs of pre-service teachers (PSTs) is vital to informing teaching practices (Tsangaridou, 2012; Hyndman, 2014; Hyndman & Pill, 2016). Despite this importance and a host of research into the barriers to in-service physical education (PE) teachers, there has been an absence of research exploring Australian generalist (classroom) primary PSTs' perceptions of their future roles as facilitators of PE (McMahon & Dinan Thompson, 2014; Haynes, Miller, & Varea, 2016). It is widely reported that PE is largely taught by generalist primary school teachers and many primary school teachers require improved skills and preparation to teach PE (Graber, Locke, Lambdin, & Solmon, 2008; McKenzie & Kahan, 2008). In Australian primary schools, it has been revealed that almost 40% of those teaching Health and Physical Education (HPE) are not a qualified HPE specialist, yet can be responsible for part or all of the HPE learning area (Lynch, 2013). In-service primary school teachers have been reported to lack foundation PE knowledge, pedagogical capabilities, professional development opportunities and can exhibit reduced confidence in teaching PE (Graber et al., 2008; McKenzie & Kahan, 2008). The experiences and knowledge learned during physical education teacher education (PETE)

programs influence the abilities to teach PE and effectiveness as a PE teacher (Tsangaridou, 2008). In order to improve the profession of PE and quality of PE emerging in primary school settings, research needs to be conducted based around PETE (Siedentop, Housner, Metzler, Schempp, & Templin, 2009).

The Social-Ecological Model (SEM) Approach

Historically, social-ecological models (SEMs) have been formed from psychological and public health disciplines (Wattchow et al., 2013). The term ‘ecological psychology’ was first described in 1936 by Lewin to explore ‘outside’ influences such as an environment or culture on an individual. Bronfenbrenner (1979) developed this work further to illustrate that multi-level systems exist that can influence behaviour. Since the work of Bronfenbrenner a range of social-ecological model frameworks have been formulated to understand human behaviour and experiences within the contexts of physical education, health education, outdoor education and coaching (Wattchow et al., 2013). The barriers to teaching PE for generalist PSTs can be partly explained by the SEM framework which can be used to provide a conceptual framework to analyse, explore and understand the multiple factors that influence teacher behaviours at the intrapersonal (individual), interpersonal (social), physical environment and policy levels (Elder et al., 2007; Hyndman, Benson, & Telford, 2014; Whittle, Telford, & Benson, 2015). The intrapersonal level consists of genetic characteristics, psychological influences (Stokols, 1992), learning histories (Hovell et al. 2009), behaviours, intentions and expectations (Glass and McAtee 2006). The interpersonal level consists of socio-cultural influences that interact with an individual such as family, friends, peers, cultures and support networks (Wattchow et al., 2013). The physical environment level refers to the structural components and resources within an environment that either facilitate or reduce the potential for a behaviour or outcomes (Wattchow et al., 2013). The policy environment level refers to laws, regulations and policies that impact behaviour across jurisdictions such as uniform requirements, access to funding and teaching guidelines. Combined, these factors can influence the behaviour of teachers and educators (Wattchow et al., 2013).

The SEM framework is described as a ‘personal-environment’ fit by providing an understanding of the multiple levels of influence that can affect teachers’ behaviour that can be used to broadly analyse educational problems in a given setting (e.g. school teaching) (O’Connor, Alfrey, & Payne, 2012; Wattchow et al., 2013; Whittle et al., 2015). The SEM framework allows the broad influences on teacher behaviour to be comprehensively understood in order to develop and implement more effective teaching solutions and programs that address multiple levels of influence for lasting behavioural effects (O’Connor et al., 2012; Wattchow et al., 2013). Example barriers on the PE teaching of ‘in-service’ primary school teachers are displayed in Table 1.

There are a number of barriers to the provision of quality PE programs in schools that can be SEM educationally framed as ‘intra-personal’ (resulting from the individual behaviour of teachers), ‘interpersonal’ (resulting from the behaviour of students, teachers and parents), ‘physical environment’ (resulting from influences of the teaching context) and ‘policy environment’ (resulting from rules and regulations governing access to teaching delivery) (Wattchow et al., 2013). Although the present study is investigating generalist pre-service teachers, there have been intrapersonal level barriers to delivering PE in primary schools of ‘in-service’ teachers that have included past experiences in PE, PE training, knowledge, preparation of lessons, self-confidence to teach PE and qualifications for providing primary school PE programs (De Corby, Halas, Dixon, Wintrup, & Janzen, 2005; Morgan & Bourke,

2005). Interpersonal level barriers for in-service teachers have included managing behaviour, peer pressures and motivations in students (Boyle, Jones, & Walters, 2008; Dagkas & Stathi, 2007; Sherar, Muhajarine, Esliger, & Baxter-Jones, 2009; Trudeau & Shephard, 2005). Physical Environment level barriers for in-service teachers delivering PE have been reported as teaching resources and PE facilities (Hardman, 2008; Le Masurier & Corbin, 2006; Morgan & Hansen, 2008). Policy level barriers for in-service teachers have included equipment budgets, a crowded curriculum, time for PE delivery and developmental opportunities (Hardman, 2008; Le Masurier & Corbin, 2006; Morgan & Hansen, 2008). There has often been less status for the PE subject in schools (Kahan, 2008). As the benefits of providing quality PE are extensive on children’s cognitive, social and physical developmental domains, addressing these intrapersonal, interpersonal, physical environment and policy level barriers early in teacher training is vital. Quality PE can result in school students meeting Arnold’s (1979) three conceptual and educative dimensions for PE, education ‘in’ (movement as a source of personal meaning), ‘through’ (movement for the development of valued ends) and ‘about’ movement (movement as a field of study). Despite PE merging with Health Education to become HPE in the Australian curriculum (Macdonald, 2013), the literature points to a continuing need to overcome PE-specific teaching barriers within non-specialist teaching pathways.

