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An examination of knowledge prioritisation in secondary physical education teacher education courses

Sid Hayes (Chelsea School, University of Brighton), Susan Capel (Brunel University), Will Katene (Exeter University), Philippa Cook (Brunel University)

Abstract

A number of terms have been used to describe knowledge needed for teaching, one of which is subject knowledge. How knowledge for teaching is conceptualised in teacher education prioritises some knowledge bases over other knowledge bases. Further, knowledge prioritised by student teachers is influenced by socialisation prior to and during an initial teacher education course and priorities for student teachers as they develop as teachers. Previous research in physical education teacher education points to the pre-eminence of content knowledge above other knowledge bases. The purpose of this study was to look at what knowledge is prioritised by student teachers, school-based mentors and university tutors working on three secondary physical education initial teacher education courses in England. Results showed that content knowledge was seen as having greater importance for student teachers and mentors, but university tutors generally conceptualised subject knowledge more broadly, suggesting that it should be seen as covering a number of knowledge bases needed for teaching. These results are discussed in relation to socialisation processes in education and phases of development. Although there is a clear physical education focus to this work, it is possible that student teachers learning to teach other subjects may also focus excessively on subject content knowledge above other knowledge bases.

An examination of knowledge prioritisation in secondary physical education teacher education courses

Introduction

Over recent years and particularly since 1992, initial teacher education in England seems to have been locked in a continuous cycle of change. One major change has been the refocusing of initial teacher education away from universities and into schools. This has taken place within initial teacher education courses based within universities, notably the one year Post Graduate Certificate of Education (PGCE) and the three or four year undergraduate with Qualified Teacher Status (QTS), but also through the development of new routes into teaching – including the Graduate Teacher Programme (GTP) and the evolving school-based route. The trend of moving much initial teacher education away from University and into schools has inevitably thrown up a number of challenges for all concerned with this process, including the challenge of supporting student teachers' development of essential knowledge for teaching.

Among other changes, government circulars in 1992 (DFE, 1992) and 1993 (DFE, 1993) introduced competencies against which student teachers were to be assessed at the end of their initial teacher education in order to qualify as a teacher. These competencies were replaced by a set of standards in 1998 (DfEE, 1998), which themselves have been replaced by the present standards for qualifying to teach (DfES/TTA, 2002). These standards, currently comprising 'professional values and practice', 'knowledge and understanding' and 'teaching', focus the attention of those involved in initial teacher education and therefore serve to prioritise the knowledge student teachers need to acquire during their initial teacher education. However, the knowledge expressed in the standards is only one view of what forms the essential knowledge required for those who wish to teach future generations. The next section of the paper looks at some different views of knowledge for teaching.

Knowledge for teaching

A number of terms have been used to describe knowledge needed for teaching. These include, for example, teachers' knowledge, professional knowledge, practical knowledge, knowledge for teaching and subject knowledge. Within some of these terms, a number of different types of knowledge have been identified. For example, Shulman (1987) identified

seven knowledge bases which he described as necessary knowledge for teaching: content knowledge; general pedagogic knowledge; curriculum knowledge; pedagogical content knowledge; knowledge of learners and their characteristics; knowledge of educational contexts; and knowledge of educational ends, purposes, values and philosophical and historical influences.

However, such terms may not be clearly defined and therefore may mean different things to different people (e.g. they are used in different ways by different researchers in different studies; or they may mean different things to different people involved in teacher education in one country, one subject or even within one teacher education programme). For example, the term subject knowledge is used widely, but generally loosely, without being clearly defined, in relation to knowledge needed by student physical education teachers. To Kay (2004), subject knowledge in physical education relates to what the subject is about and puts the child at the centre of learning. However, he stated that others, in particular mentors, use the term to mean content knowledge. Thus, he identified a 'dichotomy in perceptions … as to what constitutes subject knowledge and content knowledge in physical education' (Kay, 2004:19).

One confounding factor might be the way in which the use of terminology has changed over time. For example, the standards introduced in 1998 (DfEE, 1998) used the term 'Subject Knowledge and Understanding'. This included several of Shulman's (1987) knowledge bases in their categorisation: Content knowledge; curriculum knowledge and knowledge of learners and their characteristics. However, analysis by Ryan (2000) of reports published by the Office for Standards in Education (OfSTED) on physical education initial teacher education courses found that the major focus, and therefore priority, was given to aspects of content knowledge: particularly, the ability of student teachers to deliver each of the six areas of activity (athletic activities; dance activities; games activities; gymnastic activities; outdoor and adventurous activities; and swimming activities and water safety) in the National Curriculum for Physical Education, and the knowledge of individual activities, particularly the skills, tactics and rules, within these areas that pupils should study during their school years. A legacy of this may be association of the term subject knowledge with content knowledge.

