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The transformational wind of theoretical change

Citation for published version:

Jess, M & Atencio, M 2017, The transformational wind of theoretical change: A historic and contemporary view of physical education. in M Thorburn (ed.), *Transformative Learning and Teaching in Physical Education*. Routledge Research in Education, Routledge, London, pp. 45-61.

Link:

[Link to publication record in Edinburgh Research Explorer](#)

Document Version:

Peer reviewed version

Published In:

Transformative Learning and Teaching in Physical Education

Publisher Rights Statement:

This is an Accepted Manuscript of a book chapter published by Routledge in Transformative Learning and Teaching in Physical Education on 2017-04-07, available online: [https://www.routledge.com/Transformative-Learning-and-Teaching-in-Physical Education/Thorburn/p/book/9781138650183](https://www.routledge.com/Transformative-Learning-and-Teaching-in-Physical-Education/Thorburn/p/book/9781138650183)

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Chapter Three:

The transformational wind of theoretical change: a historic and contemporary view of physical education

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Abstract

Building on a historical review of physical education, this chapter discusses how new curriculum approaches seek to help learners negotiate the unpredictable and contradictory nature of learning across the lifespan. Subsequently, it highlights how the literature increasingly focuses on new curriculum models that present a holistic view of physical education that is participative, interactive and authentic. The chapter further discusses how efforts are being made to create overarching curriculum frameworks that are more integrated, robust and flexible. It concludes by discussing how the integration of the models-based practice and ‘connective specialism’ approaches may act as a catalyst to support future overarching curriculum developments.

Introduction

While physical education has been a regular feature of the school curriculum around the world for over a hundred years, the subject area has typically been viewed as sport, games or play and has subsequently had a ‘shadowy, marginal existence in education’ (Ozoliņš & Stolz, 2013, p. 888). Since the turn of this century, however, there is some evidence of physical education experiencing a recovery in many western countries as awareness of the lifelong benefits of physical activity and concerns about pediatric obesity and inactivity permeate public and political arenas (Jess & Thorburn, 2015). While we recognize that this revival may help secure physical education’s mid to long term survival in the school curriculum, we also suggest that future developments are likely to be ‘messy’ as the subject finds itself increasingly located in a congested, contested and largely neo-liberal policy spaces. As sport, health and education stakeholders jockey to influence future curriculum trajectory (Petrie & Hunter, 2011), the complexity of this political landscape is likely to be a constant. In particular, with neoliberalism more commonplace globally, the outsourcing of physical education has become increasingly common, particularly in primary schools, with result that the subject is increasingly being used to meet narrow instrumental goals that many

believe will decrease the educational contribution physical education can make in the school setting (e.g., McCullick, 2014). Therefore, while the current state of affairs for physical education may appear to be encouraging, the future health of the subject in schools remains open to some conjecture.

Acknowledging this ‘edgy’ context, this chapter considers how the physical education profession is addressing the educational status issue in terms of the curriculum frameworks being developed to secure the subject’s future position in schools. To do this, we first discuss how physical education has found itself in its current situation by reflecting on the non-linear evolution of the subject throughout the previous century and the accompanying lack of consensus about its main purpose in schools. In particular, we discuss the emergence of the one-size-fits-all, behaviourist-inclined multi-activity approach that was to become the dominant curriculum approach in many countries (Kirk, 2010). However, as disquiet with the educational value of this approach grew, we also explore how the early part of the twenty first century revealed a noticeable theoretical shift as the physical education profession moved to develop curriculum approaches which acknowledged the more complex and holistic nature of the subject. Building on this, we conclude the chapter by proposing that the future of physical education may be best served by encompassing an overarching and complexity-informed curriculum approach that overtly positions physical education within a lifelong learning perspective. To do this we suggest a focus on the developmental integration of the connective and models-based approaches that have recently gained some traction in the contemporary physical education literature.

Physical Education in the Twentieth Century

To place physical education in its current context, we first consider some key features of the subject's evolution throughout the late nineteenth and twentieth century. It was with the introduction of mass schooling in the late nineteenth century that physical education first appeared as a school subject in many countries. While other subjects may have been included in the curriculum on the basis of their perceived cognitive or intellectual value, the introduction of physical education was primarily founded on concerns about the poor physical fitness and health of the armed forces at the time (Kirk, 1992). From this instrumental beginning, physical education has consistently struggled to convince key stakeholders of its capacity to make a legitimate and valuable contribution to the *education* of children and young people. Consequently, physical education often finds itself positioned on the margins of the school curriculum.