Intrapersonal level (individual) influences	Interpersonal level (social) influences	Physical environment level influences	Policy level influences
<ul style="list-style-type: none"> • Past experiences in PE (e.g. primary and secondary school) • PE training • Knowledge • Preparation of lessons • Self-confidence to teach PE • Qualifications for delivering primary school PE programs 	<ul style="list-style-type: none"> • Behaviour of students • Peer pressure of students • Student motivation 	<ul style="list-style-type: none"> • Teaching resources • PE facilities 	<ul style="list-style-type: none"> • Equipment budget • Crowded curriculum • Time constraints for PE delivery • Professional developmental opportunities

Table 1: An overview of previous social-ecological model level PE teaching barriers for ‘in-service’ primary school teachers.

The Educative Implications of Gaining Social-Ecological Insight into the Barriers to Teaching Physical Education

Examining the perceptions of PSTs is important, given their future roles as teachers and the influence of beliefs on teaching practice (Ní Chróinín & O’Sullivan, 2016). The Australian Institute for Teaching and School Leadership (AITSL, 2011) standards identify a need for Australian graduate teachers to:

- Establish challenging learning goals (AITSL Standard 3. By identifying clear learning goals to achieve and barriers to overcome to teaching PE);
- Evaluate and improve teaching programs (AITSL Standard 3.6. By ensuring that teaching programs address multiple barriers to teaching PE are identified);
- Identify and plan professional learning needs (AITSL Standard 6.1. By ensuring pre-service teachers plan for associated barriers to their PE teaching);

- Engage in professional learning and improve practice (AITSL Standard 6.2. By providing insight into what areas are important for generalist PSTs to improve PE teaching practice);
- Engage with colleagues and improve practice (Standard 6.3. By providing information to mentor around the certain PE teaching barriers identified); and
- Apply professional learning and improve practice (as per standard 6.2 and 6.3).

Understanding the multiple level barriers to Australian generalist PSTs' delivery of PE is also important to meet recent Australian Tertiary Education Ministry Advisory Group (TEMAG) recommendations (TEMAG, 2015). These include:

- Providing PSTs with targeted support to ensure academic skills are developed to become effective teachers (TEMAG recommendation 12);
- Ensure PSTs have early opportunities to assess teaching practices (TEMAG Recommendation 21);
- Having effective induction for beginning teachers (TEMAG Recommendation 31); and
- Ensuring PSTs build upon their portfolio of evidence to reach full teacher registration (TEMAG Recommendation 33).

Gathering insight into the perceptions of future PE teachers can ensure teacher education providers can cater for developmental needs (Hyndman & Pill, 2016). Developing PETE training opportunities according to the multiple PE teaching barriers identified can prepare PSTs' future PE delivery to ensure the effective provision of formal school PE opportunities (e.g. PE lessons, school sport) (Hyndman, 2014). The development and preparation of quality PE teaching can also facilitate the transferability of primary school students' abilities to engage in school PE opportunities beyond scheduled classes (e.g. recess and after school time) (Hyndman, Telford, Finch, & Benson, 2012).

It has been regularly reported that PE experiences developed via an 'apprenticeship of observation' from primary and secondary schooling can have a major impact on PSTs (Jenkins, Garn, & Jenkins, 2005; Pill, Penney, & Swabey, 2012; Wrench & Garrett, 2012; Hyndman, 2014; Hyndman & Pill, 2016) and can be firmly stored in memory (Humphries & Ashy, 2006). The nature of future PE provision will "depend on the insights and commitments of the professionals responsible for future curriculum decisions" (Wiegand, Bulger, & Mohr, 2004, p.7). Despite a host of research on PSTs' background PE experiences, PE memories and teacher socialisation (Valtonen, Hirvensalo, Reunamo, & Ruismäki, 2014; Haynes et al., 2016; Hyndman, 2014), there is a gap in the literature specifically investigating Australian generalist first year PSTs' perceived barriers to teaching PE, underpinned by a SEM framework. In addition to meeting the national AITSL graduate standards and national TEMAG recommendations, the importance of identifying perceived barriers is emphasised by programs modifying and re-creating teacher preparation curriculums to meet such pre-existing teaching beliefs (Penney & Evans, 1997). Understanding the barriers perceived by Australian generalist PSTs can ensure teacher education and PETE programs implement opportunities to confront any barriers to future PE delivery by evaluating teaching practices and approaches (Haynes et al., 2016).

