ICT CPD Landscape: Final Report
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Executive summary

This *ICT CPD Landscape* study reports on Information and Communications Technology (ICT) Continuing Professional Development (CPD) programmes available to teachers in England in 2010. Data collection took place in the Autumn of 2009. Although the project findings are based on some desk-based research, the findings are mainly derived from primary data collection through traditional interviews, questionnaires and focus groups.

One outcome of the project, derived on the basis of an experimental methodology, a remotely authored digital domain map, loosely represents the prevailing ICT CPD Landscape. This mapping method was used to ascertain the value of mapping to conceptualise complex domains such as ICT CPD. The map was intended to capture and aggregate perceptions of the landscape held by representatives of the following groups: researchers and providers of, experts and teachers in and leaders receiving ICT CPD. As such the map is invariably subjective.

The map has three branches: *Climate* focusing on socio-cultural and technological as well as policy factors at local, national and international levels that impact on ICT CPD Provision; *Supply* plotting providers; and *Demand* mapping stakeholders, influential groups of professionals, both formally and informally constituted. It has to be noted, though, that these sub-domains are increasingly overlapping.

On the *Demand* side, this study investigated the opinions of 60 practitioners, 20% of whom were reluctant to use digital technologies in classrooms. 40 informants were ICT CPD leaders in schools. 30 providers were chosen to represent all the key categories identified in the domain map on the *Supply* side.

In terms of methodology, the project used largely qualitative data collection methods: 90 questionnaire responses were supplemented with in-depth individual and some focus group interviews. Given the small sample size of 130 the findings need to be treated with caution and should be viewed as emerging trends.

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The findings are discussed in relation to five categories: providers, leaders, practitioners, field forces and some general observations about the market.

Providers felt they were limited in their provision by market conditions. As a result they were rarely in a position to lead schools into new areas or challenge school priorities. The market is also small and uncertain because schools do not have ring-fenced funds for CPD in general and ICT CPD in particular. A wide disparity was noted between individual teacher's technical skills and competence among those who attended training.

The main means of advertising courses was via fliers, emails to schools, course brochures, and newsletters. Very few Providers used online advertising or social networking sites, although they noted that a number of teachers found out about their courses via word of mouth.

28% of respondents reflected on the need for changed leadership priorities at school and government level also mentioning the loss of ICT advisers as a critical factor in the lack of ICT CPD now taking place. School management or agendas were the most frequently mentioned drivers of ICT CPD. This was followed by government and Local Authority policies; 23% of the sample of provider training focused on software without apparent reference to learning outcomes or teacher confidence. Most providers referred to the necessity of accommodating school needs even if the provider identified other strategies.

The type, number of courses and number of participants varied across the group. LAs were most consistent offering half to full days, series of sessions and in-school CPD. Some Providers had a group maximum – this occurred mainly within commercial respondents while others take whoever attends. Course content is overwhelmingly about skills and ICT in classrooms, i.e. on the curriculum application of the technology rather than pedagogy. Apart from university provision there are limited opportunities to consider wider issues such as pedagogy or change management.

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There was consensus that supply cover and funding had become major factors impacting on teachers being able to attend courses, their ability to learn or to find uninterrupted time to develop what they had learnt. Many providers saw the future for CPD in blended learning, i.e. online, self-directed and face-to-face models.

Most providers have a Mission statement or Vision that they link to the evaluation of course objectives. However, the overall quality and breadth of provision could seemingly be improved if more robust evaluation were undertaken, focusing particularly on relevance to classroom practice and change management. Techniques such as evaluation by outcomes are also seemingly in need of strengthening.

The providers identified two new directions for ICT CPD: a change from skills training to strategies around the embedding of ICT and an increase in influence of face-to-face conferences, educational blogs and micro-blogging such as Twitter.

The majority of **leaders** found out about CPD opportunities via their LA or through their own initiative, primarily searching online or though professional networking. Leaders tended to promote CPD opportunities via informal colleague networks or by passing information to certain staff members who they felt would benefit. The selection of CPD programmes for staff appears to be based on an assessment of needs although it was not always clear what form this needs analysis takes. The cost and time required for training as well as the location were frequently given as factors in deciding which CPD to undertake. They were also cited as barriers preventing ICT CPD from being undertaken. Leaders also suggested the refusal of some senior management to see the benefits of ICT CPD as a barrier.

Leaders described a significant move towards in-house ICT CPD provision, provision through communities of practice and learning informally using Web 2.0 applications. The majority of ICT CPD leaders consider themselves to have high levels of skill in the application of digital technologies. A few leaders of ICT CPD in schools suggested that they are not receiving enough CPD at a high enough intellectual level to deal with the dangers and demands that digital technologies can present. These

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few leaders also wanted provision that focuses on the innovative pedagogical opportunities that digital technologies offer, the management of change and media issues. Some leaders also thought that some senior management teams might do more to tackle the issues that make teachers reluctant to use ICT in classrooms.

Practitioners complained about the lack of entitlement to CPD in general and seemingly a number of in-house CPD leaders appear to be ignoring the desire of some practitioners to pursue formal qualifications through external courses as a career enhancement move. More practitioners than leaders expressed a keenness to learn and to belong to communities of practice in order to fulfil this learning desire. Linked with this interest in informal learning, practitioners stated that the most effective CPD they had attended varied enormously. Several cited the face-to-face and online meeting through professional communities and micro-blogging as being good forms of CPD.

Some practitioners felt that issues about the use of digital technologies in classrooms were not being addressed by providers or leaders ranging from reliability problems to concerns about e-safety, unreliable equipment and web services, poor support services, ethical and moral concerns, poor pedagogical practices and fears about social isolation, lowering achievement and celebrating limited achievements too highly. Many of the teachers who are reluctant to use digital technologies in classrooms said they would welcome more professional debate at a higher intellectual level about the role of digital technologies in education and more evidence about their effectiveness as well as discussions about good practice.

External factors impacting on ICT CPD delivery. Five factors were identified on the basis of the study of background literature and baseline data; these were validated by the primary data gathered:

- the availability of external courses to meet individual and institutional needs;
- staff expertise within institutions to provide in-house CPD;
- robust ICT infrastructure and support;
- the length and timing of ICT CPD offerings;

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- leadership and vision.

A number of additional factors were identified that had not emerged strongly from the baseline data but were mentioned by the participants who were most active in seeking out opportunities for their own learning:

- professional e-communities of practice;
- informal CPD networks run by teachers' professional organisations;
- personal Learning Networks, maintained through services such as Twitter and the Blogosphere.

In addition some factors that were identified as constraints were policy and funding driven. These were:

- dedicated time for CPD: teacher tiredness in twilight sessions was cited by providers, leaders and practitioners;
- the lack of a national framework for CPD;
- no compulsion for schools to provide appropriate CPD;
- funding issues;
- CPD being driven by perceived current needs, rather than long-term strategy.

Overall the findings raise questions about how the CPD in ICT Landscape might be defined beyond 2010. The patterns emerging suggest a far more decentralised, informal and fragmented picture than had been the case in the past. The varied offering by providers and the diverse background and training of the trainers make it difficult to evaluate the impact of existing programmes. Limited rigour in evaluation of provision increased the challenge of identifying relevant and challenging course content and effective ICT CPD models.

There exists a concentration of effort into programmes about skills and curriculum applications. Harder to find are courses that link classroom applications to pedagogy, underpinning theories of learning, ICT management and the management of change. The mismatch between supply and demand appears partly to be caused by the lack of availability and funding for high-level training for providers and leaders and a lack

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of understanding at senior management level about how digital technologies best be deployed through school development plans in terms of pedagogy and management infrastructure.

Some groups of school practitioners do not have the support of their schools to pursue their own professional development because of the time and cost involved. Others complain that existing ICT CPD programmes do not meet all their needs. A few early adopters amongst these professionals elect to join national and international communities of practice to improve their informal learning opportunities - largely online.

In this context, the most significant insights appear to be around the growing 'self-help' agenda. As leaders and practitioners have become more self reliant, more schools have begun to manage their ICT CPD agendas in-house which points to even more fragmentation of the factors and field forces in this area in the future.

The trend towards fragmentation of the ICT CPD landscape shows no slowing down. On the contrary, there appears to be a growth in informal learning opportunities organised and directed by practitioners themselves. These fledgling grassroots developments can, perhaps, be harnessed to enrich more formal ICT CPD provision.

Recommendations

Entitlement to professional learning

Entitlement to professional learning in general should be a priority for practitioners and leaders. In the ICT field, it was felt courses should include coverage of e-assessment and evaluation as well as covering matters such as classroom application, subject pedagogy, underpinning theories of learning, ICT management and the management of change. Importance was attached, in addition, to entitlement to professional learning about educational issues such as e-safety and filtering for technical staff and network managers.

Most providers, leaders and practitioners asked for national policy and guidance that identifies protected, dedicated time for teachers, leaders, senior managers to attend,

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participate in and/or develop continuing professional development in the field of ICT. Consideration might also be given to funding personal CPD budgets for teachers separate from the school's CPD budget. Support for informal communities of practice might be one cost-effective way to increase the amount, relevance and immediacy of ICT CPD that can be offered online in a professional context significantly.

Some requested national CPD framework prompts that would emphasize the value of informal personal learning networks as a means of learning and recognise that online events should be accommodated and recognised within a new framework.

Evaluation and assessment of professional development and learning

The evidence collected suggests that the evaluation of CPD programmes needs to be improved including the incorporation of methods that measure impact on achievement over time. Providers should be encouraged to undertake robust evaluation of their provision, focusing particularly on relevance to, and impact on classroom practice and change management. More thought should be given to the potential role of digital technologies in assessment, including making use of the multimodal and collaborative affordances of digital technologies.

Senior management issues

Concerns about the lack of value accorded to ICT CPD by some senior managers might be addressed by provision of leadership courses that cover questions of theory, ethics, pedagogy, the integration of ICT in learning processes and change management as well as issues associated with running a network. Senior managers it seems also need to ensure the reliability of equipment in school in order to enable staff to be more comfortable using ICT in classrooms.

Support for schools

In order to extend and develop ICT CPD input through groups such as ASTs and SiPs, relevant case studies should be developed that exemplify good practice. ASTs and similar groups might be offered relevant CPD opportunities that develop their potential as multipliers.

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Provision for an overarching national online community of practice

Social learning online over a sustained period of time appears to be an effective way of learning about how to use ICT for teaching and learning. Therefore, the development of an overarching national online community of practice providing a one-stop shop for access to informal and formal CPD and expert providers might be a useful way of harnessing increasingly fragmented individual endeavours.

Improving ICT CPD Provision

Based mainly on the data gathered from providers the following recommendations can be made:

- That policy and guidance identifies protected, dedicated time for teachers to attend, participate in and develop continuing professional development.
- That funding supports dedicated time for teacher' CPD. Consideration could be given to funding for teachers' personal budgets discrete from a school's CPD budget.
- That providers undertake robust evaluation of their provision, focusing particularly on relevance to classroom practice and change management and, where possible, that they follow up evaluation of outcomes.
- That more courses go beyond acquiring technical skills and focus on pedagogical practice as well and that they also include strategic and pedagogical considerations. Provision of courses with relevance to management should also be safeguarded.

Qualitative research methodologies

The use of digital concept maps was found to provide an effective means of collaborative conceptualising of a complex domain across a distributed group of experts and other informants. Researchers may wish to consider the use of concept mapping for data the collection of perceptual data.

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The ICT CPD Landscape Report

Introduction

The objectives of the ICT CPD Landscape Review were to analyse and summarise the current provision of ICT CPD in three ways: to consider the existing evidence base; to gain a more informed picture of the national ICT CPD landscape; and, to map these findings against existing policy documents.

As a key means of representation of the landscape a concept map was developed which aimed to capture the collective conceptualisation of the ICT CPD landscape on the basis of perceptual data. In a first step, members of the research team, who had won the contract for this research on the basis of their expert knowledge of the field, constructed a map based on their understanding of the field as well as of relevant background literature. In a second step, within the limited scope of the project, a cross-section of stakeholders on the supply and demand side were asked to reflect on, and contribute to the map. Informants, particularly on the supply side, were carefully chosen in close discussion with the funders and according to a clear set of criteria aimed at ensuring representativeness of the sample.

The first objective, considering the existing evidence base, was approached through desk-based research and careful reading of key reports and studies published between 2006 and 2009 about the use of ICT, the role of CPD and the ways in which programmes are being developed. These reports included studies by the National Foundation for Education Research (NFER), the Training Development Agency (TDA) and the General Teaching Council of England (GTCE). Information from the Harnessing Technology Report together with an analysis of ICT CPD provision as represented in the TDA database of CPD provision as well as the E-skills survey also informed the construction of the survey instruments and the data collection strategies adopted.

The second objective, to gain a more informed picture of the provision nationally, was addressed by developing and implementing a programme of research designed to increase the understanding of key providers of ICT CPD and the factors relating to

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it, including relevant field forces. The research project was designed to investigate the ICT CPD Landscape from three perspectives: external providers of programmes; leaders in schools who make decisions about the choices of ICT CPD programmes for staff and sometimes deliver in-house programmes; and practitioners who are the recipients of programmes. Thirty providers were selected to represent the main provider types active in the ICT CPD market place. Overall the opinions of some 30 providers, 40 leaders and 60 practitioners were collected. Statistically, this is a small sample and any judgements about the nature, scope, quality and impact of provision, therefore, needs to be treated with some caution.

The third objective was to analyse provision against existing policy imperatives. This proved the most difficult objective because of significant ongoing changes in the ICT CPD landscape which is characterised inter alia by a lack of funds for formal ICT CPD for provision for leaders and practitioners and the reduction in the numbers of LA advisers in ICT. Another trend is the growth of informal learning directed from the grassroots by practitioners themselves.

PART ONE: Baseline data on CPD participation and ICT CPD course provision

As part of the baseline data three main reports were analysed to ensure the complementarity of data collection instruments to be developed. The first was the Teacher Voice survey undertaken by the National Foundation for Educational Research in 2007 (n=1,000): questions relating to ICT were extracted from this. The second was the Schools and Continuing Professional Development (CPD) in England – State of the Nation research project, undertaken for the Training and Development Agency for Schools in 2008 (n=1,126). The third was a General Teaching Council for England survey of professional development activities undertaken in 2009 (n=5,168).

These sources provided a useful correlate to data on ICT CPD drawn by the research team from the TDA database, the e-skills survey and the Harnessing Technology schools survey. See Appendix 1 for a fuller discussion of the baseline data and the background reports.

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Key points from the reports

72% of teachers felt that they were required to participate in CPD. The majority of their time was spent listening to lectures or presentations in workshops or seminars. (TDA, 2008)

24% of teachers reported that they had no access to CD in the previous twelve months. (GTC, 2009)

ASTs and Excellent Teachers were identified as leaders and influencers of CPD; teachers with no responsibility for CPD had far less engagement with it. (TDA, 2008)#
ASTs and Excellent Teachers have a key role in delivering and leading CPD. (TDA, 2008)

52% reported no or little emphasis on the use of ICT in learning in their CPD overall, but only 48% reported that for school-based CPD. (TDA, 2008)

Between a third and a half of teachers reported low personal skills and use of ICT for teaching and learning. (NFER, 2007)

More than half had no awareness of research evidence about ICT and learning outcomes. (NFER, 2007)

Up to 20% had negative views about investment in, and use of, ICT. (NFER, 2007)

A significant number of teachers cited external, rather than internal, factors as having an impact on education. (NFER, 2007)

Between a third and a half of those surveyed did not feel empowered to take charge of ICT and use it in their teaching for the benefit of their pupils' learning. (GTC, 2009)

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The majority of courses offered by providers are one day or less, offered at the provider's location.

The majority of ICT CPD opportunities are focused either on curriculum delivery or on ICT skills. ICT is identified as one of the course outcomes 'supporting learning'. (NFER Teacher Voice Omnibus Survey – November 2007)

Comparing the three reports

Motivation, and locus of control

A significant group of teachers in the NFER survey (between a third and a half of those surveyed) did not feel empowered to take charge of ICT and use it in their teaching for the benefit of their pupils' learning. Up to 25% of those surveyed as part of the GTC sample were not fully engaged with CPD, 72% of the TDA sample stated that CPD was required of them.

The reasons advanced in the NFER study for lack of engagement in ICT are essentially external: lack of leadership; lack of, or unreliable, resources; lack of support. The findings from the TDA and GTC surveys support this lack of engagement on the part of many teachers. Two possible reasons emerge for these attitudes.

The teachers themselves may lack an internal locus of control, so that responsibility for actions and control is located outside the individual (Rotter 1966; Mamlin, Harris and Case 2001; Marsh and Richards 1986, 1987). With an external Locus of Control the individual believes that his or her behaviour is guided by fate, luck, or other external circumstances, whereas with an internal Locus of Control the individual believes behaviour is guided by personal decisions and efforts. Arguably, a teacher's predisposition towards one locus of control or another might predicate the type of pedagogy they are likely to adopt.

A second possible reason is grounded in Maslow's Theory of Motivation (1943, 1971), particularly those needs identified as being at the top of his Hierarchy of

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Needs, which he labels Self Actualisation. He refers to this category as the quest to reach one's full potential as a person – which can never be fully satisfied, since, as one grows psychologically, there are always further and new, opportunities for growth. (see also Maslow and Lowery 1998; Franken 2006; Ryan and Deci 2000) Fullan (1995) makes a similar point when he says:

> *Teachers who want to improve their practice were characterised by four attitudes: they accepted it was possible to improve, were ready to be self-critical, and to recognise better practice than their own within the school or elsewhere, and they were willing to learn what had to be learnt in order to be able to do what needed or had to be done.* (p.73)

Improving Practice

Arguably, a desired aim of CPD programmes is to reach a point in which a practitioner's theoretical, philosophical or ideological approach to learning and education becomes embodied in their practice as a result of the learning experience: this process has been called 'praxis' (see Freire 1986). The surveys show that there is a group of teachers who do not experience praxis because they do not feel engaged by the CPD process, and that many of them feel that it is imposed on them. It seems reasonable to us to assume that a significant majority of them do not feel that the use of ICT has a significant effect on learning – and their lack of engagement with the CPD process means that their praxis is unlikely to be modified.

Advanced Skills Teachers: their role in CPD

A series of reports were considered about Advanced Skills Teachers (ASTs) in order to understand how this group, which was suggested by the funders as a potentially important field force, had been used to raise teaching and learning standards. A summary can be found in Appendix 1.

