The Role of Technology in the Mentoring and Coaching of Teachers

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Introduction

This report aims to investigate the extent to which technological tools are being and could be used to support, extend or transform the mentoring and coaching of teachers and those involved in education. Whilst examples are drawn from studies both within and outside the UK, the focus of the report is on the contribution of technology to the training and development of teachers through mentoring and coaching in the context of the English education system. The *National Professional Standards for Teachers* (TDA 2008) and the introduction of the *Masters in Teaching and Learning* (MTL) (TDA, 2009) provide a legislative, contextual and cultural background for teachers' initial and ongoing professional development in England. Within these contexts, mentoring and coaching are considered to be central to enhancing practice and developing pedagogical and subject-related knowledge and understanding.

Technological advances together with national educational initiatives such as the *National Grid for Learning* and imperatives such as the *School Whiteboard Expansion project (SWEEP)* have helped ensure that technology-based opportunities and affordances are more feasible, available and accessible to trainee and serving teachers. Ten years ago for example, few would have predicted the ease with which digital video can now be recorded, edited and distributed using portable equipment (including most mobile phones). Whilst this poses some threats and raises concerns over privacy and exploitation, it also offers considerable potential for supporting and developing teachers' practice.

This report sets out the background for technologically supported approaches to mentoring and coaching by:

- defining what is meant by mentoring and coaching and then summarising key policy initiatives and developments which have helped to define the educational contexts for mentoring and coaching in schools in England;
- exploring the nature of mentoring and coaching in supporting the schools' workforce; particularly in initial teacher education and the MTL, and through the ongoing professional development of teachers;
- discussing some of the theoretical frameworks and structures which can help explain and further enhance the development of existing and future practice and summarises the contribution which technology can make to mentoring and coaching;
- examining various existing and putative strategies for, and approaches to, the integration of ICT resources by evaluating the extent to which they can:

  - assist with the training and development of mentors and coaches;
  - support the face-to-face work of mentors and coaches;
  - afford and facilitate e-mentoring and e-coaching;
  - log and record evidence and the outcomes of reflective practice.
- outlining the specific skill-sets, roles and characteristics of mentoring and teaching in the various contexts to determine the extent to which technology can contribute to, enhance or extend what is possible;
- speculating on possible ways forward.

What is mentoring and coaching?

Before examining mentoring and coaching within the context of schools and teacher training in England, it is helpful to define what is meant by mentoring and coaching to establish some points of commonality and some clear distinctions between the two concepts.

One of the issues surrounding mentoring and coaching is that definitions are often context-related or sometimes even situation-specific (Brockbank and McGill, 2006). In sports coaching, for example, a coach has often in the past been considered to be someone who has accumulated considerable experience in a particular field and whose prime function is to help the athlete identify specific weaknesses in performance and determine the means by which these deficiencies can be rectified. In some circumstances, a coach will adopt the role of a strict disciplinarian who motivates, inspires, leads, cajoles, and/or imposes his or her will on the coachee. This definition of a coach is considerably at odds with current thinking about the attributes of a life-coach, business-coach or MTL coach (and many of the more forward thinking sports coaches) whose role is considered to be more that of a critical friend, empathetic listener or one who assists the coachee or client to become more self aware (Whitmore, 2002).

Current thinking suggests that successful coaching involves "*unlocking a person's potential to maximise their own performance… … helping them to learn rather than teaching them."* (Whitmore, 2002, p8). In essence, a coach helps coachees or clients to identify for themselves the issues which are facing them and the goals and opportunities which are available to them. Rather than presenting them with solutions, a coach helps the coachee to find the resources within themselves to make any changes which are necessary. It has been argued (e.g. Flaherty, 2005, Whitmore, 2002) that as the coach's role is to build

capacity within the coachee, effective coaches do not need to be experienced in the content field of their coachees. It is suggested that by being more detached from immediate issues, a coach will be more dispassionate and objective. By contrast, CUREE's (2004) *National Framework for Mentoring and Coaching*, implies that '*specialist'* coaching does require some knowledge and experience of the coachee's working environment and the issues which he or she may be facing, particularly when dealing with educational and child-related matters.

A further distinctive feature of coaching is that it is performance-related, situation-specific, goal or outcome-oriented and often short-term in duration. For example, Robert Dilts who has gained a reputation for his innovative approaches to mentoring and coaching sees coaching as '*helping another person to improve awareness, to set and achieve goals in order to improve a particular behavioural performance*' (Dilts, 2002). Similarly, the *National Framework for Mentoring and Coaching* (CUREE, 2004), proposes that within education, specialist coaching '*involves activities which promote and enhance the development of a specific aspect of teaching and learning or leadership practice*'. Furthermore David Clutterbuck, another influential contributor to the development of coaching and mentoring, specifies that '*coaching relates primarily to performance improvement (often over the short term) in a specific skills area'* (Megginson and Clutterbuck, 2005, p4.).

It would seem therefore that for many, coaching is focused on the identification of a specific aspect of performance identified by the client, and is probably a short-term relationship. (Although coaches may work on a series of issues with a coachee over a more prolonged period.)

So how does this compare with what many consider to be mentoring? The principal distinction between mentoring and coaching is that mentoring is considered to be more long-term, is related to career-development and is often (though not necessarily) driven by factors external to the client or mentee. In terms of education, those factors could be a set of national professional standards against which a mentee is required to be measured. Kram (1985) for example, writes that mentoring includes a career progress-oriented dimension, while CUREE (2004) argues that mentoring '*involves activities which promote and enhance effective transitions between professional roles*'. Hobson (2003, p. ii) goes on to suggest that '*mentoring is more generally used to refer to a process whereby a more experienced individual seeks to assist someone less experienced*' and Dilts (2004) proposes that mentoring involves '*helping to shape an individual's beliefs and values in a positive way; often a longer term career relationship from someone who has "done it before"*'.

Whilst definitions of mentoring and coaching abound and it is not always easy to reach some sort of consensus, it would appear that it is convenient to assume that mentoring is often regarded as a longer-term management tool for guiding an individual along a predetermined pathway. Coaching is more focused on helping clients to define their own objectives and find the resources within themselves to meet them.

It may well be, of course, that coaching techniques are appropriate for use by a mentor to help move a mentee from their present state by helping him or her identify shorter term objectives. Pask and Joy (2007) for example, insist that mentoring and coaching should not be considered as distinctive concepts but a unified whole – '*mentoring-coaching'*. They argue that '*Mentoring-coaching is seen as a tool and a set of processes aimed at helping people make their very best contribution to their personal and professional contexts and at the same time gain profound fulfilment and a sense of becoming a person.*' In other words, they would argue that whilst mentoring is concerned with fitting the person into an existing professional structure, and coaching is about developing the person as an individual, mentoring-coaching aims to achieve both.

So, how does this clarification of roles assist in informing our understanding of ways in which technology could contribute to mentoring and coaching? From what has been outlined above, it could be argued that there are likely to be more opportunities for technology to be used with mentoring. As mentoring is longer-term, career-oriented and often informed by external benchmarks and standards, there would seem to be more potential for technology-based resources to be used for logging progress and for mapping performance against competency-based criteria. However as coaching is thought to be more focused on performance, maybe there is scope for technology to be used in gathering evidence of aspects of practice (e.g. through the use of video) which can later be scrutinised by both coach and coachee in helping to enhance self-awareness.

As will be seen, there is considerable potential for technology to augment and enhance the work of both mentors and coaches, but much depends on the way in which mentors and coaches perceive and actualise their roles and the relationships they form with their clients.

Policies, initiatives and practices

This section aims to provide some background information on the policies and initiatives which have recently or are currently influencing mentoring and coaching practices within educational settings.

Educational initiatives

If we accept the broad definitions of mentoring and coaching outlined in the previous section, then it would seem that legislation and government policy relating to the professional standards guiding teachers' career development are likely to have a profound affect on mentoring practices within schools and other educational establishments. Furthermore, the recently introduced national programme for the *Masters in Teaching and Learning* (MTL) places great emphasis on the significance of school-based coaches who will be working alongside each '*participant'* engaged in this mode of study. The extent to which these policies and initiatives complement or conflict with accepted approaches to mentoring and coaching within today's (and tomorrow's) schools will clearly impact on the ways in which technology can be used to support or enhance practice.

The introduction of the *Professional Standards for Teachers* (TDA, 2007, 2008) followed two years of collaboration and negotiation with those involved in education at all levels. These were an extension of the pre-existing standards for Qualified Teacher Status (QTS) (TTA/DfES, 2002) which defined what was expected of those engaged in initial teacher training and a review and integration of the standards and expectations for induction, threshold and advanced skills teachers, together with a development of standards for the Excellent Teacher Scheme. The professional standards guide the performance management of teachers as they progress through the profession. This culture '*new professionalism'* within schools has spawned various initiatives such as *Leadership Pathways, Leading from the Middle and The National Professional Qualification for Headship (NPQH*) all of which embody mentoring and coaching as key elements.

Mentoring has long been identified as having the greatest influence on the professional development of those in initial teacher training (ITT) (see Elliott and Calderhead, 1994) and for newly qualified or novice teachers (Kajs, 2002). There has been considerable research and scholarship in what constitutes effective practice for the development of professional knowledge, skills and expertise through mentoring (Cain (2009), Malderez et al (2007), Edwards & Protheroe (2003), McIntyre & Hagger (1996), Furlong & Maynard (1995), Feiman-Nemser & Floden (1981), Fuller (1969)). Such a legacy predates the *Standards for Qualified Teacher Status* and was partly instrumental in informing the professional standards.

The publication of the *Children's Plan* (DCSF, 2007) and *Being the Best for Our Children* (DCSF, 2008) specified the government's intentions for making teaching a Masters' level profession. The goal was to provide a fully funded pathway for a Masters qualification for

those in the first five years of teaching through the *Masters in Teaching and Learning* (MTL); a national programme specifically designed for the purpose. A key feature of the MTL is the provision of a school-based coach:

> Teachers in schools would act as coaches for each participant and be responsible for providing coaching and for arranging appropriate classroom-based activities – either in the participant's own school, in a partner school or other learning setting. This might build on existing coaching and mentoring roles and should represent a significant investment in coaching and mentoring capacity in schools, strengthening the support available to all teachers in undertaking CPD.
>
> (DCSF, 2008, p14)

The roll-out for the MTL began in the 2009/10 academic year, with the first cohort of eligible Newly Qualified teachers (NQTs) in the North West region and those in national challenge schools across the rest of the country commencing their studies in April 2010. The assessment and much of the academic tutoring of the participants will be provided by participating universities. Higher Education tutors will work in partnership with school-based coaches and the participants to support, guide, tutor, monitor and assess the participants. A feature of the MTL which has yet to be evaluated is the exact nature of the relationship between the coaches, the participants and the university tutors.

By contrast to the standards-driven mentoring relationship which underpins initial teacher training , it is intended that the MTL will be principally participant-led, in that aspects of practice forming the basis for the students' enquiries will be identified primarily by the participants. However, as the participants will be working and assessed within a predefined and nationally agreed modular framework it seems highly likely that participants will also require some mentoring to ensure the evidence they gather and the quality of the reflective accounts which they produce are of sufficient academic quality to meet the assessment requirements.