By identifying first year Australian generalist PSTs' perceived learning needs and barriers for teaching future PE at the very beginning of teacher training, it is possible to provide a 'developmental overlay' via teacher training that was absent when entering the degree (Pill & Brown, 2007; Hyndman, 2014). The developmental overlay has been described as a "transformative process of forming socio-culturally responsive teacher

professional identities” (Pill & Brown, 2007, p. 15). Teacher education programs have the potential to provide PSTs with opportunities to ‘frame, disrupt and reframe’ pre-existing PE perceptions (Pill et al., 2012). The SEM provides an effective model to understand that a transformative teaching process is possible if influences beyond an individual teacher’s control are considered. Attempting to guide and transform teaching behaviour can be more effective and less resistive if the multiple (and interacting) SEM levels of influence are addressed. Regular reflection on teaching beliefs and intentions is important to enhance PE teaching practices (McMahon & Dinan Thompson, 2014; Hyndman & Pill, 2016). If PSTs’ perceptions about PE teaching during their degrees are to be critically reflected upon and potentially disrupted (Pill & Brown, 2007), teaching and learning processes need to be constantly examined (Hyndman & Pill, 2016). Brookfield (1995) describes reflective teachers as being highly effective who continue to hone a personalised voice, pedagogical rectitudes and have greater value and understanding of the worth of their practices. The process of critical reflection is to establish an increased awareness of teaching from as many view points as possible (Brookfield, 1995), especially through the lens of students, colleagues and the theoretical literature.

Despite the many findings relating to the socialisation of PSTs or barriers to ‘in-service’ generalist primary school teachers delivering PE (Morgan & Hansen, 2008) or indirectly determining barriers during PST studies (Tsangaridou, 2012), there is an absence of research specifically investigating Australian generalist ‘pre-service’ teachers’ perceptions of the barriers to teaching PE classes. There is also a gap in the literature applying a SEM framework to evaluate the multi-level barriers perceived by generalist PSTs to teaching PE. The SEM framework can support the understanding of the multiple levels of barriers to teaching PE effectively and facilitate the development of future PE teaching programs and generalist PSTs meeting AITSL standards and TEMAG recommendations.

The aim of this ‘Generalist Entry into Teaching Physical Education’ (GET-PE) study was to explore the perceived barriers reported by Australian generalist first year PSTs relating to future PE teaching delivery. The multiple SEM level barriers identified by the generalist PSTs within the GET-PE study can provide insight for early childhood and primary school PETE programs both now and into the future.

Methods

The GET-PE study was conducted at a regional Australian university. The participants were all generalist PSTs enrolled in a teacher education degree, which prepares them to teach in early childhood (birth to grade 2; children aged 0-8 years old) and primary school teaching (grades 0-6; children aged 5-12 years old). The generalist PSTs had experienced one semester of learning fundamental PE teaching content (e.g. lesson planning, classroom management, safety considerations, inclusive PE teaching). Once ethical clearance was approved from the university human research ethics committee, 175 generalist PSTs were invited to participate in the GET-PE study and contacted by an independent research assistant at the end of semester one, 2016. Project information was outlined to the PSTs with notification that they would be requested to write open-ended responses via an online survey to determine their perceptions of the barriers towards teaching PE classes. The independent research assistant addressed any queries pertaining to the PSTs’ involvement in the study and the obtaining of consent. From the 175 generalist PSTs invited to participate, 71 consented to participate in the study (65 females; 6 males; response rate: 41%). The gender distribution was to be expected within a generalist PST program and teaching profession (Haynes, et al., 2016). Once consent was obtained, the PSTs completed the anonymous online survey. The

investigating researchers were not able to identify consenting PSTs' actual names at any stage throughout the GET-PE study research process.

During the final week of semester one, 2016, PSTs responded to open ended questions via a questionnaire developed through the SurveyMonkey online platform. The SurveyMonkey software program provides a platform within the GET-PE study for researchers to collect questionnaire data online. The questions that were administered were open-ended in design (e.g. essay style) to encourage detailed responses by the PSTs (Haynes, et al., 2016). Example questions within the GET-PE study included, 'What do you believe are the overall challenges to teaching PE?'; 'What aspects could impact on your attitudes towards delivering PE classes effectively? (intrapersonal SEM level)'; 'What types of interactions with students/staff do you believe will make it challenging to teach PE? (interpersonal SEM level)'; 'What types of contextual considerations do you believe will make it challenging to teach PE?' (physical environment SEM level) and 'What policy considerations do you believe will make it challenging to teach PE?' (policy/organisational SEM level). The series of SEM framed questions were distributed online by the research assistant.

Data Analysis

Data collected from the open-ended responses within the GET-PE study were analysed using the NVivo (version 11) software package (QSR International, 2015). Immersion, and familiarisation with the survey data was initially undertaken through systematic reading, highlighting and annotation of the data (Grbich, 2012). The coding of the survey responses were based upon the SEM framework (Wattchow et al., 2013) to identify emerging themes and similarities with barriers perceived by in-service teachers (Table 1). The information provided in the survey responses were used to determine the Australian generalist PSTs' perceived barriers to teaching PE. Final analyses included a collaborative review by two researchers with a combined total of 20 years teaching experience using the NVivo feature of 'nodes most frequently coded' for the open-ended survey responses, to ensure themes frequently coded were included. In order to gain further insight into the PSTs' perceived barriers to teaching PE from the GET-PE study, responses were categorised according to the SEM (Wattchow et al., 2013).

Results

The SEM provides a multi-level framework to explore the range of perceived barriers on generalist PSTs teaching of PE. The SEM themes and sample quotes from the GET-PE study are displayed in Table 2 (intrapersonal and interpersonal influences) and Table 3 (physical environment and policy/organisational influences).

