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Technology-enabled action research in mentoring teacher researchers

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ABSTRACT

How far does digital technology enable teachers to explain the 'what' and 'how to' of their professional knowledge and enable insights into their personal knowledge, which shapes and is shaped by their practice? This article explores the genesis, evolution and 'generativity' of educational research mentoring for school teachers. It examines the use of web-based templates as a way of scaffolding and eliciting as well as enable the representation of knowledge generated by self-study action research, here presented through case studies. Drawing on recent work with teacher-researchers, the author locates the use of digital technology in action research integrated with mentoring as a collaborative enquiry.

USING COMPUTERS IN EDUCATIONAL RESEARCH

According to Rob Walker (2000)

> (the) uses that we make of computers in educational research are mostly routine and unimaginative. Computers are used to improve efficiency rather than used as a new medium that makes possible new ways of working, and of relating to and understanding the world. Yet it seems clear, looking outside education to other arenas, that the adoption of information technologies has the potential to precipitate the collapse of long-established divisions of labour, to establish new social and knowledge boundaries, perhaps to replace conventional communicative media, and to do so very fast.

How much has changed since Rob Walker presented his paper (2000) entitled 'Case Study, Case Records and Multimedia' as the Lawrence Stenhouse Memorial Lecture? Are computers still used in routine and unimaginative ways by school-based practitioners or are they now used as a platform by teacher researchers to represent their knowledge? Is web-based digital technology assisting teachers in representing tacit and personal knowledge? (Polanyi, 1998, 1967) Investigation into the use of web-based templates (Coombs and Fletcher, 2005) by teachers studying an MA module in research mentoring at Bath Spa University suggests that digital technology embedded in mentoring is transforming practice.

In October 2005 two teachers presented their own research scaffolded through content free web-based digital technology to the BERA Practitioner Researcher Conference at Liverpool Hope University; in March 2006 they presented at the National Teacher Research Panel Conference (see http://www.TeacherResearch.net). In December 2005 students at a Salisbury school presented their research to their teachers using a KEEP toolkit template[1]

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and PowerPoint. Are these examples of practitioners using digital technology to elicit and present ideas? If so, and they appear to be, what can one learn from how digital technology has been used (and might be used) within educational research mentoring to assist the growth of original knowledge? Does digital technology determine the content and impact of that content as well as the form in which knowledge is represented? If so, how does this come about?

Before I consider the use of technology by teacher-researchers I think it is useful to explain my own standpoint vis-à-vis teacher research and research mentoring and explore the context in which teachers are now becoming researchers and using digital technology.

TEACHERS-AS-RESEARCHERS

> It is not enough that teachers' work should be studied; they need to study it themselves. (Stenhouse, 1975, p. 144)

I taught in primary, middle, secondary and upper schools for over 20 years before becoming an academic committed to assisting teacher research. Being a mentor within the Licensed Teacher Scheme and acting as a mentor to mentors (Fletcher, 1997) enabled me to integrate mentoring and action research (Fletcher, 1994; 2000) and advocate digital technology to enrich and evidence mentoring (Fletcher, 2002). My experience of being a teacher-researcher was not overly encouraged. ‘I pay you to teach, not to research’ became my impetus to seek a more integrated approach in school between teaching and researching what occurred in class and how it might be improved. I researched my own teaching of modern languages and turned to writing publications as a means for disseminating my understandings and knowledge about how to assist learning. Though publishing companies enabled my language teaching research resources to be made available to other teachers (1978, 1994), I encountered considerable opposition to publishing about school-based mentoring until assigned a co-writer in higher education.

Although opportunities for research existed, during my career as a schoolteacher in the 1970s and 80s, the idea of taking up one of the government-funded sabbaticals was anathema to me. I was a teacher in school and I had responsibilities first and foremost to ‘my’ students. I eagerly undertook small-scale research to try and improve their (and my own) learning, but taking time out from the classroom was neither viable nor attractive. In retrospect, I am sure I would have eagerly grasped the possibilities of representing my personal and professional knowledge (McNiff 2003) using digital photography, video and audio, had the digital age dawned, because I could have stayed in my school … teaching.

As an academic lecturing at a university, I seized the opportunity to advise teachers in procuring so-called Best Practice Research Scholarship awards from 2001 to 2004. I successfully guided about 70 teachers in total, which included a group of 16 in a school in Salisbury and another group – again of 16 – at a school in Bath. In 2003 my Guidelines for Research Mentors were posted on the http://www.teachernet.gov.uk website for those involved in BPRS. When the government discontinued the BPRS scheme, I was part of the national working party. I remember the concern we felt on hearing the news and we reflected on the possibility that research in England had suffered a fatal blow. After a

period of uncertainty as teachers and academics looked for other sources of funding, the teacher-researcher movement in England has recently enjoyed a revival. The notion of teachers-as-researchers, that had begun with Lawrence Stenhouse and which seemed doomed, is back en vogue. A growth of interest in research-informed practice is in evidence. Use of research and evidence in education, to improve practice and policy and to help raise standards in schools, has kick-started a hitherto unseen level of support for UK teacher-researchers.

What might be the implications of teachers becoming researchers in schools at present? And, how far does the knowledge that these teacher-researchers develop influence their own and others' educational practice in school? One of the most striking implications is that teacher-researchers often encourage others to research their teaching and in turn they encourage and support the growth of action research by and for students in their classes. I term this the ***generativity*** of educational research mentoring, nurturing future researchers. To my delight, teachers with whom I have worked as a research mentor in England and Japan are research mentoring colleagues, and in one school in Salisbury students are research mentors now too.

What kind of knowledge do teacher-researchers generate? In my experience as a research mentor, teachers come to research for a number of different reasons. Some want an MA and are seeking promotion; they are less concerned with creating original knowledge than getting a qualification. Others, and these form the cohort with whom I work, are motivated by passion to be an effective teacher by studying their teaching-as-learning as their way of trying to improve. Their knowledge does not reside in any one discipline but often in many, and it crosses boundaries (McClure 1996) between being an MA student, a mentor and a school teacher. They study their lived experience (Van Manen, 1990) within these roles and create ‘living educational theories’ (Whitehead, 1989), which can evolve through co-enquiry.