A further complication is that in Phase 1 of the MTL, the coaches for the NQTs will probably be their designated Induction Tutors who have a pre-existing mentoring role in guiding the NQTs through the Induction Standards and in making judgements about their performance against defined criteria. The extent to which MTL coaches will be able to balance their roles of mentor and coach is something which will need to be monitored and evaluated as the MTL progresses.

The training of the school-based MTL coaches coincides with the writing and publication of this report and hence there is no definitive information as to the training strategies being used. However, it is likely that during this initial roll-out, little direct use will be made of technology other than for university tutors communicating with coaches and participants and

in the provision of online study materials. There has been some discussion about forming online communities of practice to enable participants and coaches with common interests (e.g. subject teachers in secondary schools) to share experiences and resources. However, there are no centralised plans at present for the deployment of technological resources for the training, ongoing support or to enhance the practices of school-based coaches.

Technology initiatives and their relationship to coaching and mentoring

In recent years there have been several national initiatives aimed at developing the use of technology by teachers, schools and teacher training providers and the schools' workforce at large.

One key policy proposal was presented in *Harnessing Technology* (DfES, 2005) which outlined the government's e-Strategy. A key component of the e-Strategy was increased access to information for pupils, parents and teachers through learning platforms and virtual learning environments (VLEs), with the aim of ensuring all schools had learning platforms operational and accessible by 2010. A further recommendation of the strategy was the provision of a personal online learning space for all learners with the capability to support an e-portfolio which could be used to chart their progress through their entire educational career. Whilst there is evidence of increased use of digital resources by teachers, levels of schools' e-maturity and e-confidence would appear to be progressing more slowly than was hoped (Becta, 2008a). However, plans are in place for improving home access to technology for children from disadvantaged families and supporting school-based innovations through targeted *Harnessing Technology Grants* (Becta, 2009).

Assuming these ambitions will be realised, there is an expectation in the near future that teachers, pupils and parents will be able to exploit the affordances offered by electronic archiving of evidence, accessing online resources and engaging in immediate forms of communication through the schools' digital information systems. It is to be hoped that issues such as the incompatibility of systems between learning institutions will be overcome and that teachers and fellow professionals will be willing and able to share experiences and practices through Web 2.0 enabled portals. When one considers that *MySpace* is just six years old and *YouTube* has only been in existence for five years, it may take a little while for a naturally cautious and e-safety conscious profession to appreciate the full potential of interactive technologies such as social networking, blogging and media sharing (Becta, 2008b).

Clearly, this impacts on the range of technological applications which are feasible for use within school settings. On the one hand, the central *Harnessing Technology* and *e-Strategy*

agendas are incentivising implementation of innovative technology-based approaches to educational solutions which could include mentoring and coaching, on the other there is clearly some reticence to take up these initiatives among a significant proportion of the teaching profession.

The picture is similar in Higher Education Institutions. Bradwell (2009) and the EIU (2009) point to the importance of universities making more effective use of technology to transform their approaches to teaching to take account of the changing nature of the workplace, the technological culture of young people and the widening diversity of the student population. Projects such as DITTE (Developing IT in Teacher Education, 1992) and more recently the TDA funded E-learning Communities in ITT Projects have inspired several worthwhile, innovative and effective technology-based learning and teaching strategies for initial teacher education. Some relevant case studies and examples drawn from the projects are described later in this report. A feature of the more successful projects identified in the evaluative reports (Foster and Parsons, 2006; Hadfield et al, 2009) has been the use of the funding to develop training providers' use of VLEs which have not only helped stimulate more sustained innovative practice, but have improved the relationship between tutors and HEIs and mentors in partnership schools. Mentoring and coaching are highlighted as key factors in the success of the projects with recommendations that technology should be used to augment trainers' (i.e. teachers' and tutors') knowledge and skills:

- high leverage professional development approaches, such as mentoring and coaching, should be targeted at trainers
- emphasis should be placed on the use of certain technologies, such as video and other multimedia approaches, which appear to generate high levels of take-up and enthusiasm among trainers and trainees

(Hadfield et al, 2009, p57)

Although the intention of the writers was not to suggest that video and multimedia should be used for supporting and developing mentoring and coaching, it could be argued that the latter recommendation should also inform the first.

Theoretical bases for mentoring and coaching and the affordances of technology

The theoretical bases used to justify the various approaches to mentoring and coaching are often dependent on the particular methodologies being advocated. However, Morton-Cooper and Palmer (1992) among others, argue that that the rationale for most mentoring techniques can be explained through a cognitive apprenticeship perspective whilst coaching strategies owe their origins to reflective practices centred on social constructivist viewpoints (Kawash and Kommers,2007; Herrington et al; 2008). As we have seen, however, there are considerable overlaps between mentoring and coaching and often the two methodologies are founded on broadly similar principles

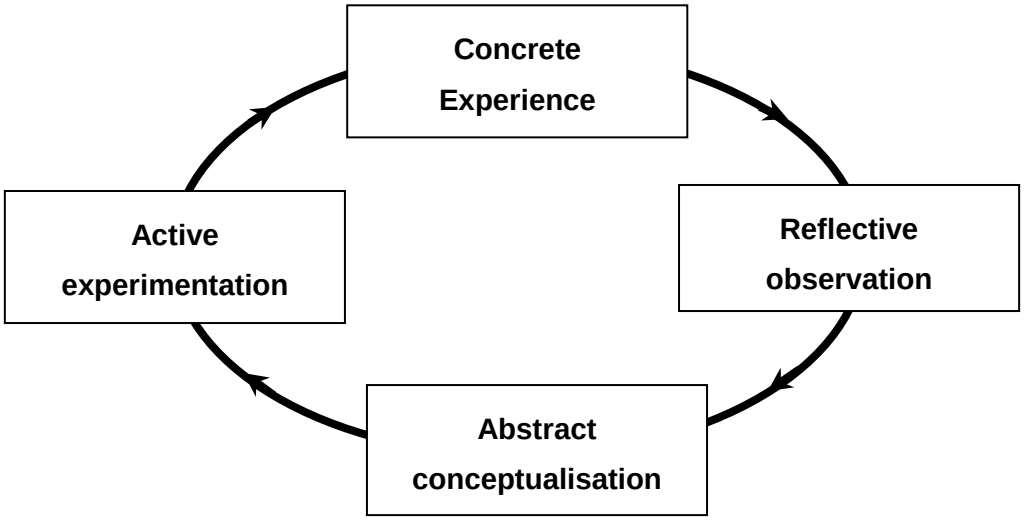
Within cognitive apprenticeships, in way similar to the traditional view of the master/apprentice relationship, the '*master'* models the behaviours expected of the '*apprentice'* through '*cognitive modelling'* (Bandura, 1997). Bandura argues that by observing and listening to the master, the apprentice will identify relevant behaviours and develop conceptual models of the processes involved. The apprentice then imitates those behaviours with the master observing and guiding (or coaching).

Some of the technological tools and resources which can be deployed to support mentoring and coaching fall more comfortably within this perspective of learning and teaching. Most notably, bug-in-ear technologies (see the next section) which are aimed at supporting real-time mentoring of someone less experienced by a more experienced mentor. In effect, the mentor dominates the relationship, decides on the focus for the input and takes the lead.

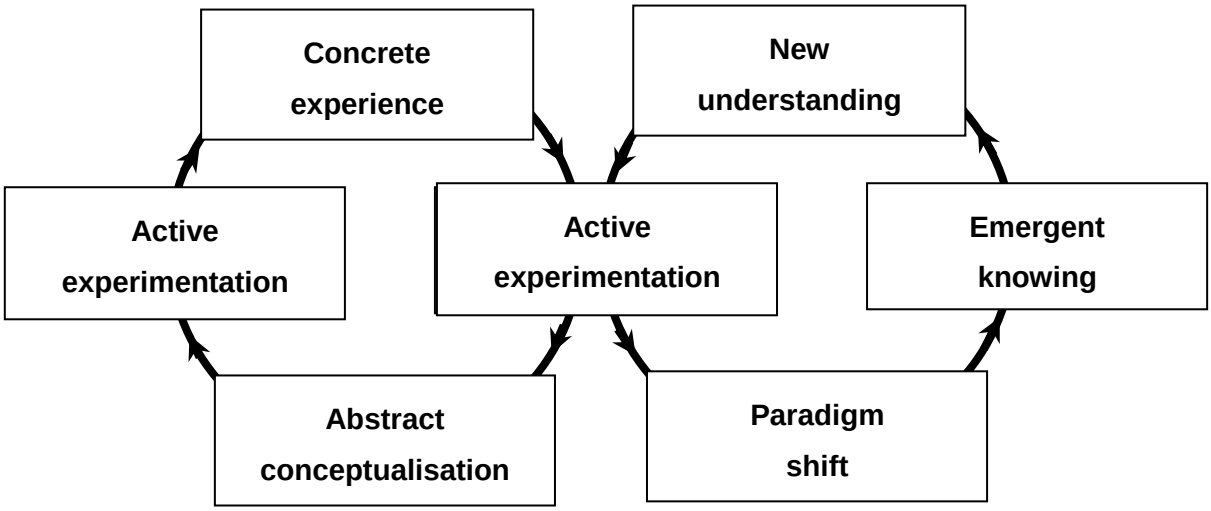
By contrast, the social constructivist's view puts the learner to the forefront of the learning and teaching relationship. Fundamental to constructivism and social constructivism is the principle of knowledge construction. Piaget's (1953) contribution to social constructivism is the *schema* - an individual's internalised representation of an aspect of the world. Learning involves the testing of schemas against the external reality and continually adjusting, extending, interconnecting or contracting schemas to match the internal representation with the external reality. Vygotsky (1978) suggests that a teacher's role is to work alongside the learner, within his or her '*Zone of Proximal Development'* to *scaffold* (Bruner, 1978) experiences which enable the learner to build on existing knowledge and understandings and/or confront misconceptions. Whilst the above implies that it would be advantageous for the teacher to have more knowledge and experience than the learner (i.e. act as a mentor) there are those (e.g. Jacoby and Ochs, 1995) who advocate the co-construction of knowledge, in which participants learn together, as should be the case with coaching.

Herrington et al (2009) for example, promote the use of *m-learning* (learning through mobile technologies) to afford authentic co-construction of learning through the immediacy and convenience offered by these resources.

The concept of the *reflective practitioner* is one which is familiar to most, if not all, of those engaged in teacher training and education. The reflection/action cycles of Kolb (1984) and Schön (1983) are useful in guiding the stages through which a mentoring and coaching relationship might progress. One example is Sir John Whitmore's (2002) GROW model in which the participants in a coaching relationship identify GOALS (G) and then identify factors in the coachee's present REALITY (R) which are affecting the situation under scrutiny. The participants then go on to explore OPTIONS (O) available for meeting the goals identified and finally the coachee or client agrees to commit to a course of action which WILL (W) address the issue. As can be seen this process can be readily mapped on to Kolb's (1984) learning cycle.



Argyris and Schön (1978) propose what they term *'double loop learning'*, which takes the experiential learning cycle a stage further.



