

Making physical education relevant: increasing the impact of initial teacher training

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This paper is developed from concern that, despite a number of developments and initiatives in physical education over recent years, there has been little change in the teaching of the subject. This has resulted in many young people being alienated from physical education and therefore physical activity. The paper focuses on how initial teacher training (ITT) contributes to this lack of change by focusing on the development of knowledge for teaching and the technical competence to deliver this. It then considers ways in which ITT could contribute to developing 'knowledgeable teachers' who are able to make change. The paper focuses on two aspects identified as relevant for trainee physical education teachers: socialization and knowledge for teaching. It recognizes that the issues are complex and that change is difficult. It also recognizes that ITT cannot change things by itself. However, it argues that by maintaining the status quo, the subject will not develop so that it is relevant to today's youngsters.

Introduction

Over recent years there have been a number of developments and initiatives in physical education. These include, for example, teaching games for understanding, sport education, cooperative learning and, in England, the introduction and development of the National Curriculum for physical education (NCPE). Despite this, it is generally recognized that there has been little change in the teaching of the subject (Laws & Aldridge, 1995; Evans *et al.*, 1997; Penney & Harris, 1998; Curtner-Smith, 1999). Thus, the traditional, multi-activity curriculum based on the acquisition and performance of skills organized mostly around team games still predominates and a limited range of teaching methods are used for delivering this content (Penney & Evans, 1994, 1999; Ofsted, 1995b, 2002; Fairclough & Stratton, 1997; Green, 1998; Curtner-Smith, 1999; Mawer, 1999; Metzler, 2000; Kirk & Kinchin, 2003). This traditional content and teaching approaches contribute to the

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alienation of many young people from physical education and therefore physical activity (Kirk & Macdonald, 1998). This is partly because the physical education taught in schools does not allow young people to participate in the types of sport, exercise and physical recreation experienced outside school. Indeed, Kirk and Macdonald (1998, p. 381) argue that 'the form of learning represented in school may have little transfer value to related situations outside school. This is problematic if the aim of school physical education is to prepare pupils to pursue an active lifestyle in adulthood'. Low participation in a physically active, healthy lifestyle after leaving school is worrying, particularly at a time when the incidence of obesity is rising.

The aim of this paper is to consider factors in initial teacher training (ITT) which contribute to this lack of change in the teaching of physical education, focusing on socialization into teaching and the conceptualization of knowledge for teaching employed on any one ITT programme, as well as the way in which programmes are structured and delivered. The paper then aims to identify some ways in which ITT could contribute to developing 'knowledgeable teachers' of physical education who are able to make change. It is recognized that the issues are complex and that change is difficult. It also recognizes that ITT cannot change things by itself.

Two theoretical perspectives are considered: teacher socialization and knowledge for teaching.

Socialization

The strength of socialization into teaching physical education has been recognized over a long period. Research, much based on that initially conducted by Lortie (1975) and then Lawson (1983a, b), has identified a number of socializing factors which shape physical education teachers' knowledge and beliefs about the purpose of physical education, its content and teaching approaches. These include experiences in physical education (Evans & Williams, 1989; Schempp, 1989; Green, 1998; Curtner-Smith, 1999), sport (both in and out of school) (Templin, 1979; Dewar & Lawson, 1984; Dodds *et al.*, 1992; Curtner-Smith, 1999), success in education and in sport (Evans *et al.*, 1995) and interactions with physical education teachers, coaches and others working in physical activity and sport contexts with whom the prospective teacher comes into contact (Mawer, 1996). Some of these experiences are likely to be stronger than others for a number of reasons. For example, research has shown that many physical education teachers are motivated to enter the profession because of their experiences, and success, in sport as opposed to physical education (see Stidder & Hayes, 2006).

The history of the subject generally, and of the training of physical education teachers specifically, contribute to the strong socializing influences. Physical education has traditionally been gendered (Flintoff, 1983; Williams & Bedward, 2001; Brown, 2005). Different rationales for, and content of, physical education for boys and girls in schools have resulted from perceived differences in need and appropriateness for boys and girls. For example, physical education was included in boys' public schools to prepare them for their role in the military; focusing both on character-building and health and fitness, whilst for girls it was included for the remedial and educational possibilities of exercise. Thus,

physical education was traditionally taught in single-sex classes (Ofsted, 1995a). As a result, the early training of physical education teachers was in single-sex institutions (Kirk, 1992), with different programmes designed to enable men and women to teach different curricula in schools (Fletcher, 1984). Despite the training of teachers no longer being single-sex, much teaching of physical education in schools remains single-sex. Thus, gender has a significant impact on the socialization of trainee physical education teachers (Flintoff & Scraton, 2001; Rich, 2001; Brown, 2005; Stidder & Hayes, 2006).