> In a living educational theory approach to action research, individuals produce accounts or explanations of their educational influence in their own learning in enquiries of the kind, 'How am I improving what I am doing?' in contexts where they are seeking to live their values more fully in their practice. The living educational theories of professional educators usually explain their educational influences in the learning of their students and can also explain educational influences in the learning of social formations…. (http://www.actionresearch.net)

Until digital technology offered us high speed broadband connections, research accounts undertaken by school teachers were all too often shared only with tutors in universities rather than with other teachers. This enclosure pertained especially to those accounts embodying digital video and photographic images. Creation of KEEP Toolkit templates by the Carnegie Foundation for the Advancement of Teaching offers a wider audience. Even so, relatively few accounts are disseminated via (inter)national websites and, as an educational community, we are still waiting for the day when each school website houses a teacher research section and these are networked to a searchable database. Teachers' enquiries remain ring-fenced by their originators, their schools and factions of the educational community rather than pooled to complement to academic research databases like ERIC. My website http://www.TeacherResearch.net offers an opportunity for

dissemination. I believe that web-based technology offers teachers a freedom to publish which has not been recognised as yet very widely yet. One hopes more will publish their findings.

Ownership of how the research is presented as well as how it is written up and how it is disseminated is, in my experience as a research mentor, an essential aspect in how a busy teacher researcher will prioritise work on their research.

> Thousands of researchers down the year have started on projects they really believed in and which embodied ideas they really cared about. But too often these projects got pared down and chopped about and falsified in the process of getting approval and the researchers got progressively more disillusioned and frustrated, as they have gone on. Thousands of researchers have ended their research soured and disappointed and hurt or cynical. It doesn't have to be that way. (Reason and Rowan, 1981, pp. xxiii-xxiv)

The observation by McClure (1996) about the way some academics can 'feed off' the research of teachers is a warning to research mentors who need to act as protectors as well as advocates for their mentees. Their research needs to be regarded as distinct from and yet complementary to, academic research in universities about teaching in schools. The few teacher-researchers who present their work at academic conferences are in danger of feeling exploited as showcase exhibits to enhance their mentors' reputations rather than being present in their own right to share insights into their own knowledge.
Teachers' knowledge is embedded in their context and this context needs elucidating.

> Knowledge is not foremost the representation of what is observed but rather one of the things embedded within acting. Knowledge is internal to practice, praxis and acting ... all knowledge claims and take ups of knowledge are embedded within practices…When we communicate with other people we do so by making assumptions of commonality. Just to communicate at all we must make assumptions about components of experience that are shared equally between the communicators. (Carspecken, 2005, p. 18)

Academics have a key role as research mentors but need to be flexible and sympathetic in recommending teacher-research methods to avoid 'strait-jacketing' teachers' knowledge so that it loses its contextual elucidation. This raises a question about how far academics understand and assist in communicating the context of teachers' research and whether they have the credibility as educators to be welcomed into the context of the classroom. Knowledge generated by teachers as researchers in the course of their day-to-day work is likely to require adaptation of traditional and the development of new research methods. I am not suggesting that 'anything goes' in approaches to teacher research. What I am saying is that academics must not be mesmerized by their knowledge of research and experience of learning to research so that they might discount 'new' approaches to research out of hand.

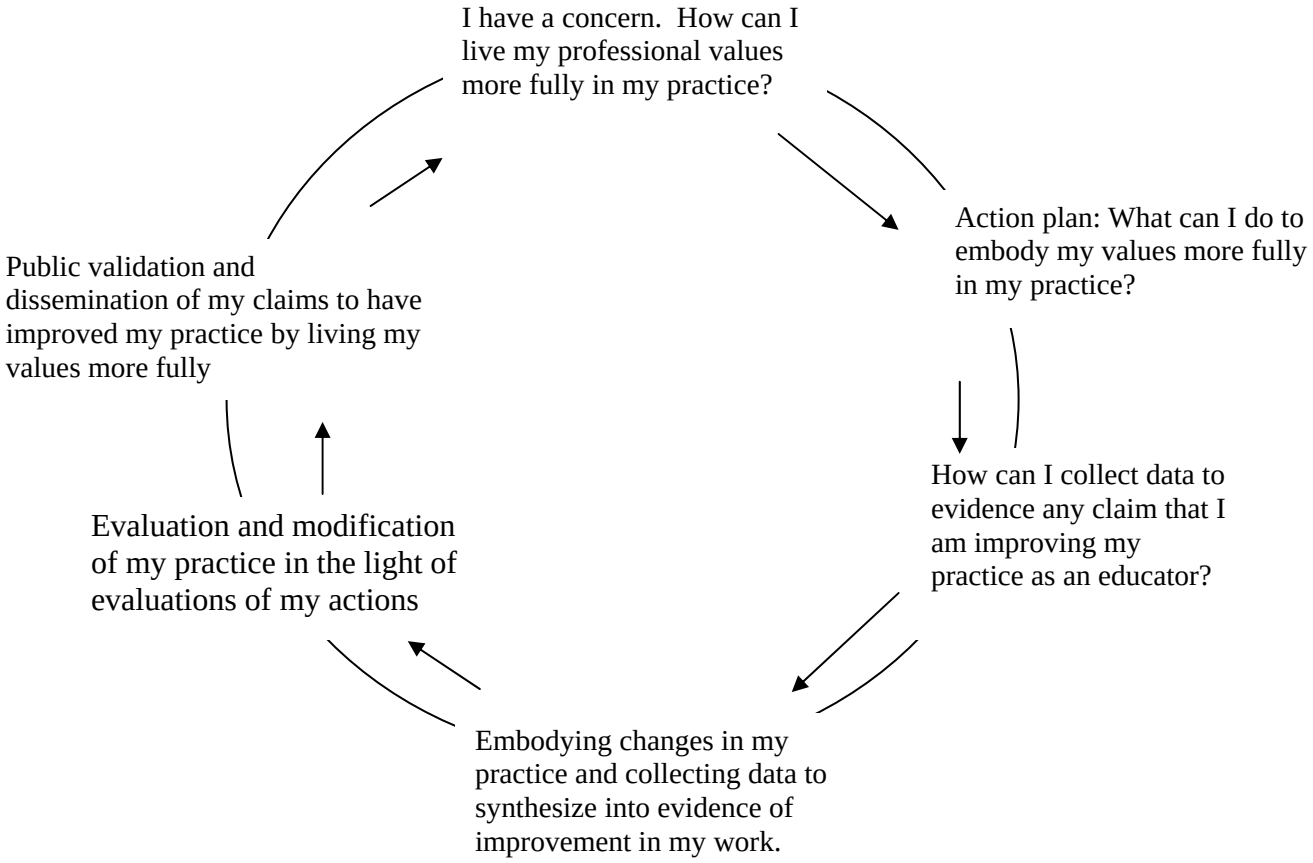
Some teachers need to make a paradigm shift too, in my opinion. All too often many look for 'quick fix' solutions from outside their own context, abdicating responsibility for undertaking research to others, to non-teachers through lack of time, funding and energy.