Given that most teachers are offered in-school or external workshops as the main approach to delivering CPD, and that these are often led by ASTs and Excellent Teachers, whose values and practice reflect the key elements and expectations of CPD, it is clear that these professionals have a key role in advancing practice and enhancing the use of ICT for learning. They are arguably the key players in providing

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ICT leadership in pedagogy and creating schools that are innovative in their use of ICT.

Fulfilling Becta's Five System Outcomes

It is apparent from the Harnessing Technology Schools Survey (2009) findings that much progress has been made with respect to Becta's five system outcomes. Teachers, school leaders and ICT co-ordinators are broadly happy with the ICT resources that that they have, both for their own needs and for the purposes of supporting and facilitating learning. There is also good evidence that new technologies are being used effectively to enhance personalised learning and to support technology confident providers.

Perhaps the strongest single theme across the surveys is the finding that school staff have increasing levels of confidence in using new technologies and are developing positive beliefs about the benefits of these technologies for learners. The findings – for example that in some respects new technologies can save time for teachers, and that greater proportions of school staff than previously believe that new technologies improve learner engagement and attainment – could be important 'threshold' findings. Other elements frequently mentioned by senior leaders are continuing professional development for teachers, investments in the school ICT infrastructure, use of the learning platform, e-safety and the acceptable use policy. (2009, p. 17)
Although teachers' confidence and effectiveness with ICT continue to improve, there are some indications that teachers would appreciate further support and, more specifically, additional continuing professional development in this area: over a half of teacher respondents said that they would like at least a little more continuing professional development support for a number of ICT activities, including using learning platforms. (2009, p. 23)

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Summary of the Provision of ICT CPD

Baseline Data

The landscape of ICT CPD was investigated against the background of the Teacher Voice survey, research into provision and participation in CPD, the varying roles of Advanced Skills Teachers and the Harnessing Technology Schools Survey.

Given the comments from schools expressed in the Harnessing Technology Schools Survey, one would expect that CPD providers would focus on CPD covering use of the learning platform and e-safety issues, even if only as part of other course content.

Data presented was drawn from two main sources: the TDA CPD database and the e-skills ICT CPD survey. The data was collated between October 26 and November 10, 2009 and supplemented from a range of other sources. All the providers in the e-skills survey focused on ICT CPD; the TDA database was searched with ICT and ICT-related search terms and returned 347 records, the majority of which contained ICT as one element, or learning outcome, of a curricular focus.

The e-skills database was provided by the e-skills UK Qualification Reform Team. The TDA database contains data uploaded by CPD providers. It does not, therefore, necessarily represent a complete picture. The e-skills research was last updated on 27.10.09. Data was analysed between 26.10.09 and 11.11.09.

This data was examined to provide information about the providers, the type and range of courses they provided, the regional coverage of the courses, Key Stage coverage and the duration of ICT courses.

Due to lack of space only data about the national picture is included in the main report and only with reference to course type. Details, such as information about geographical distribution and a detail analysis of the TDA database and the data supplied by e-skills can be found in Appendix 1.

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The National Picture

TDA Data

The TDA CPD database shows the following breakdown: Provider-based: 91%; School-based: 5%; Online: 4%.

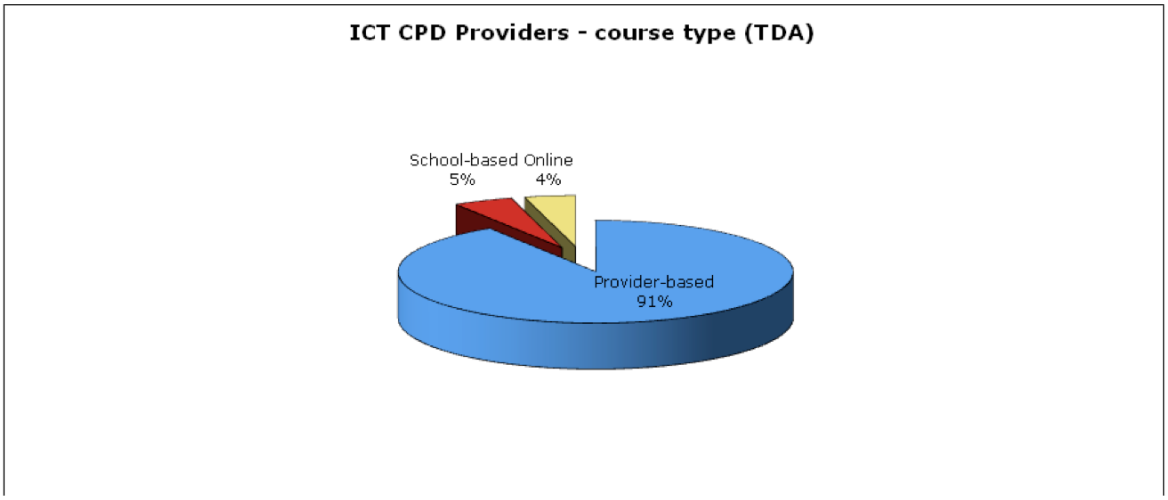
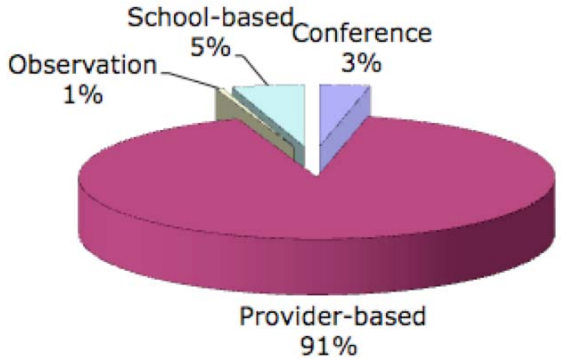


Figure 1 ICT CPD Providers by course type (source TDA)

(n=347)

e-skills Data

Data obtained from the e-skills survey – 219, compared with 347 in the TDA database – shows a slightly different picture. Of the courses, the distribution was: Provider-based: 91%; School-based: 5%; Conference: 3%; Observation: >1%.



(N=219)

Figure 2 ICT CPD Providers by course type (source e-Skills)

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An interpretation of the baseline data about ICT CPD provision

There may well be a need to re-consider dominant ICT CPD models in view of the findings of each of the surveys cited above which identified a significant number of teachers who feel no direct involvement in their own professional development. 72% feel that their school requires their participation in CPD – and, for the majority, 67%, they listened to a lecture or presentation. In this context it is hardly surprising that a significant group of teachers in the NFER survey (between a third and a half of those surveyed) stated that they did not feel empowered to take charge of ICT and use it in their teaching for the benefit of their pupils' learning. Arguably, the design and structure of the ICT experience should be to empower teachers in their use of it, and to apply it in the classroom. Unless teachers can use ICT, see its benefits and understand its implementation in the teaching and learning process then their attitudes are unlikely to change.

It is against this background that many teachers have a passive approach to the use of ICT, whilst a small minority is essentially resistant to its use. The reasons both groups of teachers give are essentially external: lack of leadership; lack of, or unreliable, resources; lack of support (NFER, 2007).

The majority of ICT CPD opportunities identified in the TDA database and the e-skills survey include ICT as only one among numerous other learning outcomes for the course, rather than the main focus itself – and the nature of the courses – one-day, at an external venue – mean that those most in need of hands-on involvement with ICT that can be embedded in their own practice are unlikely to receive the stimulus to transform their praxis, the cycle of experiential learning (Kolb, 1975) or, more pertinently, "reflection and action upon the world in order to transform it" (Freire, 1970).

Despite the entitlement to five days of CPD a year the surveys show that there is a significant group of teachers who do not feel engaged by the CPD process, and that many of them feel that it is imposed on them – an obligation, rather than an entitlement. It is reasonable to assume that a significant majority of them do not feel

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that the use of ICT has a significant effect on learning – and their lack of engagement with the CPD process means that their praxis (cf. Kolb, 1984) is unlikely to be modified.

The courses of external providers – one-day, in venues external to the school – are likely to appear in the Low Collaborative External Players quadrant rather than the High Collaborative External Players quadrant identified by Daly, Pachler and Pelletier, 2009a as shown in Figure 3. Four quadrants for CPD were identified in their overview of pedagogical approaches and models of ICT CPD showing collaborative aspects (horizontal axis) and players involved (vertical axis): High Collaborative School-Based; Low Collaborative School-Based; High Collaborative External Players and Low Collaborative External Players. These are not intended to represent deterministic models for CPD. Instead, they are intended as descriptive, and several features appear to greater or lesser extent within individual quadrants and across their boundaries. They are offered as a guide to considering the features of ICT CPD which are consistent with prevalent types of provision. It is not claimed that all of the features described appear consistently within the prevailing models. Rather, they represent the CPD 'tendencies' which appear in the literature.

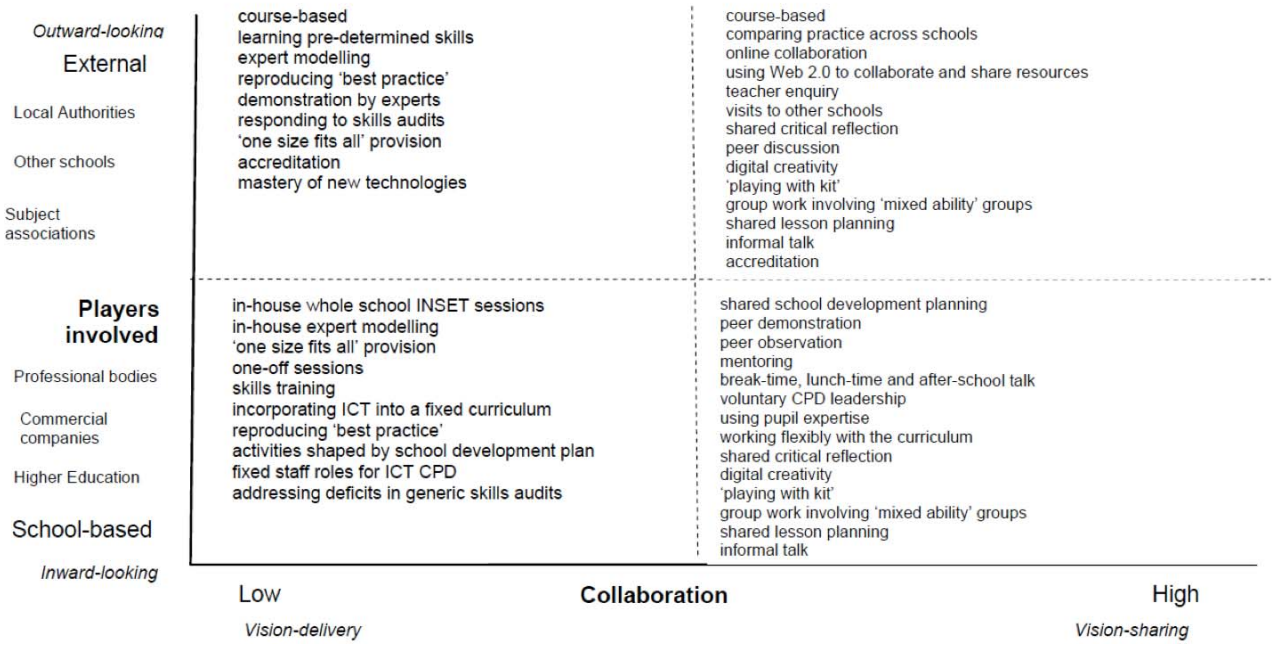

Figure 3 The ICT CPD Landscape (Daly, Pachler and Pelletier, 2009)

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The ‘one size fits all’ provision, one-off sessions, skills training, addressing perceived deficits and attempting to reproduce ‘best practice’ are more likely to be features of this type of provision than the High Collaborative External model described in Lydon and King’s 2009 study of the Earth science CPD (see below).

The majority of teachers are offered in-school or external workshops as their CPD experience. Such workshops are often led by ASTs and Excellent Teachers: their values and practice reflect Fullan’s (1995) key elements of CPD. The reports reviewed here indicate that the role of these professionals is crucial to advancing practice and enhancing the use of ICT for learning. They are the key players in providing ICT leadership in pedagogy and creating schools that are innovative in their use of ICT.

Forces impacting on ICT CPD

From an analysis of these studies a number of forces can be defined, i.e. factors that impact upon, and shape, the demand for and supply of ICT CPD: they range from organisations, institutions and individuals, through policies, strategies and programmes to attitudes, philosophies and dominant ideologies. From the review of the literature and CPD offerings surveyed, a number of these forces were identified. They covered the provision of ICT CPD, individual and institutional needs and individual attitudes. These forces were:

- The availability of external courses to meet individual and institutional needs.
- Staff expertise within institutions to provide in-house CPD.
- Robust ICT infrastructure and support.
- The length and timing of ICT CPD offerings.
- School leadership and education professionals co-ordinating CPD in schools.

These elements were used to construct the survey instruments for this study and to determine whether further forces could be identified.

Field forces as defined by the funders, i.e. groups of people with direct influence on ICT CPD, include School Improvement Partners (SIPs), Local Authority advisers, Advanced Skills Teachers (ASTs) and CPD co-ordinators. They all can and do inform schools, heads and teachers about their use of ICT and CPD matters. And,

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they form the infrastructure through which information about ICT and CPD can be communicated.

Overall the field forces to be found in the baseline reports tend to be groups of professionals that have been formally funded to have influence on schools and teachers. The primary data gathered for this study suggest a growing importance of informal communities of practice in influencing decisions about ICT CPD provision.

Recent models for ICT CPD

In this section of the report some suggestions for models of ICT CPD from relevant background literature are reported which were published since Daly, Pachler and Pelletier concluded their literature review published in 2009.

Work by Lydon and King (2009) examines the impact on professional practice of 90-minute CPD workshops, presented to whole science departments in secondary schools. The study evaluated the work of The Earth Science Education Unit at Keele University, whose approach to CPD had to be through short-duration workshops, given that science teachers were unwilling to undertake prolonged CPD in this relatively minor component of the science curriculum. The post-course evaluation provided evidence that the 90-minute ESEU workshops, resulted in positive, long-term change in the practice of teaching of earth science (n=274). The reported impact resulting from a 90 minute workshop contradicts earlier research suggesting that CPD needs to be sustained for impact to occur (see also Adey 2004). Lydon and King (2009) point at the characteristics of the CPD intervention: it was grounded in an explicit theory of learning, and promoted tried-and-tested teaching methods supported by high quality and detailed materials for a newly constituted area in the curriculum. Also teachers, who attended as whole science departments in the school-based CPD workshop, were encouraged to work in groups and share experiences and so to take ownership of the changes. These findings suggest that appropriate CPD content and a facilitating school context can offset the absence of desirable features of the CPD delivery strategy, such as an extended time period. Lydon & King identified a number of critical factors for the success of these courses.

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The first was that the innovation had an adequate theory-base, introduced methods for which there was evidence of effectiveness and which were supported by appropriate high quality materials. The second factor was that the professional development programme used methods that reflected the teaching methods being introduced. The third factor was the involvement in the programme – as participants – of senior management in the schools, and the fourth, and final factor identified was the way in which the programme was delivered and the teachers worked: in a group to share experiences; they communicated effectively amongst themselves about the innovation; they were given an opportunity to develop a sense of ownership of the innovation and, possibly most importantly, they were supported in questioning their beliefs about teaching and learning.

This model may well offer a way forward for maximising success in ICT CPD. The elements would require innovation grounded in theory; methods for which there is evidence of effectiveness; high quality materials; the use of methods that reflect the teaching methods being introduced; the involvement in the programme – as participants – of school senior management; group work involving sharing experiences, communication and innovation; a sense of ownership of the innovation and support in questioning beliefs about teaching and learning.

To this can be added observations by Mawhinney (2009) on the importance of informal professional knowledge sharing in the school staffroom. She observed that

> informal teacher interactions provide the necessary support needed for teachers in an isolating profession. Teachers use the time in congregational spaces to learn from each other with professional knowledge sharing. These interactions serve as moments of professional development, which benefit the teacher, his/her students, and the school. Recent reforms require more formalised professional development for teachers in order to insure their quality. On the other hand, teachers are gaining valuable spontaneous "professional development" when working among themselves. (p. 6)

Another recently published paper by Selwyn, Boraschi and Ozkula (2009) questions whether it is possible any longer to expect schools to resource pupils and staff with the latest digital technologies so that they can master the skills and applications. The authors observe that the relatively restricted nature of children's use of information and communications technologies (ICTs) inside the school setting has long been

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noted by researchers. With this in mind, the team studied 355 primary pupils (years three to six) from five English primary schools depicting desired future forms of school ICT provision. The article contends that the nature and content of these future-orientated pictures reflect many of the tensions underlying children's current engagements with ICTs in school. In particular, the article discusses how the drawings offer valuable insights into the issues underlying pupils' understandings of ICT and schools including: the restrictions of the school as organisation; the oppositional relationship between the 'work' of learning in school and the 'play' of using digital media at home; the unequal power relations that exist between pupils, schools and teachers. The article concludes that, rather than accede to demands for free and unfettered use of game consoles and portable devices in the classroom, schools should instead concentrate on fostering informed dialogues with young people about the potential educational benefits of school ICT use. These observations challenges what happens in many of the formal learning situations currently offered to teachers in which they are expected to master new skills in software and hardware. To be able to foster informed dialogues with young learners requires a different set of intellectual skills and generic knowledge that may well be best learnt in the kind of informal exchanges between professionals that is being promoted by Mawhinney. Alternatively the content of most ICT CPD courses would need drastic revision.

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PART TWO: Exploring the ICT CPD Landscape

Having reported on the findings of the desk research, we now turn to a description of the research methods used for the main part of the study, the collection of primary data from providers, leaders and practitioners. This will be followed by a visual representation of the ICT CPD Landscape in the form of a concept map and the discussion of the findings emerging from the survey and interview data before providing an analysis, a conclusion and some recommendations.

Methodology

The cohort

This study was planned as a largely qualitative analysis, from a range of perspectives, of existing provision of ICT CPD in England as perceived by key stakeholders, namely providers, leaders and practitioners who specialised in ICT. Leaders included senior managers but the group mainly comprised education practitioners with a leadership role in relation to ICT. Overall the views of more than 130 providers, leaders and practitioners were elicited in this survey of the current Landscape for ICT CPD, undertaken between December 2009 and the end of January 2010. The breakdown can be found in Table 1 and is referred to in each section.