In a study of knowledge about, and confidence to teach, the six areas of activity in the NCPE, Capel and Katene (2000) identified gender differences in trainee physical education teachers perceptions in relation to some activities. The activities which the highest percentage of male trainees identified as those in which they perceived that they had little knowledge were netball, dance, swimming and outdoor and adventurous activities (OAA); whilst the activities identified by the highest percentage of female trainees were cricket, dance, OAA, rugby and football. Male trainees perceived that they had significantly greater knowledge than female trainees of football, whilst female trainees perceived significantly greater knowledge than male trainees of netball, rounders, OAA and swimming. Further, a higher percentage of male trainees identified traditional male games of football and rugby, as well as badminton and athletics, and a higher percentage of female trainees identified traditional female games of netball and rounders, as well as swimming and gymnastics, as activities in which they perceived good knowledge. Differences in perceptions of amount of knowledge by male and female trainees was related to the different backgrounds and experiences which these trainees brought to their ITT programme because they were taught different activities in the school physical education curriculum and had different opportunities for participation in extra-curricular activities and activities outside school. Male trainees are more likely to have been taught football, rugby and cricket and female trainees are more likely to have been taught hockey, netball and rounders whilst at school. Also, male trainees may have experienced a more limited curriculum than female trainees. Ofsted (1995a, p.12) found that 'in a substantial proportion of schools ... the programme for boys is sometimes more limited than for girls'. Thus, the historical legacy of physical education, particularly the single-sex teaching of the subject and the training of teachers, has perpetuated the development of gender-specific curricula. This, in turn, affects the actions and attitudes of male and female physical education teachers.

As a result of their experiences, the beliefs held by many physical education teachers are 'conservative', based on a 'sporting perspective' in which the focus is on improving performance in traditional (British) team games (Sparkes, 1991b), delivered mainly through didactic approaches.

These beliefs have 'a distinct and traceable influence on an individual's future decisions, practices, and ideologies as a teacher' (Schempp & Graber, 1992, p. 333). Many physical education teachers see content and teaching approaches as 'self-evident' and 'unproblematic' (Thomson, 1999), resulting in what Penney and Evans (2005, p. 21) called 'the taken-for-granted routines in physical education'. As a result, any change in response to a development or an initiative may be superficial (e.g., use of new curriculum materials) (Sparkes, 1991a). Practice is not changed and the intended outcome is not achieved; the teacher continues to work within their comfort zone using established routines and

practices that they do not want disrupted. For example, Evans and Penny (1992) and Penney and Evans (1997) have found that many teachers in England adapt, modify and recreate the NCPE to match their existing beliefs. Likewise, despite the use of less directed teaching approaches in sport education, Alexander and Luckman (2001) warned that the focus on pupil-led organization may encourage teachers to settle for what Placek (1983) called, 'the busy, happy and good' approach to teaching, rather than seriously attempting to promote learning.

Thus, the call for fundamental curriculum change continues to be a key theme in physical education (see Locke, 1992; Penney & Chandler, 2000; Corbin, 2002). To make such change will require what Sparkes (1991a, p. 2) called real change, in which 'a key dimension for consideration is the transformation of beliefs, values and ideologies held by teachers that inform their pedagogical assumptions and practices'. Real change is very difficult: indeed, Sparkes (1987) questioned whether the constraints of entrenched cultural norms of physical education enable any change to be made. If any change is to be made, ITT, the first formal, structured development of knowledge, understanding and skills for teaching physical education must be a key component.

Knowledge for teaching

The second theoretical perspective considered is knowledge for teaching; particularly that knowledge developed in ITT. The knowledge and beliefs trainee teachers bring with them to ITT about physical education and about teaching, the knowledge they (chose to) learn during their programme, and therefore the knowledge they have at the end of their programme, and how they then use that knowledge in school, is a result of both socialization prior to and during their programme and the way in which knowledge for teaching is conceptualized within any one ITT programme.

Although one characteristic of a profession is its conceptual body of knowledge (see Hoyle & John, 1995), the knowledge that distinguishes teachers as professionals is contested. Thus, there are a number of theoretical models, ranging from rationalistic to interpretive, which conceptualize this knowledge.