They argue that whereas single loop learning might result in some immediate and surface level changes to practice, double-loop learning is transformational in that it is deeper; resulting in an enduring change to the belief system of an individual. They suggest that some sort of impetus is needed to shift from single loop to double loop learning. It follows that a coach or mentor could act as the catalyst to provide the transformational momentum needed (Brockbank and McGill, 2006). It could be argued that while technological resources such as those outlined in the following sections support the work of a mentor or coach, such resources will be unlikely in themselves to promote transformational learning. Technology will never be likely to replace a skilled coach or mentor who is able to work within a client's Zone of Proximal Development to provide what is needed at the optimum moment. However, a coach or mentor could make use of technology to reinforce a key issue, illustrate an aspect of practice or enable the client to gain an insight into his or her own performance.

It has been argued, particularly by Argyris and Schön (1974, 1976, 1993), that professionals develop '*theories of action'* and '*theories-in-use'* which inform and help to rationalise and develop their practices. The notions of '*single- and double-loop learning'*, '*reflection-on, reflection-in and reflection-through-action'* (Schön, 1983) are powerful in helping both coach and coachee to make their implicit and developing theories more explicit and hence susceptible to scrutiny, testing and challenge. Again, technology can support or enhance

this process by providing the coach, mentor and client with clear evidence on which to base their reflective analyses.

In the next section, we explore the sorts of technological resources which are already beginning to make an impact on mentoring and coaching practices and the role they may have in enabling clients to reflect on experience and to gain new insights.

The contribution of technology to mentoring and coaching

In this section we explore a range of case studies and exemplars to investigate the extent to which technology can contribute to the mentoring and coaching of teachers. Firstly, we examine some of the ways in which technology is being used to support or enhance the training of mentors and coaches, and then we study some of the approaches being used to support the work of mentors and coaches. Next, we explore e-mentoring and e-coaching and finally we examine the implications for mentors, coaches and their protégés of e-portfolios and other online repositories.

The training and development of mentors and coaches

Video case studies & TV programmes

There are surprisingly few technological resources readily available to support the training and development of mentors and coaches in educational settings. Rowley and Hart (1996) describe the use of video case studies of '*professional dilemmas'* to support the development of reflective practice in mentors, pre-service and '*veteran'* teachers. In recent years, *Teachers' TV* (www.teachers.tv) has produced a number of short video programmes which can be used to support the development of mentoring and coaching skills and techniques. As part of the series on '*Professional Attributes'* for example, there are videos examining the use of observation and feedback in classroom settings (Teachers' TV, 2007a; Teachers' TV, 2007b). Similarly, as part of the '*School Matters'* series there is a video showing a three day coach training event at a secondary school in which the GROW model (Whitmore, 2002) is explored (Teachers' TV, 2006a). These videos are not intended to act as standalone courses to develop mentoring and coaching skills. The stipulated aims of *Teachers' TV* are to provide those in the teaching profession with opportunities to:

- *'[have] instant access to up to date professional development videos and resources;*
- *learn from other education professionals by going inside their classrooms and into their schools*
- *save time with practical tips, lesson ideas and classroom resources*

- *help across the year to meet classroom targets and achieve personal goals*
- *keep informed with content covering the latest developments in the education agenda'.*

Teachers' TV (n.d.)

Whilst there are some videos on the website which are more instructional, such as a discussion of the value of mentoring for continuing professional development (CPD) (Teachers' TV, 2006b), the majority are intended for use by teachers independently or for incorporation by CPD co-ordinators or INSET providers into training or development programmes. Whilst there can be some value in observing the practice of others and sharing in others' experience, social constructivists (see previous section) and advocates of mentoring and coaching would argue that learning and hence development of practice is maximised when guided by an outside agent. Furthermore, in her study of students' responses to the use of video to develop counselling skills, Keats (2008) notes that students are inclined to focus on surface details unless their attention is drawn to specific aspects of practice. It would appear therefore, that the *Teachers TV* programmes in themselves are insufficient for developing the skills and knowledge needed for effective mentoring and coaching.

DVD and CD ROM based training materials

Another technological approach to developing mentoring and coaching capability is through the use of video, DVD and CD ROM based resources as accompaniments to training materials provided by ITT providers. For example, Homerton College in Cambridge distributes a set of CD ROMs which include video resources for mentors in partner schools (Warwick, P. Email correspondence 18/2/2010) and Byrchall High School in Wigan has developed DVDs of lessons and feedback sessions of trainee teachers for use in developing the practice of those involved in mentoring. In these cases, the video based material is contextualised for the mentors who will be using them and hence it is to be hoped that the material is presented within a framework for learning such as that suggested by Earl and Meyer-Hartwig (1986). Denton, Swanson and Mathes (2007) outline their approach to developing and supporting the practice of coaches using *Student Focused Coaching* (SFC) to enhance the reading skills of pupils within the US schools' system. Through a combination of CD ROM based material and asynchronous online support, the coaches are taken through a sequence of instructional activities and techniques which can be used with their pupils. The online resource allows coaches to upload assessment

information about their pupils which is used as the basis for analysis, leading to planned interventions following the advice of a 'Virtual Coach' skilled in student focused coaching techniques. Although termed '*virtual coaching'*, it could be argued that this approach fulfils many of the characteristics of mentoring outlined in the previous section.

Web-based resources

The *Teacher Mentor* web-based resource (Bennett, 2005) which was developed with funding from the *Training and Development Agency for Schools (TDA) E-learning Communities for ITT project* (see TTRB, 2006) aims to combine resource provision, including online video, with online activities designed to develop mentoring and coaching skills. Although this resource has not been formally evaluated, it aims to provide contextualisation of video material related to the needs of the mentors within an interactive online learning environment. Plans are in hand to develop this resource further and provide more extensive access to the online resources presently only accessible through the University of Chester's schools' partnership portal.

More generalised information and resources to support mentoring are provided online. Some are related to teaching and education, such as *Teachers First* (www.teachersfirst.com/mentor.htm) which provides appropriate links to information and resources. *The National College* (www.nationalcollege.org.uk/) provides a range of information and resources supporting mentoring and coaching for leadership within educational settings, there is also information on mentoring for personalisation. Further resources on *Teacher Leadership* can be accessed from http://cse.edc.org/products/teacherleadership/mentoring.asp

The Coaching and Mentoring Network (www.coachingnetwork.org.uk/) provides a range of sources, including an extensive collection of articles on aspects of mentoring and coaching. Although not specific to teacher education, the information provided helps provide a background to key principles associated with mentoring and coaching. Similarly articles and information on mentoring and coaching can be accessed online from the *International Journal of Mentoring and Coaching* (www.emccouncil.org/uk/public/international_journal_of_mentoring_and_coaching/), *The International Journal of Evidence Based Coaching and Mentoring* (www.business.brookes.ac.uk/research/areas/coaching&mentoring/volume/SP2.html) and *The Mentoring Leadership and Resource Network* (www.mentors.net/03articles.html)

Technology resources to support the work of mentors and coaches

Technological resources, tools and applications are often deployed to directly support mentoring and coaching processes. At one extreme, technological resources are used to provide information and documentation needed by mentors to carry out their roles; at the other, technological equipment and applications are transforming the ways in which mentors, coaches and their clients are working together to enhance classroom practice.

The use of Virtual Learning Environments

Oxford Brookes University (2005, cited in Fisher, Higgins and Lovelace, 2006) describes the impact of the introduction of a Virtual Learning Environment (VLE) to a PGCE initial teacher training programme. In addition to supporting the work of trainee-teachers whilst on school placements, the VLE was intended to support the work of their mentors through the provision of documentation and online materials. Interestingly, it was found that school-based mentors preferred not to make use of online communication tools, favouring instead more direct face-to-face communication with the trainee teachers and the university tutors.

As with the *Teacher Mentor* project mentioned earlier (Bennett, 2005), the Oxford Brookes VLE was funded through a TDA grant for developing e-learning communities in ITT. Several ITT providers have made use of this funding and its predecessor the *TDA Research and Development Grant* scheme to develop online portals with a view to improving communication with mentors in schools engaged in the initial training of their student teachers (e.g. Myhill, 2006; University of Winchester, 2004; Halnan; 2004; Williams and Tanner, 2005; Askew, 2006). Although some reported enhancements in communication and in the provision of information and documentation, many highlighted technical issues and problems associated with take-up by mentors in schools. Some identify technical problems experienced with the networks used by schools and their local Regional Broadband Consortia (RBCs) and their university systems. Current initiatives to rationalise and agree protocols for interoperability across learning platforms being adopted by schools and other educational institutions through the *Harnessing Technology e-Strategy* (Becta, 2008c) would therefore seem to be timely.

So, it would appear that while online portals and VLEs offer considerable potential for the ongoing support of mentoring relationships between ITT providers and schools, technical problems can prevent full access. Furthermore, Crook et al (2008) identify reluctance in secondary schools to make more extensive use of Web 2.0 technology, owing to:

- '…… tension between the collaborative learning encouraged by Web 2.0 and the nature of the current assessment system;
- concerns about e-safety and strict filtering in schools could be a barrier to use;
- lack of adequate bandwidth was sometimes an issue;
- teachers need[ing] the support, time and space to develop skills and practices
- …… and a "walled garden" approach that addressed safety concerns, though a minority of Web 2.0-innovating schools enabled some or all of their Web 2.0 activities to be visible on the open internet.'

Becta (2008d)

However, despite these issues, some advances are being made in utilising VLE and online technology to enhance aspects of mentoring. Hramiak, Boulton and Irwin (2009) describe the advantages of trainee teachers making use of blogs to record their reflections during periods of school-based placement. There were clear advantages over paper-based systems in that university tutors and mentors were able to monitor more closely the student teachers' development as reflective practitioners. However, there were concerns over the public nature of the blogging system being used, which may have inhibited some students from exposing their innermost concerns and anxieties. The researchers also felt that this use of technology augmented rather than enhanced existing practices.

Videoconferencing to aid communication and sharing practice

Video conferencing affords opportunities for mentors, tutors and student-teachers to engage on real-time, synchronous analysis and interaction with teachers and student-teachers. Mentors can model teaching for individual colleagues or large groups of students who can control cameras and microphones to zoom in on incidents or interview the observed teacher before, after or even during an activity. *The Teaching and Learning Observatory* which has been set-up by the University of Nottingham School of Education (2005, cited in Fisher, Higgins and Lovelace, 2006) links the university with classrooms in a range of schools. The University has identified benefits for students in observing experienced teachers and mentors in action, modelling innovative practice which can subsequently be analysed through discussion with the teacher.

Phillion (2003) used video-conferencing technologies to enable her students to gain '*virtual'* experience of teaching in an inner-city multicultural classroom. The teachers in the school modelled effective practice which the students could reflect upon and relate to what they were covering in taught elements of their course. Whilst the students recognised that video conferencing was less valuable than hands-on experience, given the geographical

difficulties of organising placement in inner city areas, they were appreciative of the valuable insights into aspects of diversity and multiculturalism.

Dyke, Harding and Liddon (2008) made effective use of video conferencing technology to enable subject specialist mentors to observe the practice of their trainee teachers remotely. They identify a difficulty for HEI teacher training providers in finding the time and financial resources to observe and provide feedback on subject specialist pedagogy. They conclude that video conferencing technology provides a cost-effective solution to monitoring specialist teaching across a wide geographical area.