These concerns about educational status were less evident in the early part of the twentieth century mainly because the subject was viewed as a form of physical training dominated by Swedish or German gymnastics. However, following World War II, curriculum development in physical education emerged as a more contested area as influences from within and outside the physical education profession sought to extend the subject's focus beyond its drill and regimented heritage (Kirk, 2013). With secondary schooling now universal and male teachers entering the profession in significant numbers, attempts were made to reorient physical education along more educational lines. While limited government input offered physical educators the freedom to develop their own curriculum approaches, as an embryonic area of study lacking 'intellectual tradition' (Gard, 2008), the development process proved to be messy and often uncomfortable. As different groups set out to locate the subject in line with various, sometimes conflicting, interests, few overarching, coherent and robust curriculum visions materialized (Goodson, 1987) although a distinct schism between the male and

female sectors of the profession appeared. While the females supported a more aesthetic and creative approach, the incoming male teachers' favored a more scientifically-informed movement skill model focused on games and sports. Tension between these 'gendered' viewpoints was to be apparent for many years, particularly as initial teacher education programmes were being developed and delivered in 'all male' or 'all female' institutions. However, with the more scientific movement approach linking to the positivist worldview of the time, this approach began to dominate the physical education landscape, particularly when it was extended beyond games and sports to become the multi-activity approach. Leaning towards behaviourist learning theory, this multi-activity approach consisted of short 6-8 week 'blocks' of different physical activities, primarily focused on the development of the technical movement skills involved in different activities and was initially considered to have some educational potential. This prominence was enhanced further when teacher education institutions were to become mixed-gender and increasingly focused on the secondary school years (Kirk, 2002).

As physical educators grappled to design an educationally worthwhile curriculum, two external events were to impact on developments. In the mid-1960s, the debate about the subject's educational status was re-visited when two prominent educational philosophers raised concerns about physical education's place in the curriculum. Writing from the Platonic-Cartesian philosophical perspective that had long-dominated western education thinking, Peters (1966) and Hirst (1968) presented a view of the school curriculum that distinguished the mind from the body and, critically, privileged different intellectual enquiry modes. Most notably, Peters (1966) challenged physical education's place in the curriculum by proposing that that games, the key component of the multi-activity approach, were morally unimportant, not serious, of limited cognitive content and easily mastered. While he

later amended his views to acknowledge practical activities may be of some educational value (Peters, 1983), this initial writing impacted heavily on the physical education profession and has remained an ongoing topic of concern (e.g., Ozoliņš & Stolz, 2013).

In addition to the status debate, the 1980s, for the first time, began to see governments take a more prominent role in curriculum development and implementation. For many within physical education, and education in general, this interventionist role was to create tension, particularly because these new developments were often driven by neo-liberal principles focused on economic, market-driven and performativity agendas. While the education profession remained largely wedded to a social justice agenda and increasingly supportive of constructivist, inclusive and critical approaches to learning, the raising of standards, increased teacher accountability and economic competitiveness all began to permeate school practices. On the margins, physical education proved to be of limited interest to policy makers and the subject increasingly took on a more instrumental role to support sport and health agendas. As the physical education profession continued its internal quarrels, it was to become an onlooker from the boundary of the crowded policy arena (Penney, 2006). In a short period of time, the subject had moved from being in ‘a world of its own’ (Thorburn & Horrell, 2011, p. 74) into a policy space it was to find particularly difficult to enter or influence.

It is also important to recognize that the second half of the twentieth century saw physical education increasingly focus on the secondary years of schooling and become less concerned about the primary years. While some primary school development activity was apparent in the 1980s, e.g. through a number of short lived daily physical education programmes, concerns about the quality of primary physical education became a regular feature in the literature. The limited number of specialist teachers working in the primary sector, relatively

low quality teaching by generalist class teachers and inadequate initial teacher education and professional development were all identified as key issues for the primary physical education sector.