Different ways of conceptualizing knowledge for teaching. In a review of changes in the knowledge base deemed appropriate to underpin teacher education in England, Hoyle and John (1995) highlighted underpinning knowledge based on the theories of Rousseau and Dewey being replaced by knowledge from the social science disciplines of history, philosophy, psychology and sociology of education. This generic approach to, and conclusions and recommendations about, teaching and learning, were translated into useable classroom activities in 'curriculum packages'. In turn, these underpinnings have been replaced by a number of other conceptualizations of knowledge for teaching. The action-research approach is built on the ideas of Lewin (1946) and Stenhouse (1975). In this approach, specific knowledge develops from 'systematic reflection on one's classroom experience, to understand it and to create meaning out of that understanding' (Hopkins, 2002, p. 5). This is related to the development of what Schon (1983) called the reflective practitioner.

Schon suggested that the capacity to reflect on action so as to engage in a process of continuous learning is one of the defining characteristics of professional practice. Other conceptualizations of knowledge include that by Elbaz (1983), who categorized teachers' practical knowledge into: knowledge of self; knowledge of the milieu of teaching; knowledge of the subject matter; knowledge of the curriculum; and knowledge of instruction. For Leinhardt and Smith (1985), teacher knowledge comprised subject matter knowledge and knowledge of lesson structure.

Hoyle and John (1995) grouped the different conceptualizations of knowledge for teaching into three rival epistemologies: positivist; interpretive; and critical. Bain (1990) identified socialization as one of three paradigms for research into knowledge for teaching physical education: the other two being behaviourist and critical theory. Carter (1990) identified three overlapping approaches to learning to teach: information-processing; the cognitive processes teachers use in thinking about teaching; teachers' professional knowledge, which includes both personal, practical and classroom knowledge; and pedagogical content knowledge: knowledge about the subject matter and how that is translated into classroom practice. Munby *et al.* (2001) classified the large number of ways in which knowledge for teaching can be conceptualized into theoretical or propositional and practice-orientated. They also recognized a 'gradual reconciliation [of the two] reinforces our view of the complexity involved in rendering the field into neat and exclusive categories' (p. 878).

Thus, the concept of knowledge for teaching is problematic. Two conceptualizations of knowledge for teaching commonly used in physical education are considered in the next section: that of Shulman (1987), which has been the focus of much research in physical education; and competencies/standards, which underpin many ITT physical education programmes.

Knowledge bases identified by Shulman. The seven knowledge bases developed by Shulman (1986, 1987) as the minimum knowledge for teaching is a framework commonly used in research about knowledge for teaching in general and in physical education in particular (Rovegno, 1992; Graber, 1995; Fernandez-Balboa *et al.*, 1996; Griffin *et al.*, 1996; Twiselton, 2000; Newton & Newton, 2001; see also a review by Amade-Escot, 2000). These knowledge bases are:

- *Content knowledge* (called subject matter knowledge by other researchers, see Grossman *et al.*, 1989; McDiarmid *et al.*, 1989; Calderhead & Shorrock, 1997). It includes two structures of knowledge: what Schwab (1964) called substantive (knowing which are the important concepts and skills in the subject) and syntactic (knowing how the concepts and skills are structured and organized within the subject).
- *General pedagogical knowledge*, which includes the broad principles and strategies of classroom management and organization that apply irrespective of the subject.
- *Curriculum knowledge*: the materials and programmes that serve as 'tools of the trade' for teachers.
- *Pedagogical content knowledge*: the knowledge that is the basis for the selection, organization and presentation of the content teachers want their pupils to acquire, i.e. the

integration of content and pedagogy for teaching physical education, which makes the content instructional. Grossman (1990) identified four components of pedagogical content knowledge: knowledge and beliefs about the purposes of teaching a subject at different grade levels; knowledge of pupils' understanding, conceptions and misconceptions of subject matter; knowledge of curriculum materials available for teaching a subject and knowledge of horizontal and vertical curricula for the subject; knowledge of instructional strategies and representations for teaching particular topics.

- *Knowledge of learners and their characteristics*: both knowledge of learners of a particular age range (empirical or social knowledge) and cognitive knowledge of learners, comprising knowledge of child development and knowledge of a particular group of learners.
- *Knowledge of educational contexts*: including a specific school, catchment area and the wider community.
- *Knowledge of educational ends, purposes, values and philosophical and historical influences*: both short and long-term goals of physical education and of education. Within this framework, Shulman identifies pedagogical content knowledge as the key to defining and understanding teaching as a special area of expertise that separates the pedagogue from the instructor.