Social-ecological model level	Theme	Quote
Intrapersonal (individual) level	Knowledge	<p><i>"...learning more in this area and transferring my knowledge of educational leadership on how to become an effective and supporting coach for PE."</i></p> <p><i>"I think the challenges to teaching PE are just coming up with new ideas to engage the children."</i></p>
	Physical abilities	<p><i>"...my concern is that there will be some activities that are likely to be taught by a PE teacher that I may not be able to demonstrate to my students."</i></p> <p><i>"...challenges would be in my own current state of physical fitness."</i></p>
	Confidence from prior school experiences	<p><i>"I did not have an overly good experience as a student of PE. Any lesson I had was more of a 'ok so run around the oval 5 times or lets go and play stuck in the mud."</i></p> <p><i>"...change my outlook of P.E. (from prior experiences). Be comfortable and confident in my ability to teach students and encourage health, fun, fitness and friendship."</i></p> <p><i>"I hated PE in school. I am terrible at anything that requires a ball and was always the last to be picked."</i></p>
Interpersonal (social) level	Community influence	<p><i>"Many adults, parents and children are uneducated on basic nutrition and healthy eating which therefore as educators makes our role more important in educating children on this matter. ie importance of breakfast!"</i></p> <p><i>"... sometimes when it comes to healthy eating etc the parents can be challenging in changing their day to day habits."</i></p> <p><i>"...the importance of looking after themselves caring for their nutrition and the environment where they live."</i></p>
	Concentration/ focus of students	<p><i>"I believe the biggest challenge of teaching PE to students will be maintaining focus during a lesson. Given that lots of these lessons will be conducted outside and be more physical that those in the classroom, I can foresee students being easily distracted."</i></p> <p><i>"...concentration levels of young children. I would like to work on how to keep children focused and interested."</i></p> <p><i>"...the most challenging in teaching preschool children physical ed is keeping them on track, a continuous approach to getting them focused and to stay focused."</i></p>

Social-ecological model level	Theme	Quote
	Inclusive teaching of students	<p><i>"...how to best engage the differing levels of sporting ability in a classroom. Not everyone has a family life that incorporates a lot of physical activity."</i></p> <p><i>"Being able to recognise different levels each student is at so they can develop their skills further."</i></p> <p><i>"... all children have different abilities and strengths and I think it will be important to structure a program that builds on children's strengths...rather than isolating less able children and highlighting their weaknesses. Physical education has tendency to also encourage competition, this can also have adverse effects on some children individual self worth and confidence."</i></p>
Interpersonal (social) level	Behaviour of students	<p><i>"... behaviour management with young students...have found that even at this age, sometimes they just do not want to listen."</i></p> <p><i>"... the main challenges of being a PE teacher...would be the vast varieties of student behaviours."</i></p> <p><i>"Challenges I feel we would face teaching PE are engaging all students, building self-esteem, working as a team, encouraging students to be aware of each other's limitations, being switched on and keep the setting neutral (bullying, tormenting, ridicule)."</i></p>
	Modelling effective practice	<p><i>"My ultimate goal would be to become able to give all children the PE education that I never received. I would love to encourage all children to participate in PE in a variety of ways unique to them."</i></p> <p><i>"I believe some may find it difficult to take health advice from myself, however by the time I am able to teach I hope to have reached my health goals."</i></p> <p><i>"Being an enthusiastic teacher and including positive experiences for students so they gain a sense of achievement."</i></p>
	Motivation of students (attitudes, enjoyment)	<p><i>"I think the challenges of teaching health and PE lie within providing children with fun and enjoyable lessons that they will find fulfilling for themselves and their physical development. If a child is not interested in sports then they will not want to be involved in the lessons, and disengage themselves from the learning environment we offer them."</i></p> <p><i>"There are a lot of students I have noticed that have low self esteem and a 'I can't do it' or 'it's too hard' attitude."</i></p>

Table 2. A sample of intrapersonal and interpersonal level themed quotes from the generalist PSTs relating to the perceived barriers to teaching PE.

Perceived Intrapersonal Level Barriers to Teaching PE

The major themes that emerged from the GET-PE study as perceived barriers at the intrapersonal level of influence included knowledge, physical abilities and confidence from the generalist PSTs' prior school PE experiences (Table 2). A reduced confidence from prior school PE experiences was regularly mentioned by the Australian generalist PSTs, "*My own history with PE may present a challenge in how I teach*"; "*I didn't feel the connection with my PE teachers, I felt they didn't care if I participated...they wanted (usually men) to hang out with the football and cricket boys*"; "*My own early childhood experiences in PE were very difficult...being picked last all the time made PE unbearable*" and "*I was one of those kids that would wag sports day, could never understand how people actually enjoy running*" (Table 2). Moreover, being generalist PSTs many hadn't been exposed to the intensive physical activity experiences, skills and requirements that more specialised PE degrees demand.

Concerns of physical capabilities to facilitate future PE classes in Early Childhood and Primary Schools were often reported, "*I believe some may find it difficult to take PE advice from myself...*"; "*...challenges could be in my own current state of physical fitness*"; "*I am beginning to understand the importance of daily exercise*" and "*...I have limitations on my mobility*" (Table 2). Additionally, the generalist PSTs felt they would need to fill a number of gaps in their knowledge base to confidently teach PE in schools, "*...try and extend my current knowledge in Health and Physical Education*" and "*Where does one begin, coming from a background in Visual Art? I had not thought about teaching PE*" (Table 2).