As these internal and external issues took centre-stage for the physical education profession, the 1980s saw the emergence of new curriculum thinking in physical education as scholars began to raise questions about the educational worth of the multi-activity approach. Sport Education (Siedentop, 1994) and Teaching Games for Understanding (TGfU) (Bunker & Thorpe, 1982) were introduced and have become the most prominent and long lasting examples of this new thinking. While neither approach was designed as an overarching curriculum framework, they both introduced a more holistic way to view aspects of the physical education curriculum and were to instigate a move beyond the physical focus and behaviourist practices associated with the multi-activity approach. Progress towards these new curriculum approaches was, and continues to be, modest and it was soon apparent that existing curriculum models had become particularly 'resistant to change' (Penney, 2006). However, by the end of the century, concerns about the educational worthiness and thinking underlying the multi-activity approach had increased and there was a growing consensus of an urgent need to construct new curriculum approaches that were 'sufficiently defensible, rigorous, and relevant within contemporary school cultures to ensure that the subject [or learning area] is positioned as legitimate work' (Macdonald & Brooker, 1997, p. 155). However, with external agents now driving the direction of physical education in many countries, a world-wide survey specifically commissioned for a World Summit in Physical Education in Berlin in 1999 reported that the physical education profession was finding it difficult to make significant impact on national developments within this new policy context and that it was '....suffering from decreasing curriculum time allocation, budgetary controls

with inadequate financial, material and personnel resources, low subject status and esteem and is being even more marginalised and undervalued by authorities' (Hardman & Marshall, 2000, p. 34). While the twentieth century had seen physical education become a universal part of most curricula around the world, with a focus on the secondary years and connections more closely aligned to health or sport agendas, as we moved into a new century the future of physical education as a school subject seemed to be in some peril.

The Early 21st Century

However, as global concerns about obesity and physical inactivity came to the fore at the beginning of the new century, the seeds of a revival for physical education were soon apparent in many countries (Thorburn et al., 2011). Although this is welcomed by many, the political landscape in which this revival has developed continues to be crowded and contested as stakeholders from education, health, sport and other sectors seek to influence the future direction of the subject. For example, physical education developments in countries like Scotland, Australia and New Zealand are now firmly rooted within a health discourse, while sport and competition agendas remain the driver in England (Department for Education, 2013). As a consequence, while physical education may seem to now have a more secure positioning in many school curricula, the enduring concern for the physical education profession is that this elevated position has its basis in the subject's capacity to meet a range of non-educational and ever-changing imperatives. In particular, while physical education's heightened status has seen increased government funding, there has been a decline in the financial support from education stakeholders and an increased contribution from the sport and/or health sectors (Evans & Davies, 2014). As was highlighted in Chapter One, as neo-liberalism continues to dominate the political landscape, accountability measures linked to specific health and sport imperatives and an increase in the outsourcing of physical education

teaching are beginning to change the nature of the physical education experience for many children. It is therefore conceivable that in some countries, while physical education may remain part of the school curriculum, its future contribution may be increasingly aligned to 'other' agendas and quickly returns to the margins of the school curriculum.

While returning to the margins of the school curriculum may be one impending scenario, we take the view that a more positive picture may evolve if much of the contemporary academic and professional work currently being carried out by the physical education profession can be harnessed effectively in the years to come. Subsequently, in this next section, we briefly consider how contemporary developments represent a shift towards a more educational perspective on physical education before presenting an overarching framework that synthesizes a number of contemporary developments which, we suggest, creates a realistic and authentic educational vision for the future of physical education

Contemporary educational developments in physical education

Around the turn of the century, there was evidence of the physical education profession beginning to seriously question its association with the positivist-leaning multi-activity curriculum approach. Although this activity approach may still dominate in many parts of the world, concerns about its educational value have become common as many now view it as simply a sampling mechanism to introduce learners to a range of fragmented activity experiences that have little connection with the deep learning that can act as the foundation for engagement in different learning activities across the lifespan. Accordingly, and in response to the emergence of ideas from postmodern thinking (e.g., Fernandez-Bilboa, 1997), a perceived need for learning experiences that were more relevant to learners' complex needs was increasingly voiced and there were moves towards a curriculum process aimed at

supporting learners who could ‘deal with the uncertainty of conflicting and changing knowledge’ (Wright, 2004, p. 6). As principles from interpretive, critical, feminist, poststructuralist and complexity perspectives became regular features of the physical literature, so the curriculum reform agenda has become increasingly informed by thinking from constructivist, situated, critical, ecological, dynamical systems and complexity perspectives on learning. As a result, this theoretical shift has acted as the catalyst for calls to introduce physical education curriculum and pedagogy that are more participative, interactive, meaningful and situated (e.g. Ovens, Hopper & Butler, 2013).