The total of approximately 130 respondents came from the following groups in the ICT CPD field:

- Universities
- LAs
- Hardware and software companies
- CPD organisations
- Commercial providers of ICT CPD
- Independent consultants
- Online networks
- Professional associations

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- Government-related initiatives
- Software publishers
- Schools.

Table 1 The number of interviews and focus groups undertaken by the research team

Group	Notes	Number
Selected Providers covering all key categories	More completed questionnaires than numbers interviewed. Some completed the questionnaire as part of the interview. 7 more interviewed to raise total to x30 participants.	23
Leaders	More completed questionnaires than numbers interviewed. Number increased to x40 through use of focus groups.	22
Practitioners	More completed questionnaires than were interviewed. Numbers participating increased to x60 through focus groups and interviews.	12
Teachers reluctant to use ICT in classrooms	Selected by peers as professionals with substantial concerns about the application of digital technologies in classrooms. 6 did not fill in the questionnaire because they found this too mechanistic as an approach.	12
Practitioner and leader focus groups x 6	Mixed groups assembled online or face-to-face at conferences and in schools who provided collaborative judgements on key issues 75% practitioners = x30	41
Leaders/Practitioners	7 respondents combined leader and practitioner roles and answered from both perspectives.	16
Provider/Leaders	11 respondents combined provider and leader roles. Not all of these completed the online questionnaire	11

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Mixed groups	Telephone or Flashmeeting conversations/interviews prior to respondents completing the online questionnaire	27

Data collection

The data collection was hampered by a late start in December 2009 which meant that schools were involved in seasonal activities. Teachers were not always able to find time to fill in the questionnaire: they were, however, willing to be interviewed on the phone. The greater challenge was the three-week period at the beginning of the Spring term when many schools were closed due to adverse weather conditions. This meant that the research team could not reach some teachers who were not in schools. The practitioner category was the most affected by these problems and focus groups were set up to reach participants face-to-face and online.

Overall the methods included: in-depth interviews, base line questionnaires, focus groups and qualitative data analysis. As noted already, a digital concept maps was also used as a means of gaining insight into the ICT CPD Landscape from the perspective of all the players.

Interviews

Telephone and face-to-face interviews represented a central data collection tool. 23 providers, 22 leaders and 24 practitioners were interviewed. During the data collection period it become clear that the operators in this field often have complex and interrelated roles that include aspects of the work of providers, leaders and practitioners and that it was not always easy and, indeed, possible, to keep these roles separate. This is discussed in the interviews and the overlaps will be highlighted in the analysis.

The majority of the provider and leader data was gathered through face-to-face and telephone interviews. Some practitioners were also interviewed as well as completing a questionnaire. Twelve of the 24 practitioners interviewed had been identified by colleagues as reluctant in the use of ICT in their classrooms. The

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decision to interview reluctant practitioners was made in an attempt to ensure a fully representative data sample and included teachers who, arguably, need, and can benefit from ICT CPD most. The qualitative interview approach was chosen for three reasons: firstly, the objections about digital technologies in classrooms were so broadly ranged that adequate questions were difficult to formulate. Secondly, because teachers who are reluctant to use digital technologies in classrooms are no longer necessarily technophobe, they are harder to identify as a group. Thirdly, many in this group are opposed to filling in questionnaires that they consider to be a mechanistic tool that cannot capture their deep-rooted concerns. They did respond well, however, to face-to-face and telephone interviews.

Table 1 provides the figures for those who were interviewed by the team or who joined focus groups online or face-to-face. Not all of those who were contacted personally also filled in the questionnaire. Others filled in the questionnaire but were not available for interviews or focus groups.

Baseline questionnaires

The questionnaire was comprised closed and free text, open questions. 26 providers replied to the questionnaire. On the basis of desk-based research, discussions among research team members and with the funder, a list of key providers was identified which was deemed to be a representative sample of providers in the ICT CPD field. The large majority were then interviewed so they could elaborate on the issues the questions raised for them. Five more providers were interviewed although they had not replied to the questionnaire as expected. A number of providers on the short list did not respond and appropriate substitutions were made from the long list in these cases so that a full range of provision could be analysed.

Twenty-seven leaders and 29 practitioners replied to the questionnaire. Only 15% of the questionnaire replies are from primary schools and, therefore, differences between primary and secondary teachers are difficult to determine from the data. This balance between the phases was improved in the interviews and focus groups.

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The baseline questionnaires were sometimes filled in during the interview and sometimes completed beforehand or afterwards. This qualitative evidence provides some helpful comments on providers' broad perceptions of the ICT CPD field and the teaching profession's various reactions to what is on offer to them. On the other hand, the statistics that are drawn from the contribution of nearly ninety providers, leaders and practitioners can only be seen as a guide to overall trends as the number for each group is, statistically speaking, low.

Focus groups

The collaborative views of 11 leaders and 30 practitioners in six online or face-to-face focus groups were summarised on issues they considered to be important. The input from interviews and focus groups raises the total of primary practitioners involved to 30% of the 60 practitioners whose views were surveyed. The members of the focus groups also contributed to the collaborative map and provided key themes used to inform the analysis. The quality of this collaborative data was often richer than the answers on the questionnaires because the group participants were stimulated by the replies of peers.

Qualitative data analysis

The raw data was also analysed using Nvivo. The main reference frame used to create the coding were the research questions. The codes were structured around the 3 different questionnaires and the themes from the research questions were organised under these main headings. A grounded theory approach was adopted when the data was coded as this allowed flexibility for new themes to be added which responded to the research questions (Strauss and Corbin 2008). As this research aimed to develop the understanding of the current situation of CPD ICT in England it was particularly important to achieve a degree of iteration with the coding frame to allow for the very latest overview to be gained.

Coding was conducted with Nvivo using 'tree nodes' as a means of emphasising themes under the main headings. The data was reviewed and then common words, phrases and themes were coded. The main themes were judged by the frequency of

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occurrence of the codes, as well as any links that emerged between the three groups of respondents.

The collaborative digital concept map

As noted already, this research adopted concept mapping as a means of generating, visualising, structuring and classifying areas that were deemed relevant by researchers, other experts and key stakeholders in the context of the ICT CPD landscape in order to identify a representative sample of informants and to formulate relevant data collection instruments.

Multi-dimensional Concept Maps (MDCMs) as modes of conceptualisation can be multimodal, multi-layered and multi-authored (Preston 2010). The reasons for the team choosing an MDCM as a key research tool were several:

- the MDCM provides an at-a-glance overview of the ICT CPD Landscape;
- the use of the MDCM involves participants from the ICT CPD community in the collaborative process of identifying representative players and the influences on them;
- a digital MDCM is easily and immediately altered;
- the concepts can be demonstrated to a group or individual with the MDCM on a presentation screen;
- focusing on a MDCM in collaborative group discussion can stimulate rich judgments about the subject in hand;
- branches can be used to indicate key areas of interest;
- multi-layering can be employed to foreground the detail when required;
- participants in the research can add to the map and modify it;
- MDCM presentation of well known data can be a catalyst to rethinking well established concepts;
- MDCMs can be authored and shared remotely regardless of location.

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Some potential disadvantages are:

- not all the participants may be comfortable with the visual representation of concepts because of possible cognitive dissonance caused by the expectation of linear, text-based information;
- some participants may have difficulty in interpreting the meaning of a MDCM, e.g. because of lack of familiarity with the use of a map to develop ideas or because they may not agree with the structure;
- the comprehensive, extensive and multilayered nature of a digital MDCM can be challenging for conventional publication modes.

As the use of collaborative maps as research tools is still relatively new it was expected that some issues would emerge and some lessons would be learnt about using concept maps in a research context. On the basis of our experience with an MDCM-based approach, we feel we can offer concept mapping up to fellow researchers as a useful and legitimate way of collecting qualitative data.
The original elements of the concept map were arrived at through an iterative process during a series of face-to-face meetings of the (extended) research team. This was on the basis of their respective knowledge of the domain and their knowledge of the background literature with individual elements arranged intuitively according to the perceived importance of the concepts.

Relevant concepts were collected and then classified into groupings, branches or areas, with the goal also of visualising and representing connections between them. The process was collaborative, multi-authored and based on group consensus. It was also multi-layered and multimodal in that the software chosen (MindMeister - http://www.mindmeister.com/) allowed for the augmentation of individual nodes and entries with digital glosses. The radial arrangement of the branches of the map disrupts the prioritisation of concepts that would be typically associated with hierarchies. This associative orientation encourages users to enumerate and connect concepts laterally. (see Figure 6) Invariably, the degree of detail across the different nodes and categories varies and entries under individual categories have to be viewed as offering examples (influenced by the perceived importance of possible

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examples by those compiling the map) rather than necessarily a fully comprehensive picture. Also, subjective judgements about 'best fit' had to be made for some entries and where it was deemed that individual items were of notable significance in more than one category, repeated entries were made. To achieve a greater fullness of coverage or a better understanding of the relative significance of individual nodes and categories targeted research would be necessary for each of them. This, however, was well beyond the scope of the current project.

The concept map fulfilled two functions in this research project: on the one hand it was used as a research tool; on the other it is an outcome of the research process, a snapshot of the ICT CPD Landscape by the research team on the basis of the data available to us at the end of March 2010. We readily acknowledge that the map to some degree remains subjective as it is based largely on perceptual data informed by the expertise and knowledge of the researchers in the field and feedback from a limited number of experts and informants from the field. This, we argue, does not, however, undermine its validity or significance as a conceptual model contributing towards a better understanding of the ever-evolving ICT CPD Landscape. The map, therefore, needs to be seen in the tradition of phenomenological and heuristic approaches to research and inquiry designed to explore and interpret experience from the lived experience of the researchers and one in which categories are neither fixed nor pre-determined but emergent and changing.

As the data in the field prior to this study was largely anecdotal and highly dispersed and this, to the best of our knowledge, is the first study of its kind, it was not possible to develop a picture of the prevailing landscape with reference to a full and established body of literature in the field. And, given the limited scope of the primary data gathering possible in the context of this project, we chose as our starting point a perceptual conceptualisation of the field on the basis of our combined knowledge of the domain and relevant underpinning sources. In order to ensure the validity of this approach, we asked informants to critically comment on the concept map we constructed as a frame for the study. In the course of the study we were able to validate some aspects of the map through explicit feedback from informants and we

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were able to fill in and triangulate aspects of it in relation to the data gathered from informants about their perceptions of the domain.

Given the limitations outlined above, the map must be viewed as 'work in progress' and invites further validation and 'filling-out' with reference to future primary data. In addition, in a fast moving policy climate any concept map is invariably out of date as soon as it has been 'fixed'. Therefore, no claims are made about the comprehensiveness of the map and, given its complexity, indeed the accuracy of all of its component parts. However, we assert that it represents a useful conceptualisation of the domain and offer it as a starting point for future research in, and exploration of this field. By presenting ideas in a non-linear manner, the resulting map is able to capture the landscape holistically.

Three branches were chosen to represent the ICT CPD Landscape: climate, supply and demand. The *Climate* branch was the focus of all the field forces that were considered as having an impact on ICT CPD Provision. The term ‘field forces’ covered a range of influences on ICT CPD provision and uptake. First were the socio-cultural and technological influences. During the study these factors became more precisely defined as the influence of emerging technologies and the currency and reliability of the technology in particular schools. Other field forces were defined as international, national, local and school level policy directives. The final branch names the stakeholders: influential groups of people both formally and informally constituted. These were explored at the local, national and international level. The research branch was split into two: organisations funding research relevant to CPD and ICT CPD and research models or models of learning that underpin or help interpret CPD research. The *Supply* branch defined all the providers of ICT CPD and the *Demand* branch indicated where the different professionals who required ICT CPD came from. This proved to be a successful outline that remained substantially the same although providers in the project made one significant addition to the map which was a branch identifying the software publishers who are increasingly providing ICT CPD.

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The building of the detail under each of the four branches took place in four stages: first, six researchers and research commissioners mapped out the area; second, the one hundred and thirty participants in three groups, teachers, leaders and providers, were asked to add their perceptions and amendments as they answered the questionnaire; third, twenty international experts in the ICT CPD Landscape were invited to comment; and, fourth, the six researchers and research commissioners reviewed the map again to see how it now linked with their original brainstorm about the ICT CPD field. Therefore, by stage four, one hundred and fifty professionals had been invited to add to the map. Stages two and three were aimed to provide triangulation by opening the map to four different groups who came with different perceptions of the field; teachers, leaders, providers and international experts. The international experts were researchers, teacher educators, independent consultants and companies that were agreed by the team to have an outstanding overview of ICT CPD in England because of their expertise in this field. The resultant map is an account of the field based on the subjective and collective knowledge of the professionals who contributed either directly as co-authors or indirectly through comments.

At each stage the map fulfilled a slightly different purpose. In the first stage of scoping the landscape, the MDCM was used by the researchers in consultation with the funders to define what might be a representative coverage of providers selected for primary data collection.

In the second stage during which the primary data collection took place, participants' views were canvassed on the map in order to explore perceptions from both the beneficiaries and the providers of ICT CPD. Seven Practitioners, 12 Leaders and 11 Providers commented on the map: a total of 30, approximately one third of the participants. This participation was intended both to validate the assumptions made by the research team and to draw attention to disagreements and areas of fluidity based on different perceptions. The collaborative map was included in stage two of the web questionnaire, which did not have to be completed at the same time as stage one. In some cases stage one was completed before the interview and stage two, the ICT CPD Landscape map, afterwards.

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The large majority of the practitioners considered this map to outline strategic national provision beyond their professional horizons. As a result only about 11% of practitioners were responsible for change to the map and this was often because they approached the exercise from the perspective of their multiple role as practitioner as well as leader and/or provider. Some practitioners perceived they lacked knowledge about the ICT CPD Landscape or they did not consider their knowledge to be worth recording; some also ran out of time and some found adding to the map challenging.

Also, twenty national and international experts in the field of ICT in education were asked to look only at the map. Due to time constraints the response rate remained small (n=3).

The extensive data provided by respondents resulted in largely factual, not conceptual changes to the map.

The researchers decided not to give the respondents open access to the map because of the danger of inexperienced mapmakers making unintentional changes and/or deleting sections by mistake. This had already happened when the researchers and funders had been given full access in the first stage without specific training in the software. However, retrieval was possible because in MindMeister the map provides a timeline where old versions can be seen and the progress of the composition explored. It is also necessary to note that although the first and second level branches were consistent and easy to read, this was not always the case with branches in the lower layers.

The most successful means of encouraging participants to engage was when researchers and interviewers looked together at the map and discussed participants' suggestions. These were noted and added later by the research team.
One important methodological outcome implication of our work relates to the future use of MDCM as research tool is the need to keep the complexity and size of the map manageable.

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The Primary Data

As is the case with many studies collecting an extensive amount of data, project reports can often only provide an overview and discussion of the main findings. This is also the case here. The raw data, which is extensive and detailed, is not presented in this report but has been made available to the separately to the funders as explained below.

Given the scope of the project, this report only contains the key findings per group of informants: providers, leaders and practitioners. In addition, we offer a brief discussion of the landscape map as well as a comparison between the views of leaders and practitioners. A number of limitations need to be borne in mind. These relate to issues about representativeness given the small sample size of the survey, the qualitative approach of the study and the difficulties of involving some groups of practitioners in the project.

Overall this small-scale qualitative study captures the views of 130 professionals, experts, providers, leaders and practitioners, involved in the ICT CPD Landscape in England in 2009 – 2010. Approximately 30 from each category answered the questionnaire and the percentages that follow are based on these numbers (n = 90). The regional representation is good although it was not possible to guarantee an exact balance of the complex types and categories with such small numbers.

In the discussion the results from the questionnaire are supplemented by the views of approximately 40 additional professionals through interviews and focus groups. The interviews provided the richest area of information about this complex and changing landscape although there is not the space here to explain the individuality of the responses, only to provide some broad-brush judgments.

Some of those who were interviewed had not been prepared to answer a preparatory questionnaire because they found this kind of research instrument too reductive and mechanistic to elicit qualitative information about individuals. Interestingly, these were mainly the practitioners who had a range of reasons for not wanting to use computers in classrooms because they considered them to be reductive and

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mechanistic tools for teaching and learning. Another comment on the data quality is that some of the qualitative evidence from the focus groups was particularly rich as the members of the group had debated with each other to reach a collaborative position on some key questions about the ICT CPD landscape rather than providing an answer in isolation from their peers.

In view of the limitations of this study, the judgments and interpretations made by the research team must invariably be treated with caution. The landscape is also complicated by the fact that the distinctions between providers, leaders and practitioners is becoming more blurred and that some practitioners are seeking more informal peer to peer modes of ICT CPD.

The findings

The Landscape Map

As has been noted above, the research team conceptualized the ICT landscape as comprising three main sub-domains: climate, supply and demand. Together, they comprise a complex picture which is represented in the form of a concept map, a zoomable online version of which can be accessed at http://tinyurl.com/ict-landscape. Only the final, validated version of the Landscape map is linked to here to avoid confusion.

Previous mention has been made of the ways in which the research team conceptualised the ICT CPD landscape and represented it in the form of a concept map: the main domains were those of Climate, Supply and Demand. Each domain can be examined in detail: many of the nodes and sub-nodes also contains notes, documents and links that provide further details of some of the research findings. The map itself can be accessed at http://bit.ly/dinYhH and can be exported in a number of formats for further scrutiny.

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SUPPLY: the providers' perspective

The sample

The report aimed to include providers that represented most of the main ICT CPD provider types. Representatives from the Provider group were invited to take part in contributing to the map and/or the interviews, thus the resulting map is indicative of the range and nature of current ICT CPD providers. These can be found on the MDCM defined as:

- Local Authorities (LA) including National Strategy-funded consultants and ASTs,
- Higher or Further Education involved in teacher education (HE & FE) including TDA-funded schemes,
- HE/FE affiliated organisations (e.g. London Knowledge Lab),
- other government-funded, e.g. Connexions, City Learning Centres (CLCs), Regional Broadband Consortia (RBCs),
- member-funded associations (e.g. Naace),
- partner-funded professional organisations (e.g. MirandaNet) incl. communities of practice,
- commercial suppliers and independent/individual providers,
- formal and informal ICT CPD by members for members (e.g. 'Teachmeet', free online CPD).

