‘First do no harm’: Factors influencing teachers’ ability and willingness to use ICT in their subject teaching

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Abstract

The paper reports on a Department of Culture, Museums and Sport (DCMS) funded project which provided modest amounts of time for teachers to be freed from their classroom teaching to explore the use of information and communications technology (ICT) in their subject teaching, and to meet up together to discuss their use of new technology. The funding was sufficient to provide a day of supply cover for two groups of secondary teachers in different curriculum subjects (history and science) to meet towards the start of the academic year to discuss their use of ICT, a day of supply cover to work on their ideas and interests, and a day to meet together again towards the end of the year to share ideas and experiences.

The rationale behind the project was to allow teachers the freedom to explore their own areas of interest in the area of ICT and to avoid a prescriptive or ‘coverage’ based approach. There was a conscious attempt to avoid target setting and audits and teachers were encouraged to come to the end of year meeting even if they had nothing ‘to put on the table’.

The concluding section of the paper describes the outcomes of the project. The main issue to emerge was the highly positive reaction of the teachers involved. Whilst for some there were significant ICT outputs, all those involved found the process useful and enjoyable, especially the collaborative sharing process in the final session. This was in marked contrast to other ICT training experiences which many of the teachers had been involved with.

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1. The context of the research

Over the past decade, there has been considerable pressure on teachers in the United Kingdom (UK) to use information and communications technology (ICT) in their subject teaching. Politicians outlined a positive vision of the beneficent and transformative influence which ICT would have on educational outcomes (see, for example, Blair, 1995, 1997; Clarke, 2003) and a series of policy documents talked up the importance of
the United Kingdom developing a technologically sophisticated teaching force which would be capable of embedding ICT in subject teaching (see, for example, Department for Education and Employment (DfEE), 1997, Department for Education and Skills (DfES), 2002, 2003). Most Office for Standards in Education (Ofsted) school inspections included a section on the degree to which the potential of ICT was being realised in schools, causing a degree of trepidation amongst departments who were not integrating new technology into their schemes of work (Harrison, 2003) and the Department for Education deemed progress in the use of ICT in schools to be sufficiently important to merit a (roughly) biennial survey, monitoring the use of ICT in schools (see, for example, Department for Education (DfE), 1993, 1995). Cochrane’s (1995) assertion that ‘in future, there will be two types of teacher, the IT literate and the retired’ was another manifestation of the belief that competence in the use of new technology was no longer to be considered an optional ‘extra’ for teachers. In the late 1990s, the competence specifications for ICT in courses of initial training became increasingly stringent and detailed, extending to 15 pages for ICT alone (DfEE, 1998) and in 1997, the government announced a major programme of ICT training for all qualified teachers through the ‘New Opportunities Fund’ (NOF) Training Scheme (DfEE, 1997).

In spite of these pressures, and in spite of substantial investment in ICT in schools, estimated at between £1.6 and £1.7 billion between 1999 and 2002 (Abbott, 2001; Wills, 1999), uptake in teachers’ use of new technology has remained disappointingly sluggish in the UK (Nichol & Watson, 2003; Reynolds, Treharne, & Tripp, 2003; Selwyn, 2003). The interim ImpaCT 2 Report noted that relatively few teachers were integrating ICT into subject teaching in a way that motivated pupils and enriched learning or stimulated higher level thinking and reasoning (British Educational Communications & Technology Agency (BECTa), 2001), and the final ImpaCT 2 Report suggested that perhaps as many as 60% of teachers in the UK were making little or no use of computers in their day to day teaching (Harrison, Comber, & Fisher, 2002). Research reports from outside the UK suggest that this problem is not limited to the UK, and that in spite of substantial financial investment in ICT in education worldwide, many teachers struggle to successfully integrate new technology into their teaching (Phillips, 2002; Zhao, Pugh, Sheldon, & Byers, 2002; Zhao & Frank, 2003).