So long as teachers allow their knowledge to be controlled and regulated by the academic community rather than developed in collaboration with it, teachers' knowledge generated through sustained and systematic educational enquiry will largely remain invisible. It will be submerged in the classroom where it was undertaken or (if written up) gathering dust on a shelf in a university tutor's office. The irony is that teachers' knowledge will be unavailable to the very educators who need it … and inaccessible knowledge is useless. Teachers need to collaborate with those who can assist them in eliciting their knowledge and disseminating it, without prejudicing originality by the form in which it is presented.

THE PIVOTAL ROLE OF RESEARCH MENTORING IN TEACHER RESEARCH

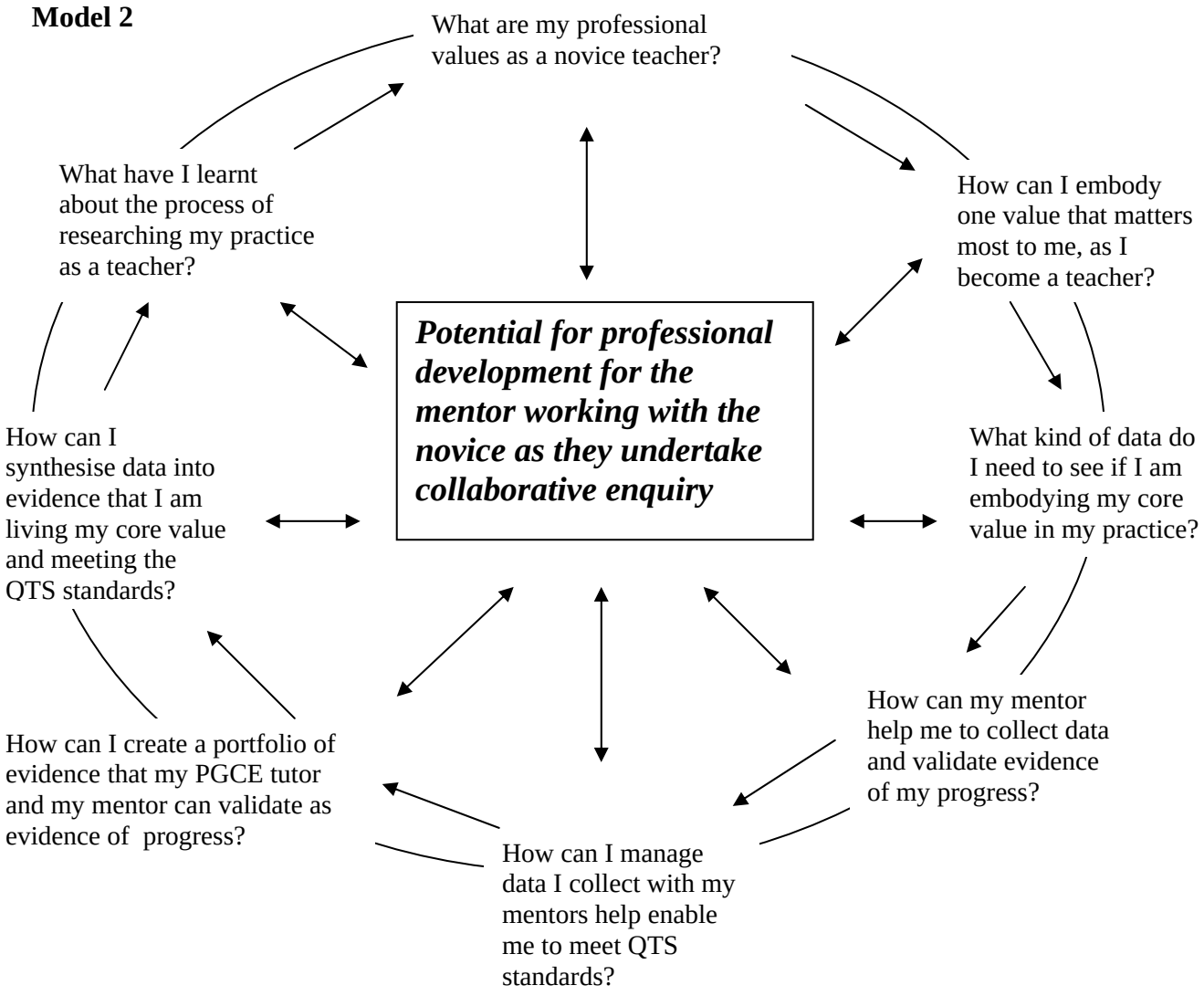
The lesson of the BPRS Scheme and a teacher-researcher scheme in Wiltshire is that the role of the 'research mentor' is a key factor in enabling teachers to research their practice. A need for mentoring to support research is borne out by reviews (Furlong, 2003; OECD 2002). How does educational research mentoring integrated with action research enable qualitative and quantitative research by teachers? How does mentoring help teachers to elicit, represent and disseminate their knowledge? My diagrams (Fletcher) provide clues:

Model 1



The approach to action research that Whitehead (1989) has pioneered is distinct from other forms of action research because it focuses on the 'I' as a Living Contradiction. *When I find that I am not living my professional values as fully as I think I am (hence the contradiction) and as fully as I might (there is always scope for improving practice) I ask myself questions of the kind 'How can I improve …?' In seeking the answer and collecting data that I can synthesise to provide evidence of any improvement, I am creating what Whitehead terms a* Living Educational Theory. *I can test the validity of any claims I might make to be improving by public validation and by using my own professional values as living standards of judgement.*