A competency-based model of knowledge for teaching. A commonly-used conceptualization of knowledge used in many ITT programmes is the identification, in a behaviourist, competency-based model, of the standards and skills which trainee teachers must achieve to qualify as a teacher. In England, there are three standards (DfES & TTA, 2003) which are the minimum legal requirement of what trainee teachers must demonstrate they know, understand and are able to do to qualify as a teacher. These are:

- *Professional values and practice* (the attitudes and commitment to be expected of anyone qualifying to be a teacher).
- *Knowledge and understanding* (the content knowledge that gives newly qualified teachers (NQTs) confidence and authority in their subject; a clear understanding of how all pupils should progress and what teachers should expect them to achieve).
- *Teaching* (skills of planning, monitoring and assessment, and teaching and class management, underpinned by the values and knowledge covered in the other two standards).

Within each of these three standards a number of individual standards are identified. These generic standards are applicable to trainee teachers learning to teach different age levels and different subjects; there are no separate standards for physical education.

The limitations of these conceptualizations of knowledge. Each conceptualization of knowledge has its strengths and limitations. The next section looks at some limitations of Shulman's and competency-based conceptualizations of knowledge in informing ITT. It focuses first on the particular content of both conceptualizations and then on the way in which that content is organized and presented in a competency-based model (using the particular classification of standards in England as an exemplar).

Teaching is a complex activity and, out of the whole range of possible knowledge for teaching, each different conceptualization of knowledge prioritizes some knowledge over other knowledge. The specific knowledge prioritized by Shulman and in the standards in England is similar, although organized differently; Shulman's seven knowledge bases are incorporated into the three broad standards. Both prioritize knowledge for teaching and, in particular, the technical aspects of knowledge, e.g., the skills, rules and tactics of different sports activities, organization and management, teaching approaches, and managing behaviour.

However, even within the knowledge prioritized, some aspects of that knowledge seem to be given greater priority than other aspects. For example, the particular focus of much research in physical education, based on Shulman's knowledge bases, is on pedagogical content knowledge, which has provided considerable information about what teachers know, how they come to know it and, therefore, how they go about teaching it (Segall, 2004, p. 491).

Those aspects of knowledge that enable trainee teachers to focus on the problematic nature of teaching physical education (e.g., why particular content is taught in a particular way and whether it achieves the aims of a particular physical education programme) are given less priority. These aspects look beyond the 'what' and the 'how' of the technical to the why, based on an individual's beliefs and values, formed as a result of particular experiences and social contexts. For example, what Shulman (1987, p. 8) called 'Knowledge of educational ends, purposes, values and philosophical and historical influences' and one of the components of pedagogical content knowledge identified by Grossman (1990, p. 120) 'knowledge and beliefs about the purposes of teaching a subject at different grade levels' seems to have been given lower priority, both by Shulman (1987), who described this knowledge as implicit rather than explicit, and in the research agenda.

As with Shulman's knowledge bases, more problematic aspects of knowledge for teaching and understanding beliefs and values are given lower priority in a competency-based model. They are only referred to explicitly in one standard in England and implicitly in another, i.e., '[trainee teachers] know and understand the values, aims and purposes and the general teaching requirements set out in the National Curriculum Handbook'; (S2.2), and 'demonstrate and promote the positive values, attitudes and behaviour that they expect from their pupils'; (S1.3).

The way in which the content is organized and assessed further reinforces the prioritization of some knowledge over other. This is related to the structure of a particular ITT programme and in this case, of ITT in England. Much training of secondary teachers takes place through the one year (36 week) Postgraduate Certificate in Education (PGCE) route. On such programmes, trainee teachers are required to spend 24 weeks in school and 12 in the university. Although both the school- and university-based parts of the programme are important and designed to complement each other, research (Williams & Soares, 2002; Capel *et al.*, 2006) suggests that trainee teachers learn more from the school- than from the university-based part of the programme. This is because assessment of their performance against the standards to qualify as a teacher largely occurs in school. Thus, the school-based mentor is particularly influential in what trainee teachers learn on the school-based part of the programme. If the school curriculum, and the mentor's and other

teachers' teaching approaches, are traditional, this will influence what and how a trainee physical education teacher teaches. This is exacerbated if the mentor is not open to other content or teaching approaches being used.

In a study of what trainee teachers learn in schools on a school-based ITT programme, Edwards and Protheroe (2003) found that learning is heavily situated, with trainee teachers learning about curriculum delivery without acquiring ways of interpreting learners that are easily transferable. They also found there to be a participatory version of training which is not underpinned by an understanding of the implications of learning. Wright and Bottery (1997) found that school-based mentors place considerable emphasis on practical classroom and personal development techniques, but do not focus on conceptions of the wider role of the teacher. Thus, there is a strong emphasis on only part of the process of training teachers. They indicated that these findings suggest a 'cloak of technical rationality shrouds the training of new entrants to teaching and that the profession is either unaware or unwilling to debate and initiate its new entrants into a rich professional culture' (p. 235).

