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Utilizing educational theoretical models to support effective physical education pedagogy

Wayne Usher^{1*}, Allan Edwards² and Bianca de Meyrick³

Abstract: Physical education (PE) pedagogy has traditionally been viewed as drill-style teaching. Whilst this traditional pedagogical approach provides exposure to various skills, used within a school-based PE and sporting context, it does not demonstrate a student's competence associated with their ability to apply these skills in complex game situations. Therefore, teacher practitioners must look to implementing educational theoretical models that go to support effective pedagogical approaches so as to ensure that authentic and effective learning and teaching takes place within the PE and sporting domains. With this in mind, this paper will discuss how effective learning and teaching can be achieved and heightened through the application of a number of theoretical models and approaches, namely; constructivism, inquiry-based learning, Moston's guided discovery, and Teaching Games for Understanding (TGfU).

Subjects: Curriculum Studies; Education; Education & Training; Physical Education; Primary Education - Teaching Practice; Secondary Education; Teacher Education & Training; Teachers & Teacher Education; Theory of Education

Keywords: physical education; theoretical models; constructivism; inquiry-based learning; teaching games for understanding



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PUBLIC INTEREST STATEMENT

Teacher practitioners must look to implementing educational theoretical models that go to support effective pedagogical approaches within the Physical Education and sporting domains. Effective learning and teaching can be achieved and heightened through the application of a number of approaches, namely; constructivism, inquiry-based learning, Moston's guided discovery, and Teaching Games for Understanding (TGfU). This paper will report on how the Australian Curriculum Assessment and Reporting Authority (ACARA), Health and Physical Education (HPE) document (2014), has been designed to support experiential learning and teaching opportunities for teachers to implement rigorous pedagogy, based on sound theoretical models. The key propositions for a "futures-oriented" curriculum is that HPE should: (1) take a strengths-based approach; (2) focus on educational outcomes; (3) develop health literacy skills; (4) value learning in, about and through movement; and (5) include a theoretical approach to guide and deliver effective learning and teaching in physical education.

1. Educational theoretical models to support and promote effective physical education pedagogy

1.1. *Constructivism: supporting learning and teaching in physical education*

The theory of constructivism suggests students create meaning by connecting their ideas with their experiences, both inside the classroom and out (Azzarito & Ennis, 2003). In the constructivist approach, educators encourage students to create meaning for themselves both individually and in social groups (Gagnon & Collay, 2001). The constructivist theories used for the development of the learning experiences include Vygotsky's principles of social construction of meaning and scaffolding, as well as the inquiry-based learning theory. Constructivism according to Dyson, Griffin, and Hastie (2004) has three distinct faces which include the "active learner", the "social learner" and the "creative learner" (p. 227). Outlined in more detail:

- (i) The "active learner" engages in decision-making, questioning, discussion, and critical thinking throughout all lessons. In this context, the student's construct their own knowledge through their experiences in responding to a problem posed, their reflections on their learning is then used to contextualize and support the next lesson, making the planning, and teaching student centered and giving them control over their individual learning (Sparapani, 2013).
- (ii) Secondly, the "social learner" works within groups to devise invasion-based games and then in pairs, posing as coaches, provide feedback. Social learning is important, according to Vygotsky, as students will construct their own understanding individually and use social interaction to test their understanding and form new shared meanings (Gagnon & Collay, 2001).
- (iii) Lastly, the "creative learner" can be supported through the use of activities which allow for imagination and creativity, the first learning experience allows for students to create or recreate their own understanding from selected games (Gagnon & Collay, 2001). By doing so, students who are creative learners are able to take ownership of their own knowledge and knowledge they have developed (Dyson et al., 2004).

Research suggests that learning experiences that are student centered are based upon a social approach to learning in which students work together to solve problems and create understanding (Sparapani, 2013). Similarly, Vygotsky believed learning takes place in a collaborative environment (Sparapani, 2013), whereas Keenan and Evans (2009) maintain that children's elementary mental functions are heightened when children are learning socially and connected to others. The implementation of social learning is therefore important to ensure an effective learning environment is achieved. Further work by Gore, Griffiths, and Ladwig (2004) suggests that higher order thinking is a basis for promoting and achieving productive pedagogy.