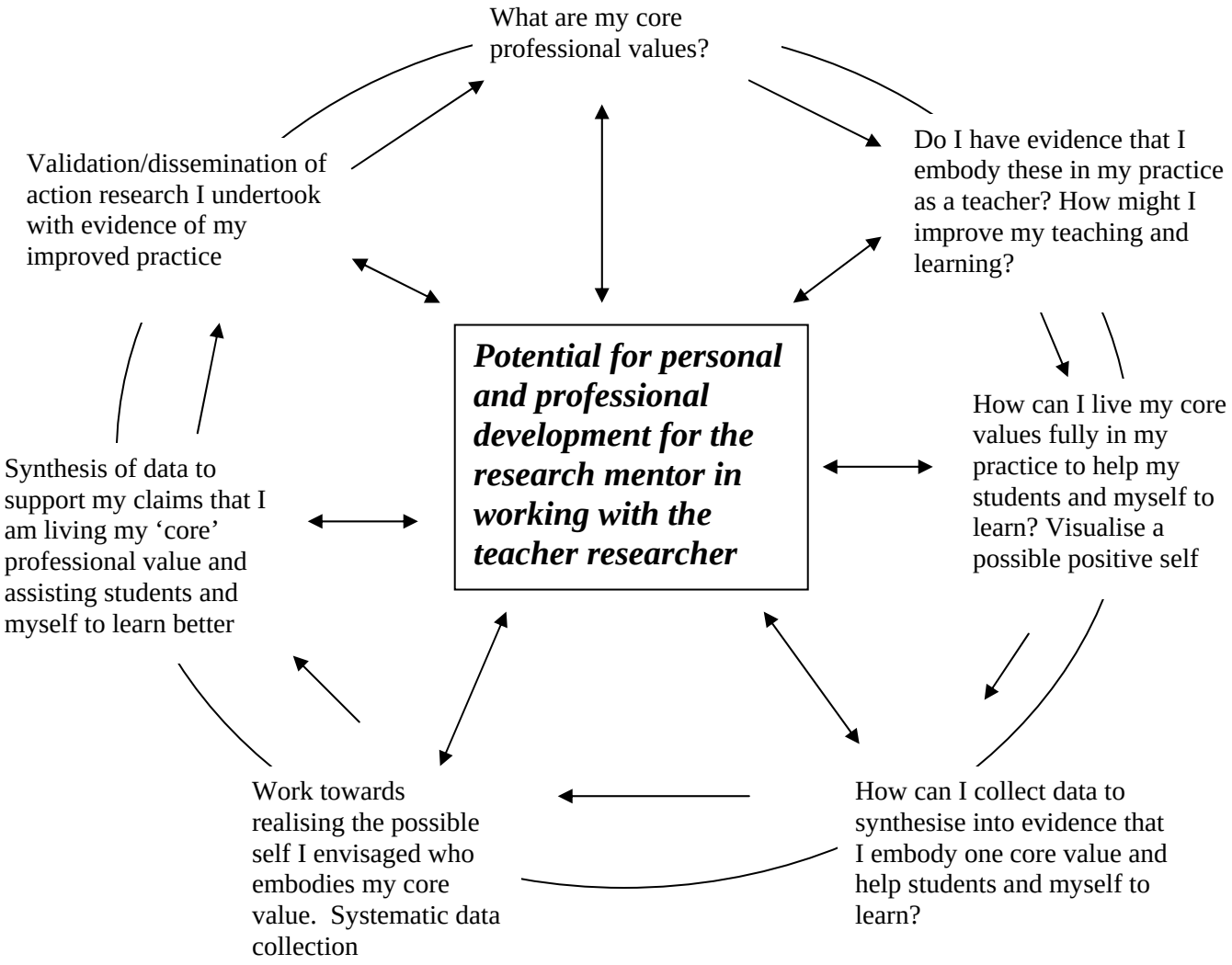
Figure 1: An interpretation of Whitehead's model of action research



My model of collaborative self study emerges from Whitehead's as I integrate mentoring (Fletcher, 2000) with self study action research (Whitehead, 1989). I have shifted the initial focus from "I have a problem" (some trainees seem to find this unmanageable and/or off-putting) to "What are my professional values?" If I am to encourage trainees to keep in touch with the reasons for coming into the profession, I need to help them explicate and refine their own professional values. My model reflects collaboration between a school-based mentor who assists a novice teacher to meet the Standards for QTS. Both parties are engaged in self-study action research.

Figure 2: A model of action research integrated with mentoring

Model 3



My model of the role of a research mentor working alongside a teacher-researcher through self-study action research emerges. I have incorporated the work by Markus and Ruvolo et al, in my study by focusing on the visualisation of a positive, possible self. This, I believe, is the key to linking a theoretical study of one's own professional development which is then applied to practice to a model where the embodied self as goal arises from practice and is attained through living theory. This is an original and communal model of self-study facilitated and supported through mentoring.

Figure 3: A model of action research integrated with mentoring (2002-3).

> The impact of mentoring on action research cannot be underestimated. The guidance and support that I have received has led me to believe in my future research and removed any fears or preconceptions that I may have had. Sarah has smoothed the way; helped me to give my work direction and filled me with the confidence to carry out action research. (Catherine Meacher, BPRS researcher, Wiltshire Journal of Education Summer 2002)

THE EVOLUTION OF EDUCATIONAL RESEARCH MENTORING

Educational Research Mentoring (ERM) developed from the integration of mentoring as CPPD (Continuing Personal and Professional Development) for teachers (Fletcher, 2000) and the approach to action research pioneered by Whitehead (1989) which he has claimed can lead to elicitation of practitioners' knowledge as 'Living Educational Theory' (LET). My experience of publishing and presenting with Whitehead (2003, 2001, 2000, 1999) convinces me his approach to action research is grounded in examination of practitioners' own values. As values are defined and refined, they become standards of judgement for evaluating and validating any claims to improve one's practice through self-study.

The LET approach has enabled many teachers to undertake self-study but it can be time consuming and energy intensive, and a process of public validation that is integral to this kind of action research approach feels threatening and invasive for some teachers. Much of the value of LET resides in the personal encouragement given by proponents. Such personal support is crucial and underpins the value of ERM. Since knowledge creation is usually considered the domain of academic researchers the move towards emancipation for teacher-researchers may arouse conflict in academic circles.

ERM, similarly, focuses on the growth of understandings and the elicitation of knowledge through self-study. In living educational theories, teachers define their values and investigate how far they are living their values. However, ERM goes beyond this to draw upon on a wider and, I would argue, more educationally appropriate 'tripartite' basis. This derives from the Chartered Teacher Scheme in Scotland (Christie, 2003), which puts action research at the heart of a dynamic interaction of professional values, skill, attributes, knowledge and understandings. 'Research mentoring' has traditionally been associated with undergraduate studies where novice researchers are inducted through apprenticeship into academic research by more experienced colleagues. ERM does not rely on the transmission

of predetermined knowledge and methods of educational research. It can generate new knowledge.