Unclear use of terminology, particularly in relation to the use of the term subject knowledge, may be one reason for content knowledge being prioritised in physical education initial teacher education. However, the prioritisation of content knowledge in physical education initial teacher education may also be due to other reasons; two of which are considered in this paper: occupational socialisation and phases of development of student teachers.

We are what we have experienced – Occupational Socialisation

The first theoretical framework is 'socialisation' (see, for example, Green, 2003; Laker, 2000), which relates to factors that may influence people on entering the teaching profession and how such factors affect perceptions and values about teaching and future teaching philosophies. Socialisation can be broken down into: professional socialisation, which refers to the process whereby a student teacher learns what it means to be part of that profession; and organisational socialisation (see, for example, Schein, 1988), which refers to the processes through and by which a student teacher learns the knowledge, values and behaviours required to perform the role of a teacher.

The strength of the socialising process into physical education teaching seems to be entrenched. This has been elaborated upon by a number of authors over a considerable period of time (see, for example, Lawson, 1983a, 1983b; Lortie, 1975). A number of socialising factors which shape physical education teachers knowledge and beliefs about the purpose of physical education, its content and delivery have been identified. Those entering physical education teacher education have been influenced to some extent by their own experiences of physical education whilst at school (e.g. Green, 2000, Rich, 2001). Other socialising factors include experiences of sport (both in an out of school) (Curtner-Smith, 1999; Dewar and Lawson, 1984; Dodds et. al., 1992; Templin, 1979), 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). The beliefs developed by student physical education teachers as a result of this prior socialisation can have 'a distinct and traceable influence on an individual's future decisions, practices, and ideologies as a teacher' (Schempp and Graber 1992: 333).

Phases of development

The second theoretical framework of particular relevance relates to the phases of development through which student teachers progress. Fuller's (1969) 'Phases of Concern' model identifies three concerns through which student teachers progress as they learn to teach: self concerns, task concerns, impact concerns (see Fuller and Brown, 1975). Initially, student teachers are concerned about themselves and their teaching techniques. They then become concerned about delivery of content or material, irrespective of the learner response and finally they are concerned for the pupils and the process of learning. The focus of concern changes as student teachers develop their own skills and competence. Not all student teachers progress through these concerns at the same rate. Different student teachers may be at different phases of development at different times during their initial teacher education. Other authors (e.g. Maynard and Furlong, 1993) offer slightly different categorisations. However, the underlying premise of these authors remains very similar in relation to progression through phases of development focusing on self, content and pupils.

Much research has been conducted on the concerns of student physical education teachers (e.g., Behets, 1990; Capel, 1997, 1998a, 1998b; Fuller 1969; Hardy, 1995, 1996; Mawer, 1995; McBride, Boggess and Griffey, 1986). Results of some studies (e.g. Boggess, McBride and Griffey, 1985, Fung, 1993, Hardy, 1995, 1997; Meek, 1996; Wendt and Bain, 1989) support a sequential model of development with beginner and pre-service teachers experiencing different concerns. However, Capel (1997) found that causes and intensity of concern remained the same over the course of four school experiences on an initial teacher education course. She suggested that the new environment of each placement results in a refocusing on self concerns rather than developing sequentially as a teacher.

The prioritisation of content knowledge

When looking at student physical education teacher's development during their initial teacher education these two perspectives, socialisation and phases of development, are likely to work together to reinforce the prioritisation of one aspect of knowledge for teaching: content knowledge as identified by Shulman (1986). Content knowledge has been identified in research as a focus for many physical education teachers and student teachers.

An investigation by Laker (2000: 68) found that physical education teachers placed the majority of their emphasis on the purely psychomotor components of their lessons,

highlighting the potential dominance of skills within the physical education curriculum. If, as seems likely, the school physical education programmes experienced by student teachers as pupils emphasised the development of skills and technique in a number of sports activities, it is likely that student teachers will assume this constitutes the main area in which they should develop knowledge in order to be an effective teacher, especially if reinforced by other factors, including both school and university-based work. Thus, if the experience on their initial teacher education programme reinforces the prior experience of student teachers which prioritised skills and techniques (socialisation), then we may be uncoiling a cycle of expectations that places such knowledge at the centre of the curriculum at the expense of other knowledge bases (e.g. as identified by Shulman, 1987) as the minimum knowledge needed for teaching.