Specific, identifiable outcome statements or standards identified in competency-based models largely prioritize observable and measurable aspects of technical knowledge, and therefore prioritize what trainee teachers can do, rather than what they know. Knowledge which is not directly observable or is not amenable to precise measurement is given lower priority. This is further reinforced if, in order to qualify as a teacher, each trainee teacher is required to present evidence to 'tick off' achievement of each specific, observable outcome or standard. Such an approach can result in learning being atomized, whilst ignoring the holistic nature of teaching; that which makes teaching more than the sum of its parts. Thus, the interrelatedness, interdependence and complex interaction of knowledge that informs teaching decisions, regarded as important by Shulman (1987), can be lost. It can also result in trainee teachers developing knowledge which is limited to that which is applicable to the specific situation, rather than developing what Fernandez-Balboa *et al.* (1996) called 'knowledge connectedness', which enables trainee teachers to transfer knowledge from one situation to another.

In prioritizing technical knowledge for teaching which is transmitted to trainee teachers during ITT then assessed on the basis of achieving specific, mainly observable, outcomes, trainee teachers can learn the 'tricks of the trade' as they pick up what has variously been described as 'tips for teaching', a 'series of recipes' or a 'tool kit' for teaching. Indeed, Rossi and Cassidy (1999, p. 189) highlighted that 'whilst this [technical] learning is important, it is sometimes elevated to a significance perhaps out of proportion with its functional utility and reduces the teacher to little more than a technician'. It results in teaching being regarded as a low-grade activity undertaken by trained technicians having served their apprenticeship. If this is the case can we really lay claim to teaching being a true profession?

The outcomes of such an approach are that trainee teachers know how to teach, for example, the javelin (e.g., how to organize and manage the class and the most appropriate teaching approaches in light of the particular safety requirements), but not why they are teaching javelin rather than another activity, nor why they teach javelin, discus and shot

each year rather than focusing on, for example, one of these as a representation of a category of activities. Likewise, they know what teaching approach to use to achieve a particular learning outcome, but may not be able to articulate why that outcome is important. Thus, the focus is on a process-product, 'if I do this, then that happens', model, rather than a model which focuses on the complex, problematic nature of teaching and learning and of physical education. Thus, there is a self-perpetuating cycle and prior socialization tends to be reinforced. This limits the opportunities to challenge values and beliefs.

Whilst this section has not covered an exhaustive list of limitations, it points to the need to consider how trainee teachers can be prepared to do more than deliver competently the current curriculum using a limited range of teaching approaches. As presently conceptualized, ITT does not seem to be challenging the strong socialization of physical education teachers. Research suggests that beliefs about physical education developed prior to ITT are not easily changed and that ITT has relatively little impact on trainee teachers (Evans, 1992; Placek *et al.*, 1995; Evans *et al.*, 1996; Green, 1998; Curtner-Smith, 1999). Further, research has found that in ITT many trainee teachers confirm, rather than modify, their values and beliefs (Doolittle *et al.*, 1993; Solmon & Ashy, 1995). The analysis above suggests that this is what is occurring on ITT programmes in England. The next section identifies some areas for consideration to develop ITT programmes so as to challenge the socialization of trainee physical education teachers and better prepare them to challenge current practice. By doing so we may make physical education relevant to today's young people, whilst working within the constraints of a competency-based model and enabling trainee teachers to meet the specific outcomes to qualify as a teacher.

Developing knowledgeable teachers of physical education able to make change

One area for consideration is changing the focus on ITT programmes from developing knowledge for teaching to developing what Rossi and Cassidy (1999) called 'knowledgeable teachers'. Knowledgeable teachers place pupils learning at the heart of their teaching. They are clear about the aims and purposes of physical education and are able to plan their content and teaching approaches to enable them to work towards achieving those aims. They pay as much attention to why they are teaching specific content as to how they are teaching and what teaching approaches they are using. They are able to challenge both their own and others' beliefs and practices and the status quo in order to make physical education more relevant to young people. Thus, knowledgeable teachers not only have relevant knowledge and technical expertise for teaching, they are also able to plan what and how they are going to teach, so that the curriculum is relevant to the pupils they are teaching. To achieve this, attention needs to be given not only to what knowledge and technical skills trainee teachers need to develop, but also to developing their cognitive capacities to enable them to consider teaching and learning in physical education in a problematic way, so that they are able to challenge the content they teach and the teaching approaches they adopt. This also enables them to consider their teaching in any one school more broadly than that specific context.

