



**global summit 2006:
technology connected futures**

**Personalised Learning – the
Technology Challenge**

Doug Brown

Personalized learning has become a key feature of debate in the English Education system. National centrally driven strategies over the last ten years have had a significant positive impact on standards in schools, but the pace of improvement has slowed, and increasingly we need to look for more personalized ways to support individual learners. This paper considers if technology might be close to being able to support – or indeed promote – a future which responds more to the individual’s educational needs.

Personalized learning – the Technology Challenge

We live in a time of significant change where the rhetoric of what technology might offer in the future often exceeds the reality. In predicting the future we often overestimate how quickly something will happen – but equally underestimate the impact it will have. But as Ray Kurzweil says “The pace of change is accelerating...the result will be far greater transformations in the first two decades of the twenty-first century than we saw in the entire twentieth century.” (The Age of Spiritual Machines).

This is difficult to conceptualize. If we look back to 1903 we would note the first manned flight by two brothers Wilbur & Orville Wright. I doubt that they ever imagined that less than 100 years later there would be 36m air travelers passing through one airport (London Heathrow) alone. Imagine the potential social upheaval if that had happened in a single twenty year period.

Yet in one sense that is what has already happened with the virtual world. In just twenty years the World Wide Web has millions of people traveling virtually, with access to encyclopedia, experts, mentors, collaborative learners and possible co-creators and importantly a free channel from which to publish. User generated media just reached a milestone of recognition with

the recent purchase of *YouTube* by *Google*.

The educational world is also in the midst of change. In the UK we might look back to 1976 when Callaghan became the first prime minister in office to voice fears about the quality of education and start a debate that education was too important to be left to the professionals. Over the next 20 years we introduced a National Curriculum; an inspection system to regularly and rigorously review the quality of our education establishments; a devolution of authority (and finances to match) from central and local governments to individual schools; the introduction of national standardized tests at aged 7, 11, 14 as well as the traditional 16+ examination - and the publication of the results of those tests as a measure of school performance.

In 1998 we introduced our primary literacy and numeracy strategies – moving the debate from ‘what’ should be taught to ‘how’. The strategies made significant improvements in standards across the whole school system to such an extent that interest was generated across the world.

However, it has become apparent that the success of these centrally driven literacy and numeracy strategies has slowed – or indeed (potentially) reached a plateau. There have still

been improvements in overall standards in the last few years and now 16% more children reach the required standard in literacy (at age 11) than did in 1997.

But we clearly want to do better and thus the debate in the UK has moved on. While we must ensure we retain the successful foundations that the strategies provided, we must find ways to support all children to achieve even higher standards. We now need a more personalized system for the 21st century. This is the challenge that the UK education system has set.

Over a similar time period from 1998, the UK also started and invested heavily in its ICT strategy. We now have an infrastructure which enables all schools to consider ICT as more than an add-on. Currently our pupil computer ratios are 6.2:1 (primary) and 3.6:1 (secondary) and still improving; nearly all schools have at least one interactive whiteboard with many primary schools able to see these as a tool for all teachers, and all schools will be connected to the internet at broadband of 2mb or better by the end of this year. Increasingly politicians, senior officials and front line staff are all expecting ICT to be part of the answer to personalization.

Indeed for some, it is impossible to envisage full personalization without ICT. Looking at the next few years there are a number of ways in which we can see how ICT might contribute to this agenda.

Access

Increasingly we are looking at personal access. We believe that personal devices will become commonplace.

There are ad hoc case studies around the world from which we seek to learn (for example, we know that in the US in Carolina a university has provided all students with Ipods and podcasts all lectures). In the UK we are also supporting trials of more personalized access. In one area (Wolverhampton) we are supporting developments where all pupils can access educational material wirelessly through the internet on their own PDA device; while in another (Nottingham) we are looking at how Intel's new pupil devices might contribute to personalized learning.

We don't know what the device of the future will be, or its final capacity, but we are looking to a future where every learner will have access to computing power and the internet with the potential memory capacity for whatever we can currently imagine will be required. In 1981 we had the first system wide initiative to put one computer in all 30,000 (approx) schools. By 2008 we know that one single hand held device will have the same processing power of the total of every computer that delivered that first initiative. Across the whole system we are moving towards the goal of universal access and have just launched a scheme to support 100,000 families from the most deprived communities to get personal access in their home.

Collaboration

Undoubtedly one technology enabled change we wish to capitalize on, is the increase in the potential for collaboration, and for receiving support. We already have our 'own' Gridclub and its 'spin offs' resulting in online communities where over 100,000 6-12 yr olds 'meet', share interests and learn together. 13-19 year olds throughout the UK now have Blast - a BBC initiative encouraging young people to get in to dance, film, art, writing and music. Ask an Expert' sites provide access to world renowned experts who just want to share their passion for their subjects – and do it freely; and of course we now have access to collaborations such as Wikipedia – with over 1.1m entries in English.