Moreover, there is evidence to suggest that within the UK, some of the interventions, policies and investment in getting teachers to embed the use of ICT in subject teaching have not been found to be helpful by teachers. The government’s ‘New Opportunities Fund’ training programme was criticised as being unwieldy, over-prescriptive and insufficiently geared to meet the needs of different subject specialisms (Leask, 2002; Ofsted, 2002; Preston, 2004). The idea of training teachers through distance learning in ICT proved to be more problematic than policymakers had envisaged (Naughton, 1998; Noss & Pachler, 1999), and many of the competence specifications and testing mechanisms for new teachers were found to be over bureaucratic and unhelpful (Barton & Haydn, 2004). This research was intended to explore an alternative to this approach to teachers’ development in the use of ICT. In an article reflecting on the lessons learnt from the NOF training, Younie (2006) concluded that the multi-agency approach had produced serious problems. She identified the need for the development of, ‘communities of practice’ and talked of the importance of a, ‘collegial culture of sharing best practice, in the form of ICT resources and training’. Our research, although on a very small scale, was intended to explore the potential of this ‘collegial’ approach.

2. Rationale for the research design

Although a decade ago there was some evidence of teacher antipathy or ‘ideological’ opposition to the use of ICT – the belief that new technology had little or nothing to offer in particular subject disciplines (see, for example, Easdown, 1994; Summers & Easdown, 1996), more recently, there is evidence to suggest that many teachers are more positive about the possible benefits of using ICT in subject teaching (Easdown, 2000; Haydn, 2004). The research design was predicated on the proposition that most teachers want to teach their subject well, that they are at least open-minded and interested in exploring the potential of ICT, and that one of the barriers to the development of ICT in subject teaching is lack of time (Barton & Haydn, 2004; Zhao and Frank, 2003). The project was designed to give teachers ‘dedicated time’ with which to explore their ICT agendas, both in terms of time on their own/within their own department, and also in subject groupings with colleagues from other schools. The idea was not to give teachers ‘more stuff’ but to give them time to explore the substantial body of resources relating to ICT which is already available to teachers.
The project aimed to draw on the skills, knowledge and enthusiasm of practicing teachers who were interested in experimenting with new approaches to developing their use of ICT by providing support and structure for developing and researching their own practice, and exploring the potential of an informal network to facilitate this process.

There was a conscious attempt to avoid a ‘top-down’ prescriptive approach and a ‘coverage’ mentality (in the sense of attempting to address all ICT applications which might be relevant to participants). It was also felt to be important to let participants choose what facets of ICT they wanted to explore. Although this might lead to a degree of replication or overlap, the project rested on the teachers being able to work on whatever they wished. We also wanted to avoid an ‘audit’ or ‘target-setting’ culture. Participants were encouraged to come to the July 2004 ‘follow-up’ research workshop whether or not they had developed a finished ‘product’ or activity. The research activity was to be conducted in separate subject groups – one of history teachers, the other of science teachers, and provision for teachers to have dedicated time within their own school and to discuss their work with other teachers of the same subject was built into the research design of the project. The overall approach was based on an action research model which would allow teachers to reflect on their practice and explore possibilities (Elliott, 1991), rather than a ‘training’ model such as the NOF scheme which had preceded this project (Leask, 2002; Ofsted, 2002; Preston, 2004). One of the research questions to be tested by the project was whether it was possible for teachers to generate their own development in the use of ICT in subject teaching, without recourse to external inputs, training, and national strategy based approaches.

3. The structure of the project

The funding for the project supported the formation of two groups of secondary teachers in science and history. The choice of subjects reflected the curriculum specialisms of the university tutors involved, and all the teachers involved in the project were members of the regional initial teacher education (ITE) partnership. At history and science mentor meetings and in letters to the history and science mentors active in the ITE partnership, teachers were invited to participate in the project, which was described as focusing on developing the creative use of ICT in subject teaching.

The framework for the project activities involved one day ‘research workshops’ at the start and at the end of the project and one day of supply cover to be taken at any time in between the two research days, so that teachers had some dedicated time to work on their ideas for developing their department’s use of ICT. The first workshops were in July 2003, and the follow-up ones in July 2004.