The organisation size is a factor in CPD with the largest offering "100 different courses, running 5000+ scheduled courses nationally each year, in the region of 25000 delegates and onsite consultancy support to schools and LAs - total on-sites 2000+; in the region of 10000 delegates" and "US, Hong Kong, Singapore, Australia, Cyprus, Malta, Germany, Falklands, Brunei, Belize, Belgium, The Netherlands".

At one end of the scale some schools work with very few of these types of providers, at the other end of the scale, some schools work with a broad variety of providers. In addition, some individual professionals are increasingly choosing to work not only

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with formal providers such as universities, but also with more than one informal ICT CPD provider that are as different as Naace, MirandaNet Fellowship and so-called 'unconferences' such as 'TeachMeet'. The outreach of many of these informal groups is increasingly international although the overwhelmingly predominant language is English. The appeal appears to be that these professional learners using informal routes to information such as blogs are more in charge of their own agenda than they can be if they pay for formal accreditation.

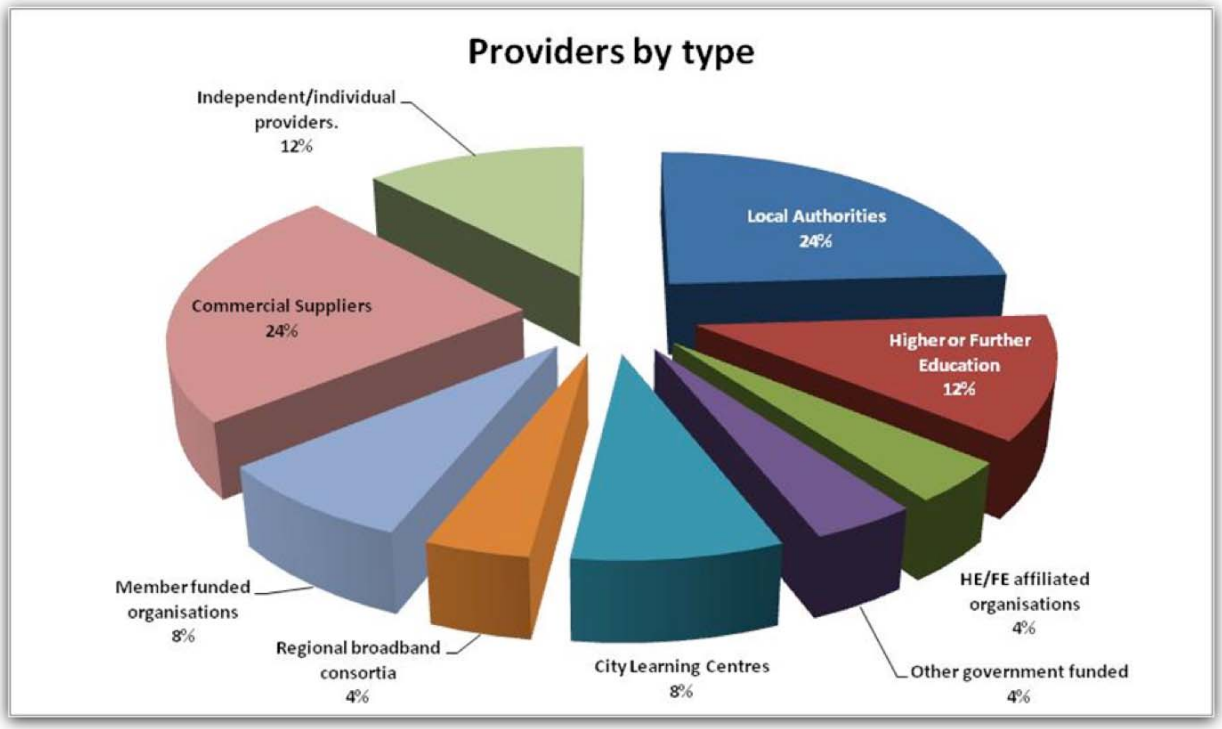

Figure 4: Provider respondents by type

Thirty providers in all were interviewed; the breakdown of respondents from the Provider group can be seen in Figure 4 above. This is a small group in research terms and means that the findings can only be interpreted as emerging trends. The interpretations of the data expressed here will need to be followed up by a larger study before they can be established as secure. However, the pattern of local and regional provision seems stable. The market range is predominantly local as defined by local authority boundaries, although this is sometimes interpreted as “regional” in relatively compact areas such as London. Some providers are involved in national

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CPD but only a few participate on the international landscape. Most providers are school focused but some include LAs (Advisors, SIPs, Senior Inclusion Officers, Management Information System teams, Consultants), CLCs, suppliers, commercial, product users and government. Of those that are working with schools, the most frequently mentioned audiences are teaching staff (including QTS, ITT, Information Technology Teacher Educators), coordinators, Learning Support Assistants and non-teaching staff, administrators, governors, SENCOs, pupils and some parents, with occasional mention of local residents. Remarkably few mentioned head teachers as a target group and senior leaders were also a relatively rarely mentioned group; supply teachers and ASTs were not mentioned as audience groups.

Providers' priorities

Figure 5: Word frequency map of providers' priorities

The word frequency map in Figure 5 gives an at-a-glance view of the providers' priorities as expressed in the questionnaire. As would be expected, teachers, schools, courses, learning are most often mentioned. However, 'training' is mentioned more than CPD which may suggest an underlying emphasis on short

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courses and skills training. This observation would need further investigation to be considered secure but encapsulates trends mentioned in this study. The appearance of ‘online’ delivery also indicates growing awareness of this mode of CPD.

Course design

The type, number of courses and number of participants varies across the sample. The structure of LA courses is very similar to each other as is the content and method. Commercial providers have great variations in their offerings.

The common course length for most LAs is half to full days, series of sessions and in-school CPD. Some providers have a group maximum – this occurs mainly within commercial respondents while others take whoever attends.

Providers are beginning to notice that teachers often use social networking sites as a means of communicating about ICT and ICT CPD. For example, teachers often share CPD experiences on such sites – the outcomes, the learning experience, the benefits and drawbacks of the course even to the detail of food quality.

Some teachers also recommend specific providers. The sites where teachers talk freely about their experiences are detailed in the leaders and practitioners’ sections under the headings 'communities of practice'.

Marketing courses

The main means of advertising courses was via fliers, emails, course brochures, and newsletters. Very few providers used online advertising or social networking sites, although they did acknowledge that teachers found out about their courses via word of mouth. Providers are beginning to notice some teachers who are already ICT aware are increasingly using social networking sites as a means of communicating about ICT and ICT CPD and are looking towards these as a means of marketing. However there are no figures as yet about the numbers of teachers using these sites.

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There is, as a result, no one group through which providers can influence schools[1]. Only one provider mentioned CPD coordinators as a route to market. Several mentioned the importance of professional networks. In general LAs recognised the importance of user group influence and focussed on leadership groups. Some of these leadership groups are by LAs but peer-selected ICT groups were also in evidence. One example of this is Cambridge. One provider observed: “All of these are created to provide a vehicle to disseminate good practice and to keep decision makers informed.” Larger commercial providers such as Capita also had powerful groups with recognised value and one government-funded provider had an extraordinary range of influence groups; some of these providers would merit a case study.

Evaluation of courses

Delegates were generally asked to complete evaluation forms following courses although some providers do not undertake course evaluation (8%) and the type of evaluations ranged from “happy sheets” to how the course would affect teaching practises. Few companies used online evaluation although where it was used providers noted improved reflection on the part of the learners.

Most providers who evaluated their own courses reported that they evaluated these using the delegates’ evaluation forms. A few providers mentioned that they had the facilitators' complete evaluation forms of the day and then compared these to those completed by delegates. Some providers evaluate the information gleaned in the light of changing local or national policies. In other cases a correlation exercise is undertaken to map delegate responses with that of every provider. One independent provider included observation of impact some time after the course and one LA commented: “Measuring impact is a challenge because of other influences. It is difficult to separate out the impact of our courses from other interventions going on in the school at the same time.” These influences might be: other training/policies/strategies, investment (or not) in technology, leadership priorities in

[1] The new OU initiative, Vital, may provide a one stop shop service in the future.

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school and so that are documented in detail in this study in the leader and practitioner sections.

Most providers have a Mission statement or Vision that links to the evaluation of courses against the intended outcomes, although a few seek to use courses as the means by which the vision may be achieved. One HE provider gave useful elaboration of what this means in practice: '*The mission statement includes the phrase 'to pursue excellence in education ... and professional practice'. ICT CPD relates to this professional practice. It also fits into our mission to engage in 'consultancy and other services to support and develop the quality of educational systems and related fields of policy and practice*.'

ICT CPD drivers

ICT CPD drivers were defined as the factors and technical advances that impact on the use of ICT, as well as national, local and school policies and attitudes towards funding technology.

The **school development plan or senior management agenda** was the most frequently mentioned driver of ICT CPD programmes followed by government policy and Local Authorities. A key issue for providers appears to be that schools decide what they need, not the LA as was the case in the past. What the schools demand may be different to what providers feel they need or it may not follow directly from government policy. In a market-orientated system, providers can often ill-afford not to adapt to what schools want whether they consider this demand to be appropriate or not. Most providers referred to the necessity of accommodating school needs even if they had identified other strategies (for) themselves.

A different concern relates to the fact that 23% of provider training focuses on software without apparent reference to learning outcomes or teacher confidence. This study did not have the capacity to investigate these tensions in detail.

There was consensus that issues of **supply cover and funding** had become major concerns with regard to teachers attending courses, their ability to learn or even

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getting uninterrupted time to develop what they had learnt. Many providers saw the future for CPD in blended learning that would include online, self-directed and face-to-face models; one articulated the concerns of a number thus: '*Unless policies change and money is released very little (will change)*'. More funding and a change in attitudes towards technology and ICT CPD were argued for by providers to improve the effect of ICT CPD.

Most providers felt that **government policy** including the Rose Review, Primary MFL, the Key Stage 3 curriculum review, National Strategies and Building Schools for the Future (BSF), were powerful drivers of CPD but often required '*translation by the Local Authority*' so that the vocabulary related to the individual school context and to the needs and outcomes of schools that may not, otherwise, understand the impact and importance of the policy.

This ‘translation' sometimes results in schools disagreeing with the LA. Some academies are independent enough to 'ignore' LAs. LA data and needs, e.g. target groups such as EAL, SEN, were also cited as important along with the importance of the head teacher’s vision for ICT and the pedagogies of Managed Learning Environments. Emerging technologies like handheld devices and learning platforms were often felt to be drivers on a more personal level.

Field forces

Field forces were defined by the funders as people influencing the design, provision, content, take up and delivery of ICT CPD; however field forces are themselves influenced by the wishes of the practitioners.

With regard to what providers perceived to be **teacher agendas** there was a significant divide. Many said that teachers wanted training that they could use in the classroom next day and the implication (or fact) was that this is essentially skills training. Another smaller group saw a move away from skills training towards longer-term strategies to do with embedding ICT and higher order thinking skills.

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Asked about influences and field forces, provider responses were diverse and did not always reflect the funder's definition of the term. 28% of providers replying to an open question reported the following as important influencers: educational blogs, Twitter, conferences and meetings or research; 16% felt Government Policy, Ofsted, Building Schools for the Future (BSF) and LA priorities to be important; 16% were concerned about the effect of school budgets and capacity; although a further 12% took heed of innovative school directions or of ICT leaders who in an open question were cited as such as Naace[2], Becta and AACE[3]. The providers who responded to this question said that courses are designed to reflect the influence of these diverse elements.

Ways forward

A majority of providers (52%) felt that better funding was a key solution improving the effects of CPD and this included personal CPD budgets, funding for release time and funding for change management. These providers felt that embedding ICT was not addressed by many current courses but should be. 36% felt that tailored programmes or tailored delivery was their suggestion of a way to do this. They also commented on the need to acknowledge that teachers are more ICT literate now than in the past. 28% of respondents reflected on the need for changed leadership priorities at school and government level also mentioning the loss of Local Authority ICT advisers as a critical factor.

DEMAND Part 1: the leaders' perspective

The cohort

The large majority of the seventy-five leaders who responded to the questionnaire, were interviewed or joined the focus groups had a responsibility for ICT CPD in school. Not many were senior managers but about 10% were involved with SiPs or were ASTs. A typical comment from an ICT AST leader in school was: '*Whole school INSET and small group and individual training is provided by me as part of my AST*

2 Professional association for those concerned with advancing education through ICT

3 Association for the Advancement of Computing in Education

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duties.' Some senior managers in secondary schools (10%) and some heads in primary schools (10%) with a more strategic post also replied. As a result the replies tend more towards ICT from a subject stance than ICT as a strategic tool for change. Other replies came from LA advisers who saw themselves as leaders in changing practice rather than just providers of courses. This blurring of roles became more apparent when professionals who were interviewed began to explain the complexity of their roles. Many leaders in schools were also practitioners and other leaders also saw themselves as providers. Some interviewees were in different part-time posts, consultancies and projects that gave them simultaneous experiences in all three roles: provider, leader and practitioner. These multiple roles are a growing phenomenon in education.

Many of these leaders aim to develop effective classroom practices in schools that result in a situation where ICT is so well integrated that it has become a seamless element in teaching and learning strategies. One leader said,

> *'Effective ICT practice can be best seen where technology is embedded - integrated into practice such that the technology becomes 'invisible' i.e. it is no longer an activity which has been 'added on,' it is just a natural part of the teaching and learning process and used in the seamless way that speaking or writing are.'*

Links between personal and professional uses of ICT

Leaders in ICT who are teaching other teachers are not only proficient in professional uses of ICT in classrooms but they also make extensive use of technologies in their personal lives as well. These two uses, personal and professional, reinforce each other in several important ways. The following comments provide some deeper insight into the leaders' sense that professional and personal uses reinforce each other:

- *'I am an enthusiastic user of video-conferencing, especially for international communication between schools and between family members at home on Skye.'*

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- *'I use games consoles both for entertainment and teaching.'*
- *'One reinforces and helps develop the other. For me the relationship is seamless - one merges into the other.'*
- *'I use the computer all day, every day.'*
- *'The two are very much interlinked, I use it to help me manage my daily life at home and do the same with work.'*
- *'I use technologies personally for social and business reasons and professionally as a tool to inform and facilitate practices.'*
- *'My professional work leads me to explore areas in leisure pursuits that I would not usually contemplate except that I have work experience of something similar.'*

Another respondent used the detailed questionnaire list of digital technologies to reflect on what he would like to learn next. The sense of overlap between personal and professional interests is exemplified well here:

> *'I am confident in using digital technologies but would like to learn about podcasts for myself and movie making for the children. I would like to see our regional portal back on the internet as I found it a very useful tool for engaging learning and I am disappointed that it has been taken off. It would be nice to see more flipchart resources on government websites for use in the new frameworks.'*

A few leaders talked about this issue in relationship to whole staff learning. Many of the leaders suggested that learning was reinforced if a teacher was using digital technologies at home and at school. For one leader a learning platform was seen as a stimulus to embedding staff learning for example. Similar comments were made by other leaders:

> *'I think personal and professional uses interlink as you gain experience from your own use which can be put into practice in the classroom.'*
> *'I find that the more I use ICT at home the more uses I find for it at school and vice versa. The more confident I become the wider my horizons stretch.'*

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'There is, suddenly, a significant overlap between the uses of ICT personally and professionally amongst our staff. Greater personal use of ICT by staff has made them more confident about using ICT professionally. I work within ICT department and everything revolves around ICT and questions like: why not teach and train people to use ICT for everyday life's necessities for our kids at home as well as learning in school. It would be fun. You could have all these function in one machine.'

Assessing and meeting staff needs

A leader who is sympathetic to real needs of the staff and the challenges they face in learning about digital technologies is likely to be at the heart of successful of in-house ICT CPD as well as an effective programme of external provision. It is not surprising where leaders are dismissive about the particular challenges for professionals in learning about digital technologies CPD programmes, if they exist, are not successful because they are not tailored to teachers' real needs.

ICT programmes are often part of the general provision for continuing professional development in schools. A very wide range of different methods for needs analysis are being used in schools where there is an organised CPD programme aimed at meeting the individual needs of staff. However, a few schools do not have an agreed plan for developing ICT CPD programmes for staff because of a wide range of challenges including the lack of provision for the time teachers need to learn. Insufficient funds and resources can be a problem that is often the result of a lack of prioritisation by the senior management team. The location of external courses is also a factor in deterring staff from attending. In detail the leaders said that the basis on which the school choose from the ICT CPD provision available were:

- value for money;
- recommendations;
- previous relationship to the provider;
- the time required to do the training;
- the relevance to identified needs;

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- the location;
- the perceived quality of the training;
- staff timetable demands;
- adaptability of the programme.

Other factors mentioned once were

- the potential to cascade the training down through the organisation;
- deference to national and school policies and priorities.

In terms of policy demands only about 10% answered this question but the few respondents provided some interesting information when asked in which ways policy had influenced practice. Some replies were positive:

- *'policy directives from government help us to set targets and drive forward';*
- *'NOF provided staff with basic ICT skills';*
- *'broadband access for all schools brought online resources and communication to schools';*
- *'computer targets gave the push to ensure schools provided funding for equipment';*
- *'learning platform directives have forced us to review our platform and where we are going'.*

One leader explained a problem that arises from one-off injection of public funding: *'As far as the literacy training goes the end of funding is the biggest problem. In this case, resources and training are still offered but no longer funded and the website is offline.'*

ICT CPD programmes choices

Most ICT CPD programmes are now run in-house and only about 20% of leaders are concerned about the lack of funds for external ICT CPD. In-house ICT CPD teachers are often supplemented by colleagues from the Local Authorities and relevant companies.

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Secondary schools appear to bring in more skills training sessions for particular products than primary schools. Currently most leaders of in-house CPD seem to be offering some kind of course in IWB use and learning platforms themselves as well. Very few leaders, however, plan ICT CPD programmes on the basis of government policy initiatives.

65% of all the ICT leaders thought that skills training in new digital products such as a MIS system or a learning platform was the most important kind of ICT CPD. This skills-based approach was prevalent amongst many of these ICT leaders who were generally specialists in the subject rather than senior managers looking at the management of digital technologies across the school. Nevertheless some ICT leaders were happy to promote the use of wider range of ICT CPD providers so that teachers had access to more variety.

