Supporting physical education trainee teachers in their use of information communication technology while on school-based experiences

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This paper explores how trainee teachers in physical education (PE) are supported in their use of information communication technology (ICT) during their school-based experiences. The data were collected from within the context of a higher education institution (HEI) and school partnership in the South East of England. All of the schools approached had previously worked, or were working, with trainee teachers from the University of East London (UEL). These data were initially collected by using questionnaires sent out to 100 PE teachers. Following initial analysis of these data, three semi-structured interviews were carried out with the hope of developing ICT provision within the HEI and discovering how best to support school-based mentors and trainees. There was evidence of lots of good examples of work within the partnership but little to support the fact that teachers were sharing this. It is clear that, in this particular case, the potential of the use of ICT in PE has not been unlocked by the profession as yet.

Keywords: Emerging Technologies; ICT; Teachers; Mentoring; Training.

Introduction

One could argue that due to developments in our constantly changing society the repertoire of skills that we possess is being challenged. We are frequently being introduced to new gadgets in all areas of our life, leaving many queuing overnight to be first to get the latest piece of technology. We have recently seen examples of this with Apple's iPad and latest iPhone. The arrival of digital technology has been and will continue to be a huge part of social and cultural change across the world (Savage 2007). This change therefore requires education systems to 'keep up' in order to equip pupils with the knowledge and skills necessary to survive and succeed in society (Jimoyiannis & Komis 2007). The term 'ICT' covers all aspects of computers, networks (including the internet) and other devices which have the capacity to process and store information. ICT resources can be classified as: *hardware*, the equipment used to process information; software, the stored instructions to operate the *hardware* and stored information; *media*, the material that carries the data generated (eg memory sticks); and services,combinations of hardware, software and human resources (eg the internet) (Kennewell 2002).

Technology is constantly evolving, and the term 'emerging technologies' (ET) is now widely used in education. ET can be defined as the tools, innovations and enhancements used in educational settings (Veletsianos 2008). They are the latest developments in software, hardware, etc, that allow us to expand our repertoire of teaching skills. Moreover they offer pupils the chance to gain access to a wider range of skills that they can develop. They can also be understood by the following statements as suggested by Veletsianos (2008). ET can be, but are not necessarily, new technologies; they are evolving organisms that exist in a state of coming into being; they go through hype cycles, are not fully understood as they are not fully researched and have not yet reached their full potential. It could therefore be argued that as they are ever-evolving their full potential will never be reached.

Up until 2000 there was not a requirement in England for PE curricula to include the use of ICT. Even after its inclusion in the National Curriculum in 2000 it was only a recommendation and not a statutory requirement. Following revisions to the National Curriculum (2007) for all subjects, this was addressed and for the first time in its history PE teachers in England had an obligation to:

> … provide opportunities for pupils to... use ICT as an aid to improving performance and tracking progress. (QCA 2007b: 179)

This suggests that policy-makers have accepted the need to keep up with the rest of society but also that they recognise the extensive benefits that ICT can bring.

Trainee teachers and their use of ICT

Tearle & Golder (2008) suggest that there is a mismatch between what trainees learn while studying at university and what they are able to use on School Experience Placements. They also highlight the fact that trainees will be key players in developing an ICT culture in schools and in PE departments in the future. The potential that trainees have to develop current practice cannot be overestimated and should be embraced. It is therefore imperative that higher education institutions (HEIs) know how best to develop trainee knowledge, equipping them with the technological know-how, but more importantly the ability to incorporate this knowledge into their pedagogical practice to ensure that it has a positive impact on teaching and learning.

Many trainees will have grown up with ICT in their lives and could be termed 'digital natives', whereas many current practitioners could be described as 'digital immigrants' (Prensky 2001 in Williams 2008). This implies that the digital age is not something that they are completely comfortable or familiar with. Although trainees or teachers of a younger age may have had more exposure to technology than their predecessors, there is no guarantee that this will transfer to higher levels of use in the classroom (Jimoyiannis & Komis 2007). This again is why the research that this article addresses was vital: as a teacher educator in a HEI, I am required to guide trainees towards effective teaching and learning strategies, which without doubt in this technological era must include ICT.