ERM communicates pre-existing knowledge about how to undertake action research in school but it is more fundamentally a form of collaborative enquiry where approaches to classroom enquiry are generated as the research process evolves. There are instances of 'research mentoring' being instituted to enable classroom teachers to become versed in predetermined social studies methodologies. There has been a fine line drawn between research mentoring and research tutoring, which has often been interpreted as 'research coaching'. The focus has been on developing research skills by practitioners rather than on enabling personal and professional development (Fletcher 2000) through co-enquiry.
My experience as an educational research mentor is that digital technology is enabling educing knowledge by teachers with whom I work and, coincidentally, educing my own. Through collaboration we are learning how to develop understandings about ERM as a process, and knowledge about ERM is being fed back as a focus for further investigation.

USING DIGITAL TECHNOLOGY IN TEACHERS' RESEARCH TO ASSIST THEIR LEARNING

What kind of technology can enable teachers to access relevant literature, access 'how to' guides in basic research techniques, e.g. how to undertake a critical literature review, as well as enabling them to write up research (and add images) in spare moments everyday? If teachers have access to appropriate literature via the Internet or in supplied Study Packs as part of accredited courses provided by HEIs, and if they have access to KEEP Toolkit Templates to exhibit and disseminate their knowledge, and if they have Critical Thinking Scaffolds[2] embedded on-line in these web-based 'snapshots', will they use these? In other words, is providing study resources and web-based templates alone sufficient to encourage teachers to take responsibility for creating accounts of their own enquiries? The simple answer is 'No'. Teacher-researchers need input from research mentors as well. Research mentors can assist teachers in framing a suitable research question, in identifying their research methodology, in collecting and analysing data and in synthesising evidence. The educational research mentor can act as a professional sounding board and 'validator' as claims to know are stated and evidenced by teacher researchers and significantly as a co-enquirer in what is a singularly challenging form of continuing professional development.

How do teachers become involved in research? Some are already working with their colleagues in higher education. Catherine Meacher, for example, a modern languages teacher and ITE mentor began to co-explore the use of digital technology for assisting her Year 8 students in becoming ICT literate. Our co-enquiry and a resultant publication were published in *Computer Education* (Fletcher and Meacher, 2003). Three years later, the vision of academic researchers enabling teachers to become in-school research 'experts' is slowly being actualised. Teacher-researchers are beginning to support their colleagues' professional development and some schools are consulting their own researchers rather than looking to outside 'experts' to shape their policies. Lieberman's (2002) call for teachers to own the process of changing their profession rather than looking to the 'outside' continues to inspire. We do not know how many teachers are involved in research in the

UK as there is no register of teacher-researchers or their research mentors. Several teacher-researchers presented at the National Teacher Research Panel Conference in 2006 but relatively few otherwise submit school-based research to an on line database.

Teachers, who undertake self-study research, are in a minority. Those who do may not have access, or may not realise the need to have access, to ways of disseminating their research to audiences beyond their classroom, peer group and school. Hiebert *et al*.'s call (2002) for a sustainable teacher-research resource and for evidence about how enquiry might assist learning remains a challenge. The search for user-friendly and accessible technology has continued. Whitehead and I gave a paper in 2002 to the British Educational Research Association: "Answering Plato's call to 'know thyself'". We modelled how to undertake self-study action research using digital video:

> we have, through DV, gathered data on which to judge our practice in terms of our values and understanding. In our presentation we have shared with you some of the ways we are applying this to our own work as educators. We are just beginning to see how DV can enable us to examine the interaction between internal and external perspectives – the challenge is to extend the use of DV so that we can see and understand more, much more, about how to live our values more fully in our practice as the basis for improving our educative influence with our students and each other. (Whitehead and Fletcher, 2003)

I continued to develop using digital photography as my core method of collecting data. Images were catalogued and many accounts of teachers' research are being embedded. Like Whitehead, I have experienced feelings of regret at limitations in omitting video to communicate claims to knowledge that are developed through systematic enquiry:

> In writing a text such as this, which is limited to the printed word and to still images, I am conscious of the limitation in the medium I am using to communicate my meanings. (Whitehead, 2005, p. 84)

The current version of KEEP Toolkit Templates offers a simple and straightforward way of embedding digital video clips within research accounts and this facility is changing the way in which we can validate how a teacher's practice is improved by undertaking research.

Using digital photography to evidence claims to know is becoming a widely accepted technique in school-based enquiry (Fletcher and Whitehead 2003) and web-based templates such as those made freely available by the Carnegie Foundation for the Advancement of Teaching at http://www.cfkeep.org are changing perceptions in practitioner research. (Fletcher, 2005, p. 23)

A PICTURE PAINTS A THOUSAND WORDS?

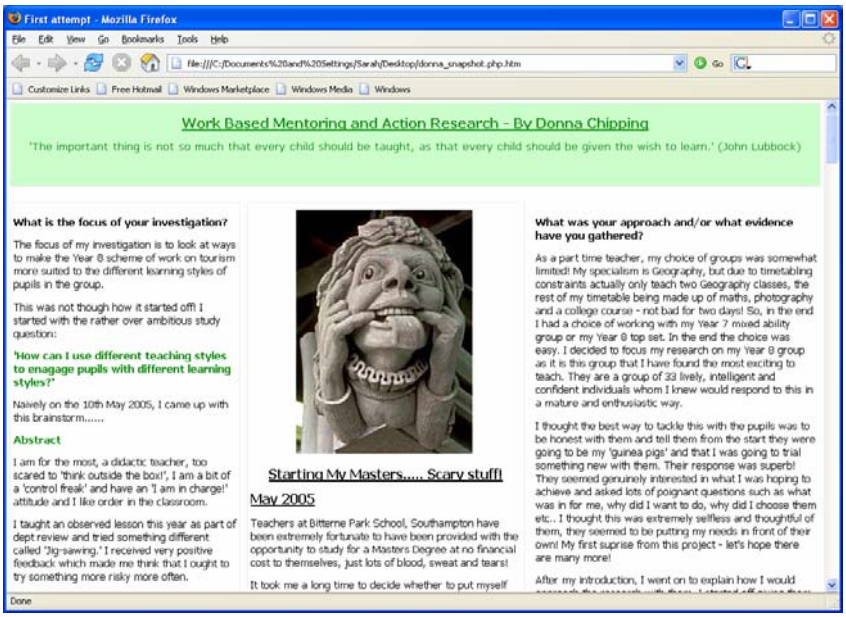


Figure 4: Using photographs to communicate emotions

In 1921 Barnard coined the phrase 'A picture paints a thousand words' as he retold a Chinese proverb. He set in motion a pathway of thought that is as relevant today in the age of astronomical technological advances as it was in the early part of 20th Century. Using photographs can assist a teacher-researcher in communicating their emotions about undertaking research, as Donna has done in the snapshot above. However, one of the challenges to using images in research accounts is that their intended meaning must be explained in the text, which accompanies them. Images are not simply for 'decoration'.