While Sport Education and TGfU were not initially designed as part of the postmodern shift, they had both created some traction within the physical education world and efforts were subsequently made to integrate them with these new conceptualisations of knowledge and learning. Both approaches thus became the precursors of a number of new curriculum and pedagogical models that include cooperative learning, place-based learning, critical pedagogy, health-based physical education, Taking Personal and Social Responsibility (TPSR), physical literacy and numerous others (see Tannehill et al., 2013). While these new models focus on different dimensions of the physical education experience, they are all connected with more contemporary thinking, present a more holistic vision of physical education and can offer more participative, interactive and authentic experiences. However, while these recent developments point towards a clear commitment to a contemporary educational agenda for physical education, curriculum cohesion and the robustness and flexibility of course descriptions have received renewed attention amid calls to create overarching curriculum frameworks that are more integrated, robust and flexible in nature.

Complexity Thinking

With these contemporary approaches in mind, our own curriculum efforts over the last decade have focused on the robustness and flexibility just discussed as we have tried to integrate ideas from a range of perspectives to design an overarching physical education curriculum framework. From this perspective, we take the view that ideas from complexity thinking not only connect with many of the contemporary views on learning but also have the potential to create an overarching frame that can help unify many of these views.

Consequently, before we present a summary of our current ideas on this overarching curriculum, we present a review of the key complexity thinking principles that inform our educationally-focused view of physical education.

For us, complexity thinking is best explained by focusing on how systems made up of many different interacting parts function e.g., cars, watches and humans. While complicated systems like cars or watches work in a pre-programmed, closed loop and predictable manner, we suggest that humans are different because they are complex systems that are less predictable, more dynamic and adaptable. The flexibility within complex systems stems from the fact the different parts of the system self-organise as they interact with each other and with the wider external system. Complex systems therefore have the capacity to produce both predictable and unpredictable outcomes. Crucially, from the myriad of interactions that occur, complex systems are able to exhibit structure, order and predictability while also revealing an inherent unpredictability. Applying this self-organising principle to the education system, children, teachers, schools, local authorities and governments are all viewed as complex systems that are constantly interacting to function in ways that display a balance between order and structure and adaptability and uncertainty. As such, all these 'actors' within the education system self-organise and interact to produce emergent behaviours that have the

coexisting potential to exhibit both predictability and unpredictability (Davis & Sumara, 2010).

The more we have been able to understand the key points, the more we have come to concentrate on working out how to support the self-organising, interactive and emergent nature of the learning process in physical education. For this, ideas from ecological and complexity thinking have helped us better understand the complex nature of the learning process and we have increasingly used the following principles to inform our approach to physical education i.e. self-organisation and emergence, predictability and unpredictability, similarities and diversities, connectedness and nestedness, ambiguous bounding and edge of chaos and recursive elaboration. While most of the discussion that follows focuses on these complexity principles, we must highlight that key features of ecological thinking were initially helpful because, like complexity, they focus on the relational nature of behaviour as it emerges from the interaction between the individual, environment and tasks being undertaken (Rovengo, 2006). As our thinking about complexity evolved, therefore, we used this ecological interactionist view as the foundation from which we describe the relationship between the self-organising individual and the ever-changing boundaries created by environmental factors, the task and the individual themselves. The key here is that, while learners may be functioning within similar boundaries, they will interpret these changing boundaries in their own self-organising way based on their previous experiences, their current capacities and their personal interpretation of the different boundaries. As such, as learners self organise they are constantly interpreting the boundaries in their own way, hence the term ‘ambiguous’.

As these interactions continue over time a process of recursive elaboration takes place as tasks are revisited in ways that may be quite similar but will often be different e.g. when you play a game of basketball each time you receive the ball it is likely you will be in a different position in the court and with a different configuration of players around you. This revisiting process is a key part of complex learning because it leads learners to respond to the ever-changing boundaries (or constraints) in different ways, sometimes responding inside, other times around and maybe even beyond the parameters of the boundaries. Critically, these different responses around the ‘edge of chaos’ result in a wide range of outcomes from learners that include making errors, being creative, consolidating behaviours and also challenging themselves as part of a complex learning process. As this recursive elaboration process unfolds the complex learning process becomes ‘dynamic, self-renewing and creative’ and brings forth ‘new’ knowledges and ways of being’ (Osberg et al., 2009, p. 225). Simply repeating the same drill-like tasks is unlikely to help support this elaborate type of complex learning.