Perceived Interpersonal Level Barriers to Teaching PE

The themes relating to generalist PSTs' perceptions of the barriers to teaching PE at the interpersonal level were the most widespread across each of the SEM levels within the GET-PE study. The themes that were regularly mentioned included 'community influence', 'concentration/focus of students', 'inclusive teaching of students', 'behaviour of students', 'modelling effective practice' and 'motivation of students' (Table 2). Some of the generalist PSTs felt that health practices in the community were concerning and that overcoming such habitual influences in children would be a barrier when delivering PE, "*Many adults, parents and children are uneducated on basic nutrition and healthy eating*"; "*...promote healthier ways both in and out of school*"; "*...ensure families and communities understand the importance of physical education and continuing this when they leave the center or service...*" and "*...need to persue this healthy lifestyle at home. This requires parental support, which is sometimes difficult*" (Table 2). The PSTs regularly exhibited nervousness that students would not focus or concentrate during their future teaching delivery, "*I think the challenges that may arise when teaching PE is ... making sure children are understanding instructions correctly*"; "*My greatest challenge would be to keep the children focused*" and "*...the main challenges that I would like to work on would be to how to keep the students engaged during my lessons*" (Table 2).

Inclusive considerations were regularly perceived as major barriers to the generalist PSTs teaching PE within the GET-PE study, "*I believe the challenges to teaching PE is finding a way where...you will teach every student as some might have different needs therefore you need to think about what will be best...so everyone gets engaged*"; "*...students all have different abilities and are at different stages. The difficulty is creating physical activities and lessons that suit each child's abilities*"; "*...getting all the children to join in and keeping them on task... get the ones that don't want to join in, to join in*" and "*...find ways to engage those children who do not feel confident about their ability to participate in*

sport and recreational activities” (Table 2). As the generalist PSTs were novices to learning and delivering teaching practices, the barrier of managing students’ behaviour by developing a positive class atmosphere during PE classes emerged as a key theme, *“I believe the challenge in teaching PE will be in managing...and responding to challenging behaviours”*; *“...there will likely be a handful of students in your class who just don't want to be out on the sports oval”* and *“Some of the challenges I believe I would come across when teaching PE would be engaging the students... peer pressure and ...providing a safe and happy environment for the students”* (Table 2). Modelling effective practices for students to learn important PE habits was also seen as a barrier for the generalist PSTs, *“...try and encourage children to participate and enjoy PE as much as I did...”* (Table 2).

Motivating students was seen as a barrier with so many distractions, backgrounds and interests within PE classes, *“...one of the challenges is encouraging every student to develop a positive goal about their own sporting and physical abilities”*; *“...with regards to teaching and also keeping kids interested, motivated and healthy”*; *“...as a teacher you may have your views of what’s important but the students ... will not engage if they feel it is not relevant to them”* and *“I believe one of the challenges is enabling every student to develop a positive attitude about their own sporting and physical abilities”* (Table 2).

Perceived Physical Environment Level Barriers to Teaching PE

The major physical environment level barrier perceived by the generalist PSTs within the GET-PE study was the influence of technology on students’ PE endeavours. Technology was perceived to impact on less motivated students and seen as a distraction to the PE teaching priorities of physical activity participation, social interactions and engaging in activities outdoors, *“One of the challenges we face ...is the advance in technology... have made life quite easy and somewhat lazy... spending time sitting down using computers, tablets and gaming consoles and even shopping while sitting”* and *“teaching children to limit their time on a device or television and spend time outdoors. PE ...can enhance social interaction and communication”* (Table 3). The importance of dealing with weather-related influences was also noted by the generalist PSTs as a barrier to teaching PE classes within the GET-PE study (Table 3).

Perceived Policy Level Barriers to Teaching PE

The policy level barriers for the generalist PSTs within the GET-PE study included ‘balancing content’, ‘professional development opportunities’, ‘recognition of PE’ and ‘work-life balance’. Balancing aspects were important with PSTs referring to a number of time barriers (including work, life, lesson transitions & time allocation of PE), *“Challenges for me are time constraints...”*; *“...time for family”*; *“maintaining good transitions and timing throughout the lesson and “...when teaching PE is that of time management”*. The balance of content was also perceived as a barrier (theory/practical content, health/PE content & learning styles) (Table 3), *“...enjoying... the human anatomy and health related issues rather than doing sport activities”*; *“I recognise the vital importance that health and physical fitness plays on children's ability to learn and see all learn areas as interconnected and of equal importance”* and *“...teaching health to children is going to be a challenge”* (Table 3). The status of PE compared to other teaching disciplines was also seen as a barrier to teaching PE within the GET-PE study. Moreover, due to the PSTs not specialising in the PE