Amongst the 30% who were thinking beyond skills, several examples of effective primary practice were cited that might be covered in courses which included good searching techniques, better work-based research methodologies and deeper understandings of software assessment and presentation:

- efficient internet searching for information
- excel for analysing information;
- video making for promoting speaking and listening skills, story writing etc;
- PSHE skills assessment software;
- using ICT to enhance learning, not for the sake of getting out the laptops nor to placate kids;
- using an audio editing tool to record and edit sound files to tell stories with sound effects;
- for monitoring, evaluating and underpinning work-based learning projects -using information with spreadsheets for analysis of data;
- for children using email to improve writing skills and also using video to record and develop oracy skills;
- using ICT to facilitate learning- children to use their research skills and presentation skills;
- effective use of IWB software to make lessons more interactive for the children.

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Secondary leaders produced a list of effective practices underpinning by technology that reflected projects with older learners. They also wanted more emphasis on curriculum learning. They also wanted schools to develop more effective practice with ICT to communicate and collaborate with parents. The effective practices they recommended included:

- 24 hr course availability;
- accessibility from home;
- marking the work online and communicating with students to improve their knowledge;
- digital projects that increase engagement in learning;
- uses of alternative forms of recording allowing for higher level or achievement;
- supporting lessons with self-generated material by teachers and students;
- shared systems for choosing the right software for the ICT task;
- generating podcasts on key subjects;
- using software tools to enhance learning, e.g. using PowerPoint as a planning and writing tool for project work;
- using digital tools to resource and manage learning practices;
- using ICT to enhance learning: “not for the sake of getting out the laptops nor to placate kids’;
- using an audio editor for recording, slicing, and mixing audio to record and edit sound files to tell stories with sound effects;
- using spreadsheets to record pupil grades;
- use of mailmerge to send letters to parents;
- using online resources in lessons.

Overall software developers were asked to provide more products that cover more complex forms of assessment of learning. Extending learning into the home was requested as well as innovative resources that encourage collaboration particularly across cultures and countries for both teachers and children.

Pedagogical needs were represented by suggestions like:

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- IWB training that is not board specific;
- ideas for teaching ICT skills in a cross curricular way;
- online mentoring and facilitating strategies;
- courses in creativity using digital technologies;
- recorded tuition sessions on DVD and video;
- digital literacy in its widest sense.

In terms of professional development one individual made a request for a course for senior managers that would change attitudes to personal professional development: '*the culture of teaching doesn't recognise the imperative for undertaking personal professional development in one's own time'.*

Promoting ICT CPD

The following comments cover a range of models for promotion that depend on the role of the ICT leader, the capacity of the workforce and the budget available:

- sharing of good practice/use and applications;
- being available to lend a hand, offer support/ direction/ confidence;
- distributing information about of events and course through email, flyers and notices via an ICT working group in the school;
- promoting staff learning through constant feedback, peer review, development of really good training days and allowing teachers to feedback at the end of the day;
- *'lending out total training DVDs that I purchased myself';*
- *'ICT CPD is two way in our school. We have a monthly CPD commitment to attend or provide training'.*

Some use examples from the communities of practice they create or are members of to promote ICT CPD:

'I promote ICT CPD through focus groups, directed as part of the SIP and CPD programmes. I've also started a Trying New Technologies (TNT) group in the region.'

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'I inform staff about informal events organised by teachers for teachers, e.g. TeachMeets, MirandaMods and MFL Show and Tells.'

LA leaders were going out to all campuses, providing voluntary training sessions and sending out videos with tips, regular CPD briefings and CDP evaluations and feedback. One adviser said that they also talk with senior managers about ICT CPD. By running whole school ICT CPD another adviser developed personalised programmes. Web 2.0 tools were also used as were noticeboards, VLE, email updates, organisational CPD calendar, internal ICT newsletter, internal 'Just in Time' emails, internal ICT CPD programme and email alerts. One secondary leader in a large school where the learning platform is well established is now creating space on the learning platform where external ICT CPD programmes are promoted to staff.

But leaders complained that finding out about what the providers offer is not easy because no clear route exists to access information about CPD and ICT courses. However, internet searching was cited as a key method for looking beyond local providers of ICT CPD such their LA.

Evaluating courses

The leaders also provided information about the ways in which their school evaluates the ICT CPD experience. Overall this is an area which is not well developed.

One leader who was proud of this prowess in this area explained: '*We continually assess staff skills levels and amount of use they make of ICT and lesson observations and impact on pupils.'*

Primary leaders cited in particular:

- the self evaluation framework (SEF)
- annual reviews
- departmental discussions
- Teaching and Learning SIGs
- feedback from staff (formal/informal)

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- forms distributed at the end of the course.

Secondary leaders provided more detail about their approach using similar methods to the primary group. They said they use:

- a standard CPD review/ evaluation form is use throughout the school so that we can compare responses although this is not ICT specific;
- the Local Authority's evaluation criteria;
- CPD evaluation forms and departmental review combined;
- a questionnaire and oral feedback;
- evaluation through performance management;
- through departmental minutes and development plans.

Another leader said that the main evaluation question for their staff is: '*Has this ICT CPD resulted in effective use in the classroom and do the teachers feel confident in using it?'*

One insightful leader was not happy with the evaluation measures in place in-house: '*Currently we only evaluate through surface evaluations - 'customer satisfaction' type feedback. In my opinion this provides little measure of impact either on teachers or students.'*

The most valued ICT CPD

Leaders had clear views about the value of ICT CPD. About 75% of leaders thought that using digital technologies is important, or very important, in teaching and learning. In contrast a very small number of institutions represented in this survey do not value ICT CPD at all.

When the leaders were asked about the most valuable ICT CPD for their institution, 65% of these replies were entirely related to hardware and software skills training rather than institutional change. These leaders said that the most valuable ICT CPD programmes for their institutions are:

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- courses covering basic applications installed on the school's PCs like uses of whiteboard, digital cameras, microscopes etc;
- demonstrations and then hands-on sessions followed up by time to consolidate;
- a varied skills programme that does not reach all the staff with the exception of Apple training every month;
- one-to-one sessions on technology and software;
- training staff to make more effective use of basic applications such as Excel and PowerPoint in their teaching and administration as well as learning how to use interactive whiteboards and to search for online resources more effectively:
- courses that do not focus on the 'capability' of the teacher with the technology, but on understand what works in terms of pedagogy and an ethos which encourages risk taking. If it doesn't work learn from the experience!
- Engaging in the dialogue with young people… they are best placed to articulate what teachers need to know.

This skills approach to ICT CPD was summed up by one leader who said: *'We do not need any courses unless there are any software or hardware updates to pass onto staff'.*

35% cited programmes that focussed on pedagogical or strategic uses or exchanges between teachers about practical projects that were intended to raise staff awareness about the potential of digital technologies to underpin change in teaching and learning as well as administration.

Main models cited were variations on:

- annual one day training course with built-in learner modules to be undertaken throughout the year;
- courses encouraging teachers to engage in sharing knowledge on underpinning theory as well as practice;
- CPD that supports user needs - teaching and learning or data management or creativity;
- in-house sharing of experience and good practice.

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There was also a consensus that the key to success is to ensure that the technology is always available and working efficiently: '*Nothing puts teachers off more than resources that they have planned to use being unavailable or services off line.'*

About 10% replies - all primary leaders of staff training offered answers that were similar to this: '*I can't answer this question as it has been so long since any one in our small primary school had any CPD in ICT.'*

Obstacles to evaluating effective practice in classrooms as a result of ICT CPD include the restrictions of current assessment methods and senior managers who do not understand the potential of what good ICT CPD or robust approaches to assessing the impact of ICT CPD might offer.

85% of leaders have had ICT CPD themselves within the last year, although these leaders are increasingly taking informal routes to learning rather than the conventional formal route. The differences are cited below:

Formal

- ICT Masters Degree '*that I see as part of my job and responsibility as Teacher in Charge (TIC) of ICT*';
- Learning how to make video;
- Microsoft Certified Application Specialist and Microsoft Certified Systems Administrator courses;
- *'Cross-phase and cross-tier interaction with practitioners and researchers when we were all invited to become co-researchers- run by MirandaNet and Brunel and funded by Becta. This resulted in a publication based on our reflections about digital tools in schools*.'

Informal

1. TeachMeets in various places in the country and at BETT;
2. informal gathering of advisors looking at technologies available;
3. one to one training on my terms with an 'expert' to answer my questions;
4. attendance at conferences;
5. various short presentations at BETT;
6. attendance at a conference;

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7. MirandaMods in person or online;
8. *''experts' online I can quiz according to the needs of my current projects staff showing what they are doing, relevant, direct and of use in own establishment'*
9. one to one VLE training in response to need
10. RSS feeds to expert bloggers.

One leader explained the value of this kind of informal learning*: 'It is available whenever there is something I am interested in learning or need to learn in order to teach it. Why not?'*

One leader described in more detail the reason why microblogging, Twitter in his case, was so effective for him: '*Becoming acquainted with Twitter has been my most effective learning experience because I can extend both the quality and scope of my personal learning according to need. As a consequence I now have access to a much wider range of learning experiences.'*

Another leader explained the thinking behind this general trend: '*Technology changes so frequently that I need to stay up to date in order to teach industry standard software and prepare students for the world of work. Students also use technology everyday and it is important to know what engages them in order to teach effectively. Formal courses cannot provide this 'just in time' experience.'*

This emerging trend towards informal learning that was found on a wider scale amongst the practitioners whose details follow.

Reasons for engaging in ICT CPD

Most leaders seek training that matches with the learning goals they have set for themselves: some look at institutional goals and a few relate ICT CPD to policy initiatives like Harnessing Technology.

About 50% of leaders admit that staff have a more limited choice about the kind of ICT CPD they can undertake than the leaders do. They also think that the

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unreliability of IT systems in schools is a major cause of teachers' reluctance to learn about ICT and use ICT in classroom.

Both primary and secondary leaders use a wide range of evaluation tools to grade the ICT CPD sessions, but few have moved towards an evaluation of impact in the classroom. Leaders consider that although ICT CPD is valued in their institution, accreditation of CPD is not.

In hardware terms, laptops and IWBs are considered to have had most impact on professional practice followed by projectors without the addition of an IWB. Where learning platforms are embedded they are perceived as having some impact already on teaching practices.

Leaders work with a wide range of LA, commercial and government partners but there is no clear pattern. However, where Advanced Skills Teachers are available they appear to have increased the availability and the range of ICT CPD that staff can access by providing another expert in the school who is highly motivated.

The significance of communities of practice

Many leaders were enthusiastic about the value of communities of practice in contributing to teachers' learning and reducing professional isolation. Many leaders belong to more than one community of practice themselves.

Many leaders saw social networking as a valuable resource for creating a sense of community that could 'inspire all teachers and provide access to innovators'. All the questionnaire respondents were articulate about the features they liked. e-Communities of practice (eCoPs) they said:

- provided timely information;
- are available anywhere;
- facilitated meetings of like minded individuals;
- are widespread and global;
- can be customised to be specific to individual needs and levels of knowledge;

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- can be followed up at times of convenience.

The leaders saw e-CoPs as a better way of organising people to share views and ideas and collect resources together. In particular leaders liked the fact that e-CoPs could be deployed for facilitating Special Interest Groups (SIGs).

Some of the comments that were made suggested a significant commitment to these e-CoPs:

- the forums provide a useful way of finding out how to do things;
- good for gaining new ideas.

The ICT leaders talked about the value of 'give and take' that was embedded in the sharing of information, keeping them up to date and able to investigating new initiatives. Only one respondent offered a concern saying that e-CoPs have huge potential but present time constraints as well.

The professional opportunities of networks were highly valued for

- learning about new developments in ICT and how they are used in school;
- sharing good practice and collaborating on resources.

As far as membership of CoPs was concerned about two thirds of leaders were members of CoPs. Several leaders thought that the increasing use of Facebook and Linkedin amongst adults was raising awareness of this medium 'generally amongst teachers and this would result in more support in safeguarding learners'.
This step change in online behaviour suggests that teachers are becoming more used to interacting with others online in applications like Facebook and sharing ideas and thoughts.

> *'As they become more comfortable with this in social areas of their lives I think community of practice networking will begin to develop professionally too'.*

Some leaders are already finding educational networking useful. This form of knowledge exchange was also praised for its potential as a mechanism for reducing

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the isolation many teachers remark on, particularly those in subject departments with only one or two members.

One leader summed up the ways in which she used online community support:

> *'The use of Twitter in the classroom is already part of my practice. The service is excellent for building up a Personal Learning Plan (PLN) and gaining instant advice etc. I love the notion of supportive communities sharing ideas and experiences: using online networking such as concept mapping and wikis and shared docs. What Twitter and my other networks give me all the time is informal, distributed, free CPD.'*

In the light of their articulateness it was not surprising that the majority of the ICT leaders were involved in a number of communities of practice and were clearly knowledgeable about the term. The e-CoPs they mentioned were international, national and local:

International

MirandaNet, Twitter, EdTechRoundUp, Ning, Delicious, ICT research network, Classroom 2, Promethean Planet, Facebook, Blogosphere, DIGG, Linked In, Googlewave, Yahoo MFL resources; Apple Learning Interchange, Apple Distinguished Educator, Googlegroups.

National

Naace, TES Resources Forum, SSAT, Wired Teachers, E-TeachMeets, SENIT, Frog, Exam Boards, BCS, AST, specialised headteacher and subject online communities.

Moodle Forums, Educational Professionals in Hospitals Network (EPiH-Net), SENIT, Augmentative and Alternative Communication (AAC) forum.

Local

West Kent Cluster Group, Learner Generated Contexts SIG

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Although some mentions, like Delicious, are resource driven they are nevertheless a way for communities to build knowledge together. Some leaders were sophisticated multiple users of different collaborative services for both professional and personal uses. For example one leader explained:

> *'I participate in MirandaNet and Promethean Planet and am also currently involved in a pilot for Fuse creator which also has a community of practice. We are also trying to set up an area of our learning platform for staff to share lesson ideas which they have found useful. Personally I use Twitter, Delicious, educational bloggers in general, Digg and LinkedIn.'*

> Overall leaders feel that practitioners as a whole have not yet understood how technology is changing the lifestyles of students. Many leaders also sense that assessment methods must change to meet the conditions of the 21st century in which formal methods of assessing written essays seem outmoded and force isolation on the learners who are used to learning socially. There is also concern that schools may not be able to sustain the need to improve digital technologies in schools because of competing financial priorities and will lag behind the technologies available in the home. Informal learning and discussion with peers and students may, in this case, be the only way that professionals can keep up intellectually with the impact on society of exponential technological change.

DEMAND Part 2: the practitioners' perspective

The sample

Twenty-nine practitioners filled in the survey and were interviews about their replies. The collaborative views of nearly forty practitioners were also summarised on issues they considered to be important in six focus groups. Additionally a further twelve practitioners were interviewed who had been selected by ICT leaders as professionals who were open about their reluctance to use ICT in the classroom. These replies have been combined in this practitioner section although the statistics are based only on the twenty-nine questionnaire replies and must therefore be

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treated with caution as these replies can only be seen to represent trends. Only 15% of the questionnaire replies are from primary schools, but input from interviews and focus groups raises that total to 30% of approximately sixty practitioners who have been surveyed. Differences between primary and secondary teachers have only been mentioned when they are significant.

Relationships between personal and professional uses of digital technologies

All the respondents to the questionnaire, except one, were mainly positive about using digital technologies as part of their personal and professional lives. Representative comments included:

- *'I could not, now, function without email to keep me in touch with my colleagues around the world. Whenever I see new kit, I think up new ways of deploying it in my classroom.'*
- *'I am actively seeking to introduce and embed personal ways of using ICT e.g. forums, mobile phones etc. into classroom practice.'*
- *'I am very interested in technology I use it personally and then try and use the skills and IT gained outside of the classroom to support my teaching and the learning of students.'*
- *'Personal and professional uses blur together - I am continually experimenting with ICT and learning new things (even in my spare time).'*
- *'The boundaries are blurred because at home AND at work I am as much learning to use ICT personally as I am professionally.'*
- *'My uses are personal - for social, entertainment and business interests & professionally as a tool to enhance learning practices.'*
- *'I am very confident using ICT both professionally and personally.'*
- *'It's an everyday event to use technology to conduct work, communicate and for pleasure. The more familiar I become with an application, the more at work the more likely I am to use it in the home and vice versa.'*
- *'The two uses are symbiotic.'*
- *'I use a lot of what I have learnt personally and referred it in my teaching in the classroom.'*
- *'I could use it more but do not feel confident.'*

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- *'The border is beginning to disappear between them!'*
- *'I actively use ICT for both professional and personal benefit. However, I use a wide range of ICT tools for professional purposes and only a few electronic communication tools for personal goals.'*
- *'ICT is key in hospital education for ensuring that patients remain in contact with their home schools and peers (email, video link etc) and also for hospital schools to receive and send info to home schools e.g. current work, reports, levels etc.'*

There were also negative comments. A selection of typical comments is listed here:

- *'I find having to use it all day in my job I do not want to use it very much personally.'*
- *'Personally I dislike the tyranny of Facebook etc. Feel young people are not sufficiently aware of how a casual teenage photo can have negative career impact etc. Also the competition amongst children to build up large numbers of ''friends' can be intimidating and cause needless anxiety.'*
- *'I shop on line but do not trust online banking.'*
- *'Professionally use of ICT is more helpful in some subjects than others, e.g. excellent for MFL but in small group work in English lessons I prefer to encourage social interaction (using film clips and word processing if necessary.)'*

Reluctant users of ICT in classrooms

The majority of practitioners believe that the use of digital technologies improves pupils' achievement, echoing the findings of Harnessing Technology (2009). The research team ensured that 20% of those interviewed were teachers who were reluctant to use ICT in the classroom. In previous studies teachers with reservations have been largely technophobic or very poorly skilled in digital technologies (OFSTED 2002, Preston 2004). In contrast in this small study, only one of practitioners was reluctant to use ICT in classrooms when the skills profiles were examined, and none of the leaders. Additional technologies the questionnaire

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respondents used were: video-conferencing, learning platforms, web bookmarking, games consoles and desktop publishing for designing publications, invites, cards, posters and newsletters. Only one respondent said that she tended to use digital technologies far more away from the classroom than in it. Positive comments for different applications used both personally and professionally were various. It was clear that none saw a division between personal and professional uses within the questionnaire respondents.