Findings

The HEI works in partnership with schools across the South East of England, and at the time of this research there were 118 schools on the database that had either worked in partnership or were working in partnership with PE trainees. Respondents were selected on the basis that they were involved with the partnership. One hundred questionnaires were sent out. They were mailed to respondents who could therefore opt out of the research by choosing not to return them. Additionally, when the questionnaires had been returned, respondents were advised that they could contact me to have their data removed from the study. Findings from the data are written up in such a way that the respondents remain anonymous and are referred to where necessary as teacher 1, 2, 3, etc, and A, B C, for those interviewed. Following the initial analysis of the data collected from the questionnaire I selected three participants for follow-up interviews. These were selected on the basis of a number of factors. Firstly I picked three schools that I work very closely with, within the partnership. I also chose three PE teachers who were in different phases of their careers, which I thought would add a different dimension to my research but would also allow me to confirm findings from the questionnaire which has a question relating to number of years' experience in teaching. All interviews were recorded on an iPhone 4.0; they lasted between 37 and 47 minutes. Following the interviews, I decided to transcribe them myself; I felt both confident and competent in doing so. Since I had done the research leading up to the interview and conducted the interview itself, leaving out the transcription process would, I felt, leave a gap in my knowledge and understanding and would therefore affect the data analysis procedure.

Cuckle & Clarke (2003) noted that a barrier to the use of ICT in education was the restricted access to computers as well as the restrictive number of applications that were suitable for use. In this research there were initial indications that departments were well resourced. The piece of equipment that was found in the majority of departments was the compact disk (CD) player (97.2% of departments questioned used a CD player in lessons). Thomas & Stratton (2006) also found that this was the most commonly owned piece of ICT equipment (88%). How it contributes or adds value to learning additional skills could be questioned and this is something that needs to be researched in the future. I was encouraged to see that 36.1% of departments that responded to the questionnaires had access to performance analysis software. Stidder (2010) claims that performance analysis software is becoming 'a more mainstream means of evaluating pupil performance and enhancing learning' (p. 177).

Although the PE teachers interviewed were aware of the benefits of this, they were also very aware of the potential barriers to its use. Money is always an issue when integrating ICT into PE lessons, but even when asked if they would invest in this software if they had unlimited budgets the interviewees still had reservations;

> I wouldn't necessarily get Dartfish unless I had a classroom that I could set it up and could use it every lesson, that's something to consider when buying stuff how many times are we going to use it? (Teacher N)

In 2009 18.3 million households in the UK, which equated to 70%, had access to the internet (National Statistics survey 2010). Therefore one can surmise that a large percentage of school-aged children themselves have access. In results published in 2008, the Office of Communications (Ofcom) found that just under half of 8- to 17-year-old children have an online profile within social networking sites; it is not clear how many of these are secondary school age children. However, with statistics showing high levels of internet use, we can presume that most children are proficient on the internet, and this should not be ignored. Web 2.0 technology is a phrase that was coined in 2003 (Sutherland et al 2009) This technology allows web-based communities, which could be schools, classes or certain groups of pupils (eg the Year 10 GCSE group), to have a space where they can share ideas collaboratively as well as using it as a social networking area (Sutherland et al 2009). The term ICT includes the word Communication, which indicates the breadth of technologies available: ICT no longer simply refers to the desktop computer (Galloway 2009). It does seem, however, that this breadth is not being fully embraced. Simovska & Jensen (2008) reported that a barrier to effective use in the classroom was the limited use of ICT in communication, and use was more focused on content. Only 16.7% of teachers in this study reported having used Web 2.0 technologies in their teaching, citing blogs, wikis and Fronter as examples (Simovska & Jensen 2008). Just over 8% of teachers were unsure what they were and 75% simply answered no. Even though two of the interviewees had used Web 2.0 technology at university in the form of a Virtual Learning Environment (VLE), they did not use or had not looked to incorporate it within their current practice. Both teachers acknowledged its benefits and could give me examples of where they would use it yet still hadn't thought about it in their context. Selwyn (2002) also acknowledges this point and states that:

> Web 2.0 tools and practices are not being drawn into education as vigorously as might be expected, despite the many examples of best practice around. (p. 26)

Teacher J, when contributing to this research, cited time as a reason that they had not looked into it but again acknowledged that it would save time if it was run and set up properly.

