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A study to find out what it means to use ICT in teaching in learning in Initial Teacher Education

Abstract

The purpose of this study was to explore the use of ICT in teaching and learning by initial teacher educators, on Primary PGCE and BEd courses, in one British university. The aim was to determine what and where good practice with ICT already existed on the Primary education courses and to identify points of action to make improvements.

This study wanted to find out what it meant to use ICT well in teaching and learning on an Initial Teacher Education course for the primary age ranges. It also wanted to ascertain the barriers to the successful embedding of ICT into the curriculum of the Primary education course. Finally, it sought to make recommendations to the case study institution as to what and how improvements could be made.

The research was carried out through a thorough review of current literature as well as an analysis of the policy documents at both a local and national level. Staff who taught on the Primary education courses completed a questionnaire which allowed them to comment on their attitudes, views and usage of ICT in their teaching and learning. These results were then cross-referenced to PGCE students' evaluations of the ICT on their course, from the previous year.

It was found that ICT in teaching and learning should be made explicit through the sharing of aims for learning. These aims should include as a minimum, coverage through subject areas of national curriculum for ICT for Key Stages 1 and 2, allowing students to see how ICT is supported in a particular field. Also, the curriculum should include the explicit modelling of ICT for teaching and learning in university sessions and also including activities for school experience which will strengthen students' understanding further. This will involve a curriculum review.

CPD at an appropriate level and in a meaningful context will be necessary, on an ongoing basis to keep up with the changes in technology. This would be supported by time for collaboration between colleagues to develop ideas for the curriculum.

Technical support, reliable equipment and easy access to resources needs to be developed and be '*sympathetic*' to the needs of ITE courses. A framework, supported by the whole department, for the development of all aspects of ICT in teaching and learning in ITE is advocated in order to keep pace with developments in the future.

Glossary of Abbreviations

BECTA	British Educational Computer Technology Agency
B Ed	Bachelor of Education degree
BREO	Bedfordshire Resources for Education Online
CPD	Continuing Professional Development
DCSF	Department for Children, Schools and Families
DFEE	Department of Education and Employment
DFES	Department of Education and Standards
DIUS	Department for Industry, Universities and Skills
ECM	Every Child Matters
FE	Further Education
GTC	General Teaching Council
HE	Higher Education
HEFCE	Higher Education Funding Council for England
HMI	Her Majesty's Inspectorate
ICT	Information and Communication Technology
IT	Information Technology
ITT	Initial Teacher Training
ITE	Initial Teacher Education
NCSL	National College School Leadership
NOF	New Opportunities Fund
NQT	Newly Qualified Teacher
Ofsted	Office for Standards in Education
PC	Personal Computer
PD	Professional Development
PGCE	Post Graduate Certificate in Education
QCA	Qualifications and Curriculum Authority
QTS	Qualified Teacher Status
SE	School Experience
SLICT	Strategic Leadership of Information Communication Technology
TDA	Teacher Development Agency
TTA	Teacher Training Agency
UCET	Universities' Council for the Education of Teachers

Introduction

A case study to investigate how ICT is used in teaching and learning by teacher educators on the Primary BEd and PGCE courses in the School of Education at a British university.

Context

To mirror the importance placed on ICT within the National Curriculum (DfES, 1989) it became apparent that a similar emphasis needed to be placed on ICT within the intitial training of teacher (ITT) (DfEE Circular 4/98 op cit, Davis and Tearle, 1999),

At the outset there are two differing definitions of E-learning (i.e. using ICT in teaching and learning) which need highlighting – one constructed by the DFES and one used in Higher Education. The former, as Preston and Cuthell (2005) point out is an all embracing term including all the elements of ICT seen in schools, from PCs to Whiteboards, and cameras to interactive toys; whereas the latter refers only to web technologies. For the purposes of this study, as an ITT provider must prepare teachers for school, the DFES definition will be used.

This study arose out of an examination of the use of ICT by Primary Postgraduate student teachers (PGCE) during their course between September 2006 and June 2007, which found that students need more time to learn about ICT, more access to the resources available, more interaction with each other and experts in order to develop their expertise. Scrimshaw (1997) adds that new teachers need to know how to interpret the uses of ICT to fit their philosophy of education and the best interests of their learners.