A key aspect of Vygotsky's constructivist theory is the idea of scaffolding; the support provided to students by a teacher or another student to help extend a student's learning (Dell'Olio & Donk, 2007). Such learning experiences which go to support this theory use scaffolding through key questions designed to develop student's critical thinking skills and enhance learning. Dyson et al. (2004) states questioning is a vital skill teachers must use to guide students and therefore, as the learning experiences progress, more specific questioning is used to introduce targeted skills. The use of questioning can promote extensive learning as students are instantly engaged in creating thought through an "active linguistic and cognitive response" (Moll, 1992, p. 181) forming a constructive pedagogy for classroom use. This concept works to not only in an attempt to extend students, but also to provide a supportive learning environment, another key element in the framework for productive pedagogy (Gore et al., 2004).

1.2. *Inquiry-based learning and guided discovery models: achieving effective physical education delivery*

Linked closely to constructivism, are two models for achieving effective physical education (PE) delivery. Both inquiry-based learning and guided discovery models can be utilized as key strategies to

motivate students to learn through making meaning and constructing knowledge (Purichia, 2015). Both models go to support a constructivist approach (Purichia, 2015) to the development of effective learning experiences. The foundation of inquiry-based learning is that students learn deeply and authentically when being presented with a problem or question in which they work to find the answer (Purichia, 2015). Inquiry-based learning can be used as a basis for the creation of effective learning experiences which supports the teacher as a facilitator by posing a skill-based problem for the student's to solve (e.g. defensive/offensive game play). By using inquiry-based learning and guided discovery approaches, students are encouraged to use higher order thinking skills such as "problem solving, critical thinking, inquiry strategies and reflection of practice" (Purichia, 2015). By providing students with open-ended, complex, and thoughtful questions and scenarios, students are engaged and are inspired to learn deeply (Purichia, 2015).

Brooks (1999) suggests successful implementation of the inquiry approach includes a question which allows for variations in responses, promoting discussion and comparison. Learning experience in the context of a PE lesson can involve student's creating various different ball games as they are provided freedom with the style of game, including ball choice and movement style, e.g. running, kicking, and throwing. Supporting such an approach is the use of the guided discovery teaching style of Moston's spectrum (Doherty, 2010) which assists in scaffolding the guidance and limitations given to students to produce a variety of responses. Within the problem posed to students in the learning experience there are conditions which the student's must follow e.g. no contact, use of pivoting, no running with ball, as well as a measure of success, e.g. the ball must reach the goal (Tannehill, Van der Mars, & MacPhail, 2013). Mawer (2014) suggests that the guided discovery approach can be used as a teaching style which supports an inquiry-based approach to learning as it provides direction as to the amount of freedom and support to provide to students to lead them to "movement solutions" (p. 176).

The use of the inquiry-based learning and Moston's guided discovery models, support a productive pedagogical framework, by way of problem posing and student-directed activities, allow students to find relevance to their existing knowledge and experiences (Gore et al., 2004). By providing students with opportunities to draw upon and apply this knowledge in a creative manner, students are making connections to the outside world as well as using higher order thinking skills, key aspects in effective classroom pedagogies (Gore et al., 2004).