Social-ecological model level	Theme	Quote
Physical Environment	Technology/ screen time opportunities	<p><i>"I believe the challenges teachers face today teaching PE is the ever increasing technology. It is all too easy for kids to sit in front of the TV or gaming devices and getting so enthralled in these activities that they are missing out on outdoor activities and games."</i></p> <p><i>"Technology consumes many children and adults alike. Teaching kids to step away from the screen and play outside, either in a structured sport or using their imagination in nature play."</i></p> <p><i>"I think the challenge will be engaging students as less children are playing outdoors and more with technical devices."</i></p>
		<p>Weather</p> <p><i>"The heat...is another challenge for a PE teacher!"</i></p> <p><i>"I think there may be issues with the weather and resources (to support weather influences) in some schools."</i></p>
Policy	Balancing content	<p><i>"...finding the right balance between teaching both theory and practicals in a way which will keep all students intrigued to learn."</i></p> <p><i>"... importance of...caring for their nutrition, sexual health, and mental health."</i></p> <p><i>"...engaging students in physical activity and teaching students to make healthy food choices in life."</i></p>
	Professional development opportunities	<p><i>"...keeping up with the most relevant health issues your students are facing."</i></p> <p><i>"I want to build my knowledge as much as I can."</i></p> <p><i>"...may find the health/muscles etc a bit hard."</i></p>
	Recognition of PE in schools	<p><i>"...the only thing that I can think of is that people do not take PE as serious as other subjects. What I have learnt from my personal experience that PE is the most important subject among all other subjects because if you are not healthy, no degrees or good jobs can give you the actual pleasure of life."</i></p>
	Work-life balance	<p><i>"The challenges I face will be juggling commitments with work and home life."</i></p>

Table 3: A sample of physical environment and policy level themed quotes from the generalist PSTs relating to the perceived barriers to teaching PE.

discipline, professional development opportunities were perceived as a barrier to gain and understand further PE training skills such as musculoskeletal considerations (Table 3).

Discussion

There is an important need to investigate the perceptions of generalist PSTs that are learning PE teaching practices (McMahon & Dinan Thompson, 2014; Haynes et al., 2016). The GET-PE study addresses a gap in the international literature by providing SEM insight into generalist PSTs' perceived barriers to PE during the process of PETE training. By unearthing the multiple SEM level barriers to Australian generalist PSTs delivering PE, it has the potential to guide the future content for teacher education programs. The paper met Wattchow and colleagues' (2013) key objectives of a SEM approach for educators by being (i) multi-level; (ii) settings-based with learning relevance; (iii) students' voice were prioritised; (iv) students could engage in the knowledge process; (v) there were interdisciplinary components; and (vi) it could lead to the development of more meaningful experiences. The findings from the GET-PE study reveal a broad range of barriers perceived by generalist PSTs that reflect the barriers of in-service primary teachers (Dwyer et al., 2003; Barroso, McCullum-Gomez, Hoelscher, Kelder, & Murray, 2005; De Corby et al., 2005; Morgan & Hansen, 2008). Yet the present study provides further insight, revealing that there can be unique barriers that that may be encountered at an early stage in the PSTs career. Barriers were reported at the intrapersonal level (knowledge, physical abilities, confidence), interpersonal level (community influence, concentration/focus of students, inclusive teaching, behaviour management, modelling effective practice, motivation of students), physical environment level (technology/screen time, weather) and policy level (balancing content, professional development opportunities, recognition of PE, work-life balance). The GET-PE study findings reveal that generalist PSTs perceive a plethora of barriers relating to the potential delivery of PE classes.

The intrapersonal influences are an important area for educators to develop key teaching program considerations around how participants can grow, maintain trajectory and meet personal attributes (Wattchow et al., 2013). The intrapersonal barriers perceived by the generalist PSTs were largely due to the influence of experiences. Having only completed a single semester of PE content, the PSTs perceived there were some content barriers (e.g. knowledge gaps) to cater for teaching PE classes. This finding isn't surprising, as previous research has reported that deep content knowledge is important to generate effective outcomes in PE (Ward, 2013). Many of the knowledge gaps within the GET-PE study revealed were related to gaining information on becoming an effective and supportive PE coach and coming up with new PE teaching ideas. Content can be a barrier for PSTs entering teacher education programs as many prefer approaching learning with a 'surface approach' to meet the basic degree requirements (Entwistle & Tait, 1990; Gow & Kember, 1990; Marton & Booth, 1997; Pill et al., 2012). Many beginning teachers prioritise the reproduction of content, rather than implementing analyses and evaluating the content based upon more sophisticated teaching approaches (Capel, 2007). Content knowledge has been linked to teaching prowess and teachers with high content knowledge have been revealed to illicit more complex questioning techniques and be more inclusive of students within lessons (Stronge, 2007; Horsley, 2012). As knowledge gaps have been previously reported in studies of in-service primary teachers, this is an important consideration for teacher preparation and PETE programs.

Past schooling experiences and physical abilities were also perceived as a barrier for PSTs to teaching PE. Many PSTs experience mixed feelings in response to PE from their

schooling (Pétrie, 2008; Tsangaridou, 2012; Haynes et al., 2016). Generalist PSTs often retain negative attitudes toward PE as they enter teaching preparation that could be detrimental towards teaching this content area (Tsangaridou, 2012; Haynes et al., 2016). Brookfield (1995) determined that teachers require critical reflection of such past experiences in order to challenge existing teaching ideas, thoughts and assumptions in order to progress as a teacher. Within the present GET-PE study past schooling experiences were related to boring activities (e.g. running around an oval), impaired confidence and comfort with PE and low level skill development (e.g. ball games). It has been reported that the greatest potential for developing primary PE teaching rests with those generalist PSTs that have impaired feelings about the PE subject (Pickup, 2012). It should be considered that generalist PSTs could have the potential to provide insight and enhanced empathy to cater for children that could feel marginalised in PE classes and can offer teaching experiences beyond the reproduction by those more specialised in PE (Pickup, 2012). The GET-PE study adds further justification to the importance modifying beliefs and intentions that are developed through an 'apprenticeship of observation' during primary and secondary schooling to improve PSTs' teaching confidence (Hyndman & Pill, 2016). Moreover, the importance of implementing a greater breadth of PE experiences is reinforced within the present GET-PE study. The findings can be used to inform generalist teacher education and PETE programs to ensure PSTs have further training of cognitive, social, physical skills and capabilities to model and deliver important learning outcomes during PE teaching.