For this reason twelve reluctant teachers were selected and interviewed separately as they could not be identified by the previously successful methods since all the respondents were making full use of the digital technologies available to them both at home and at school. The teachers who were reluctant to use ICT in the classroom in this survey were selected by their peers and persuaded to participate in order to have their voice heard. Most of them were not keen to fill in a questionnaire as they felt that their particular concerns could not be captured by questions addressed to the majority. Yet some teachers, although competent users of technology in their personal life, were reluctant to use digital technologies in the classroom. On the one hand their stated objections to the use of digital technologies in the classroom covered a wide range of concerns including: unreliable equipment, poor support services, ethical and moral concerns, lowering of achievement and e-safety issues. On the other hand, the evidence suggests that teachers who have been reluctant to use computers in classrooms will revise their opinions if issues of unreliable school equipment and poor or non-existent technical support are solved. This has happened, in particular, when the school has moved into a new building with new equipment that is state of the art. In one case the school had not been maintaining the old systems with difficulty because of the projected move to a new building; a policy that had caused the teachers to reject ICT. Filtering on school websites was considered by some to be a negative influence on accessing resources to be used in the classroom and finding out about ICT CPD as well as dampening enthusiasm for innovation and change. Teachers who are reluctant to use computers in classrooms will revise their opinions if issues of unreliable school equipment and poor or non-existent technical support are solved. A fuller account is given in the section Demand Part Three.

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ICT entitlement

About two thirds of the respondents (62%) were able to choose their own ICT CPD programme. About one third (34%) did not enjoy this freedom.

The primary practitioners seemed relaxed about identifying their ICT needs. This reply was typical of their attitude: '*I identify my own needs through knowing what children need to do in the curriculum and being familiar with those applications that will enable us to deliver effective teaching and learning. Sometimes a local or national initiative means we have to devote time to that specific ICT area e.g. learning platforms.'*

The secondary practitioners produced a wider range of replies. Many said through self-reflection

and self evaluation. For example: '*I explore my needs myself in order to plug gaps in my ICT skills and knowledge. This is frequently done INFORMALLY, by asking colleagues.'*

A sample of the replies follows that mainly rely on mixture of strategies focusing on professional judgement:

- *'I concentrate on what would be of practical use to me'.*
- *'I rely on performance management, self-evaluation and guidance from our LA provider.'*
- *'I look at the courses available and choose things where I have a weakness.'*
- *'I have made choices based on my induction programme.'*
- *'I rely on my own professional knowledge.'*
- *'I base my needs on answers from networking with other professionals or on curriculum requirements.'*
- *'I base my choices on my interests and curriculum needs.'*
- *'We have a needs analysis questionnaire in school.'*
- *'I make it up as I find out what others are up to.'*

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- *'ICT is my subject. It is my responsibility to keep my knowledge up-to-date.'*

School performance management processes

The practitioners were then asked how much the school performance management process played a part in identifying their needs?

One reply summed up the few primary replies: '*Many staff have ICT training as part of their Performance Management targets and action. However, it is often difficult to implement for only one or a few staff due to cost of courses and supply. Hence we develop a whole staff focus in staff meetings and training days linked with a professional review programme.'*

The secondary practitioners' replies were divided between those who used formal needs analysis and those schools where this was not in evidence. Those who did not have formal approaches were very few. And the large majority saw ICT as an essential aspect of every teacher's performance management review or personal development review. NQTs pointed out they were not yet part of the Performance Review.

Just a few replies were dismissive:

- *'I fill in the form, set my own goals, but never seem to see any real training.'*
- *'We don't have PM.'*
- *'We have had the VLE thrust upon us without enough time and opportunity to implement it properly.'*

Frequency of ICT training

Most of the primary teacher had had some ICT training within the last year. Secondary trainers appeared to have had more training sessions in 2008 than 2009. However many mentioned on-going training that was organised by providers or often organised themselves. Increasing lack of funding did appear to be a concern as one example points out:

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> *'I attended the HHL (Handheld Learning Conference) in 2008 but a lack of funding would not allow attendance this year. Unfortunately a lot can happen in one year, and more so with ICT!'*

Only the secondary responses cited their providers that were a combination of commercial and in-house providers, universities and LAs. Informal provision from peers was also mentioned with an emphasis on the fact that this kind of provision was not necessarily only from UK peers. They also mentioned BETT as a source of informal learning.

Primary practitioners tended to decide to engage in ICT CPD whenever they saw a curriculum need. Secondary practitioners were often persuaded by the information that was derived through using Twitter to network with others as well as podcasting and video meeting with a chat text like Flashmeeting which is free. Some based their needs on their current project, others on conference information. One respondent was led by the needs of his doctorate.

Providers of ICT CPD programmes

The replies of the practitioners about who provides their ICT CPD mirrored the trend in this survey that identifies an increasing range of professionals identified as ICT trainers both within and beyond the school. There is also a trend for some practitioners and leaders from one school to be sharing their knowledge and skills within a school cluster.

This blurring of roles between providers, leaders and practitioners is a continuing theme of this study for all groups. In-house trainers are identified as departments or groups undertaking CPD that included ICT elements like the ICT/IT Department in a secondary school and the SMT in a primary school, school leadership groups, advanced skills teachers and innovation teams. Sometimes an individual was cited: informal support from a subject teachers with an ICT interest, the primary teacher with ICT responsibility, the ICT Co-ordinator, the ICT manager or the Director of ICT learning technologies in secondary schools. One school had brought in a well-known

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personality in the field to raise general interest of staff. In another case the SiP had been invited, but these individuals were difficult to find. LAs like VT Four S (Surrey LA) were cited. University-led courses were rarely mentioned by this group.

Commercial providers seemed to be particularly active and were praised for offering CPD as part of purchasing package e.g. Espresso and Smartboard. The Espresso example represents a different model as this is franchisable by the school. On the negative side there was some cynicism about the motives of commercial providers. One teacher said he would only consider a company as a provider '*only if they are aware of the needs of children and how their product can be used for teaching and learning - not all do and the training can be quite technical*.' Another teacher was concerned that: '*Most ICT CPD providers have an agenda so I would look for practising teacher led provision - anything else would be out of date by definition'*. Another teacher in this vein felt that the informal training provided by colleagues has been sufficient so far.

Another strand emerged where practitioners were seeking ICT information from broadcasters, publishers and the blogosphere. Those cited were the BBC, Teachers TV, Becta and Ray Fleming's blog. One teacher was using total training DVDs that he had purchased.

The clear trend was for schools to deal with a variety of different providers focusing on particular needs of staff and school. There was no clear pattern in this small sample but might be an area worthy of further study.

When the practitioners asked which ICT CPD providers they preferred and why, a different set of parameters emerged: the professional organisations. All the groups cited in this category were described with affection that appeared to relate to personal membership and/or commitment. Examples of this kind of comment about membership organisation are:

- VT Four S (Surrey LA) who personalise training and create follow up opportunities to follow;

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- industry professionals who use or have even developed the software;
- people I know and trust - like MirandaNet, exam boards, other practitioners whom I know personally or by reputation;
- in-house expertise;
- MFL practitioners who are expert in ICT;
- regularly use of online networks for ICT CPD such as MirandaNet, NAACE, OCR mailing list and other online groups.
-

Finding out about ICT CPD programmes

Teachers find out about ICT CPD programmes through a variety of traditional means: a personal network, personal recommendation, informal support through peers, through the post, network meetings, personal enquiry, flyers, internet, Union magazines, and marketing from Local Authorities, examination boards and associated universities.

The various informants in school were identified that could be loosely summarised as the teacher responsible for ICT like the ICT Assistant Head and the CPD co-ordinator, peers, subject co-ordinators, in-school/college/college specialists (providing demonstrations), staff in other schools/colleges. Conferences like the BETT show in London and the MFL resources forum were also seen as key opportunities to collect information about ICT CPD.
What emerges are some new approaches to gaining information that make use of digital technologies: email, search engines, blogs, surfing, online networks and chat sites. Particularly new in this area was '*seeing what others are doing on Twitter*' because this indicates a new kind of interactivity.

Effective ICT CPD experiences

When practitioners were asked what kinds of ICT CPD experiences had been most effective a surprising range of example were cited. Work-based learning was seen as the most important element of professional learning like being a National A2 Applied ICT Moderator for OCR or an ICT Mark evaluator. Lesson observation was mentioned as well as a few references to action and practice-based research

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projects. One teacher said that working on Microsoft Certifications was useful. Another thought that studying for an MA was a valuable exercise. Being a member of the Becta/BESA judging team for the BETT awards was seen a valuable ICT CPD learning experience as well. Amongst the local professional networks a valuable learning experience was being a member of the Birmingham Learning Platform Strategy Group.

Events emerged here as well as important; comments including praise for CEOPS child protection days; BGFL training and the Interactive Pedagogies conference; and the ICT activities in MFL conference on the Isle of Wight.

An interactive strand appeared here promoting CPD organised by teachers for teachers, like: TeachMeets; MFL; Show and Tell. The growing tradition of unconferencing in the context of professional communities of practice was capturing the imagination of a small group. These events that are organised by the teachers themselves is an indicator of increasing interest in informal learning organised by professionals towards their own agenda. References to other more specific long-term ICT CPD arrangements pertained to national online professional groups providing peer support like MirandaNet and Naace. One practitioner mentioned '*the continuing inspiration of other MirandaNetters, all of who are hugely creative in areas PARALLEL to my own*'.

Other effective ICT CPD models were discussed that indicated some of the elements of a programme that motivate teachers. Active involvement in the production of digital artefacts like developing the schools MLE was another learning experience. Another example was the follow-up to a learning episode: *Visual literacy training was the as we all had a go to make animated films and as a result we could then put ourselves in the position of children. Great fun, but great results as well. The children went on to create and win local and National awards*!

A teacher commented that it was a good strategy that the primary strategies programme depended on computers so you were excluded if you did not do this. The resources were also excellent: '*Espresso was very good and we had a lot of training*

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days- trainers were good- they varied the pace – allowed time for questions and talked about uses. Parents loved Sam Learning at home- the children were very quick and where they were encouraged to help teachers very adept….'

Some established teachers praise the skills of young teachers: '*They are a different generation who do find the use of the computer so much more efficient. I often ask young teachers for help. This promoted more equality and democracy in the apprenticeship relationship. I predict that the next generation will be very 'au fait' with digital technologies and children will do their exams on computers.'*

Pupils teaching teachers

Teachers who are reluctant to undertake ICT CPD programmes are often unable to envisage the value that can accrue to learning. Particularly successful experiments in raising awareness of students' abilities in digital technologies and their knowledge and commitment were described by practitioners who had been taught by their own students. This happened either informally on a 'need to know' basis or in formal inset session set up by school leaders and LAs. In the context of increasing the opportunities for student voices to be heard 'Teaching teachers about ICT' was suggested as a topic for the Student Council.

Practitioners said that students showed remarkable sensitivity in teaching these adult learners. ICT leaders who had arranged these sessions felt that the children had more impact on the practitioners' commitment to learning about the value of ICT than they did. They also felt that by using this method more topics could be covered more efficiently and in more detail than they could hope to provide from their own knowledge. In this context one LA runs an annual ICT showcase event when students set up stalls to talk about and show digital activities that are interesting and innovative as far as they are concerned. Leaders were keen to point out that the evaluations of these events were unanimously positive. Practitioners had commented that this ICT CPD experience was amongst the most useful and challenging that these practitioners had attended. Students were praised as being not only knowledgeable but inspirational.

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ICT CPD programme spread

When asked what courses they had a attended in the last three years practitioners offered a broad variety of subjects. The small sample of primary practitioners cited a wide variety of courses ranging from pedagogical approaches to skills training to administrative subjects:

- visual literacy;
- the use of video and animation in classrooms;
- interactive whiteboard use;
- curriculum applications from software publishers;
- learning platforms;
- administrative software package training; podcasting.

They also mentioned TeachMeets and MirandaMods as a means of informal learning.

Secondary practitioners highlighted the same generic mix as the primary teachers: pedagogical approaches to skills training to administrative subjects.

- interactive whiteboard training;
- on line safety;
- use of i-touch and i-phone apps;
- different digital recording devices;
- on-line assessment programs;
- building learning communities;
- digital image management;
- subject leaders workshops;
- learning platform training;
- subject software training;
- use of Interactive technologies;
- use of Management Information Systems software;
- Gatsby Fellowship in writing SCORM based material;

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- university degree;
- in-house training.

The secondary participants also mentioned a range of informal modes of learning:

- Show and Tell days
- MirandaMods
- TeachMeets
- MFL Show and Tells
- BETT judging.

One respondent who is an ICT coordinator remarked: '*I have taken part in online four Flashmeetings for MFL teachers and been to training for online course development using MOODLE VLE. I had been to workshops on blogging and podcasting and I have started to download podcasts recommended by Joe Dale to listen to for myself - better than many courses!'*

A mixed phase focus group thought that more CPD should be based on what practitioners indicate they want and need to know. Their main request was that subject specialists should present good models for practice that they had developed in the classroom as well as time to experiment with new tools. Within this approach they were keen to see more peer-to-peer support and more professional networking encouraged.

They wanted more information online about appropriate materials and online content as well as more networking and sharing of resources. However, they felt that the profession was not yet entirely ready for online learning and sharing of resources. More explicit courses were needed about developing online communities of practice. The practitioners were also keen on programmes that acknowledged, encouraged and rewarded their own progress preferably with accreditation. Some were angry about the locking down of their systems for ‘e-safety reasons’ that it '*inhibits innovation and confidence and leads to frustration and the abandoning of ICT altogether*'.

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Needs analysis and evaluation

Digital technologies are increasingly evident within the practitioners' working lives and are now becoming an integral aspect of professional capacity. At this point in time schools where practitioners can access ICT CPD easily and those where attendance is made difficult or impossible are equally distributed. Needs analysis is not often in use to identify practitioners' needs. In addition, Performance Management programmes and Personal Learning Plans are rarely used to decide on ICT CPD needs.

Practitioners evaluated the CPD they had attended by two methods: either via formal practices of the school to include post course evaluation forms provided by the school or feedback to line managers or by whether they had been able to use the knowledge learnt practically within the school setting. The practitioners did not feel that effective evaluation processes were in place in the same way and to the extent that leaders did.

Standards of ICT CPD

The most effective CPD practitioners had attended varied enormously. The value of attending formal CPD courses was said to be to develop practice, to be more innovative in their use of technology and to keep up to date with skills and knowledge. However, several cited online communities and micro-blogging, mainly Twitter, as being good forms of informal learning where they can access 'experts' very quickly.

The answers can be found in this section of the questionnaire analysis: The majority of respondents who used a community of practice cited Twitter as one of their communities:

6c. Do you take part in any communities of practice?
(n=29)

Nil response	No	Yes
10%	34%	55%

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Primary: Yes = 66%
Secondary:Yes = 58%

ICT CPD changing practice

The large majority who replied believed that ICT CPD had changed their practice. The positive replies did not vary between primary and secondary respondents. A selection of representative replies follows:

- *'When I started teaching there were no computers in schools, so every ICT application I use professionally and personally I have had to learn about and practice';*
- *'Enables me to learn new skills that I can implement in the classroom';*
- *'One never stops learning!'*
- *'Enables me to keep abreast of mainstream developments despite being in Special Education';*
- *'ICT CPD keeps me up to date with statutory changes e.g. Curriculum 09 and allows me to be proactive in implementing APP';*
- *'I am given confidence to take risks with technology in the classroom';*
- *'My masters course provides vital input';*
- *'Departmental developments have meant that I have to train staff to use the MLE and champion its use to promote change';*
- *'ICT CPD has allowed me to have a better subject knowledge for my subject'.*

Many practitioners cited the examples of peers e.g. '*Seeing how others use ICT creatively is not something you actually COPY, but rather something you ADAPT to your own needs and circumstances.* And: *I use ICT tools to enhance teaching and learning and I have run pilot teaching/learning ICT projects that confirmed this.'*

There were also examples of the reasons why professionals are committed to personal improvement that indicate that some professional motivation is driven by belief:

- *'I believe I need to provide my students with the knowledge they need';*
- *'ICT CPD makes you aware of new ways that enhance your practices';*

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- *'I love fresh ideas that suggest ways of changing my teaching';*
- *'ICT CPD has altered the very fabric of my job and how I think things could be done. I am aware that the digital divide is growing between those in the know or digital natives and those who don't get it or who don't have the equipment.'*

When the teachers were asked what could be done to make a difference if ICT CPD has not changed their practice most of the answers focused around more time to translate the idea into practice or around motivation e.g. make ICT CPD of more value and relevance to my job.
However one practitioner was more radical: '*A whole new concept is required. CPD needs to be centrally managed on a city-wide basis and linked, at all points, to professional qualifications. What we have at present needs to be scrapped.'*

Impact of policy initiatives on practice

There is some evidence here that interventions in terms of hardware and software have had an impact. At the top of the survey were the laptop, the interactive whiteboard, the digital projector, and learning platforms. Between one third and one half of these practitioners said these had had some impact on their teaching. Using projector alone without the IWB, the least expensive and most simple device, has had most impact. There is so far little measurable impact from handheld devices that are not yet widely used. Given that learning platforms are the newest government initiative it is significant that the impact is already measured at 38% in this small group.

Despite these results linked to various government initiatives, the large majority of these practitioners have not had any training on the hardware and software they have been issued with. Less than 10% have had long-term CPD on any of these hardware and software interventions. The exception is nearly 20% have had long term CPD in learning platforms. What stands out is that far more teachers report an impact on their teaching than have had CPD. This means that they have learnt to create impact using these technologies by means other than formal CPD

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programmes. This might be informal exchanges as in this case CPD meant both external and internal programmes.

None of the members of one of the primary focus groups had received learning platform CPD. They expressed concern about the value of learning platforms in the primary school. They had many reservations about the cost and the value that they thought would need more proof before they changed their minds. When schools are small there is little need to email between staff. The original cost, the maintenance and technical aspects of up-keep were a major concern as well as the lack of ICT CPD in building communities of practice with teachers, children and parents in primary schools. They thought secondary schools had more use for learning platforms where there were bigger schools and more potential for remote learning. The members of this primary focus group suggested that there would be greater uptake of learning platforms if there was better and wider spread CPD that included more positive pedagogic examples of learning platforms and social networking practice. They thought CPD should encourage more staff and other associates, including assistants and parents to contribute and collaborate to build up effective digital practice. However, they also were concerned about the hidden and disproportionate time commitment involved in creating resources to share with others. There were also quality control concerns and dangers of the materials not being updated. They also pointed out that there is a significant minority of teachers do not want to share resources with others. They were concerned that CPD was not addressing these issues and these attitudes even if it was available.