Other applications of digital video technology

A further affordance of digital video technology is support for the development of reflective practice by enabling trainee teachers to review their own teaching whilst in the presence of a mentor or coach.

In 1998 for example, Nilssen, Gudmundsdottir and Wangsmocappelen were exploring the ways in which video recordings could be used as the basis for what they termed *'semiotic mediation'* to develop the practice of teaching, in their case to develop the interactive teaching of multiplication. Semiotic mediation takes account of all aspects of the teachers' performance including non verbal communication such as body language and paralinguistics. Clearly, video technology affords close scrutiny of practice by both mentor and mentee at any time following a video recorded lesson.

Taking this further, Whitehead and Fitzgerald (2006) describe making use of videos of trainee teachers' classroom practice to stimulate reflective dialogue between mentors and trainees to co-construct knowledge. The authors point to the additional pedagogical insights made available through accessing pupil voice by asking the learners to provide feedback on the trainee's teaching. They also highlight the transformative contribution such learning conversations can make to enhancing the professional knowledge of both mentors and trainees. Kennewell et al's (n.d.) study investigated the benefits for teachers of '*Video Supported Reflective Dialogue (VSRD)'* through which teachers identified particular extracts from a video of one of their lessons to use as the basis for reflective analysis with a cognitive coach skilled in the use of dialogic discourse. The pair co-constructed knowledge with a view to deepening their understanding about the process of teaching and learning. Yusko (2008) outlines what he terms a '*Video Technology Mentoring Program (VTMP)*'; a school-based programme for teacher induction and professional development. Video clips of participants' classroom practice were used in group-based sessions to inspire reflective

practice through discussion in a community of practice. Lancaster, Shallcross and Robinson (2005) utilised video technology by providing ITT students with webcams which were under their direct control. They could choose to record moments of practice in their classrooms to be shared with mentors for later reflective analysis.

It would seem, therefore, that imaginative use of digital technology affords synchronous and asynchronous reflective analysis of teaching practice. Two issues appear to be emerging from these studies; the locus of control regarding who selects what will be seen (the observer or the observed); and the locus of control for the analysis (i.e. who deconstructs or reconstructs the practice).

'Bug-in-the-ear' technologies

Another form of technology which is increasingly being used in a range of mentoring and coaching contexts is termed '*bug-in-ear'* (BIE) which is used extensively in sports coaching. Newell (2008) for example, describes various types of headsets which can be worn comfortably by athletes while being coached (or mentored) either individually or as a team from the sidelines by their sports coaches. Fry and Koh Teik Hin (2006) applied BIE technology to the development of the practice of trainee PE teachers through what they term '*Vygotskian'* scaffolding and peer coaching, while Goodman and Duffy (2007) used the technology to prompt special needs students in self-advocacy interactions during planning meetings to help increase and improve the quality of their contributions in order to present themselves more positively.

Some researchers have shown that it is not necessary to invest in expensive or sophisticated equipment to achieve successful outcomes. Kommers and Hooreman (2009) for example, made use of mobile phones with earpieces to coach trainee teachers while actively involved in teaching by '*whispering'* in the trainee's ear at critical moments during teaching activities. They concluded that all trainee teachers in the project improved their practice but that the least competent trainees' practice was enhanced more significantly. Rock et al (2009a) exploited the affordances of familiar mobile technology much further. Through the use of webcams and *Bluetooth* wireless headsets, they coached experienced and trainee special needs teachers through *Skype* connections across the internet. Despite some technical problems, they found the experience to be beneficial for developing their teachers' practice, as indicated by one of the participants:

> Wow! The BIE technology is absolutely amazing! Using the technology while I was teaching really helped me learn a few things about myself as a teacher . . . . Having the

> BIE really makes me think before I speak during my lessons because someone is listening . . . .
>
> Rock et al (2009a) p 73

….. and presumably also watching.

A further benefit identified by Rock et al (2009b) is an improvement in the retention rates of specialist teachers. Those who received ongoing coaching support through *Virtual Bug in Ear (VBIE)* resources were more likely to feel confident, have higher self-esteem and hence more likely to remain in post than those without such support.

Mobile technologies

Herrington et al (2009) define *'m-Learning'* as '*learning through the use of mobile technologies'*. Their study was designed to evaluate the potential cognitive benefits for learners in a university school of education setting by analysing the extent to which mobile technologies afforded '*authentic learning'*. They argue that no one form of technology *per se* is more effective than any other; what is more significant is the way in which technology is used. They concluded that activities which enabled the learners to learn *with* the technologies such as coaching and scaffolding activities for learners were more effective than those which required users to learn *from* them, such as merely accessing information.

Aubusson; Schuck and Burden (2009) by contrast evaluated the role of mobile technologies in supporting the development of professional learning, mainly through self-review and collaboration. They suggest that video clips of learning events and incidents, captured through mobile technologies, can enable the sharing, analysis and synthesis of classroom experiences. This, they argue, helps to encourage collaborative reflective practice and is likely to improve teacher and student learning as a result.

While there are (of course) ethical and safeguarding considerations which need to be taken into account, the use of mobile technologies for the accumulation of evidence as the basis for peer coaching/co-coaching, for augmenting reflective practice and for self-review offers considerable potential. A small-scale study by Wishart (2009) found that the aspects of the mobile technologies (internet enabled PDAs) that were valued by teachers and trainee teachers were the calendar, using a search engine to find information on the Internet and a capacity to take photographs or audio-record. Their use for learning through a reflective blog and a capacity to communicate with others were hardly utilised. However, as has already been shown, Hramiak, Boulton and Irwin (2009) found blogging (albeit with non mobile technology) was a valuable means by which trainee teachers could share practice

and provide tutors and mentors with ongoing information about their developing professional identities.

Online communities

Another perspective on self development and peer coaching with technology is provided through access to purposefully established online communities of practice. Burgess and Mayes (2008), for example, discuss the benefits of online discussion boards which they used with primary trainee teachers in developing aspects of mathematical subject knowledge. They found that through online discussion, students were able to effectively peer-coach each other by sharing experiences and knowledge. The boards were monitored closely by tutors who intervened when issues could not be resolved within the group or to coach individuals who appeared to be experiencing particular difficulties.

On a different scale, the National College's (NCSL) *Talk2Learn* online community boasts over 105,000 members (NCSL, 2007) who use online resources to garner guidance and advice from others and to share perspectives. Online communities such as *Talk2Learn* clearly afford opportunities for peer-coaching and mentoring though discussion boards by helping individuals to identify and address problems and issues arising from their practice. Several writers (e.g. Oliver and Herrington, 2000; Rogers, 2000; Squire and Johnson, 2000) highlight the importance of participants and facilitators using coaching and mentoring skills to manage and maintain online discussions to avoid loss of focus and degeneration. This is touched upon by the NCSL who stress:

> Effective online collaboration helps to reduce isolation and, by enabling school leaders to share insights into practice, develops the capacity for school improvement. Users do, however, need to understand the philosophy, value and purpose of participating in an online community.
>
> (NCSL, 2007, p11)

Feelings of isolation and remoteness are not only issues affecting head teachers; subject leaders in primary schools, heads of department in secondary schools, special needs co-ordinators, CPD leaders and mentors of ITT students are often the only specialists in their field within their school community and hence will benefit from involvement in an online community of practice. Webb et al (2008), for example, stress the importance of developing communities of practice for mentors which enable them to '*share, negotiate and reconstruct knowledge'* (Webb et al, 2008, p186). They explain, for example, how a community of mentors working with trainee teachers in *The London Providers Mentoring Group (*LPMG) have been able to jointly interpret the *Standards for Qualified Teacher Status* (QTS) (TDA,

2007, 2008) and between them identify the sorts of evidence which exemplify various standards.

A note of caution is espoused in a report commissioned by Becta (Crook, 2008), however. Crook found that while there is evidence that some teachers are willing to participate in online communities of discourse, many have concerns over the development of the new skills they need to acquire in managing Web 2.0 resources and the associated pedagogies. The report concludes that emphasis should be on the development of a '*Web 2.0 mentality*' among teachers rather than focusing solely on the development of technical expertise. This implies that there is some way to go before teachers are willing to engage fully in the affordance which new technologies offer to, for example, participate in online peer coaching.

Whilst technology affords opportunities for peer coaching, it could be argued that the relationships which are formed through online communities and discussion boards are often transient or issue-specific. As we have seen, mentoring relationships are long-term and require the development of mutual trust and respect. So, whilst it may be possible for short-term coaching and co-coaching relationships to be established through an online community of practice or discussion-board, online mentoring (or e-mentoring) relationships are more likely to be more formally structured and managed.

E-mentoring and e-coaching

Rossett and Marino (2005) identify the benefits of e-coaching as:

- it can be carried out remotely, at any distance, at any place or any time;
- one coach can work with several coachees across a range of locations;
- coachees can receive guidance from more than one coach;
- expertise can targeted and shared more widely.

By contrast, e-mentoring has been described as '*a computer mediated, mutually beneficial relationship between a mentor and a protégé which provides learning, advising, encouraging, promoting, and modelling, that is often boundary less, egalitarian, and qualitatively different than face-to-face mentoring'* (Bierema and Merriam 2002, p. 212).

Griffiths and Miller (2005) argue that '*technology-supported mentoring within school settings complements and extends what is achieved by face-to-face mentoring*' (p7) though they feel

it could never fully replace in-person mentoring. They identify key components of e-mentoring which contribute to its effectiveness :

- Helping participants feel valued and listened to;
- Taking account of personal details;
- Responding to affective as well as pragmatic issues;
- Validating and highlighting issues raised by participants;
- Offering options for further investigation; using a conversational tone;
- Inviting other viewpoints and contributions;
- Modelling communication and expected online participation styles;
- Responding to problems or conflicts that arose among participants;
- Ensuring that all participants are included in the discussion by directly responding to individuals and calling them by their name.

As will be seen in the following section, many of these skills are just as essential for successful off-line mentoring and coaching.

Williams and Warren (2007) describe an e-mentoring project with newly qualified teachers as '*a flexible, innovative mentoring approach'* (p9). Furthermore, they argue that there are equal benefits for the mentors whom they regard as '*veteran teachers'*. Although this was a small scale pilot project they felt that the advantages and potential of e-mentoring were very encouraging. They point to the advantages of the asynchronous nature of the communication and the ability to match mentor to mentee more closely as mentors can be drawn from a far greater pool than is possible when immediate locality has to be taken into account. Linda Perdaems (2008), the principal of a US elementary school, is enthusiastic about the benefits which e-mentoring brings to her 6th graders. Each pupil has an e-mentor who responds through email to concerns and provides one-to-one feedback on assignments. She maintains there have been tangible improvements in the pupils' written work and also, for many, in their self-esteem and outlook.

Burgstahler and Crawford (2007) bestow the virtues of an online community (DO-IT) for those with disabilities:

> In short, through DO-IT's intentional e-mentoring community, each participant gets the proverbial "village" of influences. The model embraces the value of a mentoring team in which young people find guidance not only from traditional mentors but also from peers and near-peers. Being able to tap into this village of support is of great value. For example, a young woman who is blind and interested in studying computer science is

> able to gain perspective and advice from several mentors who are successful in this career field and from near-peers pursuing studies in this area. If later her interests move on to accounting, different mentors and near-peers can give advice in that field. In each case, she might also connect with several peers with similar interests.