As our work with complexity thinking evolved, we further explored how three complexity principles help bring coherence to the learning process: *connectedness, similarity and diversity*. Given the relational nature of humans as complex systems, making appropriate connections is central to the learning process because ‘new properties and behaviours emerge not only from the elements that constitute a system, but from the myriad connections among them’ (Mason, 2008, p. 48). However, while there is the potential for connections to exist between people and/or knowledge, these connections can be limited or even non-existent and, as a result, lead to the disconnection associated with weaker forms of learning. Conversely, stronger connections have the potential to support the coherence needed to apply and transfer learning across different contexts. We would suggest that it is this weak type of connectivity

that is the problem with the multi-activity approach because the ‘sampling’ of physical activities limits the internal connections within the subject and makes it difficult to develop the shared understanding that bring coherence to the learning experience. As a consequence, we have increasingly worked to develop an approach towards physical education that is based on connected experiences that seek to integrate learning across learners’ schooling and lives (Penney & Jess, 2004).

Most recently, we have been persuaded that this connectivity and coherence can be best supported by focusing on the co-existing complexity principles of similarity and diversity. On the one hand, similarities are the inward-looking, more common features of physical education that bring order and coherence to the learning process. These similarities help create the ‘sameness’ that contributes to the coherence of experiences by enabling interactions between different internal parts and externally with the broader nested system. By highlighting similarities, we believe that physical education is likely to become a more coherent experience as it will help learners engage in experiences that help them recognise and share similarities across different contexts e.g. generic attacking and defending principles in TGfU that transfer across different games. However, the diversities within and between complex systems are the outward-looking aspects that support adaptable and creative actions in response to the dynamics across a range of contexts. In physical education these differences highlight how learners ‘require diverse and unexpected responses in terms of physical movement, cognitive reasoning and social interaction’ (Chow & Atencio, 2012, p. 2). As we discussed above, this diversity is critical because learners rarely respond to situations in exactly the same way, so need diverse behaviours to help them be adaptable and creative across contexts.

However, while similarities and diversities may be contrasting aspects of complex systems, they also act as harmonising features by operating reciprocally to preserve the effective working and coherence of the system. While too much similarity leads to the ‘sameness’ and impacts on the system’s ability to be adaptable in different contexts, too much diversity results in limited coherence between the system’s parts and also limits efficiency and adaptability. Subsequently, if physical education experiences need to be connected and coherent, we have increasingly argued that ideas from complexity thinking highlight the need to design a mix of learning experiences that focus concurrently on the similarities that bring order and structure and the diversities that support adaptable and creative behaviours across different contexts.

As we have grappled with, and shared, these complexity thinking principles, we have gradually built a vision of an educationally-oriented physical education curriculum around the following beliefs:

- Children and young people are complex *self-organising, interactive and emergent* learners
- Teachers use their own self-organising professional judgement to design and deliver learning tasks that are focussed on:
 - A long term recursive elaboration process
 - Experiences that are connected and coherent
 - A mix of learning tasks that are based on similarities and diversities
 - Amending task and environmental boundaries so that learners can consolidate, be challenged and be creative

While we acknowledge that these considerations have significant implications for teachers' pedagogy, particularly in relation to the amending of tasks and environmental boundaries, in this chapter we concentrate on how these considerations have influenced our view on the curriculum process in physical education. Accordingly, we will finish the chapter by discussing key drivers for an overarching complexity-informed physical education framework.

An Overarching Complexity-Informed Physical Education Framework

Developmental, lifelong and lifewide drivers

From this complexity perspective, we first propose that a key goal of physical education is to support learners' abilities to effectively self-organise their engagement in different forms of physical activity across their lives. This represents an approach to physical education that actively seeks to connect school-based learning with the learning that takes place in the physical activity contexts beyond schooling. It also mirrors contemporary moves towards an education system acknowledging that learning not only takes place in schools but in other sites and at different times (e.g. Scottish Executive, 2004). We stress, therefore, that in this self-organising way the role of physical education is to support the learning that effectively connects with 'lifewide as well as lifelong' learning (West, 2004, p. 141).