When embarking on teacher education, particularly their work in schools, if student teachers are concerned about themselves, it is likely that they feel they would lose some respect in the eyes of pupils should they not be able to respond appropriately to a question. Such questions are likely to revolve around skills, rules or tactics of activities which they are teaching. It would be a rare occurrence indeed if a pupil were to ask questions which related directly to other aspects of knowledge. For example, it is much less likely that a pupil would ask a question about the way in which the activity is taught. Hence, it would seem logical that student teachers would clamour for knowledge that would not place them in this potentially embarrassing, even threatening situation. Therefore, it appears that student teachers are likely (particularly in the early stages of their development as teachers and whether they progresses smoothly and sequentially through phases of concern or whether new circumstances and experiences slow or even reverse progress), to prioritise concern about content knowledge as this is where they perceive their lack of knowledge is most likely to be exposed in a teaching situation.

This is likely to be reinforced by their experiences on, and messages received through, their initial teacher education. This is illustrated by Ryan's (2000) finding that OfSTED reports of physical education initial teacher education courses highlighted the impact of the games-dominated background and experiences of student teachers own school experiences and their undergraduate degree content as well as opportunities in schools during the course of their PGCE school placements as major factors in ability (or lack of) to teach the six areas of activity in the National Curriculum for Physical Education. A further issue highlighted was

the tendency of student teachers to plan and present pupils with opportunities to develop performance aspects of physical education and thus their physical skills. However, opportunities for pupils to engage in planning and evaluating activities were less evident. One reason for this is the focus in schools on the strands of selecting and applying skills, tactics and compositional ideas and acquiring and developing skills above the other two strands in the programme of study for the National Curriculum for Physical Education (2000) (evaluating and improving performance; and knowledge and understanding of fitness and health), which together form the basis of the levels of attainment. Reasons for this dominant focus on performance are both historical – the focus has traditionally been on performance, but also they are most easily observable in an assessment dominated curriculum focused on raising standards.

Thus, student teachers may be locked into a process of socialisation prior to and during their initial teacher education which places the activity at the centre of the process and not the child. Placek (1983) provides some evidence to support this assertion when she found that teachers did not really consider pupil learning to be a major consideration in effective teaching. This is important because as McDiarmid et al (1989) have suggested, student teachers beliefs about content knowledge are as powerful and influential as their beliefs about learning and teaching, as they influence both what they choose to teach and the methods they chose to deliver it.

Purpose of the study

Previous research in physical education teacher education points to the prioritisation of content knowledge above other knowledge. The purpose of this study was to look at what knowledge is prioritised by student teachers, school-based mentors and university tutors working on three secondary physical education initial teacher education courses in England.

METHODS

Subjects

The sample comprised four student teachers and their school-based mentors from each of three universities as well as two university-based subject tutors centrally involved with the

PGCE course at each university. In total, twelve student teachers, nine mentors and five tutors were included in the sample.

The course

The PGCE course being followed by student teachers at each of the three universities in this study focused on learning to teach physical education to secondary aged pupils (age range 11-18 years). Each course met the 36 week requirement for PGCE courses in England, with 24 weeks of the course spent in school and 12 weeks in the university. Although the pattern of university and school-based work over the course of the year was different, on all three courses student teachers spent time in two different schools.

Each course was organised in partnership with schools. Each included different types of school, including high schools, comprehensive schools, specialist sports colleges and independent schools. All partnership schools in which these student teachers were placed delivered the National Curriculum for Physical Education, generally teaching four of the six areas of activity. Arrangements were therefore made so that student teachers were able to experience teaching all six areas of activity, which is a requirement of secondary physical education initial teacher education courses in England.

Instruments

Semi-structured interviews were conducted individually with student teachers, mentors and tutors on each of the three courses. The interview was considered highly appropriate as it would, as Taylor and Bogdan (1998 : 100) state, 'yield a picture of a range of settings, situations, or people'.

The purpose of the interviews with student teachers was to probe into what they understand by subject knowledge in physical education, how the course assisted the development of this knowledge and what they valued and prioritised on the course. The purpose of the interviews with school-based mentors and university tutors was to find out what they understand by subject knowledge in physical education, what knowledge they consider to be important for student teachers to develop and where they access this knowledge.

Procedures

This study gathered data over an extended period of time (one year). Four student teachers on each course were randomly selected by a university tutor for interview. Student teachers were interviewed twice during the PGCE year, at the end of the first term and again towards the end of the course. The first interviews were undertaken in the university and the second interviews in their school experience school. School-based mentors were interviewed once during the same visit to each school at which the student teacher was interviewed near the end of the course. Thus, the mentors included in the study were in the second school in which student teachers were placed during the PGCE year. University tutors were interviewed once at the university about half way through the PGCE year. All interviews were undertaken by the same researcher who was not known to any of the interviewees.