The University, as an ITT provider it should be confident that it's graduates have developed into teachers who can use expertly ICT, at a personal level e.g. for administration and record keeping, but also so that they use ICT as a teacher for teaching their pupils and as a teachers for the benefit of their pupils learning (Kennewell et al, 2000).

The University has a range of appropriate ICT resources. There are PC and laptop facilities available for use in and out of taught sessions, with a variety of software, both general and education specific; rooms with an Interactive Whiteboard and projector; equipment can be borrowed from the University's Audio Visual

department, additionally, there is subject specific ICT equipment and software, for example, sensors used in science. The University has an established Learning Platform (known as BREO), There is technical support for the ICT in the University, provided by diverse teams, with varying responsibilities, and a recently drafted strategy for Technology-Enhanced Learning from 2008 to 2011 (University, 2008) demonstrates a commitment to moving ICT in teaching and learning forward.

As part of this commitment to developing and evolving appropriate curricula, there is a review in progress of the current provision across the Primary undergraduate (BEd) and PGCE courses to be implemented in September 2009. This study will inform, shape and plan for the provision of, and for, ICT across the new programmes.

Purpose and Aims

Following on from the evaluation of the Primary PGCE students this study will focus on:

- How is ICT used in teaching and learning across the Primary BEd and PGCE courses?
- Where and what is the existing good practice that can be shared with all members of the School of Education?
- How can teaching and learning with ICT be improved across the Primary BEd and PGCE courses?
- What is needed to ensure that improvement can happen? E.g. training, resources etc

The Wider Background

Given that:

> "teacher educators teaching ITE (pre-service) courses in English HE
> institutions are nearly always qualified school teachers, with considerable
> experience of teaching and middle or senior management in the school
> sector." So.. "entering HE they bring with them a wealth of professional
> knowledge and expertise accrued in and through school teaching" (Murray,
> 2005:69) ,

including the classroom ICT skills they have developed. In the current climate, all
teaching staff are facing rapidly changing skill requirements and rising expectations
with regard to ICT. ITE clearly has a central role to play in this and are under
increasing pressure that the educational workforce of the future is effectively
prepared which was pointed out by DfES in a Report of the IT and ITT Expert Group
(1989), as they recognised then that ITT would need to change as a result of
changes in technology.

ITE and HE have developed together over a long history. They have gone through
distinct phases of development over the last 50 years finally being brought into line
with other professions in the 1980's with the university departments of education
becoming prominent and students being taught by 'expert' university tutors (Murray
2, 2002, Taylor, 2008). However there are conflicts of interests and aims between
different groups in HE (Hatt, 2001).

ITE balances between an academic study of education (HE aspect) and a
professional study (teaching in schools aspect). Each aspect has its own specific
demands, policies, language etc, each controlled by different bodies, namely TDA,
UCET, DCSF, DIUS, HMI, BECTA, HEFCE, GTC and OFSTED (Leask, 2001) and is
frequently therefore required to fulfil opposing requirements. In the future these
relationships will become increasingly complex as under the ECM agenda teachers
will inhabit a very different professional world, integrating with other lead
professionals in associated fields (Kirk and Broadhead, 2007). Taylor (2008) also
raises the point that students have to view themselves as both teachers and learners,
bringing a duality, and an added pressure to their role. Taylor's (2008) research
goes on to show that teacher educators themselves face challenges about their
identity in terms of needing to balance university expectations for academia and
school expectations for professional expertise. These dualities are a very important

consideration as there can be conflict created if the expectations of each part are not clearly delineated.

Murray and Male (2005) (and John, 1996, Murray, 2002) note that teacher educators are generally expected to be effective facilitators of learning from their experience in schools. They outline that the teacher educator must have the knowledge and understanding in the subject to be taught and the capability to teach it in an HE setting (Clegg, 2002). However, as they are removed from the school setting it is essential that teacher educators continue to enhance and generalise their existing knowledge base of schooling. Murray and Male (2005) (supported by Boyd et al, 2006) go on to explain that it is this understanding of the profession and how to teach, as well as knowledge of contemporary school contexts that gives credibility to their role as teacher educator and enables them to support and empathise with students. This could be true of any academic teaching on an HE course in their field. However, teacher education is unique because the teacher educator has to manage what is taught with how it is taught. This requires a deeper knowledge of self-consciousness in practice, which is communicated to students. Both the Dutch and American standards for teacher educators stress the pedagogical roles in modelling practice (Murray and Male, 2005).