It would be difficult to see how this level and diversity of support could be achieved without technology, particularly for those with mobility and/or communication difficulties. In this respect, the affordances of technology for mentoring and peer coaching are immeasurable.

In a different context, Shrestha et al (2008) describe the benefits and drawbacks of e-mentoring first year university students using student-mentors from later years. Using a blended approach of face-to-face and online mentoring, they argue that there are subtle differences in the role of the mentor and mentee with an online relationship compared with one which is face-to-face. It cannot be assumed for example, that those who can successfully manage face-to-face mentoring relationships will also be able to perform equally well when mentoring online. There is more to online mentoring than being able to mentor and use technology – particularly as communication online is largely written. They conclude that the training of mentors and auditing of mentees is a necessity to ensure the most is made of the online mentoring environment.

Kasprisin et al (2008) take this theme a stage further by arguing that there is evidence to show that the mentees should be given training in being mentored before embarking on an e-mentoring relationship. Without this, they argue, mentees are unlikely to reap the full benefits

Gilly Salmon (2004) has gained an enviable reputation for her work in developing online learning practices through her work with the Open University in the UK. She has identified skills required for successful e-moderation which change as the online relationship progresses and develops. Salmon's five stage model of an e-learning relationship draws attention to the way in which the skills required for e-moderation and similarly for e-mentoring are not static or immutable; an e-mentor must aim to be proactive in consciously maintaining, managing and actively progressing an online relationship.

In the next section (*The skills and practices of mentoring and coaching*) we examine the skills needed for successful mentoring and coaching, and their relationship with the skills needed for making effective use of technology to support, enhance or transform mentoring and coaching relationships.

Logging and recording of evidence

With the advent of Web 2.0 technologies, rather than the internet being used only to access and download information, tools are now in place for uploading, sharing and contributing to the store of knowledge which is afforded through the internet. As a consequence of Web 2.0, what can be expected of learners (professional or otherwise) and what is expected by learners, is and will be shifting. According to Cross et al (2008), Web 2.0 is characterised by these online affordances:

- Trading (e.g. eBay);
- Media sharing (e.g. Youtube);
- Media manipulation (e.g. Animoto);
- Data/web mashups (e.g. Popfly);
- Conversational arenas (e.g. MSN);
- Online games and virtual worlds (e.g. World of Warcraft);
- Social networking (e.g. Facebook);
- Blogging (e.g. Blogger);
- Social bookmarking (e.g. Del.icio.us);
- Recommender systems (e.g. Digg);
- Collaborative editing (e.g. Google Docs);
- Wikis (e.g. Wikipedia);
- and syndication (e.g. podcast).

They go on to suggest that the impact of Web 2.0 can be summarised into four broad forms:

- '*inquiry'* (e.g. personal research),
- '*literacies'* (i.e. going beyond the traditional print-based definition of literacy),
- '*collaboration'* (e.g. coordination of activities via the internet)
- and '*publication'* (e.g. becoming producers of information).

It could be argued that electronic portfolios (or e-portfolios), if used imaginatively, could span all four areas afforded by Web 2.0 technologies. In the words of Batson (2002)

'*Electronic portfolios have a greater potential to alter higher education at its very core than any other technology application we've known thus far'* (p. 1).

Professional learners (i.e. mentees and coachees) would be expected to use their e-portfolios to become not only creators of information with information about their professional practices, but also use the creative process as a means of examining, investigating and developing their practice.

> *'In general, an ePortfolio is a purposeful collection of information and digital artifacts that demonstrates development or evidences learning outcomes, skills or competencies. The process of producing an ePortfolio (writing, typing, recording etc.) usually requires the synthesis of ideas, reflection on achievements, self-awareness and forward planning; with the potential for educational, developmental or other benefits. Specific types of ePortfolios can be defined in part by their purpose (such as presentation, application, reflection, assessment and personal development planning), pedagogic design, level of structure (intrinsic or extrinsic), duration (episodic or life-long) and other factors."*
>
> Cotterill (2007)

Much has been written about the virtues of portfolios and e-portfolios for learners and their assessors. Of particular relevance is what has become known as *'Patchwork Assessment'* in which a series of focused assessment tasks or outcomes are '*stitched'* together to form an overall assessment through reflective and critical synthesis (Scoggins and Winter, 1999). The explicit interlinking of elements through critical reflection embodies a social constructivist approach to learning which also stresses that verbalisation is central to understanding and the development of more *'inclusive'* and *'integrative'* professional practice (Mezirow, 1990).

A major advantage of online e-portfolios for those involved in mentoring and coaching is accessibility. Mentees can upload evidence and reflect on their developing practice through an e-portfolio system which can then be accessed immediately, from any location by their mentors.

Several teacher training providers in England have introduced e-portfolios to enable their student teachers to collate and present evidence of their practice in relation to the *National Professional Standards for Qualified Teacher Status* (TDA, 2008). For example, students following the ITT programme at Scarborough are making use of *Pebblepad* to record and reflect on their experiences (HEA, 2009) Similarly, Liverpool John Moores University is using an e-portfolio with its PGCE students (Strivens et al, 2009). They are finding that the management of the evidence which needs to be accumulated has been simplified and that university tutors and school-based mentors are able to formatively and summatively assess the students' progress with relative ease. The University of Southampton has a well

established *E-Portfolio System (EPS)* for use by student teachers for recording progress (Lenton and Woollard, 2009). The value of the Southampton's EPS for teacher trainees, university tutors and school-based mentors is summarised by Woollard (2001):

> *'The Electronic Portfolio System, based upon technology used widely on the internet, provides our teacher trainees and students with easily accessible space to save work they wish to submit for examination. EPS enables tutors and mentors to access trainees' and students' work for review and assessment from any computer that is attached to the internet'*
>
> (Woollard, 2001).

The tripartite relationship in the *Masters in Teaching and Learning* (MTL) between participant, tutor and school-based coach is in many ways similar to that between ITT Trainee, school-based mentor and university tutor. A distinctive feature of the MTL is that there is likely to be very little direct contact between coaches and tutors who will have the participant as their mutual focus. In addition, the relationship between coach and participant (and possibly tutor) could endure for three to five years. It is likely, therefore that e-portfolios will provide an effective approach to supporting longer-term reflective practice. Already, Northumbria University has expressed an intention to make use of an e-portfolio with its MTL participants to record progress. (Strivens et al, 2009).

Swan (2009a) describes the impact on learning and assessment of the introduction of an e-portfolio system within the context of the US pre-service teacher education system.

> *'……. the student uploads artifacts, which are accessed primarily by the university supervisor and faculty members to gauge performance and provide the student teacher with guidance for improvement. The cooperating teacher completes midterm and end of term evaluations of the student teacher, which can be reviewed by the student teacher, university supervisor and faculty members.'*
>
> (Swan, 2009a, p633)

Through his well established system, mentors (cooperating teachers) have an important part to play in monitoring and evaluating the student teachers' progress. At the same time, those in the university are able to review progress and intervene when necessary. A system of aggregation enables tutors to see at a glance which students are most likely to need attention and those which are performing up to expectations, thus ensuring their interventions are targeted. However, some university tutors found the system to be impersonal; preferring face to face contact. Swan (2009b) suggests, however, that the decentralising of responsibility afforded by the use of an e-portfolio encourages greater independence and reinvention.

Portfolios and e-portfolios are not without issues. There is a continuous tension between quantity and quality, particularly where assessment is linked to academic assessment

criteria. At one extreme, a portfolio could become a repository of miscellanea; a scrapbook of artefacts and objects which are accumulated haphazardly in the hope that some may have relevance. Pecheone et al. (2005) argue that mentorship, guidance and support mechanisms are critical to the compilation of evidence and the synthesis of reflective practice. At the other extreme, Barrett (2003, 2004) expresses concerns that some portfolios and e-portfolios are becoming overly prescriptive; that the contents are being specified too rigidly by assessors thereby undermining the constructivist learning principles on which they were founded. Evans and Powell (2007) argue that when e-portfolios are used solely for assessment, they lose their potential as a cognitive tool to support learning through the construction of an individual's knowledge or the co-construction of knowledge in a community of practice. This is taken further by Wray (2007) who stresses:

> *'Everything, including the data collection and documentation process, the support and mentoring offered to the students, and the assessment of their efforts, stems from the purpose of the portfolio.'*
>
> (Wray. 2007. p50)

When e-portfolios are used appropriately they enthuse, engage, motivate and inspire learning. Cohen (2005) cites examples of e-portfolio assessments across a range of age groups which demonstrate their effectiveness as cognitive tools for student learning. She quotes learners' comments to illustrate the pedagogical value of e-portfolios -

> *'"The ability to reflect and see all of your accomplishments and progress. I also enjoyed looking at my peer's work, and comparing it with mine;" ….. "It made the classroom environment more lively and added fun and excitement to our lessons;" "That all the work I did on the computer was easily posted and didn't have to be put into a portfolio and organized—it was much faster and easier;"'*
>
> (Cohen 2005, p4)

A great advantage of e-portfolios over their paper-based alternatives lies in the range of media which can be included. Whilst many e-portfolios cited previously have become extensions of pre-existing paper-based systems and hence rely heavily on text-based documentation, Cheng and Chau (2009) have been exploring the implications for student teachers, mentors and tutors of the inclusion of digital video clips in e-portfolios. They found that video clips of practice led to more intense self-reflection than other forms of evidence. Moreover, when student teachers shared or '*showcased'* video extracts of their practice with peers, they received more and deeper levels of reflective feedback than when only text files were showcased. Cheng and Chau (ibid.) suggest their small scale study would benefit from further research and analysis. There are clear overlaps between the self, peer and mentor/coach reflection of teaching practices and the use of video for counselling and family intervention which has been well documented (e.g. Wels, 2004).

It would seem there is more room for growth in fully realising the potential that e-portfolios can have to support the work of mentors and coaches in initial teacher education and in the professional development of serving teachers through, for example, the Masters in Teaching and Learning. As Wray (2007) suggests:

> *'While sensitive to the process/product dichotomy that portfolios foster, future research must focus on how, in what context, and to what degree electronic portfolios facilitate student growth and learning. While theoretical support regarding the benefits of portfolios is strong, scant empirical support is available (Borko et al, 1997; Pecheone et al, 2005). It is with this future focus that teacher educators and the students with whom they work will realize the true potential of electronic teacher portfolios and how best to implement them within teacher preparation programs.'*
>
> (Wray, 2007, p50)

The skills and practices of mentoring and coaching

As we have seen in terms of the premises on which this report is based, whereas coaching is intended to be client-led, mentoring tends to be directed more by the mentor and/or is mapped on to external benchmarks or criteria. Hence, while some of the skills required are common, others are quite specific to mentoring or coaching.