Ethical Issues

The authors understood fully the ethical and moral issues arising from the dual role of the researcher as university tutor/course leader and researcher. This issue requires the authors to strike a balance between the demands placed on them as educational researchers in pursuit of knowledge, and the study participants' rights and values that might be potentially threatened by the research. There will always be the usual sensitivities and problems about: (a) tutors researching the very students who will be graded by them, (b) pressures on students' time, (c) the issue of the power differential between the researcher and his/her students, and (d) the ways in which students' rights to withdraw at any point can be made real in the context of their position on the course. The authors proceeded ethically with this integrated role without threatening the validity of the research or infringing upon the rights of the study participants.

The authors proceeded ethically and carefully with this integrated role, in a justifiable and sound manner and without threatening the validity of the research endeavour. This was achieved in the following ways: (a) *voluntary informed consent*: Consistent with individual autonomy, participants were informed about the nature and consequences of the research study in which they were involved. Participants agreed voluntarily to participate (i.e. without physical or psychological coercion) and agreement was based on full and open information (i.e. purpose of the study, duration, methods, possible risks); (b) *Deception:* Participants' voluntary informed consent was secured before research got underway and thereby avoiding deception, (c) *Right to withdraw:* All participants were given the right to withdraw from the research for any or no reason, and at any time and they were informed of

this right; (d) *Privacy and confidentiality:* The confidential and anonymous treatment of participants' data was considered of paramount importance (e.g. participants' entitlement to privacy was made very clear to them and personal data was secured and concealed); (e) *Actual interview:* These were carried out by an experienced research assistant whom the respondents did not know and in no way could have any influence on the students in terms of their success or otherwise on their courses. The interviewer was also not known to the school mentors and university tutors.

Data analysis

As Taylor and Bodgan (1998: 138) emphasise data analysis is not an easy process because it, 'is not a mechanical or technical process; it is a process of inductive reasoning, thinking and theorising'. Interview data was transcribed word for word and was inductively analysed. This meant that the researchers read and re-read the data. Once familiar with the data, content analysis began. Emerging themes from the data were highlighted and once common themes were identified, data was categorised according to the themes created. In order to increase consistency the research team met and discussed coding and categorisation.

RESULTS

Meaning of the term subject knowledge in physical education

Analysis showed that the term subject knowledge in physical education meant different things to different people. The difficulty of saying what subject knowledge is was neatly encapsulated by one university tutor who said

> Its not easy to define, it's a combination of things, first of all it relates to learning practices in order to develop a particular objective. One aspect of subject knowledge relates to all the technical aspects that make up the skill, another aspect relates to pedagogy of how to teach the skill *(University tutor B*)

Despite this difficulty, and although a number of Shulman's (1987) knowledge bases were mentioned by student teachers, the overriding definition identified content knowledge including skills, rules and tactics for different activities. For example, students 5 and 8 at the end of the year stated that it is:

> How well you know each of the activities you have to teach or the activities in the National Curriculum (*Student 5*)

> Understanding the key concepts involved in physical education and the different areas that embody physical education. So, for example, the knowledge of dance, how to express dance knowing the different ways of dancing (*Student 8*)

Some student teachers also referred to ability to teach the content to pupils. For example:

> Your understanding of rules, skill, techniques and tactics; the different components that make up a successful performer at that sport. Subject knowledge in the theory side of sport is completely different, it's more your ability not only to understand the rules but also to be able to present it to the pupils. There is no point in knowing the off side rule but only knowing one way to explain it; good subject knowledge would be to have such a good understanding of it that you can explain it in different ways. You need to be able to demonstrate it and have different games to practice it. Subject knowledge is your ability to regurgitate all of that quickly without losing any members of the group (*Student 2*)

Others linked this generically to broader aspects of education. For example:

> An understanding of everything you have to teach, a variety of different games and activities and how they relate to sport and fitness and how you can relate that to healthy lifestyles. Also adequate knowledge so you can teach A level and GCSE effectively (*Student 10*)

> Being able to deliver not only just a wide range of sports and skills, but also knowing about how physical education can help you socially, morally and culturally (*Student 12*)

Prior socialisation was a factor in student teachers view of subject knowledge. For example:

> Knowing the basics of sports so you know enough to be able to teach them to whatever year. In some areas you will have much more knowledge than others because you have

been involved in these sports. I have always played netball so I am able to teach it in lots of different ways and adopt strategies because I feel confident in it (*Student 7*)

Subject knowledge equating to content knowledge was reinforced by students teachers identifying coaching courses as the major way in which subject knowledge could be developed.

