

## ICT and educational policy in the UK: are we on the way towards e-maturity or on the road to digital disaster?

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### Abstract

Despite successive government training initiatives, policies and extensive funding over the last 15 years, little has been done to effectively tackle the disparity of ICT skills and the training of the UK teaching workforce. The current Secretary of State for Education, Michael Gove, is committed to an agenda of promoting computer science in schools which overshadows previous governmental initiatives aimed at tackling teachers' digital literacy and computing skills. There therefore needs to be consideration not just of how to bolt and weld computer science into the curriculum, but also how to ensure that teachers remain equipped to teach pupils fundamental ICT skills.

**Keywords:** computing; digital literacy; ICT; teachers; education.

### Introduction

This paper is, in part, a response to David Wells' (2012) article 'Computing in schools: time to move beyond ICT?', although it is also geared towards presenting findings from empirical research carried out for the British Educational Communications and Technology Agency (Becta) shortly prior to its demise in 2010. At the time of writing, the recent disapplication of ICT means that teachers no longer have to follow the existing National Curriculum although the teaching of ICT is still statutory. Although there will be a new ICT curriculum in September 2014 and emphasis on teaching computer science as well as digital literacy, it is not yet clear what shape these will take in the classroom. The Royal Society (2012) is helpful here by providing definitions and making the distinction between ICT, digital literacy, computing and computer science relatively clear:

*'Digital literacy – The general ability to use computers... [ie] a set of skills rather than a subject in its own right. Computing – The broad subject area; roughly equivalent to what is called ICT in schools and IT in industry, as the term is generally used. ICT – The school subject defined in the current National Curriculum. Computer Science – The rigorous academic discipline, encompassing programming languages, data structures, algorithms, etc.'* (Ibid.: 5)

In terms of Initial Teacher Training (ITT), however, the profile of ICT on the surface would appear to be currently taking a back seat. Teachers training today are still required to pass the numeracy and literary skills tests but no longer have to pass the ICT skills test, and the new Department for Education (DfE) teaching standards (2012) which came into effect in September 2012 make no reference to ICT whatsoever. Whether this is because it is assumed that those entering, or those who are already in, the profession have the requisite ICT skills is not made clear. If one goes under the radar, however, there is evidence to suggest that even in the current climate of economic austerity the Government still values the status of ICT, at least in terms of developing ICT practices as part of teacher trainees' school-based training.

Although the Training and Development Agency (TDA) was replaced by the Teaching Agency (TA) in April 2012 the TDA ICT Grants 2012 initiative continues to exist. This is perhaps evidence in itself that funding of, and interest in, ICT in both the primary and secondary sectors is still alive within teacher education. Bidding took place in November 2011, and the criteria for these bids centred on how ITT providers would develop and enhance trainees' experience of successful technology-based practice within core subjects, regardless of their specific school placement, as well as developing and strengthening partnership between providers of ITT and leading practitioners in the use of ICT in teaching. The focus here is clearly on the use of ICT to support the teaching of the core subjects

– literacy and numeracy – and not the teaching of computer science. It also pertains to pedagogical aspects of ICT rather than a discrete set of ICT skills.

At this point, therefore, it is worth returning to the Royal Society and its recent report, *Shut down or restart? The way forward for computing in UK schools*, which was undertaken in response to ‘a high degree of concern ... about aspects of the current provision of education in Computing in UK schools’ (2012: 5). In addition to identifying the rationale for teaching computer science, the report also raises several perennial issues including ‘a shortage of teachers who are able to teach beyond basic digital literacy’ as well as ‘a lack of continuing professional development for teachers of Computing’ (ibid.: 5).

These themes are returned to further below, but first it is helpful to define, in terms of ICT, what is meant by e-confidence and e-maturity as well as briefly considering the rise and fall of previous governments’ initiatives to train and develop the ICT skills of the teaching workforce.

### Considering digital literacy, e-confidence and e-maturity

It is pertinent to note that the Royal Society (2012) advocates a ‘terminological reform’ which recommends a moratorium on the use of the expression ‘ICT’, as it carries ‘too many negative connotations’. Instead, it considers the possibility of ‘disaggregating’ ICT into three ‘clearly defined areas’, namely ‘digital literacy, Information Technology and Computer Science’ (ibid.: 8), although this, arguably, may only succeed in further compartmentalising the use of technical vocabulary.