Emery (1998) suggests that without opportunities to critically examine practice, students are likely to adopt practices they experienced as children in schools which might reinforce poor models. Loughran (2006) see this as an opportunity to model professional feedback and to allow student teachers to see into the practice along with seeing the good things practised (Loughran and Berry, 2005). Equally, if this modelled process of explaining and exploring perspectives was not done, then there would be a danger of simply offering knowledge – "*telling as opposed to teaching*" (p201).

However, this modelling in teacher education is not common according to the research of Lunenberg et al (2007), where there appeared to be a lack of understanding by teacher educators of how to use these modelling skills effectively to make the connections between practice and theory explicit. Loughran (2006) also notes that modelling demonstrates vulnerability and therefore teacher educators do not wish to be exposed to scrutiny as this feels risky (Loughran and Berry, 2005).

Teaching with Technology in Teacher Education

Progress in ICT will mean that students will have an acceptable general computer literacy and therefore teacher educators will be expected to teach the use of ICT as a *'sophisticated and empowering tool'* (Simpson et al, 1999:248, embedded in the pedagogy of teacher education (McDonald_b, 1993), rather than teaching the hardware and software operations (Pianfetti, 2001). However if this is to happen, teacher educators, Simpson et al (1999) go on to point out, will need to be more than basic users of ICT; they will need to be secure in the pedagogical understanding of the use of ICT as required by students and NQTs. Yildirim (2000) suggests, educational institutions struggle with how to teach ICT given the vast array of technologies available, and that the biggest obstacle to teachers using technology in their classrooms is the lack of adequate teacher training (Yelland et al, 2000); and yet teachers need to be digitally literate so they can prepare students to be successful in a workplace which is dominated by technology (Yelland et al, 2000, Pianfetti, 2001, Robertson, 2003, Eriksen, 2004); a situation that student teachers already recognise (Pritchard, 2001). There is no doubt that, *"in order to prepare tomorrow's teachers as technology-using teachers, faculty department is the critical enabler."* (Judge and O'Bannon, 2008:26)

The most significant factor from Jones' (1998) study was that the students felt that there was not enough time spent during the teacher education course on modelling and using ICT to develop their understanding and skill with ICT in practice in the classroom thus causing them to be anxious when using ICT in schools. Yildirim's (2000) research makes the point that teacher educators should demonstrate the use of ICT and be role models for prospective teachers in integrating technology into the classroom.

Simpson et al (1999) found that teacher educators generally used ICT for administration tasks and to produce traditional resources, and adopting a 'let's find out together' approach when incorporating ICT in teaching and learning.

Continuing Professional Development with Technology in Teacher Education

Edmonds (2007) points out that, teacher educators should continually engage as learners, to reflect upon their own practice and professional development and so to model good teaching practice. Lavonen et al (2006) found that although there had been many ICT developments in many countries associated with education, the one common area where progression had been slow was in the use of ICT in teacher

education, where teacher educators did not have current knowledge of ICT in schools (Simpson et al's 1999). Consequently, many young school teachers have felt unconfident with the use of ICT in their classrooms.

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CPD should encourage teacher educators to concentrate on designing good educational opportunities for their students (Littlejohn, 2002). Knight et al (2006:319) state that *'the Government are taking teaching quality and its enhancement very seriously'* in HE. They believe that the importance of CPD lies in importance to teachers, at all levels, to learn new ways of teaching and assessing, just in order to keep working.

In conclusion there are several common themes to all the aspects considered here.