The interpersonal influences are vital for educators to determine the impact of social interactions on behavioural solutions (Wattchow et al., 2013). The interpersonal barriers were the most prevalent perceived by the generalist PSTs. As daily interactions between teachers and students (including parents) occur regularly, there were a number of themes that included community influence, concentration/focus of students, inclusive teaching, behaviour management, modelling effective practice and motivation of students. The interpersonal themes were quite inter-related with themes based largely around engaging students in classroom learning (e.g. motivation, focus, inclusive & on task). There has been little investigation into primary school-based studies relating to difficulties experienced in engaging students in PE, although intrinsic and motivational barriers have been reported (Mowling, Brock, Eiler, & Rudisill, 2004; Sherar et al., 2009). It has been suggested that in order to engage students in PE classes, teachers need to ensure that content is developed which meets students' diverse interests (Mowling et al., 2004; Dwyer, Allison, Goldenberg, & Fein, 2006). Given the diverse experiences of the Australian generalist PSTs, alternative ideas about what it means to be engaged in PE can be fostered beyond more competitive team sport models delivered within PE classes. Much of the concerns from the PSTs in the GET-PE study centred around the open spaces in which PE is delivered, distractions in such outdoor spaces, keeping students on task and ensuring the children listen to instructions that are delivered. Simply planning and delivering classes can be insufficient to motivate students to engage and participate in PE (Dwyer et al., 2006), especially as some students could be having negative PE experiences at school (Haynes et al., 2016).

Children have been reported to disengage with having fun and being physically active during PE as early as the middle years of primary school (Mowling et al., 2004). Nurturing teacher attributes that are based around caring and support could be important for teachers to ascertain the learning interests of students to enhance engagement in PE (Hyndman, 2014; Hyndman & Pill, 2016). Learning engagement has been previously reported to be facilitated when teachers care for their students (Clarke & Jarvis-Selinger, 2005). Enthusiasm and passion are other key factors that could be important to improve the teaching effectiveness of students by creating a positive class atmosphere (Kunter, Frenzel, Nagy, Baumert, & Pekrun, 2011; Horsley, 2012). A positive class atmosphere was seen as important to facilitate by

many PSTs within the GET-PE study such as procedures to reduce competitiveness, developing teamwork, accepting other students' abilities and preventing bullying-type behaviours. As teachers regularly display elevated nurturing teaching perspective scores (Collins & Pratt, 2010; Hyndman, 2014; Hyndman & Pill, 2016), further prioritisation of developing enthusiasm and passion could be a key solution to overcoming barriers in student engagement within PE. The generalist PSTs within the GET-PE study perceived that influencing parents and the community to develop improved health and physical activity practices was an important barrier to overcome. The most common health practice noted by the PSTs in the GET-PE study that they perceived as a barrier to overcome was to influence family nutrition and eating behaviour values. Attempting to instil and influence community health values during teaching delivery (e.g. influence family nutrition values) is similar to the 'social reform' teaching perspective in which teachers attempt to influence students' embedded values and ideologies (Hyndman & Pill, 2016). By modifying values and ideologies during PE teaching this can be transferred to the home and community settings. Hyndman and Pill (2016) advise that due to the low perceived importance and dominance of social reform values in PE teaching, further investigation of social reform values within teacher education programs is recommended.

The physical environment level needs to be carefully considered to evaluate within educational settings to determine external variables on teaching behaviour via interaction, moving through, within, and relating to facilities and resources that can impact on teaching (Wattchow et al., 2013). Whilst a number of previous studies of in-service primary school teachers have reported on the physical environment level barriers that include a lack of facilities and equipment (Le Masurier & Corbin, 2006; Morgan & Hansen, 2008), the Australian generalist PSTs in the GET-PE study regularly perceived the influence of digital technology as the most significant barrier for delivering PE classes. Such technology-related barriers in the present study related to the lure of screening devices that could be a preference for primary school children ahead of physical activity. The PSTs perceived that enhancing the lure of physical activity opportunities in such a technology-driven society will be a major barrier. The impact of electronic screen time on school children's sedentary behaviour is a national health problem (Active Healthy Kids Australia, 2014). Today's students can be termed as NextGen'ers', 'Millenials', 'Generation Y' or 'Digital natives' that were born after 1982 (Oblinger, 2004). Such students have digital technology as a natural part of their upbringing as personal computers were introduced before they were born (Oblinger, 2004). As technology is now a major part of the modern lifestyle and learning landscape, teachers are seeking new methods to integrate digital learning resources and support into classes (Kim, Bonk, Teng, Zeng, & Oh, 2006; Hyndman, 2017a).