The variety and accessibility of images from the Internet as well as the ease with which teachers and students can import images from digital stills and video cameras is enabling a transformation of the representation and dissemination of research undertaken in schools. Teachers and students have access to pictures to paint thousands of words and bring insights into educative interactions in ways hitherto unappreciated.

There is, of course, a danger in assuming that images selected have a universal currency. The face in the image in Donna's snapshot could be interpreted in many different ways and it is only through the explanation she gives (about her reticence to undertake MA level research) that we can be sure we understand and are able to empathise with her feelings.

HOW DOES DIGITAL TECHNOLOGY ENABLE TEACHERS TO EMBED MULTI MEDIA IN RESEARCH?

"There are two types of photographs: those which contain information and those which evoke an emotional reaction". (Prosser, 1998, p. 71) In reality, I believe these categories often overlap.

Rachele Morse's KEEP 'Snapshot' is accessible at http://www.TeacherResearch.net
The four images in Rachele's snapshot offer us a way to see how she views engaging in research as well as the focus of her investigation. She selects images about 'imagination' and her conceptions of 'mentoring' and 'action research'. The fourth image – as child – particularly reflects her perspective. She sees herself as being afloat and not isolated but aware she is exposed and cannot see. She is vulnerable and her images symbolise this.

Figure 5: Image from Rachele Morse's KEEP 'Snapshot'

Freedom to explore the Internet for images seems crucial to a sense of ownership in teachers' research and the means to symbolise their conceptualisation can be enabled through web-based technology. Images seem as important as writing textual accounts.

Extract from Rachele's KEEP Toolkit Snapshot
As a typical stubborn Aries, I am not especially good at accepting criticism, however constructive, even when it comes from myself! As I have started this research I have been forced to consider my own mentor style and how successful it has been in the past. Through my reading and more recent experience of being a research mentor, I have been forced to reassess my approach to being a mentor.

Figure 6: Image from Rachele Morse's KEEP 'Snapshot'

A sharp contrast between Rachele's early conception of mentoring as power and control to her later conception of mentoring as handholding is reinforced by her images in text.

Figure 7: Image from Rachele Morse's KEEP 'Snapshot'

As Donna's MA tutor, I was interested to see how she constructed her KEEP Toolkit Snapshot. When she sent me the URL of her webpage I could see that she had already decided which subtitles would frame her account including one section entitled 'Recommendations for the Future'. What I didn't expect, was that she would have selected her images for the Snapshot before she had written up each section. I suspect, therefore, that she had pre-verbally constructed her research account – using subtitles that were adapted from the ones that she chose to insert in her previous research submission. Having a clear impression of what she wanted to say she had scoured the Internet for suitable images and intended to write her research using these as a form of framework. The images below relate to a non-verbalised communication about school improvement.

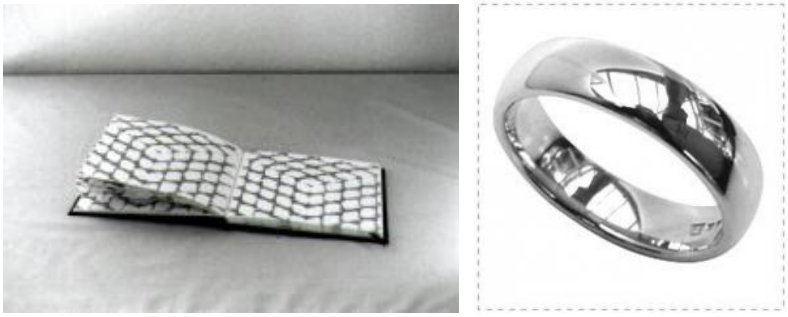


Figure 8: Image from Rachele Morse's KEEP 'Snapshot'

Of all of the images that Donna could have chosen why did she select these in particular? How do they influence how I engage with her as a mentor? The tessellations and ring suggest harmony to me but also (perhaps?) a need to make boundaries more permeable.

SOME IMPLICATIONS OF USING DIGITAL TECHNOLOGY IN EDUCATIONAL RESEARCH MENTORING

'I couldn't manage without the KEEP toolkit. It helps me structure what I want to say. I can do a bit of work on it, save it and come back to it later. I can see what I am doing and how

it fits together ….' 'I like the way I can move sections round within it – I can experiment with the way I set out what I express and check it out easily with my research mentor to see if it makes sense …' (Tele-mentoring comments from teacher-researchers studying research mentoring March, 2006)

'I thought I was never going to write the 'Professional Learning Task Account' – it was difficult at first but now it's invaluable. I read something, underline the bits that I think are important and then bring together my thoughts abut the things I have read (Comment during a tele-mentoring conversation on using Critical Thinking Scaffolds)

Critical Thinking Scaffolds (Coombs, 2000) were available only in hard copy but in the course of tutoring a group of teacher-researchers in 2005, it occurred to me that it would make far more sense to offer them online as a resource. Teachers accessed templates from http://www.TeacherResearch.net added text and saved them to their computer desktop and sent me a copy to incorporate into a group resource. Teachers' spidergrams then became the focus of critical review by others. What fascinates me as a research mentor is how teachers like Donna have chosen to personalise the format of their research spidergrams.