Mentors also identified content knowledge as the dominant aspect of subject knowledge. For example:

Basically the know how to teach the skills in different activities. There are a lot of generic skills. In terms of actual activities, not everyone is a specialist and you need to be a good all round teacher in most schools *(Mentor 2)*

The different activities in the curriculum. Practical activities range from games to gym and dance; also examinations. So subject knowledge is really what you know about the subject (*Mentor 5*)

A sound understanding of different activities you are going to teach in the National Curriculum, but also anatomy, physiology, psychology, current issues (*Mentor 6*)

Your understanding of the different areas you teach. The knowledge you need to deliver successful lessons (*Mentor 8*)

Some mentors also mentioned the ability to teach the content. For example:

Knowledge not just about how to do the skills but how to break it down and teach someone else. So, it's not just I know about cricket, but I know how to teach cricket. I know how to differentiate that one skill that I may be able to do but a pupil may not be able to. So it's not just the skill but how to teach it (*Mentor 1*)

Gym, dance, athletics, and then GCSE and A Level. Within that will also come knowledge of teaching style and understanding of various teaching policies, but my initial

> thoughts would be the activity areas and the rest would come from there as well (*Mentor 3*)

> Knowing the activity you are teaching and knowing how to teach it, also different ways of dealing with behaviour with students is all included within subject knowledge (*Mentor 7*)

On the other hand, university tutors generally had a broader conceptualisation of subject knowledge as comprising different knowledge bases. For example:

> Within subject knowledge you have to have knowledge of: curriculum; how people learn; different learning strategies to suit different learners. You have to have knowledge of wider aspects i.e. pedagogical knowledge. So, there is a whole range of knowledge bases you need, which all together produce subject knowledge for physical education (*University tutor C*)

> Not just knowledge of the subject but the principles (for example, stability and rotation) that underpin the subject and a clear understanding of how they underpin movement, which is what physical education is all about. Within subject knowledge you also have other knowledge bases, such as pedagogical knowledge, curriculum knowledge, the content and aims of physical education, what education is all about, i.e. what its purpose is, the aims of education. In summary it's a knowledge base for teaching physical education *(University tutor A)*

Herein lies a possible area of tension between the student teachers and mentors who generally prioritised content knowledge and university tutors who had a broader conceptualisation of subject knowledge. One of the university tutors recognised the different views held by student teachers and mentors and university tutors, stating that:

> This is quite contentious I suppose. There is a lot of discussion about what it means and certainly from a teacher's perspective their use of subject knowledge is fairly limited in that it very much relates to the ability of somebody to do a range of sports. So that kind of content knowledge is very much at the top of teachers thinking; content knowledge is what subject knowledge is all about, but obviously it isn't. I think it is still very much

> content knowledge which drives the physical education profession without considering the other knowledge bases you need (*University tutor C*).

What comprises subject knowledge in physical education, as identified by student teachers, mentors and university tutors, is likely to influence the priority given to, and value attached to, different aspects of initial teacher education. Responses to the remaining questions analysed need to be considered in light of how student teachers, mentors and university tutors defined subject knowledge in physical education.

Knowledge covered on the PGCE course, and what was valued and prioritised

Student teachers were asked a generic question about what they had covered on their course to date. Both at the beginning and end of the year they had some difficulty in identifying the range of material/topics/issues covered. Responses consistently identified the practical aspects of the course, e.g. specific activities such as gymnastics, dance, swimming, games, or aspects of immediate relevance to work in schools such as lesson planning, organisation and classroom management. Aspects of work not of immediate relevance to work in school or theoretical aspects were mentioned only by a very few student teachers and often only when prompted.

These results are reflected in responses by student teachers to a question about the value they attached to the material/topics/issues covered on their PGCE course**.** Overwhelmingly, content knowledge (knowledge about practical activities, particularly skills, tactics and rules and practices and material which enhance their practice of teaching), were identified as being the most valuable.

> The practicals such as gym and dance. I have never done that as a male physical education student. The lesson planning, we have to do that so that's useful; however, when I become a teacher I wouldn't do lesson planning in that much detail (*Student 1 start of the year*)

> I think the practical sessions will help me teach because they have given me so many ideas, tactics. The way you kick a ball properly after doing the course in football that helped a lot *(Student 10 start of the year***)**

Material/topics/issues not directly related to their teaching were not as useful. For example:

> Just the practical ones really. I think on placement the stuff about examination etc isn't relevant and I doubt it will be as a newly qualified teacher because you aren't the ones selecting the exam board. We spent so much time on that and it was a complete waste of time (*Student 2 end of the year*).