<table>
<tr><th>The skills of mentoring</th><th>The skills of specialist coaching</th></tr>
<tr><td>Mentors:
relate guidance to evidence from practice and research
broker access to a range of opportunities to address the different goals of the professional learner
build a learner's control over their professional learning
use open questions to develop plans, understand consequences and explore and commit to solutions
listen actively; replaying what's been said using some of the same words to reinforce, value and reframe thinking
relate practice to assessment and accreditation frameworks.</td><td>Specialist coaches:
facilitate access to research and evidence to support the development of pedagogic practice
tailor activities in partnership with the professional learner
facilitate growing independence in professional learning from the outset
use open questions to, encourage professional learners to arrive at their own plans, understand consequences and develop solutions
listen actively; replaying what's been said using the same words to reinforce, value and develop thinking
establish buffer zones between coaching and other formal relationships.</td></tr>
<tr><td colspan="2">relate sensitively to learners and work through agreed processes to build trust &confidence
model expertise in practice or through conversation
observe, analyse and reflect upon professional practice and make this explicit
provide information and feedback that enables learning from mistakes and success
use open questions to raise awareness and explore beliefs
listen actively:
• accommodating and valuing silence
• concentrating on what's actually being said
• using affirming body language to signal attention.</td></tr>
</table>

Using the *National Framework for Mentoring and Coaching* in educational settings (CUREE, 2004), the table above summarises the skill sets involved.

As we have seen in the previous section, it could be argued that an additional skill required by mentors in some mentoring relationships is that of making judgements or assessments of professional learners' practice. This is a particularly important aspect of mentoring pre-service and newly qualified teachers. A further set of skills which are missing from the above are those associated with identifying goals, setting targets and giving feedback.

CUREE (2004) recognises that several skills are common to both mentoring and coaching, and even those which are specific have a degree of overlap. Unpacking and examining these skills further it can be seen that there are opportunities for technology to support, enhance or extend the processes.

Skills common to both mentoring and coaching

Relating sensitively to learners and working through agreed processes to build trust and confidence

On initial scrutiny, it might be expected that technology has little to contribute to the initialisation of a mentoring and coaching relationship or the development of mutual respect and trust. The relationship between mentor or coach and the client or, as termed by CUREE, the '*professional learner'* is clearly central to the coaching or mentoring process. A key issue here is to ensure that both participants are clear about agreed processes. Many researchers and advocates of coaching and mentoring (e.g. Hays, 1995; Megginson and Clutterbuck, 2005; Tolhurst, 2006) emphasise the importance of setting up the relationship and building rapport, particularly when the two parties involved are previously unknown to each other. It has also been stressed (e.g. Furlong and Maynard, 1995; Rowley, 1999) that when those involved know each other, ground rules are established to guide the way the relationship will operate and develop. This is especially important when there could be conflicting interests. For example, many coaches in Phase 1 of the MTL are likely to also be the participants' induction tutors. As we have seen earlier, an induction tutor's role is that of a mentor as they guide newly qualified teachers through an important stage of their career. More significantly, induction tutors have an assessment role in that they have to make judgements about the progress of newly qualified teachers in relation to the national professional standards. By contrast, MTL coaches are expected to follow the participants' lead as they investigate aspects of practice, gather relevant evidence and reflect critically on

their developing practice. Although the skills of mentoring and coaching overlap, induction tutors who also become MTL coaches will need to be able to differentiate between potentially conflicting aspects of their dual roles.

Although the MTL is, at the time of writing in its infancy, the relationship between HEI tutors and both the coaches and the participants will be a blended approach (TDA 2009) via face to face meetings and online through synchronous and asynchronous communication channels. The formulation and maintenance of such working relationships will be likely to employ the skills of e-moderation (Salmon, 2004) and e-mentoring (Single and Single, 2005). For those engaged in e-mentoring or e-coaching, establishing protocols and rules of '*netiquette'* to manage and maintain an online working relationship which fosters trust is of critical importance. For this reason, many distance learning programmes and courses include an initial face-to-face meeting and/or a series of ice-breaking activities to help set-up the working relationship.

Modelling expertise in practice or through conversation

Modelling is likely to be more evident for those working closely together on, say, a daily basis; such as mentors and induction tutors working with pre-service or newly qualified teachers, or those working with High Level Teaching Assistants (HLTAs). It could be argued that modelling practice is more likely to be a feature of a mentoring relationship in which the mentor is more experienced than the mentee. However, in coaching relationships, arrangements could be made for coachees to observe others who are not working directly with them – for example, in another department or in another school, particularly where it is possible to observe examples of excellent practice in a particular field or where a colleague has a creative approach to, say, behaviour management which could form the basis for further analysis and reflection. Technological tools such as digital video, video-casting and video-conferencing afford opportunities for '*fly-on-the-wall'* approaches to accessing and observing the practice of others.

Research such as that into role modelling (Murray & Main, 2005) suggests that modelling is most effective when a clear focus has been identified for the observer prior to the observation of practice. When a need for modelling has arisen as part of target setting or action planning, then the types of behaviour, strategies or techniques can be discussed and unpacked beforehand (Samson and McCrea, 2008). The same is no less true when practice is being modelled through virtual methods such as that afforded by video-based technology,

particularly where a key objective is for the observers to project themselves into the role of the observed (Keats, 2008).

Observing, analysing and reflecting

Whilst observing others modelling practice can prove valuable, providing opportunities for professional learners to observe and review their own practice, under the guidance of a mentor, can lead to insights and increased self-awareness. The advent of highly portable video technologies, including head-cams and unobtrusive miniature digital video cameras creates possibilities which were not conceivable ten years ago. Some ITT providers have issued student-teachers with portable technology (Wishart, 2009) to enable them to record aspects of their own practice for later reflection and analysis. Others (Phillion, 2003; the University of Nottingham School of Education (2005) as cited in Fisher, Higgins and Lovelace, 2006) have set up webcams for video streaming between school and university. Issues such as permissions, confidentiality and data protection must be taken into account before these strategies are considered, however.

There is some debate as to who benefits most from analysing and reflecting in a mentoring/coaching relationship (Showers and Joyce, 1996). Those who favour competency-based approaches to mentoring (see Brookes and Sikes, 1997) suggest that it is the role of the mentor to analyse the mentee's practice and provide feedback (against pre-defined competencies). This accords with a standards-based approach to teacher-training which requires mentors to assess trainees' progress in relation to a set of nationally-defined criteria. However, as can be seen, coaching is often regarded to be a sub-skill of mentoring. Hence, a mentor will, at times, adopt coaching methods when identifying specific aspects of practice in need of development and providing specific targeted support. Many models of coaching adopt a more reflective, even reflexive, stance (e.g. see Tomlinson, 1995; Jackson, 2004) in which coaches encourage coachees to reflect on their practice, to analyse for themselves their strengths and areas for improvement. The aim here is to encourage the professional learner to become more independent, self-aware and resourceful in developing his or her practice. Clearly, the use of video and/or audio technology can assist in this process. However, Aubusson, Schuck and Burden (2009) caution against the use of such technologies in classroom settings, partly owing to anxieties over the abuse of video material (the '*YouTube Fear Factor*') and also, they argue, because few teachers are yet digitally competent and '*a large number of teachers are resistant to use of ICT for professional learning'* (Aubusson, Schuck and Burden, 2009.p 244).

Providing information

ITT providers and schools are increasingly making use of web-based portals for the dissemination of information and documentation to mentors, coaches, student teachers and others such as colleagues in local authorities or other support services. (e.g. Oxford Brookes University, 2005 as cited in Fisher, Higgins and Lovelace, 2006). Trainee teachers can gather considerable information about the policies and practices of their placement schools before stepping over the threshold. It follows therefore that mentors and coaches in educational settings should be expected to develop the skills required for presenting information for their professional learners in digital formats, particularly as '*the Government wants every school to be making effective use of learning platforms by 2010*.' (Becta, 2009).

A balance will have to be struck between what will be of value to a student teacher and the level of detail a school is prepared to put into a document which could become publicly accessible. However, most of the information will already be contained in policy documentation which, one would expect, is designed for mass publication.

Using open questions

Video and audio recordings are particularly valuable in helping mentors and coaches to acquire or develop questioning techniques. Whilst watching experienced questioners in action can prove useful (Webb et al, 2008) the opportunities which digital technologies offer for coaches, mentors and learners to reflect on and improve their own practices in asking and responding to questions provides affordances for self-development (Clarke, 1995). Most, if not all, coaching and mentoring approaches stress the importance of effective questioning, to encourage professional learners to draw upon their understanding in framing a response. Questioning allows the mentor or coach to gain an appreciation of the learner's perspective of a situation and help the learner to begin identifying their own options or solutions (Blair et al, 2006). Ideally, professional learners should be identifying and formulating their own responses to issues which arise from their practice and hence the role of the mentor and coach should be to use questioning to encourage them develop the awareness needed to reflect on their own practices. Zeus & Skiffington, (2002) suggest that questioning is a core dialoguing skill to help clarify a situation, while elaborating, challenging and confronting questions help move the learner forward. They argue that there should also be '*Appreciative Questioning'* to focus on strengths and '*Problem-Free Questioning'* to focus

on aspects of practice which are successful. Hence, questioning is not only used to elicit information and personal perspectives, it is a means of sustaining and supporting an ongoing coaching or mentoring relationship.

The framing of questions is no less important for those involved in e-mentoring, e-coaching or '*telementoring'*. In a study of 10th Grade (Year 11) students, Asgari & O'Neill (2004) found that the biggest single predictor of students' judgements of the overall success of their mentoring relationships was the degree to which their mentors asked helpful questions. Clutterbuck (2004) suggests e-mentoring encourages mentors to ask fewer but more succinct and more insight-provoking questions than in the heat of a face-to-face dialogue. Furthermore, he suggests that an important benefit of the asynchronous nature of most e-mentoring relationships lies in having increased opportunities to respond to BDQs (*Bloody Difficult Questions*) as it allows more thinking time. It would appear that e-mentoring may have a series of benefits over more traditional mentoring and coaching relationships, though some would argue that face-to-face mentoring provides a richer and more emotionally-aware experience (Merleveden and Bridoux, 2004)

Listening actively

A key contribution which technology offers to the development and application of listening skills lies in the opportunities it affords to observe and re-run events through digital video and audio.

Active Listening is a well-documented technique (e.g. see Robertson (2005), New Jersey Self-Help Group Clearinghouse (n.d.)) which is employed in a range of fields from counselling, through mentoring and coaching to personalised learning. It involves the listener in continually probing, replaying, seeking clarification, testing ideas, summarising and giving feedback to ensure that the information which is being received is congruent with what was transmitted. When combined with effective questioning, the coach can often learn as much, sometimes more, about a learning event than the coachee (Showers and Joyce, 1996). An important function of listening is for mentors or coaches to gain insights into professional learners' perspectives to uncover what the learner is experiencing in a situation; to establish the learner's '*reality'* (Whitmore, 2002) and to help them develop '*self knowledge'* (Megginson and Clutterbuck, 2005) and '*awareness'* (Whitmore, 2002). Increasingly, with attention focused on personalisation in education, '*learning conversations'* (Egan, 2009) are being used with pupils to check on their progress and understandings. The

techniques involved in active listening and in managing learning conversations are complementary.

The techniques of active listening are equally applicable for those engaged in e-mentoring and e-coaching relationships whether synchronous or asynchronous (Canada Infonet, n.d.; Knight and Zheng 2009). Interestingly, a study of e-mentoring conducted by Shpigelman, Weiss and Reiter (2009), found that while e-mentors considered themselves to be active listeners and were regarded as such by their protégés, the protégés considered themselves to be passive listeners and preferred to adopt a passive role despite the best efforts of their mentors. As has already been suggested (Kasprisin et al, 2008), it is as important for e-mentees to be trained in what is expected of them in an e-mentoring relationship as it is for e-mentors to acquire and develop the skills needed to manage one.