2. Teaching games for understanding (TGfU): supporting higher order process thinking in PE

2.1. Teaching games for understanding as a theoretical model for effective PE pedagogy

There has been considerable research on Teaching Games for Understanding (TGfU) and although it is a relatively new concept in the Australian curriculum, it has been studied for many years. O'Leary (2014) suggests that it may be difficult for some physical educators to address higher order thinking in PE; however, TGfU is one pedagogical approach that may assist teachers to address this issue. Research over many years has supported the TGfU approach and Thomas (1997) found that through the use of a TGfU model the students became more tactically aware and were able to make better decisions during the game, thereby adding to their enjoyment of playing the game. Furthermore, Thomas (1997) identified five major themes associated with the adoption of the TGfU model, with these being: (1) encourage a holistic approach, (2) promote enjoyment for students, (3) promote player centered learning, (4) cater for varying abilities, and (5) be efficient in its implementation. Martin and Gaskin (2004) found that TGfU has resulted in improved fundamental movement skills for students. In addition, The Australian Sports Commission (2007) prepared a report which showed that children who were competent in fundamental movement skills and their physical literacy levels, were more likely to enjoy sports and activities, and to develop a lifelong commitment to physical activity.

McKeen, Webb, and Pearson (2007) state that PE teachers play a significant role in influencing the likelihood that their students will engage in lifelong physical activity. McKeen et al. (2007) believe that for PE teachers to be successful they are required to engage students in quality and enjoyable

learning opportunities to develop prescribed learning outcomes and skills. Yet, Pill (2011) indicates that there are many challenges facing the PE teacher and the subject in general, as such: (1) increasing “overcrowding” of the curriculum, (2) changing school priorities, (3) funding constraints, (4) changing societal leisure pursuits (i.e. technology use), and (5) the wider youth obesity epidemic. Roberts (2011) further suggests that traditional, outdated Australian PE has been described as rewarding those students who enter lessons with existing skills and athletic competencies while potentially isolating and marginalizing students who are not highly skilled. Additionally, Pill (2010) believes that the historical dominant curriculum focus of teaching “sport-as-technique” undermines “learning in movement for movement”. Such a “sport-as-technique” teaching approach provides limited learning through decision-making and tactics within movement. A possible way forward, to address such a compelling issues, could be ameliorated through multisectoral actions across a number of external health, community, sporting, educational, and governmental departments.

From a pedagogical standpoint, Lynch (2014) describes that recent changes to the Australian PE curriculum offer possible strategies for promoting effective learning and teaching in relation to both content and strategies for achieving higher order process thinking. The Australian Curriculum Assessment and Reporting Authority (ACARA), Health and Physical Education (HPE) document, has been designed to offer experiential learning, with relevant, engaging, contemporary, physically active, enjoyable, and developmentally appropriate. Begoray, Wharf-Higgins, and MacDonald (2009) identifies that “the key propositions for a ‘futures-oriented’ curriculum is that HPE should: (1) take a strengths-based approach; (2) focus on educational outcomes; (3) develop health literacy skills; (4) value learning in, about and through movement; and (5) include an inquiry-based approach” (p. 1). It further advocates for the acquisition of movement skills, concepts, and strategies that enable students to confidently and competently participate in a range of physical activities. Whilst physical activity feasibility needs to be considered, the options should reflect the culture and interests of the students (Webb & Pearson, 2012). Likewise, consideration should be given to the diversity of the students by approaching the curriculum flexibly, and including an array of physical activities and sports likely to engage all students.

By utilizing such an educational theoretical model as TGfU, effective strategies would foster such considerations as well as promoting and sustaining student co-operation, encouragement and collaboration. What is more, Lynch (2014) maintains that the level of student enjoyment is much higher in the TGfU model as compared to traditional “technique based” teaching approaches. One of the priorities in the ACARA, HPE document (ACARA, ACARA Australian Curriculum, Assessment & Reporting Authority, 2014) is valuing movement where PE teachers support students in developing the movement skills and concepts required to participate in physical activities with competence and confidence. According to the ACARA, HPE document (2014) the knowledge, skills and dispositions students develop while moving in PE classes will encourage ongoing participation across a student’s lifespan and in turn lead to positive and beneficial health outcomes.