Although phrases such as ‘e-confidence’ and ‘e-maturity’ may well derive from the previous Labour Government’s bag of buzzwords, they are still useful in helping to clarify, determine and discern differences between levels of digital literacy. Adam sees the two terms being linked in the following way:

*‘E-maturity is understood as an additional stage of development beyond e-confidence. The latter embodies high levels of ICT knowledge and skills, and a readiness to apply these to existing situations and new challenges. E-maturity is demonstrated when professionals apply ICT in strategic and discriminating ways, taking into consideration a balance of advantages and alternatives.’ (2007: 2)*

At this stage, it would be logical to elevate the status of e-confidence beyond digital literacy because its characteristics, according to Becta (2005), include more than just technical skills but also the dexterity to ensure personalisation of learning as well as evidence of the innovative embedding of ICT across the curriculum. Adam’s description of workforce e-maturity, however, clearly present a more advanced and forward-thinking set of attributes. For example, e-mature professionals:

*‘Draw on best practice with ICT and consider developing technologies from areas of life beyond the educational environment... They [also] engage with ICT as a significant element in a personal and professional learning journey as well as assessing the potential impact of ICT on the expected outcomes of their role.’ (ibid.: 7)*

If the teaching workforce of today has not yet reached such standards of practice, and if ‘digital literacy’ is still a term to be used with which to describe the ICT attributes of some teachers, then it is important to understand, historically, the reasons why this still may be so.

### The legacy of the New Opportunities Fund (NOF) and Hands on Support (HoS)

The main aim of the NOF programme, which ran from April 1999 to December 2003, was to bring all full-time classroom teachers up to the ICT standard of a newly qualified teacher, and, according to the then Department for Education and Employment (DfEE) (1997), the purpose of NOF was essentially that by 2002 all serving teachers should generally feel able and competent to teach ICT within the curriculum. Ten years later, and despite further initiatives and funding, and a change of government, for many teachers this has yet to become an actuality.

NOF had a difficult start insofar as the intention that teachers would upgrade their skills before the start of the programme was not realised (Preston, 2004) and the idea that schools would receive their Government-funded ICT equipment and broadband connections before they started their training was over-ambitious. The official figures for completion were 81% of primary teachers and 75% secondary (Conlon, 2004: 125). However, these statistics may be misleading, and completion rates between sectors at the time were varied. Conlon (2004) draws our attention to the Ofsted (2002) evaluation of NOF in which it was reported that 50% of primary schools had failed to adequately tackle issues relating to the quality of ICT

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use in the classroom and that in many secondary schools the programme had ground to a halt. Overall, in around 60% of secondary departments and 50% of primary schools, NOF failed to build on teachers' ICT skills or their ability to tackle pedagogical skills adequately.

Following the shortcomings of NOF, and in response to teacher feedback, the then Department for Education and Skills (DfES) (2004) launched the HoS programme which was mainly focused on delivering peer-to-peer support provided by 'credible professionals' (ibid.: iii). This support was not only customised to meet the needs of individual teachers, but was also tailored to be subject- or phase-specific and delivered in the classroom environment. In addition, HoS was designed to build on the significant recent investment in ICT infrastructure and ICT support with a view to using equipment with which the teachers were familiar.

In order to capitalise on the number of schools reported by Ofsted as making effective use of embedding ICT across the curriculum, a key feature of HoS, however, was that it was *not* concerned with basic ICT skills training or technical support but was focused on pedagogies to support the more effective use of ICT in teaching and learning across all subjects and key stages. Although there are indications that HoS had a positive impact on teachers' confidence and skill levels because of its flexibility, in contrast to the NOF one-size-fits-all approach (Condie et al., 2007), a common issue which is still prevalent today is the continuing demand for ICT-based continuing professional development (CPD) (Royal Society, 2012).