In terms of the composition of the working groups, there was a range of abilities in terms of previous knowledge and experience of using ICT. Some (particularly in the science group) already had a high level of technological expertise in ICT, and as well as being subject teachers, were ICT coordinators for their schools. Others were not particularly accomplished in terms of technological expertise but were heads of departments interested in exploring the potential of ICT, and some were self-acknowledged ICT novices who were keen to learn from departments who were more advanced in this area.

The first research workshops involved eight science teachers and 15 history teachers but more teachers became involved over the course of the project. Second year funding was obtained to continue the project through 2004–2005. In the second round eight science teachers were involved, two of whom participated in round one, and for history, all but one of the original participants wanted to continue their involvement in the project. In all, 37 teachers were involved and approximately 80% of those involved in the first phase of the project opted to continue their involvement into the second year.

Some time at the start of the initial research workshops in July 2003 was spent discussing the action research approach which we intended to adopt, and then participants gave a brief description of the ‘state of play’ relating to their current use of ICT, in terms of facilities, staff expertise, interest and recent use, including some discussion of the factors which they felt were either conducive or unhelpful to the development of ICT use in the department. Although this was time consuming, and reduced the time available for ‘hands-on’ practical demonstration of the forms of ICT related activity that had already been developed, it gave some indication of the current interests and aspirations of the participants in the area of ICT in subject teaching.

The aim was that during the course of the subsequent school year, the members of the two groups would work on a specific development of their use of ICT to support their teaching. This was to be followed by a
second research workshop to be held towards the end of the next school year, where they would report back on ideas, experiences and reflections on the project. The meetings concluded with a brief discussion on the format of the second research day and email addresses were exchanged, in the hope that there would be communication between those involved between the two research workshops, and so that teachers could work collaboratively if they wished to do so.

4. Processes and outcomes

The discussions on previous use of ICT elicited considerable comment on participants’ experiences of New Opportunities Fund (NOF) training in the use of ICT in subject teaching. The vehemence of teachers’ views was one of the most striking aspects of the feedback from the initial research workshops. The most positive comment was that the training ‘was not a complete failure’, but generally, comments were disparaging and negative:

‘A waste of money … and created a lot of resentment.’
‘It was like a driving lesson that consisted only of learning the highway code but which had not actual driving tuition.’
‘The training provided was patronising, unrealistic and painful in its delivery … The effect on staff morale was devastating. Nothing in recent years has done more to put teachers off using ICT.’
‘I was tasked to deliver the training and implemented one course with 15 members of staff …. attendance dwindled within weeks to four or five and the course was never fully completed. I was unable to coax any other staff onto the course as they had heard of the experiences of others.’
‘It was “done to us” in a way that left us deflated and angry. We needed time to debate and trial ideas – we did not have this. The sessions were geared around certain information which was going to be delivered come what may and usually this was not really linked to what we wanted to do. We persevered despite the training, not because of it.’

Other factors which emerged as constituting barriers to the embedding of ICT in subject teaching were lack of time to plan for and execute this, difficulty in securing access to computer suites, and the limited availability of data projectors in ‘ordinary’ classrooms which would allow for ICT use as a regular component of lessons in day-to-day teaching so that computers could be used ‘not as a special event, or to impress others, but naturally, when the need arises’ (Ogborn, 2000, p. 26). There was a consensus amongst both history and science teachers that provision of whole class projection facilities in teaching rooms would be more helpful than investment in more ICT suites.

One other facet of recent policy relating to ICT which was deemed to be unhelpful by some of the teachers in both subject groups was the feeling of being overloaded with information, whether in the form of online sites or guidance booklets and folders from official agencies, which they felt they simply did not have time to consider given the overall demands on their time. The volume of information relating to ICT was seen as overwhelming and unrealistic. In the words of one teacher, ‘Who writes this stuff? I don’t have time to read through it all … they obviously don’t have a clue about what teachers’ lives are like.’ There was a general murmur of assent to this from other members of the group.

The hope that teachers would stay in close touch by email and phone over the course of the year to keep up to date, share ideas and map developments, proved to be unrealistic. Beyond a handful of phone calls and emails this just did not happen. At the end of year workshop, several participants acknowledged that it was difficult to keep up a sustained collaborative research agenda in the face of the many other demands on their time. Compared to the exigencies of examination classes and departmental responsibilities, this project was clearly a luxury item, and in some schools, cover was not possible even though funding was available.