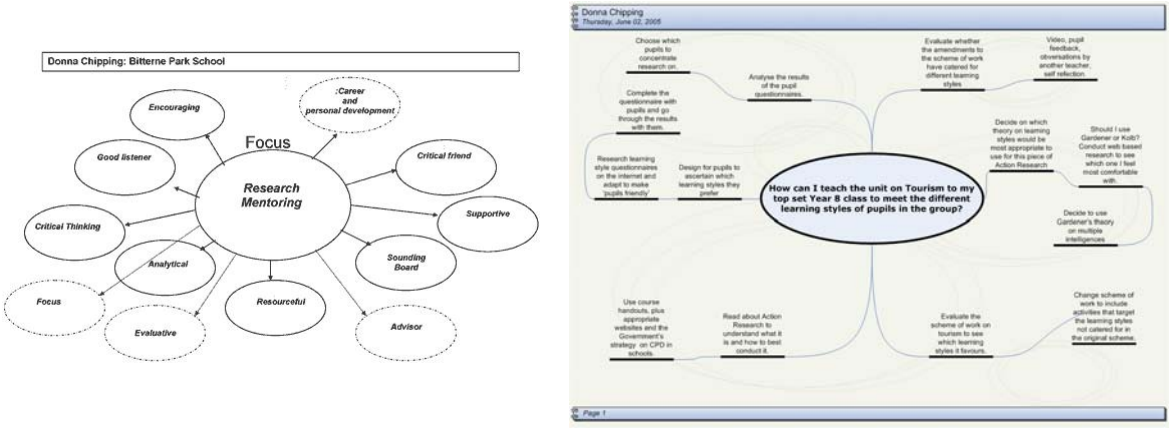


Figure 9: Example of teachers' spidergrams

An element of choice seems to be an important motivator for teachers in M level studies. I believe that this freedom to choose enables personalisation of the research process by teacher researchers in schools. Simultaneously, I think it fair to say that it raises the profile of school-based enquiry among school teachers in an already crowded professional agenda.

A KEEP TOOLKIT 'SNAPSHOT' EVALUATES THE IMPACT OF TEACHERS' RESEARCH

Figure 11: KEEP Toolkit snapshot

Not only can digital technology assist in the dissemination of knowledge it can assist in disseminating and evaluating the impact of teachers' and students' research in schools. The KEEP Toolkit snapshot above provides a platform for teachers from several schools to offer some insights into the impact of becoming researchers on their motivation and their perception of 'professionalism'. It is accessible at http://www.TeacherResearch.net Discussion about what counts as impact evidence merits discussion beyond the remit of this publication. Suffice it to say this webpage was chosen as a model of IE by the DfES.

A PERSONAL VIEW OF THE VALUE OF USING DIGITAL TECHNOLOGIES IN RESEARCH MENTORING

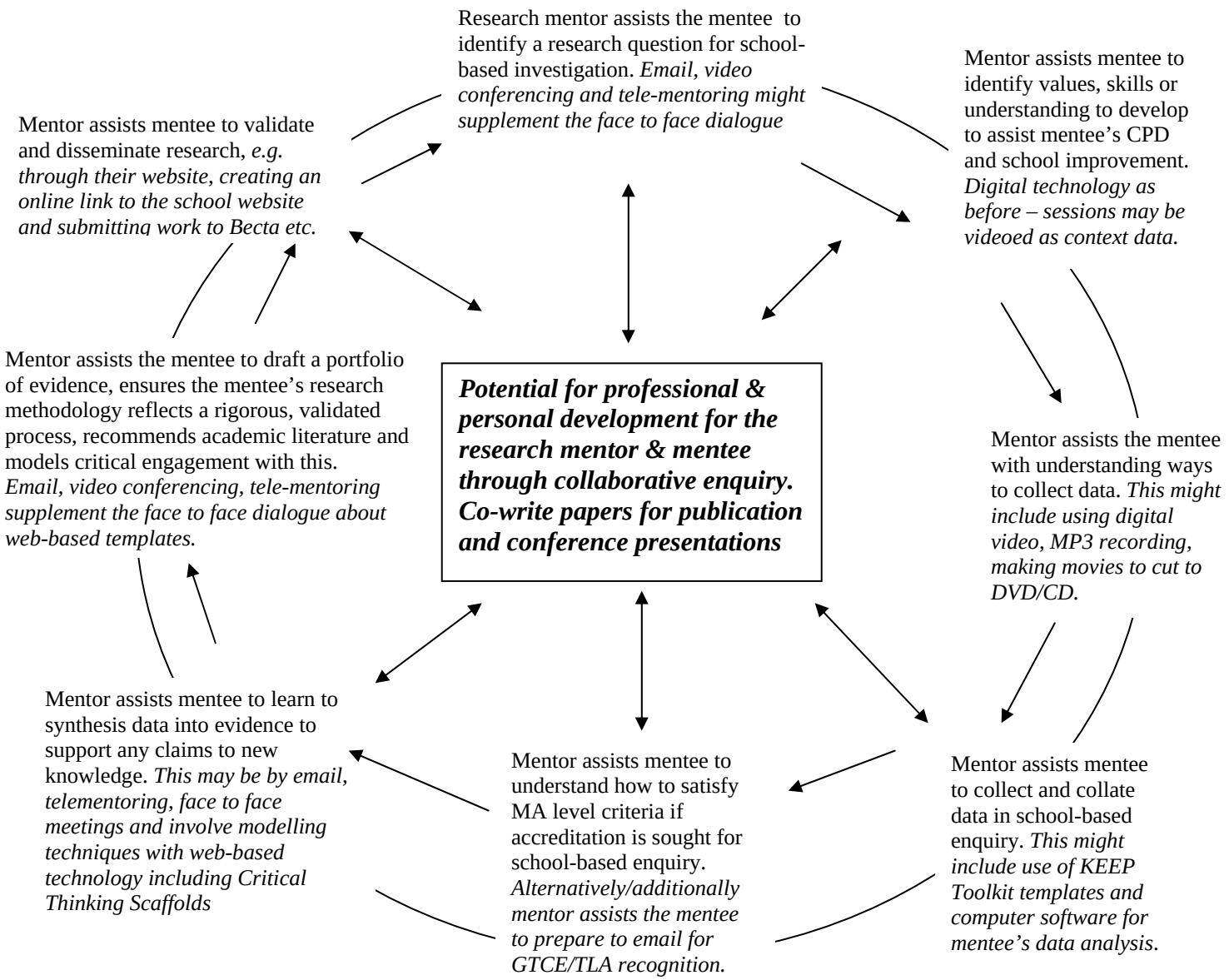
Advantages of digital technology	Disadvantages of digital technology
Speed – Internet searching for data	Accessibility of computers for research in schools (Internet access is blocked in some UK schools)

Wide variety of digital technologies	Unfamiliarity – steep learning curve and time needed to master new digital technologies
A potential to research internationally, nationally and locally using the Internet	Potential information overload
Knowledge can be networked globally	Knowledge may be context bound and non-transferable
Knowledge is not validated or moderated at source. Freedom to publish inter/nationally	Cultural/ideological problems arise

WHAT ASPECTS OF EDUCATIONAL RESEARCH MENTORING HAVE ENABLED TEACHERS' RESEARCH?