As a starting point for this lifelong and lifewide driver, curriculum physical education, extra-curricular activities and community experiences have key roles in helping learners connect and sustain their participation in an assortment of physical activity pursuits throughout their lives *for whatever reasons they choose*. These reasons could be for personal health, lifestyle, enjoyment, social interests and, for some, to improve or excel in a specific activity.

Significantly, these reasons relate to a life of complex learning and not one that is solely

about engagement in physical activity. Over a decade ago, Penney and Jess (2004) conceptualized lifelong physical activity (LLPA) holistically as having four dimensions:

- Functional physical activity, in response to demands of everyday work and home life;
- Recreational physical activity, as a leisure pursuit, which, for many, is a socially-orientated activity;
- Health-related physical activity, concerned with fitness, well-being and/or rehabilitation;
- Performance-related physical activity, concerned with self-improvement and/or success in performance environments.

As learners move through their school years and beyond, these LLPA dimensions involve a self-organising web of decision making as each individual recognises the demands of different activities and acknowledges their own needs, abilities and interests at different times in their lives. The key point here is the purpose each individual puts on an activity at a given time in their lives. Activities therefore are not inherently associated with a single LLPA dimension rather these associations fluctuate as learners self-organise to engage in particular activities for different reasons.

While the Penney and Jess (2004) paper continues to have some traction within the physical education literature, there do not appear to be any examples of serious engagement with this lifelong approach. This is particularly evident within the primary school context where physical education is still either seen as a break from the ‘real work’ of the classroom or used to ‘fit into’ secondary school agendas. However, we take the view that this connected lifelong and lifewide approach would enable physical education to have a more educational and

developmental focus and could inform and represent a focal point for curriculum development in schools from the preschool to the senior secondary years and beyond.

Deep and cumulative learning

Focusing on this lifelong and lifewide agenda, the recursive elaboration principle discussed previously becomes another key driver for school physical education. Revisiting tasks is particularly important because, without this, it is almost impossible to develop the deep and cumulative learning that organises our knowledge into a cohesive framework that can be applied and transferred across different contexts (Bransford, Brown, & Cocking, 2000). To achieve this deep and cumulative learning, learners need to engage in deliberate practice in relation to learning goals so that learning 'unfolds recursively by constantly invoking and elaborating established associations' (Davis & Sumara, 2010, p 201). Therefore, within the context of contemporary thinking about physical education, this deep learning not only suggests the acquisition of adaptive and creative movement competence over time but also the concurrent developing of the cognitive, social and emotional learning that will support engagement in a wide range of lifelong and lifewide physical activity contexts (Jess, Atencio & Thorburn, 2011).

Unfortunately, developing the deep and cumulative learning that supports a connected and cohesive physical education experience will not happen if the curriculum continues to be conceptualised and organised in ways that are “destined to have partial and short-lived relevance to many people’s lives’ (Penney & Jess, 2004, p.275). As we have noted numerous times in this chapter, the traditional multi-activity approach with its superficial and fragmented sampling experiences is unlikely to develop deep and cumulative learning that enables application and transfer across different contexts. With this deep and cumulative

learning in mind, we have been attracted by two recent developments that set out to present an overarching view of the physical education curriculum i.e. physical education as a ‘connective specialism’ (Penney, 2008) and ‘models based practice’ (MBP) (Kirk, 2013).

Integrating the ‘connective specialism’ and ‘models-based practice’ approaches

The idea of physical education as a ‘connective specialism’ resonates with much of what has been written above because it proposes that learning tasks should focus on the core knowledge and skills that act as the catalyst to support participation in physical activity across a range of contexts (MacDonald, 2014). Physical education is therefore seen as the ‘hub’ to integrate school learning with the learning experiences in ‘real life’ contexts (Rovegno, 2006). This not only aligns with ideas from situated learning and social constructivism, but also highlights the importance of collaboration in local settings and across the different sectors of the school and community systems. Situating learning in this self-organising way captures the lived experiences of young people and shows how, as learners, they integrate and co-construct school knowledge with their lives. This idea of a ‘connective specialism’ is apparent in much of our own work with the primary physical education curriculum where we have been particularly attracted to core learning as being the connective catalyst (Jess, Keay & Carse, 2016).