- There is a dichotomy in teacher education between the demands of schools and the demands of HE.
- There are rapid changes to technology and therefore pedagogy in both teacher education and schools needs to develop accordingly; although development needs to happen in context and in manageable amounts.
- The role of the teacher educator has many dimensions, including teacher, professional expert and most importantly role model.
- The student teacher has to balance being both a learner and a prospective professional who requires ICT skills for both aspects.
- Seeing good practice modelled has positive benefits on the practice of the observer. This can be student to teacher educator, student to teacher, teacher educator to teacher, teacher educator to student, student to student, teacher educator to teacher educator (Loughran, 2006).
- Time and support for development need to be allocated for both students and teacher educators to collaborate and reflect on practice if changes are to be implemented. Personalised progress is essential, rather than "blanket" expectations.
- Teacher educators need to keep up to date with current practice in schools, especially with evolving technology demands, and this means establishing strong links in partnership with schools. CPD plays a beneficial role here.

Research Methodology

A 2-part questionnaire, completed by University tutors on the Primary BEd and PGCE courses gathered staff views on how ICT is being used in learning and teaching and, using a tool developed by NCSL and BECTA to evaluate the level of ICT skills held by school leaders.

The handbooks for the units taught on the Primary PGCE and BEd, together with the University's current learning and teaching policy, ICT policies and its newly drafted strategy document for Technology-Enhanced Learning will provide evidence of what is 'expected' to happen. This evidence will be the matched against the findings from the existing completed student questionnaire of July 2007.

Summary of Findings and Recommendations

It is important to reiterate that there are pockets of good practice across the Primary BEd and PGCE courses; however this is inconsistent. Therefore the main objectives of action taken from this report will be to make small, yet effective changes to practice, rather than instigate radical change. This a strong starting point on which to build good practice with ICT in all its varied forms for Primary education.

1. Make explicit the use of ICT in Teaching and Learning – The sharing of aims for learning with and about ICT has been highlighted as important. This can be included in course handbooks and should include elements the Characteristics of ICT.

2. Minimum Coverage in Subject Areas of National Curriculum ICT for Key Stages 1 and 2 – This would currently be ideal in Year 1 of the BEd and throughout the PGCE year and would ensure that all students had an understanding of ICT in the ages ranges for which they will qualify, across the curriculum. This will allow students to see how ICT is supported in a particular field (Sandholtz, 2001 and Yelland et al, 2000). This will involve a curriculum review and there are resources (Appendix O) to start the process moving forward. Stevens and Lonberger (1998) emphasise the importance of this explaining that ICT cannot just be a subject in its own right and should be shown through the curriculum. This point is supported by Judge and O'Bannon (2008) and the views of staff and students. Additionally a curriculum review of ICT as a subject in its own right is important to ensure specific skills for encouraging learning with ICT and for teaching with ICT are developed as appropriate for Key Stages 1 and 2.

3. <u>Continuing Professional Development of Staff</u> – This would develop staff skills in weaker areas, both at a personal level and for their embedding of ICT in their curriculum (Edmonds, 2007). This has already been highlighted as a need in the Action Plans 2007-2008 for the BEd and PGCE courses (Appendix G). This will allow confidence to grow at a progressive rate and, in turn, improve the modelling of ICT as a methodology in teaching and learning. This will then lead to greater strength in practice of the students. Individual skill levels and requirements for development activities have been identified specifically, as well as areas of strength that can now be built on to incorporate the University's new Technology-Enhanced Learning Strategy 2008-2011 (Draft 2008) and the CRE08 (2007) agenda. However, it must also be recognised that there are different levels of 'readiness' amongst staff which must be taken into account if change is to be successful. Equally, there is more to ICT in Primary education than e-learning and this needs to be considered at all times.

   <u>3a. Time Allocated for Collaboration and Development of Ideas</u> – This would involve opportunities to discuss specific aspects about ICT in a subject e.g. set up and organisation, management or the development of ideas. Goos and Moni (2001) advocate a 'team-teaching' approach, which Sinkinson (1997) also favours explaining that staff can work together to model practices and reinforce principles according to their own strengths. Both Dawes (2001) and Uys (2007) found that staff benefited from working with more experienced colleagues. Lavonen et al (2006) advocate this too as a means of planning together and exploring ideas. Edmonds (2007) explains that this does not need to be face to face discussion, it could happen in the virtual world, thus strengthening staff skills in and through the principles of e-learning, in line with the Technology-Enhanced Learning Strategy 2008-2011(Draft 2008). Whichever method is adopted, Uys (2007) explains that it must be at regular intervals in order to keep up to date.