Descriptor	Stage	Digital Technology	Mentor's focusing questions
Coaching – focuses on skill development	Mid and longer term	KEEP Toolkit templates, software for data analysis	How will you synthesis your data to provide and disseminate evidence from your research?
Personal Development Mentoring	Early and mid-term (perhaps longer-term too)	Tele-mentoring, email, video conferencing	How can we work together to develop your confidence as a researcher/knowledge creator? How can I assist you to make public your research findings?
Professional Development Mentoring	Early, mid-term and longer-term	Video and audio data collection, Tele-mentoring, email, video conferencing	How can I assist you to collect data? How can we co-enquire to improve teaching and learning? How might you assist me to develop as a research mentor?

Table 1: What aspects of educational research mentoring have enabled teachers' research?



My model of collaborative research mentoring merges Whitehead's approach to action research through self-study (1989) and my model of mentoring (Fletcher, 2000) as CPPD (Continuing Professional and Personal Development). Much of the early stages of research mentoring with teachers in schools are concerned with reassurance that they already have or can readily acquire the skills for undertaking classroom based research. (Personal development complements professional).

Glossary: *GTCE General Teaching Council for England; TLA Teacher Learning Academy; Becta: British Educational and Communications Technology Agency*

Figure 13: A model of Integration Mentoring and Action Research for teachers' Continuing Professional and Personal Development using digital technology

EDUCATIONAL RESEARCH MENTORING INTEGRATING DIGITAL TECHNOLOGY – SOME CAVEATS

Taking responsibility for creating knowledge through research *by teachers for teachers* might seem to offer a perfect solution to a recurring problem of lack of relevance of much 'academic' research to resolving problems that arise in schools and improving education:

> teachers seem to be saying … that the trickle down approach fails because the practical goals for research are not achieved. They are not achieved because the knowledge produced by research does not directly lead to the betterment of their teaching. One problem with research for these teachers is that it is difficult to use in their classrooms. (Gitlin, 2005: 117)

However, while teacher research might seem to be a 'perfect' solution, it is not without substantial drawbacks. Perhaps the most pressing of these is the question of available time. Teachers withdraw from accredited courses even when they are well motivated to undertake research to improve their own practice because they don't have time to reflect on practice, to read others' writings and engage *critically* with what they are reading.

Then, there is a question of accessibility of educational research mentoring for teachers. The feedback teachers offer about this (Whitehead and Fletcher, 2003) confirm that ERM is an important ingredient in enabling teachers to evolve ways of thinking and improve their teaching. On the other hand, there are relatively few *educational research mentors* with the skills, knowledge and school-based credibility to work with the teachers. The language and culture of schools is very different from that of universities and when time is short socio-linguistic barriers arise which impede communication and creativity. ERM, which incorporates digital video technology – perhaps through video on demand – offers a possible solution but this would depend for its effectiveness on the quality and level of support offered by school-based coordinators of teacher research groups. Since these coordinators are likely to be senior members of staff, time is again at a premium.

There is the question of funding too. Without funding for school-based MA programmes teacher research groups tend to struggle. Teacher researchers benefit from TDA (Teacher Development Agency) funding given for 60 credit study per year at Bath Spa University. Schools sign up to a memorandum of understanding that sets out clearly what is expected. School leaders undertake that teacher research is embedded in whole school development and they are responsible for funding travel and subsistence for visiting university tutors. In return Bath Spa undertakes to provide in-school educational mentoring and tutoring to support teacher researcher groups undertaking distance learning modules at MA level.

As for using digital technology in educational mentoring, there are caveats there too. The school where research mentoring and tutoring takes place must provide access to on-line facilities so that tutors/mentors can assist teachers in learning new techniques. In time, these could be provided through video streaming alongside modelling using the KEEP Toolkit Templates (accessible at http://www.cfkeep.org). For now, modelling how to complete Critical Thinking Scaffolds (Coombs and Fletcher, 2005) must be managed in a

face to face context but could be online. Modelling can be recorded on digital video and so, in time, will be incorporated into teaching resources using KEEP Toolkit 'snapshots'. Educational research mentoring using digital technology is one way of assisting teachers to research their practice, represent their knowledge and present it in a form to be shared. It enables them to 'stand outside' what they do – as one of my PGCE students once remarked when using digital video to record and subsequently study his own teaching: *'I can critique the guy on the tele in a way that I can't if I just think about my teaching'*. Digital technology enabled this teacher to study his own teaching with greater objectivity and he was no longer reliant on observations by his mentor. He could select sections of his video tape to evidence claims to be fulfilling standards for Qualified Teacher Status.

CONCLUSION

In this paperI have explored the origins and nature of educational research mentoring using digital technology. Points made have been exemplified through research reports by teachers and self-study by the author. The excitement of using web-based templates from the Carnegie Foundation cannot be underestimated as a motivator in enabling teachers to undertake research. The crucial factor, it seems to me, in determining whether teachers undertake, exhibit and disseminate research in schools revolves round relationships with technology, i.e. how user friendly do they find it? How far does it enable elicitation and representation of their knowledge and, crucially, how far does it engage their creativity?

Van Manen (1990) has pointed out that writing exercises the ability to see and, if this is so, the use of digital technology enables a sharing and critical engagement in seeing that paper based text alone cannot. When a teacher-researcher can construct a multi-media account of their research their seeing can be communicated in a dynamic and living form using, still and video photography. But digital technology by itself is unlikely to entice teachers to overcome the barriers of time and funding that can often beset their research.
Providing critical friendship through educational research mentoring does assist the process of knowledge creation when coupled with using digital technology. Where teacher and academic researchers collaborate in co-enquiry to explore how teaching and learning might be enhanced and extended in schools, there is a potential for developing understandings and disseminating this knowledge through the Internet. Perhaps the greatest challenge is to convince the teaching profession in England that it should occur.

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[1] The latest KEEP Toolkit (Version 1.8) includes a set of tools that enable faculty and students to create succinct Web-based representations of aspects of teaching and learning so they can be shared with others. Users can also create templates that provide both conceptual organization frameworks and visual layouts. By guiding users through framing questions, directions, and rubrics, these templates help them organize materials – such as course materials and artefacts, student work examples, audio, image and video files – in a manner that represents and contextualizes content and linked resources. KEEP Toolkit templates like the web shots shown in this paper are accessible at http://www.cfkeep.org.

[2] Critical Thinking Scaffolds include Spidergrams, Personal Learning Contract Conversational Templates, Professional Learning Task Account Journals and Self Assessment M level Report Tables. They form part of a knowledge elicitation system**.**