Secondary teachers were most positive about learning platforms generally although they wanted more illustrations of good practice from early adopters.

The questions of whether the provision of ICT CPD has been effected by other more general government initiatives was answered by very few which suggests that practitioners are not operating at the level of policy directives and are largely unaware of these drivers. When asked in what ways the policy had affected practice there were not many answers. However, the few that did answer made comments about the initiatives that had led to the useful outcomes often as a result of CPD.

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Primary teachers cited the National Literacy Framework and Assessment for Learning for improving achievement and reaching targets. For the same reason, secondary practitioners cited the National Strategies as well as Assessment for Learning. Another said that they had started looking at mini laptops and leasing schemes whereas another practitioner said that the learning platform installation had resulted in an entire scheme of work delivered in business studies using website created on VLE.

Practitioners talked generally about government policy impacting on strategic issues like vision, commitment, funding, central organisation, sharing effective ideas and collecting teachers' feedback virtually.

One respondent made a broader comment that suggests that overall government initiatives have had an impact on the profession: '*As a teacher, if you cannot use the systems and technologies now in schools you cannot do your job!'*

Another practitioner described her reaction as a classroom practitioner to questions about policy: '*This is shocking - I cannot think of the names of initiatives. I did take part in the initial NOF training in the early 90s and it was ok. However, I don't think I am aware of government influences when I have my head down in the classroom.'*

Formal Learning

Practitioners said they worked with a range of partners who could be categorised as: in-house CPD and subject leaders as well as ICT coordinators; learning platform strategy groups; commercial company and LA advisers: funded research projects and university lecturers. In interviews and focus groups the few practitioners and advisers who were following university courses like Masters and PhDs were the most enthusiastic about the value to their learning in the long term.

The large majority of primary practitioners thought that external accreditation for CPD was sometimes or quite important. 10% considered this to be very important. The secondary practitioners responded nearly as positively. About two thirds thought

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that external accreditation for CPD was sometimes or quite important. 12% thought it very important.

In-house training

The range of ICT CPD experiences that were considered to be effective in the forums and the interviews parallels the pattern in questionnaire responses of increasing in-house training programmes. These were considered to be a good means of encouraging the sharing of good practice, identified in one case as '*INSET for staff based on need and priority and once a week a drop in sessions after school*'. Some practitioners cited commercial backing as the reason for this growth. For example one respondent who was enthusiastic about his opportunities said '*We are a Microsoft academy*'.

Another description of an in-house programme provides a flavour of outstanding practice in one of the academies that specialises in ICT: '*Time is set aside in staff meetings, team meetings and training days for ICT CPD. Time is also given for staff to work on assessments and planning during PPA. All staff have a laptop and we have an ICT suite of 32 computers so we can all work together. All rooms have Interactive Whiteboards so CPD can easily be conducted in any room.'*

Another practitioner explained their model: '*We have had a few session on IWBs and VLE skills sessions and a lot done semi-informally by colleagues which is under the wire. We are a very sharing staff and most ICT CPD is all very informal just in time model. Although the focus is an informal and unplanned approach to ICT CPD, informal does not mean ineffective. We will say, 'Go and see the French department because they are ahead with this' for example. We are, in fact, very far ahead. Video conferencing, international work, IWBs, VLE with sound files for our children in hospital. It does not seem planned but ICT CPD is going well because of the good will of the staff who are very friendly.'*

This approach to ICT CPD was described by one practitioner as a means of acknowledging the practitioners' learning agenda: '*Time is the problem – ICT CPD*

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must be inspiring. We do not want an expert speaker most of the time but the time to explore our own things – we do not want to be talked at - the real work of the school gets done when teachers share across departments and interest groups. Using time effectively means not our leaders telling us what to do but sharing our own good practice. We do not exclude external input but there is a tipping point when so much is happening in school that we need the time to share with each other in order to move forward on the ground where the real action happens. This is a recipe for change at its most basic level. Formal ICT CPD does not achieve this kind of school community movement.'

One school was typical of the approach taken by several secondary schools who were interviewed about their in-house ICT CPD. The school had integrated digital technologies fully within the existing pedagogical and administrative agenda. The school was equipped with IT suites and IWB and all students had with laptops. This was challenging for all staff especially those who were new. Staff had different levels of skills, knowledge and commitment and the only way to deal with that was for one to one, subject based and departmentally based in-house CPD. The school has two ICT champions who are both engaged in practice based research Masters. This ensured a level of reflectivity that is evident in the way that solutions to ICT CPD are constructed.

The champions run weekly training session after school meeting the needs expressed by individuals and departments. The programme can include new program skills alongside curriculum applications and sessions requested by administrative staff like the reprographics departments. There might be a demand for topics like Twitter, UTube and digital video. The Champions have to be versatile to cope with the extensive and unrelated demands that are the inevitable result of the rich use of digital technologies in teaching, learning and administration.

External speakers and advisers are invited to sessions wherever a clear need arises and this approach is seen as helping to prevent the school from becoming isolated from external influences and emerging knowledge.

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Informal learning

More than one third of the respondents were involved in online or social communities of practice. This may have been because many teachers do seem to be involved in Facebook or an equivalent outside school as it seems unlikely that 41% of the teachers are involved in online professional networks overall.

Practitioners were on the whole more reliant than leaders on online communities (such as forums) and professional networking sites and micro-blogging, like Twitter, for information concerning ICT developments and good practice. Although some professionals are still not ready for learning in informal settings, there is evidence that there is now a significant move in this direction amongst interested individuals. Knowledge and understanding of the role of online communities of practice in formal and informal professional learning is growing. Participation in a range of social and community networking activities is also increasing amongst professional teachers as can be seen in the leaders' section. Communities of practice in various iterations were a source of communication and shared experience about particular CPD courses; some respondents stated they had attended courses after hearing good reviews via these means.

When the interviews and focus group findings were analysed the practitioners distinguished between formal and informal accreditation and recognition of participation by communities of practice as well as those communities of practice who peer review contributions to web-based knowledge resources. In this context, three mentioned MirandaNet e-journals where practitioners' submissions are peer reviewed for relevance to teachers.

The participants mentioned a very wide range of online and social networking sites which suggests a considerable growth of this kind of informal learning in recent years. At the turn of this century this kind of venue was more or less unknown to the profession except for MirandaNet and Naace members (Preston and Cox, 2000). There was no discernible difference between secondary and primary teachers in the kinds of sites mentioned which suggested that phase is not an issue in this kind of

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informal learner based on ‘need or know.’ The professional can select from what is on offer and create their own specialist groups under some key umbrellas.

- EdTechRoundup;
- Apple Learning Interchange (ALI);
- Twitter;
- ADE;
- Googlegroup;
- TES Resources;
- Yahoo MFL resources group;
- MirandanNet:
- Local Authority Intranet:
- various subject communities for sharing of good practice such as Religious Education, Science, History;
- Communities found through search engines e.g. Roald Dahl society;
- Subject leaders in commercial companies;
- Apple Learning Interchange;
- My Twitterhood;
- Classroom 2.0;
- Naace;
- OCR.

Three respondents only lurked and one expressed ‘fear of being shown up’. A typical comment, however, was: '*I get most of my CPD through networks. However the ‘who what why and when’ of network connections has a rate of change way above that of other concepts at this level and greater potential to positively impact all CPD never mind ICT.* '

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DEMAND Part 3: practitioners who are reluctant to use digital technologies in classrooms.

The sample

In this section the report deals with the lack of demand for digital technologies from some practitioners. In contrast with earlier studies conducted by the same researchers, it was quickly found that the term ‘technophobe’ can no longer be considered as a description for practitioners who are reluctant to use digital technologies in classrooms. ICT leaders were asked to select practitioners they knew who were open about their doubts about ICT in education and would be willing to undertake a telephone or Skype interview about their views.

This section covers the key issues raised by twelve reluctant practitioners who represent a range of professional status from new teachers to heads. Some of their views have been quoted in the other Demand sections. In this section, any relevant issues raised in the focus groups are included.

The cohort represented both genders in the primary and secondary sector and covered a range of ages, specialist subjects, regions and pedagogical disposition. Whereas no consistent picture of a reluctant professional emerged, these professionals with reservations can no longer be classified as technophobes or as professionals with limited computer skills. They all had an email address that they checked daily and they were all able to use basic computer software and search the web efficiently. In particular they all used computers to complete a variety of personal objectives: booking tickets, downloading music and audio books and engaging in social networking at home. Their profile was indeed similar to the twenty-nine practitioners who answered the main questionnaire. However, it needs to be noted that only twelve teachers were interviewed in this category.

Their professional reservations, however, which were carefully considered and well articulated, covered a range of issues:

- threatening e-safety considerations;

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- anger about the futility of much unused data collection coupled with security fears;
- poor quality of equipment and internet support;
- unreliable administrative systems;
- lack of support when new systems are adopted;
- draconian and illogical filtering systems;
- lack of details and demonstrable pedagogical benefit;
- clashes between interoperable systems;
- the lack of explicit pedagogical principles which promote deep learning in educational software design;
- the lack of availability of time to experience with new ICT tools;
- lack of appropriate formal or informal CPD;
- using computers to reinforce traditional styles of learning
- the difficulty of finding the networks of colleagues working on similar issues.

Reluctance to engage with ICT CPD

These teachers who were reluctant to engage with computers in the classroom were generally hostile to the idea of engaging with ICT CPD or had been affected by poor experiences of ICT training. The few who had had good experiences valued simple skills-based courses with one-to-one attention. But poor experiences on skills courses and poor relations with technicians of IT network managers were often at the root of the reluctance to take up more ICT CPD. For example, some reluctant teachers found technical staff and skills trainers either condescending or unable to understand what the beginner does not and cannot know. Some of this group did not want to interrupt the ICT network person for help if the network manager was also a teacher.

Some teachers who were reluctant to use ICT in classrooms were against any form of ICT CPD for themselves. The general view amongst this group was that they had more important things to learn professionally than to invest significant time in mastering digital technologies. They were able to take this line were there was no directive about CPD and no key ICT targets to meet. In the same vein those who did

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not want to devote their own time to ICT CPD would use digital technologies if they had an assistant teacher in the classroom to set up the computer and the IWB. One teacher used students to load the software so that she could concentrate on what she thought was important - her relationship with the pupils.

Social isolation

Relationships with students were very important to this group. One teacher of English was typical of a viewpoint that saw dangers when pupils are isolated in front of a screen. Her strong professional belief was that the most important aspect of her work was her interaction with the pupils and her interaction with them.

She became concerned when the computer screen dominated the learning situation although she was happy to use a whole film or some clips to make literature more real.

E-safety

These teachers would have liked CPD in the area of e-safety. It was a contentious issue with strong advocates for more freedom and others for more control. Because there was no CPD forum for debate there were two unresolved issues. One was anger about school technicians' preference for locking down the systems for security reasons so that many creative Web 2.0 applications were banned: '*All is banned in our school. But teachers should be teaching children how to use Face book and Twitter properly, not ban it. More CPD for technical staff and network managers about these educational issues was advocated.*'

Another practitioners' school where there had been no external ICT CPD preferred to avoid the dangers of social networking and accessing inappropriate sites:

'We do not use social networking and chat because we are a Catholic girls schools and I am in favour of this. What they do at home is their problem. We have no plans at all to use the chat facilities which is a problem for media and the firewall is so

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strong that the 'A' level students cannot do their research and I cannot read websites. It's a price we have to pay for safety.'

If this school had access to external ICT CPD courses they might have come to a different viewpoint about what was best for their pupils.

Fear of public failure

One teacher complained about the culture of schools. She had had no ICT CPD and did not want to be seen deploying digital technologies as a result: '*As it is now you cannot close your door. When the computers go wrong it is very public and embarrassing. I feel for young students in these conditions*.'

Inappropriate presenter styles and disturbing noise

A few teachers had been concerned by the design of software they saw in ICT courses, in the homes of friends and family and in other classrooms. They found these designs that intruded on the classroom ambiance unacceptable: '*I was also worried about some 'all singing and all dancing' software where adults are too jolly and childish. There is often far too much jangling noise and not much thinking behind it. Programs based on multiple choice designs are particular culprits.'*

These teachers would not attend skills courses about software in the future.

Incitement to violence

Other teachers who were reluctant to use computers in schools had some concerns about the gaming culture. One teacher who had sons said: '*Is digital technology different from other kinds? My teenage boys are listening to gunshot and playing adventure games with a violent theme much of the time. What do we know about the impact of this violence on their future behaviour?'*

Assessment and testing

Although computers are widely used in schools for national examinations, assessment and testing there was no evidence of any ICT CPD programmes that

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deal with the professional issues this general trend raises. For some teachers this use of computers impinges on their professional judgement and their sense of professionalism. One teacher was particularly convincing in her frustrations that had no forum for expression.

'I feel as if I am trying to everything with few resources. Too much to do with too many lessons - too many things and too many responsibilities that I cannot do all together. The targets are too high. They are expecting too many grades. Exam machines; children are pressured as well. So many of them are being failed all the time. Labelled as failures. Too many schools are manipulating the figures to meet targets. Yet qualifications are not worth as much as they were.'

Some resented the increasing involvement of computers in examinations and testing. Several of these teachers considered mechanistic exams including multiple choice testing to be a main barrier in the adoption of new ways of working with ICT.

One respondent was unhappy about computer-based assessment without consultation with the staff:

'This exercise involves terrible clicking on meaningless phrases. Is this supposed to make me more discerning? I was quicker in writing my own sentences then choosing from other people's standard phrases. Do we really know if computerised reports are better? Teachers live and die by assessment. Computerised tick boxes compromise our professional judgment. SATS at key stage 2 should certainly go. This is when the judgement of teachers is paramount. A teacher should know what is needed to do to take the child to the next level. I do approve of higher levels of accountability in schools and computers have facilitated the efficient collection of necessary data as evidence ... but designs are poor and vital judgements get lost.'

There were also questions around how ICT CPD and ICT for pupils should be addressed. One issue raised was about assessment requirements that do not include the demonstration of ICT competence in subject areas. In the focus group participants felt that until this was the case and until assessment values some of the

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ICT skills pupils are developing outside of school, teachers who are reluctant to use new technologies or just not confident in using them can always excuse their attitude because there are no targets. Teaching to exams was seen as the enemy of creativity and experimentation by this group who saw computers as one of the enemies weapons.

A false sense of achievement

One point that underpinned this group's sensitivity to computers was that pupils did not learn enough when they engaged with them. This view led these teachers to conclude that ICT CPD in digital computing would not be worth their while either - the learning was seen as trivial.

One reluctant teacher, a primary literacy coordinator, spoke for many when she expressed her pedagogical concern about over-use of computers creating a situation where passive learning becomes the norm.

'I warn my team about passive learning and the dangers of reducing opportunities for speaking and listening especially as we have so many pupils for whom English is a second language. Computer must not be seen as a substitute for books. But I did say that the computer can be helpful for the reluctant reader. I certainly saw strugglers who ended up using presentation software to explain to the others what they had done. The pupils did want to get the text right if they were showing the rest of the group. In these circumstances they were much quicker at picking up the mistakes. Pictures from the internet were also valuable in the early stages of learning English. However I also warned against Death by Powerpoint.'

Another teacher was concerned that children think they are very computer literate but they bring in printed pages from the internet that they cannot read or that are too sophisticated in content for them.

Research for project should be a case of explaining what you have read and understood to others. But many pupils now indulge in passive learning. They learn a

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few tricks that make it look as if they have digested the information but this is far from the truth. This 'know it all' generation needs teachers who are de-skilled in understanding the issues in order to gain good marks. Unfortunately it looks as if this is happening.

The group were in schools where they felt that computers were in fashion and that they were not free to speak against them. This lack of awareness of issues was felt keenly by those who were thinking more deeply. Some ICT CPD that broached these issues might be a source of confidence in initiating debates of this kind.

Pressure to be sociable

Some of these teachers who had not had any appropriate ICT CPD were also fearful of the social pressure to get involved for themselves and for young people. One teacher exemplified these fears. In her personal life another teacher did not like online banking or social networking - even though she had been invited to join FaceLift for the over fifties. She did not want the 'tyranny' of attending to 500 friends. The pressure to create these superficial evidences of 'friends' and popularity was a major problem developing that she saw - especially in primary schools. To an alarming extent, in her mind, pressure on young children and teenagers to be pretty and have friends was generated by communications technologies.

Mechanistic data collection and report writing

One ICT practitioner had moved from a private school into a state academy with an ICT specialism. He was not against ICT CPD in any way as he had gained a Masters in ICT in Education - he would have liked to move onto a doctorate but there were neither time nor funds. But he felt that his wider knowledge and experience as well as his theoretical knowledge was not being used in the school. He was frustrated by a situation that had arisen in this new-build academy. He felt that the computer systems were being used as part of an assault on teachers' professional judgement and that computer administration and data collection about students was at the core of this situation. He did not like the emphasis on record keeping and lesson planning either. A key reason for this was that he that this form-filling these restricted his

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freedom as a teacher to use ICT wisely. Some of his advanced ICT ventures in the private school like setting up a radio station and developing video conferencing did not fit into the academies target driven curriculum.

Reinforcing traditional teaching with computers

Some of these teachers were themselves competent with computers as well as being innovative practitioners. A few complained that high levels discussions about the use of computers in schools were not happening especially for senior managers: a CPD forum would provide a focus for that kind of debate. But because of lack of knowledge amongst senior managers computers were being used to replicate traditional methods of teaching and learning. One comment along these lines was: *'In our school we have 1,000 computers to 2,000 children. Can this be positive? I can go home and get on with my personal computer. Yet we are teaching kids the 1995 model with computer suites and no Web 2. And this is a famous new-build academy with an ICT specialism. What is happening here?'*

Changing perceptions of ICT in classrooms

Focus groups raised questions about new-build schools and the lack of ownership that they and the pupils feel when they are transported into a new environment that has not always been well set up for professional or student learning. Five areas of consultation were suggested that had should be considered by the whole school in cooperation with the architect. These were: the design of the physical space: the balance of spending on traditional learning and digital technologies; appropriate ICT CPD; finance and resource; levels of connectivity within and outside the school; security issues; professional attitudes - making sure that all voices have been heard including those who have valid concerns.