This requires trainee teachers to be able to reflect and constantly be willing to question teaching approaches; asking questions about how to combine knowledge and delivery methods successfully to transform information into forms that are 'pedagogically powerful', inclusive and inspiring for all pupils (Shulman, 1999). This is further supported through Schon's (1995) view that professional practice should be based on science and not on intuition. This is vital as, in future, teaching and learning will have a complexity that precludes any paint-by-number plan that practitioners can easily stick to (Toole & Seashore Louis, 2002). There is a developing view that the educators of tomorrow in what ever form they take—teachers, coaches, mums, dads, brothers, sisters, volunteers or highly paid professionals—will see themselves as 'social pedagogues' (Jones *et al.*, 2004), innovators who view their role in the educational relationship differently; challenging their own past in search of a more inclusive, successful and rewarding future.

If reflective skills are to be developed to enable trainee teachers to develop into knowledgeable teachers, not only must they be taught how to reflect, but the right environment must be provided for the skills to be practised. Further, the methods of assessment must also enable reflection to be rewarded. If priority, and therefore attention, is given on competency-based ITT programmes to trainee teachers providing evidence of meeting a number of identified competencies/standards, then it is that knowledge that is likely to be prioritized and it is unlikely that reflective abilities will be developed. Consideration therefore also needs to be given to teaching and learning approaches and assessment of both the school- and university-based parts of the programme and to the context in which trainee teachers are located.

Developing reflective practitioners also requires consideration of the content of reflection; of the views of self and others being examined. Reflection needs to focus on more than technical content; more than on different views of how to improve the teaching of a particular skill (e.g., different theories of motivation of pupils; effective ways of providing feedback to pupils), which draws on research that takes a technical perspective (Rink, 1985; Mosston & Ashworth, 1986; Siedentop, 1989, 1991). Rather, reflection must focus on the problematic nature of teaching and learning in physical education (e.g., educational ends and purposes, why the content is as it is and whether this is appropriate, and alternative curriculum models) and therefore draw on research that takes a problematic view of knowledge about teaching (Kirk, 1986, 1988; Lawson, 1993; Tinning *et al.*, 1993). Aspects of teaching that cannot be observed and/or which are difficult to measure must therefore be prioritized and must be approached from a problematic perspective. For example, in order to become knowledgeable teachers, Rossi and Cassidy (1999) highlighted that trainee teachers need to develop the ability to reflect on all aspects of physical education, so that they can critically evaluate the conventions and routines they have absorbed during their own education and while on school placement, as part of their professional preparation to inform their own practice, and therefore to challenge their own beliefs and values. This may enable them to become NQTs who are better prepared to challenge the status quo. Such an approach gives the greatest likelihood of the strong socialization, both through own experiences and through the weight of history and tradition of the subject, being challenged. This may require those involved in training teachers to look at teaching and learning more coherently across all aspects of the programme.

According to Mayer (1992) and Sudzina (1997), constructivism is the most frequently used model of learning and teaching in ITT. Knowledge construction involves identifying patterns and regularities and being able to relate ideas to each other in a way that gives meaning to new experience (substantive and syntactic knowledge) (Bruner, 1966). A social constructivist approach involves learners in (re)constructing knowledge through a process of interpreting and making sense of new information in terms of their prior knowledge and experience, as a result of interaction among individuals and between one person and their environment (Littledyke, 1998; Noel, 2000). It involves participation in a variety of 'hands on' learning experiences which involve interactions with a variety of people, e.g., role play, discussions. These are then examined from the trainee teacher's own, as well as others' point of view, and also from theoretical perspectives, explicitly followed up with reflective activity. The insights gained about aspects of teaching and learning are used to inform future practice.

The importance of reflection in the development or construction of knowledge as part of the learning process has been emphasized by many educational theorists. Schon (1983) conceptualized reflection as 'knowledge gained from the practitioner's own experience' through 'reconstructing experience'. To Loughran (1996, p. 14), reflection is 'the deliberate and purposeful act of thinking which centres on ways of responding to problem situations in teaching and learning'. Although many ITT programmes, including those operating in a competency-based structure, claim to develop reflective practitioners, as indicated above competency-based ITT programmes prioritize the achievement of specific, observable skills through 'concrete, hands on' learning experiences. This suggests that the development of reflective practitioners is given lower priority. Thus, reflection may be 'caught' rather than developed systematically. This may be one reason why Taconis *et al.* (2004) questioned whether trainee teachers concentrate too much on being active and seeking concrete experiences and neglect abstract thinking and reflection. Thus, in order to maximize the effectiveness of a constructivist approach, consideration needs to be given to whether greater priority should be given to developing skills of reflection.