Skills specific to mentoring

As we have seen in the section on mentoring and coaching, the role of the mentor is considered to be more global than that of the coach. A mentor is someone who would be expected to support a mentee through a significant career transition and could be involved in making assessments or appraisals of performance; sometimes in relation to benchmarked criteria or '*standards'*. It could well be, however, that a mentor will engage in coaching when particular aspects of performance are being developed.

Relate guidance to evidence

For many of those involved in mentoring relationships in educational settings, whether it is supporting a trainee teacher in meeting the Standards for QTS, an NQT in addressing the induction requirements, an HLTA or Early Years Practitioner in demonstrating professional competences, it is highly likely that the mentee will be expected to accumulate evidence of his or her performance. Portfolio assessments are now a familiar part of the assessment process for those being trained in work-based settings (e.g. see Hsiao, Chiang and Yueh, 2002; Byrne et al, 2009). Mentors have a role in guiding their mentees in identifying the evidence which is appropriate, monitoring ongoing evidence-gathering and assessing the relevance, quality and range of the evidence provided. Mentors also have responsibility for ensuring they themselves are accumulating evidence of mentees' performance in relation to

the specified requirements, particularly when justifying their assessments through moderation or other quality assurance processes.

As we have seen in the previous section, the e-portfolio is rapidly becoming accepted as an effective and efficient means by which a range of evidence-types can be accumulated, mapped and monitored. This technological approach enables the progress of mentees to be monitored and assessed at a distance, improves the accessibility of evidence to those who may wish to scrutinise it at any juncture, increases the range of evidence types which can be included and also helps ensure that evidence is safeguarded and secure (Barrett, 2000; Lenton and Woollard, 2009).

Technology also has a part to play in helping mentors and mentees to identify evidence which is appropriate for making judgements about their mentees' performance. The online video and downloadable resources presented on the *Teacher Mentor* website (Bennett, 2005) for example, provide guidance for school-based mentors on the sorts of evidence which is supportive of various levels of performance of trainee teachers in relation to the *National Professional Standards for Qualified Teacher Status* (TDA, 2007, 2008). Similarly, the CD ROM based materials provided by the University of Cambridge (Warwick, P. Email correspondence 18/2/2010) guide inexperienced mentors in helping ITT students to accumulate relevant and meaningful evidence of practice.

Broker access to a range of opportunities

Whereas a coach tends to work one-to-one with a coachee on a particular focused aspect of practice, a mentor may decide to arrange additional opportunities for a mentee to gain experience. For example, this may be through the observation of a leading practitioner, discussions with a specialist (e.g. a SENCo), participation in staff development or collaborative planning sessions, involvement in parents' meetings or school events, visits to neighbouring schools (e.g. a feeder primary school), etc..

Communication technologies expand the range of opportunities which can be made available either directly, through electronic correspondence or indirectly through, for example networks and online communities of practice (Wenger, 1998, 2000; Smith, 2003, 2009). With increased emphasis for schools to develop their use of learning platforms and the affordances which Web 2.0 (and now it is being mooted, Web 3.0) technologies, there is an increasing likelihood that those in education are going to become active participants in a range of online communities of practice – whether through formalised or informal networks. A new role which those could find themselves adopting is that of a '*facilitator'* for an online

community of practice. Palloff and Pratt (1999) suggest that a facilitator is an instructor or a group leader who acts as a '*gentle guide'*, who fine-tunes and nudges discussion and learning in the right direction. Rogers (2000) argues that the facilitator's role can be regarded as that of a moderator, a coach, or at times, a mentor. Clearly, the facilitation skills of mentoring and coaching outlined here (which are drawn from social constructivist approaches to learning) are highly relevant to maintaining and managing an online community.

Provide feedback / Relate practice to assessment

Reflective, developmental feedback is often provided immediately following an observation of a lesson or work-related activity, though more detailed feedback is sometimes deferred to provide more time for reflection by the observer and the observed. There is considerable debate as to whether feedback is most effective when it is in real time, immediately following an observation or deferred to a later date (see Sharpe, Lounsbury and Bahls, 1997; Scheeler et al, 2006). Such feedback could be formative or summative or both, dependent on the context. In terms of mentoring however, there is a high likelihood that feedback will lay greater emphasis on summative assessment. Observation and feedback sessions which are conducted in relation to professional standards will often include some form of assessment and will most certainly lead to target setting and action planning. McDonald (2008) makes the point that assessment of practice is more convincing and robust when related to evidence rather than personal opinion or vague recollection.

The contribution which technology can make to observation and assessment is through the accumulation of evidence by, for example, the use of video and audio technology. However as we have seen, increasingly '*bug-in-ear'* (BIE) and '*virtual bug in ear'* (VBIE) technology is being used to provide live, synchronous guidance and feedback on performance in practice. There is some debate as to whether continuous feedback such as this creates dependency rather than encouraging self-reliance and reflection (Scheeler, Macluckie and Albright, 2008; Gallant and Thyer; 1989). However, in general it is felt that the advantages arising through the enhancement of self confidence far outweigh any risks of dependency.

In the earlier sub-section on gathering evidence, we explored the extent to which technology can support mentors and mentees in identifying, capturing and accumulating appropriate evidence in relation to benchmarked standards. When it comes to making judgements about the relative quality of evidence, school-based mentors are sometimes at a disadvantage as they may be working in isolation or may have only limited experience of supporting those in

training. There is an expectation in the English education system that those training to be teachers will have their practice graded using criteria specified by OFSTED (2009). Various technological approaches have been used to support the moderation of judgements in relation to the criteria and their predecessors. The video-based online *Teacher Mentor* resources (Bennett, 2005) were designed for example to provide mentors with examples of trainee teachers' practice which had been assessed by a team of experienced mentors against which the practice of their own trainees could be benchmarked.

Target-setting and action planning

A significant omission from the CUREE (2004) *Coaching and Mentoring Framework* is '*target setting and action planning'*. In terms of guiding a student-teacher in meeting the requirements laid out in the Standards for QTS (TDA, 2008), having a series of clear, achievable goals is an essential part of the process of review and forward planning.

In the previous sub-sections we have seen ways in which technology can support the training and development of aspects of mentors' practice. Those familiar with Whitmore's (2002) GROW model will appreciate that an important feature of a mentoring and/or coaching relationship is encapsulated in the 'O' of GROW – exploring the OPTIONS which are available before making a decision about what 'WILL' be done. Whitmore argues that brainstorming a full range of available options is extremely important before making a commitment to a course of action. In his words '*When you are sure that you have no more ideas, just come up with one more'* (Whitmore, 2002, p81). Mind-mapping (Buzan, 2009, 2003), concept mapping (Novak, 1990, 2006) and cognitive maps (Tolman, 1947) provide a means of making explicit an individual's knowledge structure. Megginson and Clutterbuck (2005) refer to '*Role Environment Mapping'* in which a mentor or coach works with a client to build up a picture of where that individual is situated in an organisational structure in terms of the pressures, agendas, beliefs and barriers which they feel are impinging upon them. Zanting, Verloop and Vermunt (2003) have used concept maps to ascertain mentor's knowledge structures, but there seems to be very little evidence of mentors and coaches using mind mapping or concept mapping with professional learners for target setting and action planning within educational settings. There is however, evidence it is being used elsewhere, for example in the human resource management services (Nousala, Miles, Kilpatrick and Hall, 2009) and in healthcare (Gul and Boman, 2006) with some success.

There are many software solutions presently available to support and document mind-mapping and concept mapping. *Free-mind* (Sourceforge, 2009) is probably the most well-

known as it is open source and hence freely available for non commercial use. Whereas mind maps and concept maps can be drawn out readily by hand, a key advantage of a computer-based version is extensibility and flexibility. As a mentees' practice develops, so will their knowledge and understanding and mind-mapping is a means of making that explicit for scrutiny.

Build a learner's control

As indicated in the subsection above, a key objective for a mentor is to develop the mentoring relationship from one of dependence on the part of the mentee to independence, by shifting the locus of control from mentor to mentee.

Much has been written about the stages through which a mentoring relationship develops, particularly in the field of teacher training and education (Furlong, Hirst, Pocklington, and Miles, 1988; Martin, 1994; Maynard and Furlong 1993; Phillips-Jones; n.d.)

Regardless of the labels used, these models suggest an effective mentoring relationship is one which shifts over time. Within the English education system, the omnipresence of the professional standards and the assessment/appraisal regime which this evokes will inevitably result in a significant level of control remaining in the hands of the mentor. The introduction of grade criteria (OFSTED, 2009) which go beyond the Standards by adopting a '*best fit'* approach adds a further level of complication to the assessment process but does seem to be an attempt to move away from the '*box-ticking'* competency approach to mentoring to one which lends itself more to a reflective, learner-centred model.

It can be argued that the extent to which technology can assist a professional learner in gaining and exerting control is dependent on the relationship which exists between the mentor and the mentee. A proactive professional learner/mentee will use an e-portfolio, for example, to drive the mentoring relationship by setting the agenda for action planning and target setting. Kasprisin et al (2008) discuss the importance of ensuring that e-mentees or protégés are trained in their role, to maximise the benefits for themselves of a mentoring and coaching relationship whether online or face to face.

Skills specific to specialist coaching

It is noteworthy that the CUREE (2004) model uses the term '*specialist coach'*. In much of the literature on coaching (e.g. Whitmore, 2002; Dilts, 2003; Megginson and Clutterbuck, 2005) it is argued that a coach does not need to specialise in the field of the coachee, but

does need to be expert in generalised coaching techniques. It is inferred from the CUREE model that within the field of education, it is advantageous, if not desirable, that a coach has some understanding and experience of the context in which the coaching is taking place – if for no other reason than for issues surrounding child protection.

Taking the skills which CUREE identifies as being specific to specialist coaching, the following sub-sections identify some of the opportunities which exist to exploit the affordances of technology to support or enhance practice.

Facilitate access to research and evidence to support the development of pedagogic practice

An interesting dichotomy has arisen with the introduction of the Masters in Teaching and Learning over the coach's role in brokering access to research evidence. While, within the MTL, the role of the coach has been identified as brokering local support within the school and its immediate environs, the HEI tutor has been charged with the responsibility of providing participants with access to national and international research-based evidence and to colleagues who are able to provide more specialist support and information.

To this end, universities involved in the MTL are registering participants as students within their organisations and will thereby be providing them with access to the full range of resources and online sources which will enable them to support their academic studies. For most universities, online resources now include access to e-journals and e-books which enable students to download full text articles and read text books at any place and any time.