The main aim of the project was to gain insight into the factors which influenced teachers’ motivation and commitment to developing the use of ICT in subject teaching. In order not to lose feedback from participants who might not develop a tangible end product, it was made clear at the first meeting that those who had not been able to produce an end product were still welcome to attend the final session. However, in the first year of the project, the vast majority of those involved (12 out of 15 of the history group and six out of eight in the
science group) did manage to develop at least one element of their ICT use, and attended the end of year workshop. Perhaps more significantly every teacher who produced something had already made use of it in their teaching. Clearly, the level of sophistication varied considerably but in every case the teacher had identified something which they felt would directly support their teaching. Ownership of the process and product would seem to be an important factor.

Amongst the history group, three teachers had developed departmental websites, two had focused on exploring how to make best use of interactive whiteboards, and a cluster had formed ‘to find ways of making PowerPoint less boring’. Two teachers had learned how to use Macromedia Flash, and other projects included the development of themed collections of images on particular historical topics, materials which might develop pupils’ understanding of the reliability of the internet as a source of information about the past, and materials to develop pupils’ democratic literacy. Another department had focused on the development of web templates which enabled pupils to make their own web pages without wasting too much time on technical issues, and another had focused on the use of databases and word processing exercises to develop and test historical understanding.

The science teachers reported on using ICT to address pupil misconceptions at Key Stage 3 (11–14-year-olds), bringing applied science to life, on-line testing to prepare pupils for science exams, developing pupils’ skills of scientific education using ICT and new approaches to running an out of hours science club, and the development of science department websites.

Second phase funding made it possible to continue the project into a second year, with the same pattern of group meetings early and late in the year, and supply cover to support activity between meetings. By the end of the second phase of the project, over 30 of the 37 participants had reported on some form of development or activity in their departmental use of ICT. Throughout the 2 years of the project, the history teachers and science teachers worked separately from each other, but a conscious decision was made not to separate ‘new’ and ‘experienced’ participants. One advantage of this approach was that in the first meeting of the second phase, it was helpful to have some teachers from the first round able to discuss their experiences with new members of the group. End of project feedback from both the science and history groups suggested that the teachers involved also found the decision to work in a single subject group helpful, as it enabled them to work in a loosely collaborative way, in what were in effect ‘mixed ability groups’ (see comments below). It is clear that the group interaction and mutual support from each cohort is much more significant than prior experience either in terms of personal ICT skills or the length of time teachers have been involved with the project. This is mainly due to the style and approach adopted in this project, which relied on personal motivation and mutual support rather than any attempt to include a specific training component, and which allowed teachers to pursue their own preferred avenues of development, rather than attempting to impose a standardised programme.

Again, rather than looking for some objective measure of the quality of the individual end products, our main focus was to explore the extent to which engagement in the project had impacted on teachers’ commitment to developing the use of ICT in their subject teaching. We felt it was significant that the teachers were already using these resources in their teaching, impacting directly on their pedagogy. There was no significant disparity between the science and history cohorts, in terms of the proportion of teachers producing some form of finished product or activity in ICT, with 13 out of 16 science teachers and 17 out of 21 history teachers presenting some form of development in ICT in the end of year workshops.

5. Evaluation

Feedback from participants was obtained by devoting the last session of the research workshops to reflection on participants’ involvement in the project (audio or video recorded), by follow up emails and by subsequent face to face conversations with those involved. By these means, some comment was elicited from 31 of the 37 participants (three teachers had to leave before the end of the afternoon, and two made no comment and two of these did not respond to follow up emails). ‘Internal’ evaluations are, of course, notoriously prone to accentuate the positive especially as in this case when comments were not anonymous, but we believe that there is sufficient evidence from the comments of those involved to suggest that giving teachers time to explore their own particular strands of interest in ICT in subject
teaching is a strategy which is worth further exploration and investment. It must be acknowledged that although the lack of specific outcome targets had a positive effect on the teachers’ morale, in one sense it made it more difficult to assess the outcomes of the programme in terms of the quality and impact of the ICT resources and activities which had been developed. However, we would defend this approach, since teacher development is a continuing process and not easy to quantify with objective measures. Teachers are very effective in providing qualitative feedback on the benefit of the continuing professional development (CPD) they receive, and the teachers were unambiguously positive about their involvement in the project, and about the positive effect this had on their interest and commitment to exploring the use of ICT in subject teaching.