Research has shown that TGfU has resulted in improved fundamental movement skills for students, and students who are competent in fundamental movement skills are more likely to enjoy sports and activities and to develop a lifelong commitment to physical activity (ACARA Australian Curriculum, Assessment and Reporting Authority, 2014). It is also suggested, that by applying the TGfU model, the ACARA, HPE document (2014) strand “Valuing Movement” can be effectively consolidated and comprehensively addressed within a PE context. Another aim of the ACARA, HPE document (2014) is for students to acquire, apply and evaluate movement skills, concepts, and strategies to respond confidently, competently, and creatively in a variety of physical activity contexts and settings. TGfU has been proven to support students in this area, where students became more tactically aware and became better decision-makers. Hence, students who become better decision-makers can apply their knowledge across a variety of sports, allowing them to respond competently and confidently. Another positive aspect of the TGfU model, is the potential of implementing strategies to address gender separation within a co-educational class. Such an approach, as TGfU, can positively impact on girls’ participation rates and minimize feelings of incompetence and a feeling of being undervalued (Webb, Pearson, & Forrest, 2006).

Webb et al. (2006) describe the TGfU model as encouraging decision-making within students and highlight specific skills, tactics, and problems involved in the full version of sports. According to Stolz and Pill (2014) when using TGfU, the development of any game will proceed to include the game, game appreciation, tactics, decision-making, and skill execution and performance. The TGfU model can be applied to four categories of games which are target games, net/wall games, striking/fielding games and invasion games (Stolz & Pill, 2014). Stolz and Pill (2014) go on to state that all games in each category of TGfU have similar concepts and share similar tactical problems to be solved allowing transfer of tactical understanding across games. By using the TGfU approach PE can be implemented in a student-centered manner which encourages authentic engagement from students in their own learning (Dyson et al., 2004). With an emphasis on student involvement and the creation of active learners who create meaning in social activities the TGfU approach has many similarities to constructivism (Derry, 2013).

The TGfU model considers authentic lessons which begin with the involvement in a game and then the gradual appreciation of the rules and structure of the game (Dyson et al., 2004). Students then move on to developing knowledge of tactics and the ability to apply these skills through strategic decision-making (Webb et al., 2006). By basing the structure of the learning experiences upon the TGfU model, for authentic lesson planning and delivery, the learning experiences should aim to move students throughout the decision-making stage. What is more, by providing opportunities for student's to develop their own modified games, they are further encouraged to form an appreciation of the need for certain rules, skills, tactics, and safety concerns through their experimentation, individual skill level, team work, and class discussion.

With the general aim of the TGfU model to move students to become proficient in applying tactical awareness and decision-making strategies (Webb et al., 2006) this approach supports ACARA's HPE (2014) requirements for cognitive involvement in PE. Through a modified game approach, student's become more aware of what skills and tactics are needed to play specific games effectively. The student's knowledge of tactics, as well as their appreciation of them, and their ability to decide when and how to implement them, extends students' critical, higher order thinking. As students take on the role of coach and player, they are able to engage in critical thinking about how best to implement effective tactics within game play (Purichia, 2015). Similarly, Vygotsky's constructivism, inquiry-based learning and Moston's guided discovery models, support the need for effective questioning as a key strategy within the TGfU model (Webb et al., 2006). Within each lesson, specific questions should be designed and implemented that could be used as a pedagogical tool to encourage students to analyze their own and others use of skills and tactics (Pearson & Webb, 2008). Questions should be developed around addressing three key areas, being to: (1) space, (2) time, and (3) risk (Pearson & Webb, 2008, p. 5). Questioning techniques are aimed at assisting students in considering their own and their group's actions whilst playing.

The personal and social capability priority within ACARA, HPE document, emphasizes the effect "working collaboratively" has on the development of communication, social skills, recognition of perspectives, teamwork and negotiation within students (ACARA Australian Curriculum, Assessment & Reporting Authority, 2014). These learning outcomes heighten an array of opportunities for group and pair work which helps to support the personal and social general capability (Mawer, 2014). It is widely recognized that pair and observational work improves students' interaction skills and assists in developing their appreciation for others strengths and capabilities (Mawer, 2014). Constructivism is underpinned by a theoretical premise that higher order mental functions are achieved through "social situations" and such a principle is fundamental in achieving effective pedagogy (Keenan & Evans, 2009). Additionally, by incorporating an inquiry-based learning approach, in which students are presented with a problem, students are challenged to think in new ways and find different approaches to respond to an open ended question (Purichia, 2015). The ACARA, HPE document (2014) promotes learning experiences that provide opportunities for students to observe, analyze, compare, create, and use critical thinking skills to produce sophisticated responses. Kirk, Macdonald, and O'Sullivan (2006) suggest that by students being actively involved in an inquiry-based learning