Within the MTL, there is some blurring of the roles of the in-school coach and the HEI tutor with regards to coaching. There is also some debate as to the exact nature of the tripartite relationship between participant, coach and tutor. A coaching relationship as we have seen earlier, is client-led; the coach being a facilitator and hence responsive to the needs and concerns of the coachee. Within the MTL, the coachees or participants have some control over the direction in which their studies will take them, but only within the constraints of the module they are studying. Similarly, we have seen that a mentoring relationship is designed to support a mentee through a significant career change and can involve some form of appraisal or assessment. The MTL has been designed to meet the needs of NQTs and newly appointed Heads of Department – both cohorts experiencing a significant change in career status and, as it is an accredited academic programme, will be formally assessed against internationally agreed benchmarks for Masters level study. It could be argued that as the HEI tutors will be making the assessments, their role is that of a mentor while the school-based coach will be taking a more facilitative coaching stance. However, it is highly

likely that MTL coaches will inevitably be switching from coaching to mentoring, particularly as many of those coaching participants at Phase 1 are also acting as induction tutors for the NQTs. Pask and Joy (2007) argue that, within the field of education at least, that it is pointless trying to differentiate between the concepts and roles of mentoring and coaching. They advocate a single unified concept of '*mentoring-coaching'* as the mentor-coach slips in and out of these complementary roles.

In HEI-based ITT it is assumed that the HEI will provide student-teachers with online access to research and inspection evidence to support the development of their practice. With the vast majority of PGCE programmes now being assessed at Master Level, it is hard to imagine that student-teachers would not be expected to draw extensively on research to analyse, evaluate and reflect upon key aspects of practice.

The development of reflective practice is given a high priority in all aspects of teacher training and development, from initial teacher training through to head teachers and prospective heads working through the *National Professional Qualification for Headship (NPQH*). A thought-provoking perspective on the use of technology to support reflective practice is offered by NIACE/Becta (2009). Focusing on those involved in Further Education, the purposes identified by teachers in the study for accessing online information to support reflective practice were:

- Finding out about the use of IT for *Family Learning*
- Exploring social networking websites
- Developing resources for delivering *Moodle* learning platform training
- Learning to use an *iPod* to record feedback sessions
- Watching online resources downloaded from *Teachers' TV*
- Investigating software technologies for gaming devices.

(NIACE/Becta, 2009, p30)

Most of those now entering the teaching profession will be '*digital natives'*, familiar and confident with accessing information and resources for their own purposes. The role of the coach, mentor or mentor-coach is therefore not to provide them with the technical skills necessary for accessing the information, but to alert them to what is there and what is relevant. It will also be to create opportunities for making use of technology through their institutions' learning platforms.

Tailor activities in partnership with the professional learner

Whatever the role or stage of development of the professional learner, a significant part of the coachee's developmental experience is to be provided with opportunities for building, developing and improving practice. A coach's role is therefore to draw upon local knowledge

to help ensure learning activities are scaffolded to provide the learner with the right form of experience at the most opportune moment in his or her developmental cycle. These activities can arise formally through negotiated target-setting and action planning or less formally as issues and opportunities arise.

We have seen that technology affords opportunities for coaches and coachees to participate in online communities of practice which, in their most effective form, can lead to the co-construction of knowledge. Most professional associations have already established information portals, online resources and networking tools for teachers and recently appointed tutors in HEI education departments through the *Subject Resource Network* (SRN) which is linked to the *Teacher Training Resource Bank* (TTRB, 2006) and the *Council for Subject Associations* (CfSA - http://www.subjectassociation.org.uk/). Most are now working on developing resources and networks to support teachers working towards their MTL qualification (CfSA, 2008). Through such networks, it is envisaged that those involved in the MTL will be able to collaborate on projects and share their experiences, whether as participants, coaches or tutors.

Facilitate growing independence in professional learning from the outset

Whitmore (2002) regards the promotion of coachees' '*awareness and responsibility'* to be fundamental to the coaching process. As indicated in the mentoring section above (*Build a learner's control*), having an awareness of the stages through which the coaching relationship is developing will help the coach gradually shift responsibility for target setting and action planning to the coachee. Furthermore, the use of technological tools, such as e-portfolios, help shift the locus of control from the coach to the coachee.

Other affordances of technology can also be used to help coachees build confidence and nurture their identities as professional. Rhine and Bryant (2007), for example, made use of digital video and web-based discussion with pre-service teachers to enhance self reflection and analysis:

> *'The use of digital video in web-based discussion is an effective way for us to remain connected to our pre-service teachers while they are in the schools full time, facilitate professional dialogue and collaboration among our students, and provide a means for them to learn how to reflect-inaction. We believe the project certainly has had positive impact on students' growth through the stages of development as teachers.'*
>
> (Rhine and Bryant, 2007, p357)

It was evident from exchanges on the discussion boards that the sharing of video material from classroom practices helped their pre-service teachers gain the kind of immediate and specific nurturing that was an essential part of developing their confidence.

It would seem that whilst coaches can provide ongoing and immediate feedback and support, the affordances which technology can provide through networking present greater opportunities for fostering growth, self-confidence and independence.

Establish buffer zones between coaching and other formal relationships

Within educational settings it is rare that teachers will have a single, distinct role. Many wear several hats, switching from class teacher to year leader, to form tutor, to disciplinarian, to counsellor, to subject leader and so on. Mentors and coaches within school settings tend also to have relationships with their professional learners. As we have seen, this is particularly apparent in the relationship MTL coaches may already have with NQTs as their induction tutors. It will also arise where heads of department act as mentors or coaches, or where a class teacher coaches a teaching assistant or a pupil. To obviate or reduce these potential conflicts, many proponents of coaching and mentoring advocate the use of formalised, written, signed and dated coaching or mentoring agreements or contracts (e.g. Carroll, 2004 cited in Brockbank and McGill, 2006).

Another approach to formalising the relationship is through the use of coaching supervision. Bond and Holland (1998) describe coaching supervision as '*a regular, protected time for facilitated, in-depth reflection on coaching practice'* (p 87). To some extent, university tutors when making visits to schools to monitor the progress of trainees following ITT programmes act in a supervisory capacity. Indeed, in many institutions, tutors were originally referred to as '*supervisors'* (Wilkin, 1992). However, for many the role does not take account of all aspects of coaching supervision which are listed by Parsloe and Leedham (2009) as:

- regular sessions (between coach and supervisor);
- reflection on practice (on the supervisee's coaching practices);
- alternative perspective (acting as a mentor to guide the coach's practice);
- independent integrity (taking an impartial and external view);
- learning focus (proactively developing the coach's practices).

Given the issues associated with managing placements for those involved in training for educational contexts, the e-supervision of coaches and mentors could promise to be a productive approach to helping school-based colleagues formalise their roles. The concept of e-supervision is already well established in fields other than teacher education. For example, in psychotherapy (Topel, 2000), with exchange students (Pauschenwein, Jandl,

Riegler and Vasold, n.d.), in clinical practice (Dudding and Justice, 2004) and in family therapy (Fialkov, Haddad and Gagliardi, 2001; Bacigalupe, 2010) to name but a few. While the definitions and practices of those engaged in '*e-supervision'* vary across the disciplines, the general principles for the e-supervision of mentors and coaches involved in teacher education would not be dissimilar to those for e-mentoring and e-coaching.

Summary

So, in terms of the contribution which Information and Communication Technology (ICT)could make to mentoring and coaching processes it might at first seem that as the skills are primarily interpersonal and largely on a one-to-one basis, Information and Communication Technologies (ICTs) are more likely to interfere with than facilitate the formation and development of such relationships. However, given the practicalities of managing mentoring and coaching partnerships in educational settings, sometimes at a distance, communication tools such as messaging, online discussion, video conferencing and podcasting afford many opportunities for mentoring and coaching relationships to be supported, enhanced or in some cases, transformed.

Another key component of mentoring and coaching to which technology can contribute is the review of practice and performance through, for example, the use of video or audio recording. ICTs can also contribute to the development of reflective practice and to the monitoring and assessment of performance through the use of e-portfolios as a repository of evidence and reflection. Finally, ICT resources can be deployed to support the training, development, monitoring and supervision of coaches and mentors.

It could be argued that technologies which support *reflection-in action* could include bug-in-ear devices, provided the mentor explains, justifies or rationalises the guidance which is being provided – in ways not dissimilar to those who take an *Advanced Motoring Test* who are required to talk through their actions while they are taking them. We have seen an array of technologies which can be deployed to support *reflection on action*, particularly those which make use of video-based evidence to support post-analysis of practice. The use of e-portfolios, e-mentoring and communities of practice, it could be argued, provide support for *reflection through action* – particularly when used to inform target setting and action planning or, using Whitmore's (2002) model, exploring options and identifying a course of action.

Conclusion

From the evidence herein presented it would appear that technology can make a distinctive and positive contribution to mentoring and coaching. In a supportive role, ICTs have the capacity to assist with the training and ongoing development of those engaged in mentoring and coaching. However, if, as has been argued in the previous section, a prime objective of a mentoring and coaching relationship is paradigmatic double-loop learning, then those technological applications which enable or encourage transformational relationships are likely to be the most productive.

Considering the role of technology in the training and development of mentors and coaches, we have seen that online resources, courses and communication tools offer opportunities for personal and professional development which can be accessed by individuals to meet their identified needs. It is unlikely however that a self-selected, immediate needs-related form of self-development will lead to transformational double-loop learning. The provision of online resources, need to be balanced with opportunities for interaction with others who can provide some sort of impetus to inspire a paradigm shift. This could be achieved by supervisors or link tutors working in tandem with mentors and coaches to draw their attention to specific resources which are particularly pertinent to issues arising from practice. This might be done directly through face-to-face encounters or remotely through an e-coaching or e-mentoring relationship. It could also be accomplished through the co-construction of knowledge and new understandings inspired by participation in online communities of practice, provided they are monitored or moderated to avoid degeneration.

As has been seen, affordances offered by Web 2.0 technologies are complementary to the development of online communities and also for the more immediate satisfaction of needs arising from practice. Whether feedback is provided in real time, through bug-in-ear technologies, immediately following a teaching and learning event through video conferencing or later through one-to-one correspondence with an e-mentor or through a discussion, supported by video clips with peer coaches, the potential which technologies offer can augment or even transform what is possible in a mentoring and coaching relationship.

What next?

It would appear that Web 2.0 technologies yield many affordances for supporting, enhancing and transforming mentoring and coaching practices. At present, there are

pockets of exemplary practice as teachers, academics and students, 'professional learners' or 'participants' develop the skills, confidence and experience needed to exploit the potential which is available. Whilst there is evidence that bug-in-ear technology, e-portfolios and digital video are making an impact on practice, there is relatively little evidence of e-mentoring of learners and, more particularly, e-supervision of coaches within the English education system. With the momentum growing for the development of learning platforms through the *e-Strategy* and the increased availability of affordable technologies, it is to be hoped that the use of technologies to support reflective practice will burgeon.

From the analysis of the research which has been presented so far, there is a need for focused training and development in teachers' use and confidence to make more productive and widespread use of Web 2.0 technologies in mentoring and coaching. Ironically, it may be through Web 2.0 technologies themselves that such training and awareness raising will be most effectively achieved.

> *'Given my prior experiences, personality, and demeanor, much of my educational history has been carried out in a solitary fashion. The BIE has instilled in me the need to work collaboratively with others. This will be accomplished as I move out of my comfort zone and commit to creating these partnerships. The BIE is an excellent way to launch out and connect with others, which will in turn lift our children to higher levels.'*
>
> Rock et al (2009) p 80

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