To engage in reflection trainee teachers must use appropriate cognitive processes and skills. Higher order thinking skills (see, for example, Bloom's (1956) taxonomy) enable the examination of the views of others but also, and perhaps more importantly, the examination of (and challenge to) own views and beliefs and values. Some evidence suggests that students enter undergraduate education with a surface approach to learning and that this is maintained throughout their programme (Entwistle & Tait, 1990; Gow & Kember, 1990; Marton & Saljo, 1997; Lawrence *et al.*, in press) and into ITT (Marton *et al.*, 1993; Vermunt, 1996). Learners motivated by the desire to meet minimum requirements with minimum effort adopt surface learning approaches. Trainee teachers adopting a surface approach to learning are likely to memorize and reproduce material without analysing or integrating it, and to model the teaching approaches of their own teachers and those they observe in schools. Therefore, rather than changing beliefs, prior socialization is likely to be reinforced. Reflection is likely to be limited to the specific lesson or unit of work and any change is likely to be superficial. Thus, trainee teachers are unlikely to use higher order thinking skills and complex reasoning to challenge a variety of views on the problematic nature of teaching and learning in physical education, which leads to deeper

understanding. Without careful planning and structuring of an ITT programme, particularly one based on a competency-based approach, a surface approach to learning is likely to be reinforced.

Thus, consideration needs to be given to whether, and how, trainee teachers can be supported in developing and using deep approaches to learning (Ramsden, 1992; Biggs, 1993, 1999; Marton & Saljo, 1997; Entwistle, 1998). This will enable them better to understand the material by actively integrating new information with old, or with information derived from other sources. This generates higher-quality learning outcomes, e.g., the development of analytic skills and improved teaching practice. Trainee teachers adopting a deep approach to learning analyse their own and others' teaching approaches and develop their own approaches. Reflection is likely to be deeper, e.g., on the appropriateness of specific content and how it is being taught in relation to the aims and goals of the physical education programme. If a deep approach to learning is to be developed, it needs to be actively promoted (Gordon & Debus, 2002) on ITT programmes. One model that may help is Leach and Moon's (1999) work on pedagogy, considering teachers, learners, knowledge and the learning environment. These can be conceptualized as individual, yet interlinked elements that can be used as a framework for supporting trainee teachers' understandings of educational relationships and how knowledge can be translated to support learning.

However, it is not enough just to concentrate on the content, teaching and learning and assessment of reflection and the cognitive processes and skills required to reflect. The context in which they are working, and those with whom they are working, must also be considered if trainee teachers are going to be able to develop into reflective practitioners. Thus, consideration needs to be given to the role of school- and university-based staff working on ITT programmes, whose role is vital in maximizing or hindering the impact of ITT on the trainee teacher's ability to reflect. Particular attention should be given to the role of school-based mentors as they are particularly influential. School-based mentors and other teachers have power over trainee teachers as they take a large responsibility for their assessment. One outcome of this is that trainee teachers accept the established views of their mentors and copy their mentor, teaching what and how their mentor or other teachers teach (Mawer, 1996). Another likely outcome is that, if there is incongruence between the focus of school- and university-based parts of the programme, trainee teachers are likely to dismiss the university-based parts of the programme as not relevant to their work in schools. As research (Lortie, 1983) shows, teachers' practice becomes more traditional the longer they are in the profession. It is therefore perhaps worth questioning the potential diet of surface-level knowledge received by trainee teachers, reinforced by busy mentors who may not always have the opportunity to reflect critically on their own practice or who do not want to move outside their comfort zone, and therefore have great difficulty deconstructing trainees' teaching that does not directly resemble their own. Therefore the reactive, intuitive cycle of teacher-centred educational practice continues to be reinforced. This further reinforces the opportunities for the overt power dynamic that evidences itself in what is a far from organic mentor-trainee teacher relationship. Thus, the attitudes of all staff, but particularly mentors, and their openness to new practice, are important in either supporting trainee teachers in developing into reflective practitioners or becoming competent technicians.