In addition to the ‘products’ which had emerged from the project, teachers talked about some of the ‘process’ issues involved. Although the amounts of time made available for teachers to explore ICT were quite modest, they spoke of this time as (in the words of one teacher) ‘an incredible luxury’. It would seem that this small amount of additional time was so significant since it enabled teachers to work on developments which had personal professional significance as opposed to contributions they would make to their department as a whole.

Several teachers talked about the impetus to try things out which derived from talking together, looking at ‘other people’s stuff’ and discussing ideas, examples and possibilities. In spite of the absence of intermediate meetings or contact, the combination of some time for teachers to just get on with it and work on their own, and some time to get together and share ideas appeared to have worked well. All the teachers who had taken part in the project had enjoyed being involved, exploring creative approaches to ICT use, and coming together to present their work and look at the work of others. Some teachers said that they had been ‘inspired’ by talking and working with colleagues. There was an obvious contrast with their experience of NOF training.

We would not wish to claim that involvement in the project transformed practice for all teachers in all the schools involved. Approximately three-quarters of the teachers reported a positive but modest impact on their use of ICT. In a few cases, participants reported that involvement in the project had a substantial impact on departmental use of ICT (between six and eight responses could be construed as being in this category). For the remainder there were good intentions which were not followed up and some felt that the main benefit was meeting up with other colleagues and acquainting themselves with some new ideas and possibilities (there were six responses of this nature). This was reflected in the comments made in the evaluations which ranged from unreservedly positive in a few cases, through cautiously and sceptically positive for the majority, to acknowledgment in six responses that in spite of good intentions, little practical progress had been made in embedding ICT in day to day teaching in an effective way. In no cases however, did teachers feel that engagement with the project had been either harmful or a waste of time. The following comments give a flavour of the spectrum of teachers’ reflections on involvement in the project.

One of several comments which suggested that the project had transformed departmental use of ICT came from a teacher who had used the time to set up a departmental revision website:

‘Our school is well resourced in terms of equipment, but the funding bought us time. We feel that time is one of the crucial components teachers lack because of the extensive workload. We were able to take three days to plan and design the (web) sites, something that would have been otherwise impossible without financial backing. The web site has been a big success, it has had a massive impact on the department and the pupils and it has led us on to develop other things.’

Many of the teachers involved talked about the generally positive effects of involvement. Two examples are given:

‘It has provided a great way to get started in a manageable and realistic way. It compares very favourably to other CPD (continuing professional development) experiences as you have time to implement your ideas with the supply day. Too often you go to courses and leave excited but then have no time to do anything and the course file just gets put away. It was also better as we were given access to some excellent resources from others involved in the project which will enable us to continue to develop further.’
‘We did feel inspired and energized after talking with everyone during the first meeting, it was the stimulus of this contact and interaction that started us going, and got us beyond the ‘good intentions’ stage. Sharing the outcomes and meeting up again was also really enjoyable and interesting, and has set us off on new tracks.’

Some teachers acknowledged that limited progress had been made in spite of good intentions, but even in these cases, they wished to stay involved in the project. Three comments of this type are given:

‘I’m one of those who have not found using ICT the most pleasurable pastime in the world, but have persisted as it has benefits. It was good to at least meet others with the same attitude as well as those able to sail ahead with it. I learnt a great deal . . . also in terms of what is and isn’t available and more pointers on how to use the stuff . . . so, we will actually use directly some examples offered. I could use the day’s cover, but there isn’t a prayer of getting time off until after half term.’

‘I’m afraid I don’t have a great deal to offer. We were supposed to work on updating the revision website but with many great intentions it didn’t end up happening. I would love to have the opportunity to try and do something like this at my new school so if anything ever comes up let me know.’

‘We’ve not followed up things as much as we hoped but I am meeting up with J. (from another school involved in the project), using one of the supply days . . . . It was helpful and I’m glad I got involved.’