Taking a slightly different view towards an overarching curriculum, MBP is based on the belief that physical education has a number of different forms (Casey, 2012). It proposes that a range of new contemporary curriculum models (discussed earlier), and others still to be developed, can be used collectively to construct an overarching curriculum framework that seeks to achieve a range of holistic educational outcomes. While MBP may appear to have similarities with the multi-activity approach, its attraction is in the belief that these different

forms of physical education have the potential to contribute to a wide range of educational outcomes (Kirk, 2013). Teachers and schools therefore need to have the autonomy to choose appropriate curriculum models based on the attributes of the learners, the local context and the learning aspirations of the teachers and/or school. While there are few examples of this approach being used in secondary schools yet, Quay and Peters (2008) in Australia have explored the possibilities of the framework by focussing on primary school children's skill and fitness, personal and social development and physical activity learning by integrating a physical education programme to include fundamental motor skills, creative games making, TGfU, sport education and TPSR. In our own work, we have termed this diverse range of models as applications and, as we now discuss, integrate them with our ideas on core learning (Jess, Keay & Carse, 2016).

From a complexity perspective, therefore, we recommend integrating these two overarching approaches to present a unifying framework that presents core learning as the similarities to bring overarching order and structure to the curriculum experience while MBP offers a diverse range of models that can help consolidate, apply, transfer and extend core learning across a range of different physical activity contexts. In addition, we have recently been discussing how physical education may benefit from broadening the range of these physical activity contexts to move beyond the traditional focus on more formal physical activities, particularly team games, and include the more informal physical activities that have become popular in many local communities e.g. skateboarding, cycling and walking. As such, this integrated, broader approach not only offers a mix of similar and diverse learning experiences but considerable self-organising and recursive potential for *all* learners. In addition, and we believe critically, it also presents teachers with the opportunity to become curriculum

architects who, in their own context, can design connected and coherent lifelong and lifewide programmes focused on clear educational aims.

Future directions

Acknowledging that this chapter has largely been a conceptual exploration of the changing face of physical education over the last hundred years, we finish by considering how the complexity-informed ideas we have presented as an overarching framework may unfold in the future. In context, we recognize that much of what we have written stems from our applied efforts in primary physical education with the Developmental Physical Education Group (DPEG) at the University of Edinburgh over the last fifteen years. During this time, as we have worked with our ideas for Basic Moves, Early Moves, Core Learning and different applications, much of our work has involved an ongoing grappling with the theory that informs these curriculum approaches (see Jess, Atencio & Carse, 2016). In a similar vein to points made earlier about Sport Education and TGfU, we stress that our starting point for these curriculum ideas was not complexity thinking, but more a concern with the existing early childhood physical education curriculum we saw in schools. Consequently, we were trying out something different and, while we were to some extent successful in our initial efforts, the last decade has seen us focused on efforts to collectively work with the theory while concurrently trying to apply our ideas in practice: recursive elaboration in practice. In addition, given that our work has been focused in preschool and primary settings, we are conscious that the continued focus of the physical education profession on the secondary years has meant that the impact of our work on any wider curriculum development has been limited to date. This chapter, therefore, represents our first significant attempt to take our ideas, developmentally, beyond the primary years. The next step is to share the content with our undergraduate and postgraduate students, primary and secondary teachers and, in journal

articles, with the academic community. It is also our intention to apply the ideas presented with the primary teachers we work with within the local community. Progress may still be relatively modest, but if the last fifteen years are anything to go by, the next fifteen should be interesting.

Summary of key findings

- The historical development of physical education over the last hundred years has had a significant impact on the way the subject areas is viewed within the educational arena today
- The future of physical education will be influenced by a wide range of key stakeholders across a number of domains
- Complexity thinking is presented as a useful way to view learners within the physical education context
- Developmental, lifelong and lifewide drivers have the potential to more clearly position physical education as a subject area of educational value
- Integrating ideas from physical education as a ‘connective specialism’ and ‘models based practice’ may offer a more robust educational view of physical education for the future

Reflective tasks

- Discuss the benefits of having a good understanding of the historical development of physical education over the last century
- Why is it beneficial for physical education to be viewed as an educational subject area?
- Discuss your views on yourself (or others) as a self-organising and interactive complex system

- Review whether it is important to identify the similarities and diversities that make up physical education?
- Review whether the integration of physical education as a ‘connective specialism’ and ‘models based practice’ can create a physical education approach that is more connected and cohesive?

Further readings

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