4. <u>Modelling of Practice</u> – This has been a reoccurring theme from the analysis of the data. Loughran and Berry (2005) advocate the need to understand the thinking behind the use of ICT, that is the pedagogy, as well as the practice of using ICT for learning and teaching. They believe that this can only be achieved through modelling. This provides an understanding that ICT is one of a range of methodologies and should be implemented in an appropriate way. This could be enhanced through a more directed approach towards using and exploring ICT

during School Experiences. This would link closely to the Standards for QTS (2007) (Appendix I) and would also help to ensure that Learning Objectives relate closely between school and university work.

5. <u>Technical Support, Reliable Equipment and Easy Access</u> – This is an area that requires review, as advocated by Judge and O'Bannon (2008), Dexter et al (20020 and Somekah (1992). It has already been highlighted in the Technology-Enhanced Learning Strategy 2008-2011 (Draft 2008). However, it must be stressed again that this needs to be altered to be '*sympathetic*' to the needs of ITE courses, as the TDA (Draft 2007) point out. Lavonen et al (2006) advocate that it needs to be staffed by people who understand education and its complexities, rather than simply technical experts. They should also be available to join sessions in order to increase staff confidence and improve student learning, this therefore makes it meaningful as it is in contexts.

6. <u>Recognition that ICT is not Standing Still and Planning for its Development</u> – It has continually been highlighted that technology is changing rapidly and staff are concerned that they will be unable to keep up to date. The TDA (Draft 2007) (Appendix K) makes the suggestion that ITE institutions should consider using the BECTA Self-Review Framework as a model for planning for change with ICT. This framework (Appendix M) helps to map out CPD, resources, policy development and practice as advocated by Lavonen et al (2006). Judge and O'Bannon (2008) and Dexter et al (2002) emphasise that ICT development requires whole department impetus. This is concerning from the existing policy documentation as it does not cater for ICT in education, only ICT in HE.

Conclusion

The study found that there is wide variety of good practice within the Primary education courses, which is dependent on staff personal skills however, as the PGCE students had highlighted this is inconsistent. A major area of weakness was that, through auditing the subject areas, ICTwas not explicit within subjects,. This can simply be addressed by auditing the curriculum in each subject area and using example materials altering learning activities to accommodate the ICT element. Staff attitudes are generally positive towards using ICT for teaching and learning and they would welcome greater understanding, recognising that ICT will be part of the students' teaching experience. However, successful integration of ICT into teaching and learning activities was hampered by a number of factors including, access, resources, technical problems and personal skill levels. Indeed there was found to be much encouragement about using ICT, but in comparison, little actual content coverage, which is likely to be due to the staff member's personal ICT skill levels. The study concludes therefore that there are two main points of action required in order to improve the teaching and learning with ICT on the Primary education courses.

1. Continuing Professional Development – This needs to be in the form of skill specific training as well as opportunities to spend time collaborating with colleagues. This enables a personalised approach to CPD, making staff learning meaningful and contextualised for all.

2. Structure for Ongoing Development – It is now acknowledged that ICT is an ever-changing area and so contingencies for this must be put in place. Having a structure for development in place would provide meaningful direction to the integration of teaching and learning with ICT in all its forms, thus developing staff and students needs in an ever-changing world.

The profile of ICT at this level of study must be raised, in line with the increased use of ICT in an ever-changing technology-rich society, where increasingly student teachers, and equally the pupils they teach, are more digitally literate. Boyd et al (2006) point out that ITE courses should therefore have an understanding of this as this gives them credibility with the students they teach because it demonstrates an understanding of their 'real-world'.

Drawing on the work of Pan (2000), it can be concluded that the University should support all students to be competent in using ICT for teaching and learning in all its

various forms. They will need to be equipped with a level of understanding that enables them to make an impact during their school experiences. This is equally true of all staff members, thus creating an environment conducive to modelling the practice and pedagogy of ICT in teaching and learning. The University should show leadership in their community for the development of ICT in teaching and learning through developing programmes and structures which meet the needs of today's digital society. It should be recognised that the School of Education should be technology-rich, but not dominated by technology as there are a great many other methodologies to utilise in learning and teaching, other than ICT.

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