In light of the shortcomings of the NOF and HoS programmes and Gove's crusade with computer science, the following caveats about the factors which lead to effective ICT CPD are highlighted by Conlon:

*'At least 80 hours of professional development are required before teachers can really begin to integrate technology into their teaching. Carlson and Gadio (2002) [also] recommend that ICT related CPD should be funded at a level equivalent to 40 per cent of expenditure on hardware and software which, when compared to NOF, only amounted to less than 13 per cent of the expenditure on the NGfL [National Grid for Learning].'* (2004: 134)

### An overview of the ICT competencies of the teaching workforce today

A diverse landscape still exists within the teaching workforce and there would appear to be – despite over a decade of previous government funding – several distinct issues concerning ICT in schools which have persisted over the last 12 years and which still emerge in the literature today. They can be summarised as follows: a disparity in ICT competence between the primary and secondary sectors, with primary teachers emerging as more e-confident (Ofsted, 2011; Smith et al. 2008); a limited range of applications used by teachers (Cox and Marshall, 2007); a perennial weakness in the teaching of control technology, programming and data handling (Ofsted, 2009; 2011); a continued need – and demand – for teachers' CPD in ICT (Becta, 2010; Royal Society, 2012); a lack of auditing staff ICT skills (Ofsted, 2009; 2011); and an ongoing forum concerning the 'digital natives debate' (Prensky, 2001; 2010; Selwyn, 2009).

Although there is a tendency to consider the younger generation to be more ICT-savvy, research would appear to indicate that age is not necessarily an issue. A three-year study in the United States involving over two thousand pre-service teachers found that there was no significant statistical difference in terms of ICT competence across age groups, although learning behaviours between 'natives' and 'immigrants' tended to vary (Guo et al., 2008: 252). The UK teaching workforce, as it currently stands, could be considered to be 'young', with 50% of primary and 36% of secondary teachers having up to ten years' experience (Smith et al. 2008), although Hobson *et al.* (2009) point out that there are some younger teachers in their early twenties who still lack the confidence and training to engage with, for example, interactive whiteboard technologies (IWBs).

### Case studies with key stakeholders in the teaching workforce

Using the findings from the literature as a barometer, a series of one-to-one interviews were carried out to explore themes including: assessing ICT skills; skills sets and approaches to training; contrasts in ICT skills sets between different groups of teachers; and barriers and enablers.

Although the sample size of this study (six respondents) is arguably small, the interviewees were considered to be representative of the workforce and included local authority (LA) personnel, head teachers

and ICT coordinators working in both the primary and secondary sectors. The questions were delivered to the respondents well in advance of the interview so that any anomalies or any misunderstanding of the questions could be dealt with beforehand. The interviews were recorded digitally and the transcripts were then word-processed. The participants were as follows: Secondary, Assistant Head Teacher; Primary, Infant Head Teacher; Secondary and Primary Local Authority School Improvement Advisor; Primary Local Authority Advisor; Primary Head Teacher; and Primary ICT Coordinator.

## Findings

Ofsted (2009; 2011) has consistently reported that where ICT skills are being audited, subject knowledge and practice among the teaching workforce appears to be stronger, particularly in the primary sector, and in order to improve practice they recommend that schools should systematically audit staff skills. However, none of the respondents in this small-scale study had completed a full staff audit in their setting, and only one school and one LA adviser indicated that this process was happening and even then it was at an 'embryonic stage', although a third respondent said they intended to use the audit proforma provided by the LA at a later stage. Alternative approaches to assessing staff skills included 'learning walks', lesson observations and discussions with staff. In terms of using the information known about existing skill levels, there was general agreement from all respondents that training needed to be personalised to the needs of the individual and that staff needed to be involved in their own self-assessment.

All respondents apart from two agreed that there were teachers who still lacked basic ICT skills, although the number of teachers lacking these skills was greater in the secondary sector, with some, for example, not possessing the skills required to compose and send an e-mail. At the other end of the spectrum, all respondents reported that there were teachers in their setting who possessed advanced ICT skills, although in one case this was a teaching assistant (TA) and not a teacher. Both the respondents who worked for LAs said that leading ICT teachers were recruited on a part-time basis to deliver INSET and share good practice. Again, it was noted that the secondary sector was less effective at sharing good practice between schools, although this contradicts findings reported by Smith et al. (2008). All other respondents reported that, in one form or another, staff expertise was shared, although this was mostly in an informal way as characterised by the HoS initiative (DFES, 2004).