approach, critical and creative thinking is achieved. By inviting student's to become problem solvers and making the PE and sporting domain a more student centered environment, student's will be encouraged and supported to engage more deeply in critical and creative thinking.

2.2. Relevance of TGfU to the Australian curriculum, assessment and reporting authority

Integral to the successful delivery of school-based PE is the concept of valuing movement, where PE teachers' support students in developing the movement skills and concepts required to participate in physical activities with competence and confidence (ACARA, HPE, 2014). Knowledge, skills, and students' dispositions are developed while undertaking school-based PE and sport, and will encourage ongoing participation across a student's lifespan and in turn lead to positive and beneficial health outcomes (ACARA, 2014). Specific aims for the ACARA, HPE document are outlined as being developed so as to allow students to:

- Access, evaluate and synthesize information to take positive action to protect, enhance and advocate for their own and others' health, well-being, safety, and physical activity participation across their lifespan
- Develop and use personal, behavioral, social and cognitive skills, and strategies to promote a sense of personal identity and well-being and to build and manage respectful relationships
- Acquire, apply, and evaluate movement skills, concepts, and strategies to respond confidently, competently, and creatively in a variety of physical activity contexts and settings
- Engage in and enjoy regular movement-based learning experiences and understand and appreciate their significance to personal, social, cultural, environmental, and health practices and outcomes
- Analyze how varied and changing personal and contextual factors shape understanding of, and opportunities for, health and physical activity locally, regionally, and globally.

What is more, research has shown that TGfU has resulted in improved fundamental movement skills for students, and students who are competent in fundamental movement skills are more likely to enjoy sports and activities and to develop a lifelong commitment to physical activity (Australian Sports Commission, 2007; Martin & Gaskin, 2004). This key research suggests that a TGfU approach can contribute to the success of valuing movement whilst addressing the ACARA, HPE document's (2014) aims and objectives for students' learning. Supporting such ideals, is a main underpinning of the ACARA, HPE document (2014), that is, for students to acquire, apply and evaluate movement skills, concepts and strategies and to respond confidently, competently and creatively in a variety of physical activity contexts and settings. TGfU has been proven to support students in this area, and as outlined by Thomas (1997), "students became more tactically aware and became better decision makers" (p. 51). Hence, students who become better decision makers can apply their knowledge across a variety of sports, allowing them to respond competently and confidently.

The movement and physical activity strand of the ACARA, HPE document (2014) has a sub strand called "Learning Through Movement", and is well suited for the adoption of the TGfU model to address the learning for movement for students. The "Learning Through Movement" sub strand, in the document for year 7–8, contains a focus area which identifies the importance of students being able to "evaluate and justify reasons for decisions and choices of action when solving movement challenges" (ACARA, HPE, 2014, p. 48). Supporting such a pedagogical framework is Pearson and Webb (2008) who describe "active questioning" as an integral aspect to the success of TGfU, where effective questioning is a move away from the traditional teacher centered model of teaching to a more student centered approach providing opportunities for students to make decisions and think for themselves. In doing so, situations are created whereby the students learn skills and tactics whilst making decisions and can justify their decisions and choices in a variety of movement contexts. It is important to note, that a traditional game approach to teaching school-based PE and sport instead of the TGfU approach, would not permit the time for students to reflect and justify their

decisions due to limited time for the PE teacher to implement “active questioning” to further enhance students’ decision-making skills in the PE context.