> The things we did that were practical based were more useful than the theory based stuff (*Student 6 end of the year*)

> I think the practical ones have been really helpful. Gymnastics has been really helpful in terms of subject knowledge, as has dance. Games hasn't been as helpful in terms of subject knowledge but in terms of organisation I think they have been really beneficial. I am not really keen on discussions on, like, physical education. I think they are beneficial to the background of teaching but not to the actual teaching, so practical ones have been much better. *(Student 7 start of the year***)**

These findings are perhaps endorsed by those topics which student teachers identified as least useful. For one student teacher this was 'anything that did not relate directly to teaching'. This included: professional studies lectures; the national curriculum; and assessment, but also activities that student teachers were not teaching in school, e.g. swimming. Thus, student teachers have a utilitarian attitude towards their learning to teach programmes focusing on their needs in the immediate situation.

When asked a question relating to links between school and university-based work, a number of respondents felt that links were quite tenuous.

> They are not linked really. I suppose some of them are but my problem is that they are unrealistic. I know they have to do it and stuff but some of it just goes out of the window *(Student 11 start of the year)*

> The links between school and university are not so good *(Student 1 start of the year)*

There were mixed responses from mentors, with some valuing both aspects of work. For example:

> I think they are in school for a long time. In the college based bit they are given loads of information and cover units quickly, cramming in so much over a short period. In school they are picking up a lot of information, but over a longer period of time (*Mentor 2*)

However, the school-based parts of the course were generally prioritised by this mentor (and other mentors):

> The school-based experience gives them more idea about teaching as a profession and what schools are like on a day to day basis. Being a physical education teacher isn't just about teaching physical education. Here we make sure student teachers are attached to a form group, they get involved in one on one teaching. I noticed on my current student teachers profile that she hadn't done anything on personal, social and health education and she needed post 16 so I look and see what she needs to cover (M*entor 2*)

However, the value of the university-based part of the course was recognised by some mentors. For example:

> I think the time in school gives them a chance to try things out. They may come with a lot of theory but in practice it may not work. I don't know how heavily they come knowing about teaching, a lot of it is actually trial and error, and experience (*Mentor 8*).

> Nothing teaches them as well as experience. So school-based learning is most useful to them. I think they still have to have the university part to prepare them, so they get the initial tools, so they can go away and develop their vocabulary as a teacher, they don't have to start from scratch. So they have the experience of hundreds of people. This is what works, this is what you can do, so its preparation for teaching (*Mentor 1*).

University tutors, perhaps predictably, identified the importance of university-based work/theory. However, they recognised it is difficult for student teachers to see this. For example:

> You only have time to discuss these concepts very briefly sometimes and because we don't go into them in much detail or over a long period of time, it's not that kind of deep learning you would hope they would pick up. Student teachers don't always make the connections back to the lecture. It takes a long time to see an issue in a number of different contexts before they can understand it and use it (*University tutor B*)

> It is a case of gradually drawing all the pieces together and certainly when student teachers get into the school-based environment they can see the relevance even more of the work we covered at university and the way it was delivered and how that links to what is going on in schools. There are one or two who find it difficult to see the relevance of all the aspects we cover but once they are in schools they see the bigger picture. So they can see it in practice which gives them a clearer insight (*University tutor C*)

> The major tensions come through how we want students to teach (e.g. educational gymnastics or teaching games for understanding) versus skills-based approaches taught in most schools (*University tutor E*)

They also recognised that university-based work is not always prioritised by others.

> There are some mentors who ensure what the student teachers learn in school complements what they learn in university. In contrast, there are those who are of the old school and are inflexible and have views on how the subject should be taught. They may say, for example, whatever you learn in university forget about it. This is a fresh start. Fortunately these are few and far between. It does have an impact on student teachers progress if this happens because they have the dilemma, knowing that there are more creative ways to teach (*University tutor A*)

DISCUSSION

Results of this study showed that student teachers and mentors generally conceptualised subject knowledge as content knowledge, such as skills, tactics and rules of activities/sports, although how to teach the content was also identified by several student teachers and mentors. University tutors generally conceptualised subject knowledge more broadly, to include a number of Shulman's (1987) knowledge bases. Other results also pointed to student

teachers and mentors valuing and prioritising content knowledge above other types of knowledge.