An overwhelming 83.8% of teachers in my study rated ICT either very high or high for the role it plays in PE. This is a very encouraging statistic and is consistent with previous studies which found that teachers or trainee teachers were generally enthusiastic about new initiatives including ICT (Thomas & Stratton 2006; Weir & Connor 2009). Teacher J rated it as very important because ICT plays such a big part in children's lives, and Teacher A linked it directly to achievement:

> Yeah I can really see the benefit of it the more I've used it in the past two years has significantly improved… the level of achievement from my classes… in key stage 3. (Teacher A)

So if teachers are enthusiastic and see the benefits of ICT use in PE, why is its full potential not being exploited? Barriers have previously been considered in this research, with time and resources being prominent in discussions. However, researchers (Rutherford 2004; Thomas & Stratton 2006; Jimoyiannis & Konis 2007) have also claimed that inadequate training is one of the main reasons why teachers have negative attitudes towards ICT.

Karagiogi & Charalambous (2002) found that:

> Continuing professional development (CPD) has a significant impact on teachers' attitudinal stance as training participants had overcome their fears in the use of technology and became empowered by its opportunity… (p. 406)

This was backed up by Spakes & Hirsh (2000) who suggested that the improvement of teacher skills was essential to improving pupil performance (in Karagiogi & Charalambous 2002). When considering the nature of training in ICT, it has been suggested that the top-down type of initiatives that have been implemented thus far have not taken into account teachers' individuals needs and attitudes. Moreover whole-scale training materials do not account for the context that teachers work in. When asked about the nature of training, my respondents fell into three main categories: those who had received none at all (28%), those who had received training on specific pieces of equipment and those who could give examples of several in-school training experiences. Those that had not received any had the following comments:

> Everything we do we have learned ourselves (Teacher 8)

> None... and have a Bed in Sec PE with IT degree (Teacher 26)

> … generally left to fumble through (Teacher 5)

> Very little to be honest, have learnt as I've gone along (Teacher 35)

Of those that cited training on specific pieces of equipment (44%), only 36% of these applications were PE-specific or indeed those that pupils could work with directly in PE lessons. In many instances the training was a one-off and several years ago.

Although a wide range of equipment was cited by schools it is still only a minority who have access to and utilise more sophisticated performance analysis software. As a result of the interviews from this work, it would be fair to conclude that this equipment is indeed desirable but the use of video cameras for similar purposes can bring about some very positive outcomes. We could therefore argue that access to suitable equipment is not a barrier to use of ICT in PE, but the way in which it is used is. However, access to software such as Dartfish or KANDLE (these are trade names of certain brands of performance analysis software) could further enhance learning and teaching experiences.

Having read about issues surrounding training in the literature, I was not surprised issues were raised. However, I was amazed by the number of mentors who were left to teach themselves! Several national strategies relating to the use of ICT in education have been introduced (Laptops for Teachers project 1996–98, New Opportunities Funding for teachers and librarians 1999–2002), but not one teacher in this research cited any of these, which supports previous claims (Karagiorgi & Charalambous 2002) that many of these initiatives have been unsuccessful.

Many of the well-documented constraints on the integration of ICT in practice could be addressed through effective CPD. It seems that providing opportunities for teachers to gain a wider and more in-depth knowledge of ICT for some practitioners is crucial in strengthening their beliefs about the value of ICT in teaching and learning (Jimoyaiannis & Komis 2007). Building a strong base of skills and knowledge also provides teachers with increased confidence, which leads to increased morale (Baylor & Ritchie 2002). This in turn would lead to higher effective use of ICT within a teachers' practice as previously discussed. Hennessey et al (2005) noted that it is essential to offer 'opportunities for exploration and familiarisation with technology… to build teacher confidence' (p. 187). This confidence will no doubt affect the quality of mentoring available to trainee teachers in this area. This was evident in this research where there were several negative responses by mentors when asked how they supported trainee use of ICT. There were specific groups of teachers identified here; these included those who showed explicitly negative attitudes through their response; one teacher simply

reported that their support entailed pointing at the equipment. However, there were also those who felt that their own personal skills would now allow them to adequately support the trainees who, they believed, had a more enhanced set of skills than them.