Another focus area within the sub strand “Learning Through Movement” in the ACARA, HPE (2014) document for year 7–8 is the focus area which addresses the concept of “modify rules and scoring systems to allow for fair play, safety and inclusive participation” (p. 46). Interestingly, Light and Georgakis (2005) found that a traditional approach to teaching games was limited in its ability to modify rules, whereas the TGfU approach can modify the game to ensure fair play and inclusive participation. What is more, Light and Georgakis (2005) goes on to indicate that the TGfU approach promoted high levels of participation and enjoyment, and was able to cater for varying abilities.

2.3. Teaching games for understanding and teacher education

Almond (2010) believes that the TGfU approach has not been as well accepted by teachers as it has by academics and that further research is warranted so that the TGfU pedagogy in PE becomes a central and practical issue. Research on innovation in teacher education found that pre-service teachers viewed sport in PE as substantially concerned with teaching the technical skills of various sports and how to progress or extend the development of those skills, and the rules of sport (Pill, Penney, & Swabey, 2012). This research suggests that the pre-service teachers were reflecting on how they were taught at school, by way of adopting a traditional teaching approach, and not embracing effective teaching innovation such as the TGfU model. Furthermore, Pill (2012) found that the pre-service teachers regarded experience as a sport participant or player as essential in providing the knowledge for sport and PE teaching, and identified that experience in a specific sport as essential if they were to design and enact effective teaching strategies for quality learning. These findings suggest that content knowledge is essential, and that a lack of this knowledge may be a barrier for some pre-service teachers in their implementation of the TGfU approach.

Light and Geogarkis (2005) state that the ability to use the TGfU approach requires considerable pedagogical skill and also requires those using the approach to have a broad perspective and deep understanding of games. Forrest, Webb, and Pearson (2007) suggest that if pre-service teacher education programs and professional development programs about TGfU do not develop “games programs”, that allow participants to develop skills in these areas, the approach may be devalued as a pedagogical method. Similarly, Webb and Pearson (2012) suggest that course work at university can improve the pre-service teacher’s understanding of curriculum and pedagogical understanding of sport teaching; however, the practicum experience is fundamentally influential. With that in mind, it is essential for pre-service teachers to undertake practical teaching rounds to further improve quality delivery of effective teaching in PE and improve content knowledge to implement the TGfU approach. Forrest et al. (2007) suggest that a game for outcome approach can address many of the limitations pre-service teachers may confront when trying to implement a game-based approach such as TGfU. McKeen et al. (2007) describe the approach as the pre-service teacher creating a variety of challenges which can be set for all students, regardless of ability in the game context, through methods including the manipulation of team members or the changing of conditions; which in turn allowing for a constantly engaging, motivating, and challenging environment for the students. Using this approach, students can gain an understanding of all of the different components that are part of the makeup of a game and teachers do not need to create multiple variations of games and can focus more on active questioning.

3. Conclusion

The incorporation and utilization of educational theoretical models, as those described in this paper, allows for the creation of learning experiences which foster effective pedagogical choices. To meet the demands of the changing nature of both International and National (Australian) Curriculums, which now calls for more cognitive involvement of students in PE and sport, pedagogical approaches can make use of theoretical models and approaches to ensure higher order critical and creative thinking is reached by students. Supporting such a comment is the importance of TGfU, as an appropriate practical model for addressing and achieving the desired aims of the ACARA, HPE

document (2014). What is more, Australian schools should priorities TGfU approaches in PE programs and support specialists, as well as general teachers, in professional development so they can continue to build their pedagogical knowledge. This will allow teachers the ability to deliver the TGfU approach as an effective teaching strategy to ensure students are experiencing quality learning and desired aims, focus areas, and learning outcomes. Learning experiences designed in PE classes can be supported by constructivist approaches, inquiry-based learning and the TGfU models through the use of pedagogical strategies such as questioning, student-led activities, and group work. This paper concludes by indicating that current and future teacher practitioners need to give consideration as to how to utilize educational theoretical models for supporting effective pedagogy in PE and undertake a concerted effort to create environments in which students take control of their learning and construct meaning relevant to their own lives – resulting in lifelong learning in PE.

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