There may be a number of possible reasons for student teachers and mentors on PGCE physical education courses conceptualising subject knowledge as content knowledge and valuing and prioritising this above other types of knowledge.

This may be a result of using the term subject knowledge, which was used in this study without definition. This was deliberate as it is a term used widely, but loosely within physical education initial teacher education. However, use of this term may suggest certain aspects of knowledge are prioritised above others therefore, at least partly, may influence responses. One reason for this may be that the term 'Subject Knowledge and Understanding' was used to identify one standard in the 1998 standards for the award of qualified teacher status (DfEE, 1998). Further research is needed using different terminology to determine if this elicits a broader view of knowledge required for teaching or, indeed, whether student teachers and mentors conceptualise knowledge for teaching as content knowledge.

However, prioritisation of content knowledge may also be due to experiences prior to and during initial teacher education which influences perceptions of teaching and therefore what is valued and prioritised in initial teacher education. Results suggested that for student teachers, experiences prior to their initial teacher education course influenced their socialisation, e.g. they valued prior experiences of some activities.

Results also suggested that prior socialisation was reinforced on the initial teacher education course. This may have been due to the influence of mentors. For many student teachers the school-based part of the course and hence the influence of the mentor was identified as being more important than the university-based part of the course and therefore the influence of university tutors. Likewise, mentors prioritised the learning on the school-based part of the course. On the other hand, university tutors generally could see the value of both the university and school-based parts of the course. As mentors prioritised content knowledge, this supported any preconception of student teachers to prioritise content knowledge. The prioritisation by student teachers and mentors of content knowledge may also have been linked to the concerns of student teachers at different stages of their development. Initial concerns of student teachers are likely to be about themselves, then the material they are

teaching. Only later do they become concerned about the needs of individual pupils and their learning. They may not progress to focusing on meeting the needs of individual pupils for a couple of reasons: first, they do not have time to do this on a one year PGCE course (this may be related to the new environment produced by being placed in two different schools requiring a refocusing on self concerns, as suggested by Capel, 1997), therefore this may be an unrealistic expectation; or alternatively, they are not challenged to move beyond focusing on content due to the prioritisation by mentors of content knowledge.

Within the prioritisation of content knowledge, the results suggest that student teachers and mentors identify content knowledge as being specific to each activity taught, e.g. the skills, rules and tactics of individual activities, such as gymnastics or swimming, but particularly of individual games such as football, rugby, netball. This has several implications. First, time limitations on an initial teacher education course, particularly a one year (36 week) PGCE course, mean that it is not possible to cover the range of possible content knowledge (Loewenberg-Ball, 2000). For example, in the context of physical education it is not possible to develop the necessary knowledge to be able to cover the breadth of work in the National Curriculum for Physical Education, in which there are six areas of activity, each of which comprises different activities, each with its own specific content knowledge. This is exacerbated by the flexibility within the curriculum which means that, for a number of reasons, e.g. preferences of teachers or availability of facilities, schools make different choices of areas of activity taught and specific activities taught within each area of activity. Thus, student teachers may be asked to teach a considerable range of activities. For example, if the games area of the curriculum, is taken as an example, it would be very difficult for PGCE students whilst on the university part of their course to acquire the necessary content knowledge across all the games activities that may be delivered in schools. Hence it may be necessary for the parties involved in initial teacher education to work together to reassess expectations about what level of content knowledge student teachers can conceivably bring with them when they arrive on placement. Further, it may be necessary to alter perceptions of what it is important for student teachers to know, for example having an understanding of generic principles which they can apply to specific activities when needed. The issue of breadth of content may well also apply to other subject areas, an example being science, where content knowledge in physics, chemistry and biology may be difficult for student teachers to acquire during a 36 week PGCE course.

Second, and perhaps more importantly, this view of content knowledge suggests that the subject is a collection of separate activities; rather than one subject with an overall set of aims and objectives. By prioritising content knowledge and therefore knowledge of the activities taught, it is likely that a product based curriculum is prioritised above a process based curriculum in which the child is placed at the centre of the learning process. Further, it suggests that student teachers focus on how to teach something – knowledge for teaching. This is likely to maintain the status quo and perpetuate a situation in which the physical education curriculum may not be relevant to the needs of today's children and may not encourage them to be engaged in physical activity throughout life. This does not enable student teachers to develop into 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. 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.