Facilities to ensure weather conditions wouldn't be a barrier to delivering PE classes is also an important consideration noted by the Australian generalist PSTs within the GET-PE study. The influences of heat and whether there were enough resources to protect primary school students against extreme weather was noted as perceived barriers. In very hot climates, environmental heat can negatively influence engagement in outdoor PE activities via heat stress (Hyndman, 2017b) which can cause children to appear 'listless' or 'restless', complain about the heat/humidity and voice negative feelings about physical activity throughout a school year from heat stress (Doecke, 1992). Similar to the extremes of heat, cooler weather can negatively impact on school children's physical activity participation (Hyndman, Chancellor, & Lester, 2015). Teachers have reported on the negative impact that wet conditions can have on children's physical activities (Hyndman et al., 2014). It has also been revealed that children's enjoyment of being active is significantly lower in cooler months, suggesting that PE facilities can be required to prevent such weather barriers (Hyndman et al., 2015). If specific equipment or facilities are not readily available according

to weather conditions, teachers can usually innovate with alternative spaces (Hattie, 2003; Mowling et al., 2004; Stronge, 2007; Whittle et al., 2015), yet facilities to support teaching during the extremes of weather is indeed a barrier. Investigation of nearby facilities to schools could be a solution to support school PE program against weather barriers. Working with neighbourhood spaces can ensure community partnerships are established and could be prepared for generalist PSTs to counteract the barriers of extreme weather during PE classes.

The examination of policy influences is vital to establish whether teachers can control norms, guidelines, procedures, rules and regulations on teaching behaviour (Wattchow et al., 2013). The generalist PSTs within the GET-PE study perceived that professional development opportunities to be in touch with the latest in PE teaching delivery would be a key policy level barrier. The future availability of development opportunities were identified around the latest health issues/statistics, increasing knowledge bases around PE teaching ideas, anatomy/physiological components, technology and of course the broader themes of barriers revealed in the study. Such professional opportunities are important for PE teachers, as a diverse range of teaching styles to facilitate quality PE classes can ensure students' learning of concepts across a range of contexts are catered for (Whittle; Hattie, 2009; Grieve, 2010; Stronge et al., 2011; Pill, Harvey & Hyndman, 2017). Interestingly, as the generalist PSTs within the GET-PE study had yet to experience full-time teaching in schools, there was an absence of concerns relating to a crowded curriculum or timetabling compared to studies of in-service primary teachers (Morgan & Hansen, 2008). Although timetabling of PE was not mentioned, there were some concerns from the PSTs about the status of PE as a subject that can infer that schools may not prioritise PE in timetabling. The subject of PE has been previously deemed 'peripheral' in some primary school settings, resulting in the elimination and reduction of PE classes (Kahan, 2008). With a reduction of PE classes in some primary schools, this has the potential to negatively impact on the amount of time for generalist PSTs to practice the teaching of PE to improve teaching confidence. With the merging of both Health and PE into the Australian curriculum (Lynch, 2015), the balancing of teaching content was also perceived as a unique barrier for the generalist PSTs.

It was alarming that PSTs within the GET-PE study perceived work-life balance as a barrier to delivering PE classes at such an early career stage, yet many higher education students experience high levels of stress early in their teaching training due to a host of academic demands and hectic schedules outside university (Geng & Midford, 2015). The facilitation of strategies to form important stress reduction habits could be important for the PSTs to manage future work demands during the delivery of PE classes in schools. Although it should be acknowledged that the integration of further study methods (e.g. interviews and focus groups) may have generated further insights to those gained, the responses of the Australian generalist PSTs yielded a broad range of barriers to teaching PE. Nonetheless, the findings from the GET-PE study provide incentive for further research to explore Australian generalist PSTs' perceptions of the steps to influence the health-related habits of families beyond schools and maintaining wellbeing during teaching. Research is also required to determine the amount of time generalist PSTs receive for PE development within teacher preparation programs (Lynch, 2013). Moreover, further methods to engage students that are unique to PSTs' and teaching primary school children to step away from the lures of technology are required.

Implications for Teacher Education

With mounting demands on schools (Hyndman, 2016), PSTs must continually improve preparation and readiness for teaching practical subjects such as PE. By developing

insight into what the barriers are for Australian generalist PSTs to teaching PE, teacher education and PETE programs can reflect upon the findings from the GET-PE study and facilitate learning environments that meet the needs of our future teachers. In addition, the GET-PE study also provides multiple SEM level insight for teacher programs of the barriers to teaching PE in generalist PSTs to address key AITSL standards (e.g. establishing learning goals, evaluating teaching programs and planning for developmental needs) and TEMAG recommendations (e.g. identify targets for academic support, allow PSTs to assess teaching practices against such barriers and ensuring such barriers are overcome during the transition into teaching). While addressing all barriers perceived by generalist PSTs may not be possible, promoting awareness of the broad themes from this research can further ensure early childhood and primary school teachers can teach PE with improved confidence in the future.

Conclusion

This is the first study to the author's knowledge to directly investigate Australian generalist PSTs' perceptions of the barriers to teaching PE classes at the entry point of teacher training, underpinned by a SEM framework. It was revealed within the GET-PE study that PSTs perceived a myriad of SEM barriers at the intrapersonal level (knowledge, physical abilities, confidence), interpersonal level (community influence, concentration/focus of students, inclusive teaching, behaviour management, modelling effective practice, motivation of students), physical environment level (technology/screen time, weather) and policy level (balancing content, professional development opportunities, recognition of PE, work-life balance). The GET-PE study results reveal a number of contemporary factors through the lens of the Australian generalist first year PSTs, including emerging barriers such as technology influences, balancing the content of both Health and PE (now merged within the Australian curriculum), balancing theory-practical content and work-life duties. As technology is now a major part of the modern lifestyle and learning landscape, teachers must continue to seek and develop new methods to integrate digital learning resources and support into PE classes.

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