In terms of the proportion of participants who emerged with a finished product or outcome as a result of engagement with the project, there was no clear disparity between those who started the project with high levels of ICT skills and those with less expertise in ICT, although the nature of the ICT initiative which had been embarked upon was more likely to be technologically sophisticated (such as the creation of a departmental website or work with Flash Multimedia) where teachers had high level ICT skills.

There were some teachers who wished to become involved in the project but were not able to be released from school. There is no single explanation as to why some of those involved were unable to complete the project, but factors such as promotion, family tragedy and difficulties in getting supply cover, were some of the issues to emerge. In two cases, teachers ‘confessed’ that in spite of their best intentions, the business of school life and other pressing school and departmental commitments stopped them from developing in ICT as they would have wished.

It was beyond the scope of this small scale study to attempt to assess the impact of these developments on departments or pupils. However, the feedback we obtained would suggest that there is some potential in pursuing this model of teacher development. The ‘ongoing’ nature of the project evinced positive comments from participants, both in terms of the ‘social’ benefits of getting together on more than one occasion with a group of colleagues, plus the opportunities afforded for reinforcement and consolidation of new found expertise in ICT, as opposed to ‘one-off’ sessions where good intentions to do follow up work were not always fulfilled. This would also appear to support Younie’s suggestion (2006) that the establishment of ‘communities of practice’ and the fostering of collegial culture might be factors which contribute to the effectiveness of continuing professional development interventions in the field of ICT.

6. ‘First do no harm’

Given the history of teacher development in the use of ICT we believe the maxim taken from the medical profession of, ‘first do no harm’ is a sensible starting point. Although not all the teachers involved in the project made major strides in embedding ICT into their subject teaching, there were no instances of teacher ‘regression’ or ‘allergic reaction’ to the research workshops, such as that reported in their experiences of NOF training. Almost all the participants reported that they had gained something from involvement in the project (even if in a few cases this was only in terms of a greater awareness of ‘what there was to think about’ in ICT related to their subject, and a more positive disposition towards future exploration of the use of ICT in subject teaching). Over three-quarters of the participants could identify at least one outcome which had improved the department’s use of ICT, and for several of the teachers involved, the project had
a radical positive impact on their use of ICT in subject teaching, and on their determination to explore the potential of ICT further.

Teachers’ time emerges from this project as a very precious resource in education. Giving teachers time to explore the potential of ICT may be a cost effective way of enabling them to develop the use of ICT in subject teaching, especially if it also affords teachers the opportunity to work collaboratively with other teachers of the same subject. The outcomes of the project also suggest that allowing teachers to pursue particular facets of ICT in some depth may be more productive than putting them through ‘general’ training courses. As one teacher remarked, ‘It’s better to just do one thing that makes a real difference to your teaching . . . then you’ll go on to do other things as well.’ One of the factors which we believe had a positive effect on the outcomes was that teachers chose their own learning agenda in ICT and had ownership and control of their work. We believe that the absence of a ‘performativity’ climate of targets, audits and testing (Ball, 1997; Elliott, 2001) also had a positive influence on teachers’ commitment to the project.

The outcomes of this project suggest that in the area of developing teachers’ use of ICT in subject teaching, simply providing support for teachers, in the form of time to explore the potential of ICT, to meet together to discuss ICT in subject groupings, and freedom to focus on their preferred ICT agendas, may be a more effective way forward than prescribing lists of required competences (see, for example, DfEE, 1998) and providing generic ‘training’ type courses such as the NOF programme. This goes against the grain in an era characterised by ‘top down’, centrally directed national strategies, high levels of accountability and auditing of teachers, and ‘coverage’ models of competence (Ball, 2003), but there is scope to at least experiment with complementary investment in ‘bottom up’ continuing professional development strategies for embedding ICT in subject teaching. The costs of the project were not insignificant (approximately £7000 for each subject strand per year), but this may well be a cost effective form of CPD compared to other recent strategies and initiatives in this field, and unlike some other recent initiatives in ICT in education in the UK, it does not appear to have any negative or counter-productive effects.

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