Thus, one area for development is the role of the mentor and hence the focus of mentor training. Bullock and Wikeley (2004) present a starting point for the mentoring relationship through the 'zone of proximal development', with the mentor viewing themselves as a more capable other, supporting the trainee teacher in the rigorous and complex process of self-reflection, thinking about the extent to which their pedagogical choices directly and indirectly support pupil learning and esteem, acknowledging that learning is both active and a social process. In order to achieve this, mentor training would need to focus on the mentor adopting the role of significant other who supports the trainee teacher to a position of increased capability in terms of their knowledge, skill and understanding.

Consideration then needs to be given to how mentors can practically support reflection. One area for potential investigation is how mentors and trainee teachers interact within lessons. Questions which need to be asked include whether mentors could support a deeper level of reflection on practice through intervention and questioning while the trainee teacher is teaching a lesson (with a pre-agreed arrangement to prevent any unnecessary anxiety on behalf of the trainee teacher). Other questions include whether this strategy would support the trainee teacher in developing an enhanced ability and knowledge of reflection on action; whether it would support trainee teachers formative assessment and planning of subsequent lessons; whether it would further develop trainee teachers' ability and awareness of thinking critically about the consequences of their pedagogical choices and how they are received by the learners.

A further consideration is how much trainee teachers are able to develop on a one-year ITT programme and therefore what the focus of programmes should be and what the focus of induction and early career development should be. Much research has been conducted on the concerns of trainee physical education teachers (Fuller 1969; McBride *et al.*, 1986; Behets, 1990; Hardy, 1995, 1996; Mawer, 1995; Capel, 1997, 1998a, b). Although the results of some studies (Bogges *et al.*, 1985; Wendt & Bain, 1989; Fung, 1993; Hardy, 1995, 1997; Meek, 1996) support a sequential model of development with beginner and pre-service teachers experiencing different concerns, Capel (1997) found that causes and intensity of concern remained the same over the programme of four school experiences on an initial teacher education programme. She suggested that the new environment of each placement results in a refocusing on self concerns rather than sequential development as a teacher. Capel *et al.* (2006) support this finding for trainee physical education teachers on a PGCE programme. One outcome of this is that it is likely that trainee teachers focus on developing content knowledge and technical expertise to address their immediate concerns and to meet the standards to qualify as a teacher. They therefore may not be able to focus on the learning of individual pupils. This suggests that in ITT, the content of reflection may need to be focused on these areas of concern, as trainee teachers may not be ready to address teaching and learning in a holistic way, considering their own teaching, content and pupils learning. Thus, when they start their first job, and in the early stages of their career, NQTs need support to continue to develop their teaching; otherwise, they are likely to get better technically, but not to challenge current practice. However, as with trainee teachers, NQTs have no power in the school, therefore it is important to ensure that mentors and other teachers have skills and the attitude to encourage reflection.

Conclusion

As currently conceptualized, ITT is a 'low impact' enterprise (Lortie, 1975; Lawson, 1983a). This may be especially true if it focuses on trainee teachers practising teaching to enable them to acquire a set of predefined competencies or skills to meet specified standards. It is argued that if trainee teachers are going to be more than teaching technicians, but are going to be able to develop physical education programmes that are relevant to today's young people, then ITT should focus on more than knowledge for teaching and the technical skills for teaching. ITT, teaching and physical education need to be viewed problematically and critically and focus on developing knowledgeable teachers able to focus on questions of 'why' rather than 'how'. Thus, by placing greater focus in ITT on those aspects of teacher knowledge that are not readily observable and/or that cannot easily be measured, (the 'why' as well as the 'how'); on developing cognitive skills; and on the ability to reflect and challenge one's own beliefs about the value and purpose of physical education teachers may be encouraged to take a problematic view of teaching and learning in physical education. This will enable them to challenge traditional content and teaching approaches so that physical education becomes more relevant to young people, therefore reduces alienation and encourages participation in physical activity both outside and after leaving school, with its implications for health, including obesity. However, this impact will be lost without school- and university-based staff working with these trainee teachers in supporting the development of a problematic view of teaching.

Further, ITT is only a small part of the profession and does not operate in isolation. Trainee teachers work with, and are subject to, pressures of socialization from all physical educators as well as those outside the profession, including teachers of other subjects, coaches who work in schools as well as those in the community, parents and others, including the media. Physical education will not change without a broader challenge to the socialization of physical education teachers. Thus, consideration also needs to be given to the continuing professional development of practising teachers, as well as to others who work in schools, including coaches.

It seems worth putting effort into both the research agenda and to developing practice on current ITT programmes, to focus on thinking rather than action; on the problematic rather than the technical, on the why rather than the how.

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