What was hopeful within this group was the indications of changing perceptions about the pedagogical potential of digital technologies as this group gained more familiarity with computers, were provided with better and more reliable equipment and moved into newly built schools. One primary respondent had begun to feel more positively disposed towards computers in classroom when her school moved into a

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new building two years earlier. The computer systems suddenly became reliable when before they had been reliably unreliable. She had also been given planned courses on basic skills and IWBs that lasted five weeks each. In these courses she had been given one-to-one tuition as and when she needed this. This had made a significant difference to her attitude towards computers in her last year in school.

In her words: '*I surprised myself that I was quite positive about computers after the move. This shift in my thinking was predictable because when the facilities are better you are able to be more discerning choices and also bank on reliability.*'

This teacher, who had retired two months before, had found more time in retirement to gain personal mastery and confidence. She was developing skills, pleasure and interest in emailing, social networking and digital photography now that she had the time. She had the luxury to fail without feeling she was impacting on her pupils' potential achievement in exams. These comments indicate three of the barriers that caused her negative approach to computers at school: unreliable equipment, lack of time and fear of failure.

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DEMAND Part 4: comparisons between leaders' and practitioners' perspectives

Changes in professional learning

The way in which courses are delivered seems to be changing. The portfolio of digital knowledge and skills professionals require to do their job is now so complex and comprehensive that leaders and practitioners in interviews and focus groups suggested that much of the learning needs to be done on a 'need to know' or 'just in time' informal basis provided by a community of practice rather than on formal courses.

There appears to be a general belief in the profession that the use of ICT improves the achievements of pupils but that the traditional ways in which teachers and pupils are currently assessed like the 1,000 to 2,000 word written essay is a formidable barrier to innovation. Limited awareness appears to exist, however, in the profession about government initiatives about ICT provision.

In focus groups some professionals indicated that the issues for a democratic society that are raised by the increasing use of digital technologies at home and at school are not being adequately debated within many schools or on in the large majority of ICT CPD courses.

New hardware and software like Interactive Whiteboards, laptops, projectors and learning platforms make a difference to classroom practice according to the majority of practitioners and leaders even if they are unaware of the underlying government policies. However, leaders and practitioners do not always feel ownership of new-build school projects and find some of the new digital systems intrude on established classroom practices particularly in the areas of testing, surveillance and accountability. There are implicit dangers here that some digital systems may alienate staff and students and disrupt some aspects of social and constructive learning: issues raised by teachers who have doubts about the value of computers in learning. To be effective formal and informal ICT CPD programmes may need to be

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designed in the future to help teachers to be in more control of the ways in which digital technologies impact on learning. Currently there is a significant group who feel that they are at the mercy of innovators and early adopters instead of being involved in decisions that affect their practice.

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THE DOMAIN MAP: Part 5

The inception process behind the domain map at the heart of this study has already been discussed in some detail in the methodology section in Part 2.

Due to its complexity, the map itself cannot be reproduced in this report: it is too large and multi-layered to find inclusion in full in an A4 format (in portrait or landscape format). An impression of the structure and layering can be gained from the diagram in Figure 6. A .pdf file of the final landscape map and an outline of the text in linear form can be downloaded from http://iho.me/ictcpdmap. Readers who wish to explore an online version of the map can find it at http://www.mindmeister.com/63687845/the-ict-cpd-landscape. These maps can be enlarged on the screen and some explanatory notes are embedded in the files. Other options available are to:

- copy the map
- embed the map in another website
- export the map in a number of formats:
    - Mindmeister format
    - Free Mind file
    - MindManager file
    - a document outline (.rtf file)
    - a.pdf
    - an image file in a range of formats

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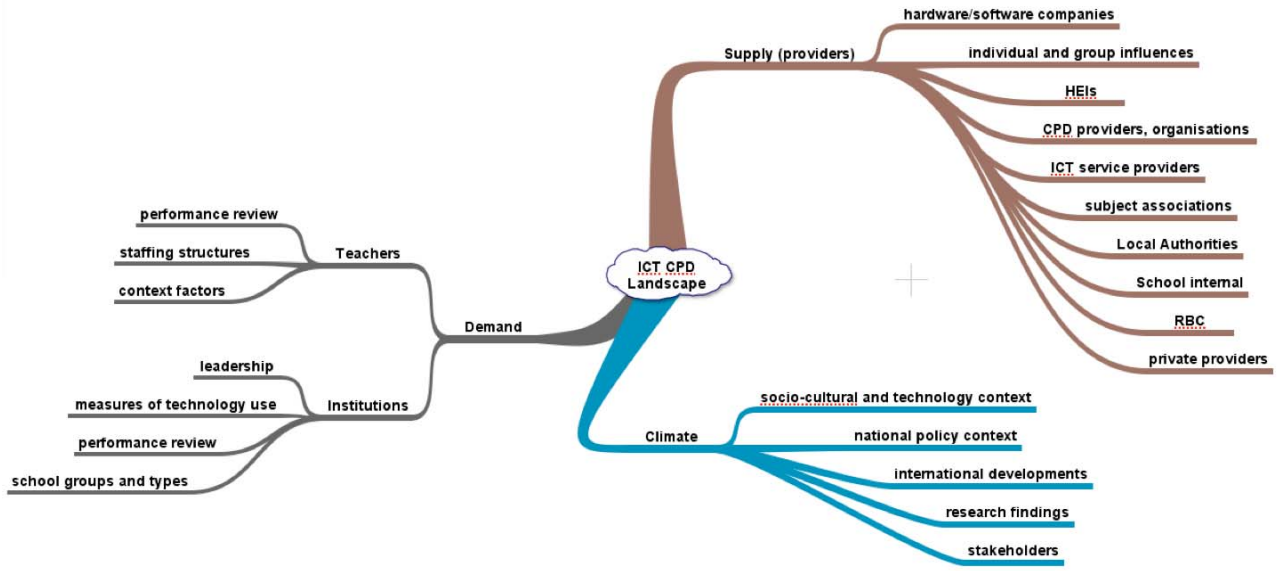

Figure 6 The Landscape map in outline (created using Inspiration 8)

General observations

The first objective of this ICT CPD Landscape Review was to analyse and summarise the current provision of ICT CPD for schoolteachers. The key themes in the existing policy base over the last three years as well as government surveys of the landscape proved to be useful in conceptualising the current picture and in informing the survey instruments and the data collection strategies designed to explore the state-of-play in relation to a selected sample of providers, practitioners and leaders and the challenges that still faced them.

Fragmentation of (field) forces impacting on ICT CPD

In the course of this study it became clear that the (field) forces that impact on ICT CPD arrangements are even more fragmented than had been anticipated. Obvious forces were the policy context, availability of funding, technical reliability and teachers' time.

The study found that the influence of professionals on each other's ICT CPD is rising. In view of the definition of field forces suggested by the funders, namely around (groups of) people who exert influence about ICT CPD choices, peers can be considered to be an increasingly important group.

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What is surprising is that groups such as ASTs, who have been put in place by government to have influence, do not appear to have a strong sense of group identity to do so. Aside from those funded to have an influence, such as ASTs and SiPs, there is a large group of ICT advisers who are not sharing any kind of common training programme nationally and internationally and may have a rather local view of what is required. Overall the evidence suggests that many leaders tend to think of ICT in terms of skills and course resources they can deliver to groups. The low level of evaluation that is operated by most trainers is not likely to change this situation.

Our data suggests that an emerging influencing factor, certainly amongst leaders but also some practitioners, are online communities, which they join in order to fulfil their information needs. We found some evidence to suggest that social networking is also seen to have potential for informal learning opportunities as well as for identifying some formal opportunities such as courses. This area strikes us to be of significance moving forward and seems to tie in with the growth of applications and tools.

The blurring of roles

At the beginning of the research design it seemed clear that the perspectives of three types of stakeholder should be investigated: the external providers of programmes; the leaders in schools who make decisions about the choices of ICT CPD programmes for staff and sometimes deliver in-house programmes themselves; and the practitioners who are the recipients. Providers, leaders and practitioners pointed out that the clarity of role that had once separated different groups no longer existed. Many professionals tackle all three roles from time to time, or concurrently, as many teachers are now consultants and advisers working outside the classroom and many classroom teachers and senior managers also have a responsibility for teaching their colleagues.

One of the causes was the reduction in permanent LA advisers and the increase in independent consultants who might also do some teaching. Another factor has been the rise in in-house ICT training in schools. Digital technologies are also now more

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mainstream in the delivery of different subjects and in the processes of learning for both teachers and pupils.

This blurring of roles may be a reason why learning preferences are also changing. Practical advice informally conveyed by subject teachers is highly valued for its currency and authenticity alongside specialist advice from ICT teachers and network managers. The factor that may be most telling in the future, however, is the fact that few professionals have learnt about ICT as part of their period of initial teacher education and many are self-taught. In this situation where professionals gain their experience of digital technologies outside school, they are often competing with the outstanding competence of their own children and of students in school. In addition, the top-down approach in which experts tell teachers what to do and how to do it is being challenged. These factors are unsettling the power relationship between trainers and teachers and between teacher and their students in school. An additional point here is that, while the use of internal/in-house staff may provide great authenticity, there may be a lack of national perspective and appreciation which could be a disadvantage when it comes to judgements about what ‘good ‘ looks like and matters of quality of practice/ pedagogy.

Mobile technologies and change

What emerged from the focus groups was the strong sense that the coming years will be a period of considerable change. One of the challenges is coming from practitioners who are increasingly engaging in the growth of informal learning activities, e.g. through microblogging; informal meetings of communities of practice are on the ascendancy involving practitioners face-to-face or through virtual environments; and expert and practitioner blogging. Setting an agenda at the grassroots was illustrated by one practitioner, who was inviting other teachers to add to a Google.docs knowledge base he had instigated on a range of ICT topics of immediate interest to his peers.

Although these bottom-up initiatives already have strong roots, given the highly fragmented and distributed nature for example of the tools and fora used, there exist challenges in reaching the majority of practitioners through these methods. More and

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more teachers are becoming technically 'savvy' and a growing minority are finding independent means of meeting their own learning agendas.

Motivating teachers to learn

Many answers revolved around the challenges in motivating the profession to learn about digital technologies in classrooms. Some of the suggestions that emerged from the free text questionnaire replies, interviews and forums that focused on motivation included:

- Carefully planned incentives to encourage the whole workforce to take part at appropriate levels in CPD.
- A reconsideration of the value of twilight sessions because providers report that teachers are tired at this time of day.

The use of government funding for CPD was also considered important as a motivator. Some providers thought that teachers' time should be funded in order to learn, even if the CPD is run in-house. Some practitioners thought that government funding should be set aside for professionals who would like opportunities to pursue externally accredited masters and doctorates. It is worthy of repetition that some practitioners were keen on accreditation whereas the leaders and providers were not keen to offer external rewards.

Professional Entitlement to CPD

To promote the CPD entitlement of each teacher, it was suggested that performance management programmes and personal learning plans as well as school development plans should be central to deciding on what CPD staff should undertake.

An idea that was advanced with caution was the development of a CPD framework that would enable teachers to personalise their professional development needs. Such a framework, it was suggested, should recognise the needs of the individual as well as those of the institution. Such a CPD framework would also provide practitioners with recognition for ICT CPD that would transfer across institutions. The

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caution related to the danger of such a framework becoming ossified and out of date quickly.
In this context, the range of ICT CPD programmes for leaders was felt to be inadequate; the percentage of ICT CPD leaders who favoured skills training above all other topics seemed high at 75%.

23% of provider training, for example, focuses on software without apparent reference to learning outcomes or teacher confidence. This study did not have the scope to investigate these tensions more thoroughly but they should be of major concern.

In-house ICT CPD programmes

In-house ICT CPD agendas are gaining ground in schools that are technology-rich, mainly because the traditional routes of courses and external speakers can no longer provide the kind of day-to-day support that the teachers need. In some schools teachers are given ICT CPD days in schools in which they pursue their own interests and share their findings at the end of the day. This helps to provide the time that practitioners need to develop the skills and the knowledge that they have identified as lacking. Some teachers will chose to work in interest teams or departments on these ‘free’ days. What was felt to be important was that the agenda was not presented externally or from an in-house manager or expert. In this way a better grasp appears to be achieved by management about what kind of ICT CPD is really needed by the practitioners as well as improving the motivation of those who are reluctant to use ICT tools in classrooms or simply do not feel they have the time to master digital tools.

The implications of this growing trend for in-house training are likely to be significant in planning government initiatives. Several practitioners in a focus group discussed the new in-house topics that embrace the use of digital technologies to facilitate learning: digital video used to develop narrative; educational games used in teamwork and problem solving activities; and, virtual worlds used to develop life skills especially amongst learners with learning difficulties and those with challenging behaviour.

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Attitudes of senior management towards CPD in school

In some cases respondents noted concerns about the attitudes of some senior managers towards the value of ICT CPD. There appeared to be little understanding at times of the role of digital technologies in change management and as a catalyst for changes in teaching and learning. More ICT CPD at higher intellectual level was advocated for senior managers by some respondents. In this context providers made a plea to senior management to consider the conditions they offer for ICT CPD in schools. Providers reported that there was often poor or insufficient technology or software not updated that affected the value of the training and made them and the teachers feel inadequate.

Some practitioners felt that senior management should be more intimately involved in network filtering decisions that impact on learning innovation. Some teachers complained that their creativity was undermined by systems that are 'locked down' without proper debate. A more informed approach to filtering, it was felt, would also allow innovative practitioners to organise and manage their own informal CPD within the context of their online working environment.

Evaluation of CPD and assessment of teachers

Evaluation of CPD as well as assessment in ICT and assessment using ICT were areas where there appeared to be little evidence of adequate CPD for leaders or practitioners. Some respondents were also concerned that traditional assessment techniques based on essay writing or multiple choice answers inhibited innovation and experimentation with digital technologies. One way to improve this situation might be to introduce more varied ways to assess professional learning using a wider range of media in order for the profession to experience the value of innovative assessment.

Skills information and trouble shooting online

Many leaders found various conferences and informal gatherings to be the most effective type of CPD. Therefore, it seems, informal learning might warrant being

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encouraged and financially supported as it may represent better value (for money) than some traditional formal short courses. Many practitioners were interested in the application of skills. Some practitioners suggested that leaders should model the techniques they want to see used in classrooms. Reluctant teachers wanted more courses that covered the area where they have doubts such as ethical, moral and pedagogical concerns.

Since the evidence from this study suggests that teachers are generally fairly capable in the use of the internet, it may be possible to consider offering skills training through e-learning in the way leading companies such as Apple now provide support to their customers online.

Teachers who achieved greater levels of online skills also wanted a better balance in course development between 'just in time' learning and 'continuing' professional development.

National resource banks

Many practitioners and providers bemoaned the lack of information about courses. One way to meet the demand for more access for leaders and practitioners to relevant information might be to put courses online in widely publicised and used repositories. The TDA Teacher Training Resource Bank (TTRB http://*www.**tda**.gov.uk/partners/quality/practiceresearch/ttrb.aspx*resources) is already well established and could be used for this purpose. But there are also other websites that could be used for this purpose.

Encouraging the establishment of communities of practice

Some practitioners, especially those with reservations about digital technologies, suggested that one way to improve access to information about ICT CPD would be for providers to make more use of existing professional communities of practice.

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They wanted more case studies and practical examples. Currently the course information as well as the case studies and practical examples providers publish do not seem to be reaching individual teachers.

Leaders suggested that more providers should invest in online advertising and in developing an online presence so that leaders and practitioners can find them when they search online using their own initiative particularly with the intention of downloading materials for courses.

Such resources featuring potential examples of the use of digital technologies in teaching and learning could be created by various local, regional and national project partnerships between universities, relevant companies, professional associations and schools with the help of appropriate financial support.

Ongoing change

As already noted, the third objective of this study, the analysis of the evidence against existing policy documents proved to be the most difficult objective to fulfil. This study revealed that certain key factors make the ICT CPD Landscape increasingly difficult to define and, therefore, to create relevant policy guidance and provide central direction. These factors include: the increasing fragmentation of the commercial market; the demise of many Local Authority advisers; the limited uptake by the profession of university programmes; the paucity and inconsistency of ICT CPD funding and support cover for leaders and practitioners as well as the lack of national benchmark standards.

One seemingly important, but difficult to quantify factor is the increase in informal learning organised at the grassroots of the profession fuelled by affordances of social networking tools around the exchange of knowledge and expertise. Existing policy documents appear not to be reflecting these ongoing changes such as the increasing complexity of the landscape, the diminishing opportunities for centrally funded support mechanisms and the growth of informal learning opportunities in much detail yet.

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This study revealed an increasing gap between the content of ICT CPD programmes and the experience of practitioners using digital technologies for learning. ICT CPD programmes that reflect the changes in ICT use for learning are not (yet) easy to find.

Further research

Three points were made by participants about further research. Some participants in this study wanted a stronger focus on the theoretical and practical knowledge that underpins ICT in curriculum topics and staff training. Into this category fell professional learning online, collaborating in communities of practice and using work-based learning to build case studies of effective practice.

Some practitioners, especially those who were not convinced about the power of digital technologies, were interested in an investigation of the role of teachers in this digital age and a teacher-friendly account of the pedagogy associated with digital technologies. Frequently requested from providers were more case studies focusing on successful, replicable practice. A follow-up to this study using critical incident survey techniques could map some of the most innovative practice that is emerging. A key area for development would be a project to engage providers, leaders and practitioners as co-researchers in developing techniques for the effective evaluation of ICT CPD. Effective evaluation by outcome was a particular area where more information seems highly desirable. Assessment of teachers and pupils in ICT and using ICT was also an area where more information was desired.

The research team also reflected on further research involving the development of the collaborative domain map. At the start the ICT CPD Landscape in England was known to be fluid, subject to frequent change, fragmented and open to different interpretations. As has already been noted, several factors contribute to the fact that the map does not offer a definitive, lasting representation of the landscape but, rather, it represents the time-bound consensus on perceptions amongst those who contributed to its construction and engaged with its development. By implication, greater accuracy, detail and currency of the map could be achieved by engaging a

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wider range of informants and by keeping it under review in light of ongoing changes, such as the untimely demise of Becta.

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