Whilst content knowledge is unquestionably an important aspect of knowledge required for teaching, it is of concern if other aspects of knowledge are perceived as being less important. The emphasis placed on content knowledge by both student teachers and mentors, particularly in the early stages of student teacher development, seems to result in less value being placed on aspects of university-based work that focused on knowledge other than content knowledge. This applied particularly to knowledge that was not seen as immediately relevant in schools. In the early stages of work in schools student teachers are likely to be pre-occupied with gaining content knowledge as they are in the self concern stage of their development. This may then be further accentuated by mentors focus on content knowledge. When geography is added into this permutation, i.e. different locations, schools and universities, it is understandable why links between university and school-based work may be problematic. This is an area that needs addressing, otherwise the prioritisation of content knowledge throughout their initial teacher education and greater value being placed on school-based work may result in student teachers not developing the full range of knowledge to enable them to develop into effective or knowledgeable teachers.

Perhaps one of the areas for further investigation therefore is the extent to which those involved in initial teacher education are able to move students on from their initial concerns, which would implicitly require students to develop aspects of subject knowledge other than content knowledge as they progress to becoming concerned with pupils learning as identified in the latter stages of the stages of students development as teachers . This could be an area where the profession could consider more focused mentor training which may also contribute to challenging the seemingly continuous cycle of socialisation into physical education. As Capel states:

> In order to undertake the mentoring role effectively, mentors of physical education students should recognise that students go through different stages of development as teachers (although these may be overlapping rather than sequential), that they are likely to have different needs and concerns at different stages and therefore need different learning experiences to meet their needs and address their concerns at different stages. However, how stages of development apply to any one particular student varies according to student's individual needs and situation. (1998: 13)

Thus, it is important that teacher education courses recognise the influence of both socialisation and phases of student teacher development; otherwise content knowledge is likely to remain the priority. Based on their own experiences student teachers, many of whom will become the next generation of mentors, may be left with the perception that an effective or knowledgeable teacher of physical education is one who delivers content knowledge associated with the subject and that other knowledge bases are not important.

With reference to inter-subject links, there may well be value in considering these issues both within physical education and across other subject areas such as science and design and technology, where student teachers' subject content knowledge is reported as a serious cause for concern (Cochran and Jones, 1998; Finlayson and Lock, 1998; OFSTED, 1999). In spite of the enormous amount of research on subject knowledge and application that is going on in particular subject communities, the extent with which researchers working across different subject areas interact with each other's work, especially in the area of subject content knowledge and pedagogical content knowledge, is open to question. Cochran and Jones (1998) argue that Shulman's model merits extension to all subjects in the school curriculum, especially in relation to subject content knowledge and pedagogical content knowledge.

CONCLUSIONS

The results of this study suggest that in physical education initial teacher education content knowledge is prioritised by student teachers and mentors. If knowledge for teaching is conceptualised more broadly than this, e.g. Shulman's (1987) knowledge bases, then a conceptualisation which prioritises one aspect of knowledge above other knowledge bases needed for teaching impoverishes the profession. This may be partly influenced by the term used to describe the knowledge for teaching. However, results of this study suggest that socialisation and concerns of student teachers at different stages of development as teachers are influencing factors. This suggests that there is still some work to be undertaken to effectively identify the essential nature of the knowledge required to become a teacher and then to find a mechanism by which one aspect of this knowledge is not prioritised above the others. In order to do this it is important that those involved in initial teacher education share a view about what knowledge is required for teaching and understand both why content knowledge is prioritised as well as the impact on student teachers development and on their teaching and pupils learning, if this one aspect of knowledge is prioritised above other aspects.

As teacher education continues to develop and the roles of mentors and university tutors in the process continue to be refined, there needs to be a collaborative relationship between the student teacher, mentor and university tutor; a shared sense of ownership (John, 2002: 324). This collaborative approach may need to re-examine the meaning and variants of knowledge as well as the socialisation that takes place for those who enter the profession whose values and philosophies are moulded primarily from their own physical education experiences. It also needs to plan different learning experiences suitable for different needs and concerns at different stages which enable student teachers to move beyond a concern with content knowledge. As Hastings (2004: 34) suggested from one of his interviews with a Mr Smith about changing practice whilst undertaking an open university course development,

> Its not theory for theory's sake, it's about making practical changes… Teachers tend to carry all sorts of baggage from their own schooldays, or from the way they've taught in the past.

Thus, student teachers need to be clear about the nature, aims, objectives and purpose of the subject in order that they do not just perpetuate the existing status quo but enable the subject to meet the needs of the children who experience it. This process should be undertaken with the child being placed at the centre, rather than the activity. This may then allow us to engage in a discussion about the essential nature of the subject knowledge required for future generations of teachers. This, in turn, should help to identify what knowledge student teachers should be developing in their initial teacher education.

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