Findings from the literature would indicate that there are few teachers who employ a wide range of ICTs in their teaching (Becta, 2010; Cox and Marshall, 2007), and all respondents apart from one agreed that this was the case in their setting. Reports on practice in the Early Years Foundation Stage (EYFS) were also worth noting. Aubrey and Dahl (2008) would suggest that this phase is the weakest in terms of practice in the use of ICT. However, two respondents were able to give examples of exemplary practice in terms of projects using a wide range of ICT applications to support communication, language and literacy.

In terms of good practice, all respondents were able to cite examples in their settings which provided a positive illustration of how institutions are moving along the road towards e-maturity. For example, there was evidence of e-postcards, voice changers, audio story phones and digital cameras being used in the EYFS to support Communication, Language and Literacy. In Key Stage 1, respondents reported the use of blogging, e-mail systems and video editing. Practice in Key Stage 2 included laptops and other mobile technologies to support off-site learning, and in Key Stage 3 use of voting systems, wikis and podcasting was reported. Other initiatives included systematic assessment of pupils' progress in ICT at primary level, and managed learning environments (MLEs) used to support off-site learning in the secondary sector.

Approaches to CPD and how skills were built upon were varied, and this commonly included ad hoc support where staff exchanged knowledge and skills informally. It also included attending off-site and on-site training by key members of staff who then cascaded this to colleagues. In some cases, training was focused on particular year groups and then filtered to others on a rolling basis. At LA level, training was geared to meet the individual needs of teachers and this was either provided on site or at LA centres.

Almost all respondents felt that newly qualified teachers possessed better ICT skills than serving teachers, although it was felt that they still needed time to develop their pedagogical knowledge. However, responses included the acknowledgement that there were some exceptions to the case, although higher skill levels were attributed to their age and the input they had received during their training. It was also interesting to note that all the respondents apart from one felt that age was not necessarily a factor in terms of ICT competence. Many of the respondents gave examples of mature colleagues who were highly competent with ICT, which would appear to underpin the findings of Guo et al. (2008).

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Although the Qualifications and Curriculum Authority (QCA) scheme of work is, in some cases, still being used in its existing form, some respondents indicated that they had either adapted it or were using their own schemes of work. Strands reported as areas of weakness in both the primary and secondary sectors include control and data handling, and the areas of strength which emerge are communication and presentation – findings that are very much in line with recent literature (Ofsted 2009: 2011).

As far as barriers and enablers are concerned, time emerged as an issue, with half of the respondents citing this as a problem: not just time to attend CPD, but also having time to consolidate skills and further self-development by exploration of the resources available. Other barriers mentioned included a lack of access to resources and 'people' in terms of whether or not they were willing to embrace change and move on. Funding was also mentioned as a barrier in the sense that money was no longer ring-fenced.

From the research presented here, a diversity in resource settings clearly emerges, where some schools have a far lower computer-to-pupil ratio than others, with some in this small-scale study falling well below and others far exceeding the national average (Morris and Trushell, 2009). TA skill levels were also generally reported to vary, with some TAs being labelled 'experts' and others 'technophobic dinosaurs'. Although time had been reported as a barrier, there was also evidence from the interviews that ICT was beginning to become an enabler in terms of saving time when planning.

### Conclusion

The journey towards e-maturity within the teaching workforce today remains patchy and is paved with pockets of outstanding practice alongside some rocky stretches of road where teachers still lack the basic skills. On the surface, the Government would appear to be backpedalling on the status of digital literacy and e-confidence for teachers, both by the removal of the ICT skills tests and the failure to mention ICT in the new standards for teachers (DfE, 2012). On the other hand, Gove has appeared to emphasise the reinstatement of computer science into the curriculum, and the recommendations from the Royal Society (2012) provide, at least, some possible blueprints to achieve success.

The problem facing the workforce with regard to ICT and computing is the disparity of ICT skills which currently exist, as well as the challenge of recruiting

teachers with the requisite background to teach computer science (Wells, 2012). There is also the perennial issue of time both in terms of undertaking CPD and having time to consolidate the skills learned. For Gove's vision to be successful, there may well need to be the recurrence of a national training programme both in terms of teachers' ICT skills as well as training teachers 'to successfully shift from teaching ICT' to delivering 'a more enhanced computer science based curriculum' (ibid.: 10). If this is to be the case, and if the Government wishes to avoid a 'digital disaster', then they will need to study carefully the mistakes and lessons learned from the NOF and HoS training programmes.

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