Discussion

Teachers within the partnership highlighted several ways in which they felt they could be supported to better aid trainees. It is from these points that I will draw my final conclusions and make recommendations for future research. My conclusion will also provide schools and HEIs with action points for consideration. The majority of schools now work within the context of a school sport partnership (SSP), and this coupled with the partnership that a HEI provides offers many opportunities for collaboration among colleagues. There is evidently good practice going on in the schools involved in this study, but little evidence that schools are sharing ideas. Sharing does not necessarily come naturally to many teachers (Tearle & Golder 2008). It is therefore important to investigate possibilities for collaboration through HEIs and SSPs; these could be in the form of workshops and mentor training. I have previously attempted this though the use of a 'mentor wiki', but it has not been successful. I now realise that I overestimated the number of teachers who would be confident or competent on this platform.

Cuckle & Clarke (2003) found that among mentors and trainee teachers, classroom management and planning skills were a higher priority to develop than ICT competence. This was discussed during the interviews, but all teachers still remained positive about ICT. It is the responsibility of the HEI to place trainees in schools where they will benefit from the positive attitudes of trained teachers and where they will also have the opportunity to develop their skills. It is important that they have the opportunity to observe lessons where ICT is modelled so that they can start to understand what approaches are conducive to enhance and support learning in PE (Elbourn & Cale 2001 in Tearle & Golder 2008). In providing these opportunities, teachers can equip trainees with a medium from which they can develop their practice in a proactive way (Sime & Priestely 2005). Teacher educators also need to be aware of the need to model good uses of ICT in their lectures and practical sessions.

Developments since the research

Following this research, several developments have been made within the HEI programme which has inspired further innovations within the PE course. All trainees are now required to conduct a project using New & Emerging Technologies. In order to adequately prepare trainees for this project and to open their eyes to what is out there, I have introduced them to a range of new technologies and modelled their use. Trainees have been able to access weekly podcasts, and have included summaries of lectures, reflections from school-based visits and follow-up tasks from taught sessions. Flip cameras have been used to provide feedback on teaching and for use during practical sessions. A portable projector has been used in all practical sessions to show video clips, objectives and to support observation and analysis software.

The most recent innovation has been the use of voice recording software directly available from the Virtual Learning Environment. This allows for two-way interaction, something that podcasts cannot offer. Virtual job interviewing has been the primary use for this software. I recorded several 'common' interview questions; trainees could then access these where they had access to a computer with speakers and internet access. Trainees could then record a response. Immediate feedback could then be given either verbally (through a recorded message) or through a typed response. Guidance was given on both the context and the delivery of the answers. For example, I could pick up where trainees over-used words: 'basically', 'um' and 'like' were very common. All the examples given above are transferable into school-based practice and demonstrated the pedagogical potential that ICT offers.

A further development has been the introduction of a library loan system. Trainees are able to borrow equipment to take into their school experiences in an attempt to address the mismatch that Tearle & Golder (2008) discussed. Within partnerships, whether through SSPs or HEIs, there is a wealth of expertise and experience. It is down to the managers of these partnerships to ensure that this knowledge is disseminated appropriately. This will ensure that trainees gain experiences that contribute to them being well-skilled, motivated teachers who recognise the benefits of and are enthused to use ICT in PE throughout their careers.

Concluding thoughts

It is important that mentors understand what is required of them and how best to support trainees.

Mentor training needs to concentrate on the specifics of the qualified teacher status (QTS) standards. Mentors need to understand that simply because trainees have grown up with ICT as a central point in their lives does not necessarily mean that they will be able to apply their knowledge in lessons. Teachers must guide trainees with their pedagogical knowledge acquired through experience. More research is needed into the impact that the ICT used in PE has on learning and how HEIs are supporting mentors working with trainees.

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