Learners as creators

This also leads to more opportunities for learners to see themselves as co-creators of learning content. Outward signs of this are the moves from personal websites to Blogs (from 'publishing' to 'participation'). On websites such as *Fanfiction* anyone can write either new or 'in the style of' books. As an illustration of the power – and the changing age profile – there are 420 additional 'chapters' on Hitch-Hikers guide to the Galaxy and over 268,500 new Harry Potter stories!

Our education system will see young people bring this experience of peer critiquing and publishing for an audience and thus expecting to be

partners in their learning. So we are challenging our Content Suppliers to address this in commercial learning materials with more problem based learning approaches – and considering more use of interactive 'games' (see below).

Parallel processing or using new tools in different ways

Many anecdotal stories are told of students who can listen to music; be on 'Messenger' communicating with friends; watching TV; and on the computer doing their homework simultaneously! Each new generation challenges the previous generations about what limitations (or even damage) new technologies might bring. This implies questions about the learning environment that best suits their needs or abilities. In the UK we have eminent scientists raising questions about the current use of video games etc. - not just dismissing these tools, but rather saying that we need more research to see what is happening to young brains when exposed to visual media rich environments.

However, some schools are already using what our greater understanding of the human brain allows us to do and for example, are trying out accelerated learning ideas and playing background music as part of creating the right environment for learning. We know we need to increase our understanding in this arena but in particular whether the use of ICT can support – or indeed

promote – new ways of learning. For example, we are already seeing the growth of technology enabled problem based learning. St. George's University Hospital in London currently reduces the time taken to train a doctor by 20% partly by using PBL as a teaching methodology – enabled because all necessary factual content is online.

Informal v formal learning

All media producers are in the midst of a revolution. We now have on demand programmes and increasingly the value to a broadcast is in the follow up broadband materials. We are working with others to ensure better and easier access to materials with the development of intelligent agents to interpret needs and find digital assets and offer these directly to the teacher or learner. These assets include our wealth of cultural materials from our museums and libraries, but also the archive of audio and video assets from our public service broadcasters including the BBC.

This brings high quality, learning curriculum focused materials directly to the learner not necessarily mediated through a school. Assuming that the materials being produced can engage learners and support their learning, we will have learning resources outside the school of equal or better quality than the materials in school and this will raise the challenge of how we deal with – and accredit – the concurrent and distributed learning which will take place.

We have a number of test bed schools where all homes have been connected to the schools learning platforms and where learning materials are available to learners at home. So we are seeing different ways of addressing traditional concerns. For example, one school is making available online learning modules to enhance and support the curriculum as the 'homework' for all lessons. No regular lesson based homework is being set, but all children are expected to do a set number of the online modules – which are marked by the system and information fed to parents and teachers. There are interventions if work is not completed, but rewards for those who exceed expectations – and crucially no teacher has to start their lessons with challenges and disruption about homework not being completed!

Multi-media / Multi modal content

Over 55% of the workforce from European creative industries are based in the UK and seen as an essential part of our future economic platform. We have applications today which have internal diagnostic processes leading to each student being guided through differentiated routes, and we also know that programmes which recognize an individual's learning style and tailor future presentation to provide the support best suited for each learner are already being created.

New understanding in brain science can, and will be applied in a digital context. This means we can better

focus material on auditory, visual or kinesthetic learners in ways which currently only the best quality games do. We are working with other government departments – most notably the Department for Trade and Industry and the Ministry of Defence on understanding the serious application of gaming technology – which could for instance support literacy development in adults - and looking at how we might apply the principles to other educational opportunities.

We recently commissioned a report published by the Entertainment and Leisure Software publishers Association on 4 October 2006.

“Unlimited Learning: Computer and video games in the learning landscape” has been developed to offer a snapshot of what is already happening across education and, importantly, offers an evidence base from which informed decisions can be taken by industry and education alike about the use of games in education. This report is available from www.elspa.com.

Implications for teaching

What is quite clear is that we must address this future where a one-sized fits all solution will not be tolerated by a generation that has the access and opportunities described above – and the potential to take full advantage of them. Schools have to be places which respond to the needs of their students as well as (and these are not exclusive) delivering to societal expectations.

Anecdotally, we have already had comments from children such as “we ‘downskill’ when we go to school” or “School is where you go to pass exams – but real learning takes place outside of school”.

The debate about how we use technology in schools is only really now being mainstreamed –but encouraged increasingly by the recognition that ICT is fundamental to this personalized learning future we wish to attain.

A scenario posed to encourage debate amongst head teachers about the future runs as follows:

Last period on a Thursday, a teacher offers her year eight class a glimpse into the next half term’s work. She follows good Ofsted practice sharing the desired learning outcomes and the resources that the class will be able to use.

The following Monday, one of her children comes in and says: “It was wet over the weekend and I got bored – but I thought what you had shared on Thursday was really interesting so I logged back onto the school intranet, and downloaded the resources you suggested. I also downloaded some BBC materials which helped me learn some of the background, and when I got stuck I emailed Homework High and a nice teacher in South Africa gave me advice on how to move forward. I got really interested in one bit and went onto the ‘Ask an Expert’ site and got into a discussion with a PHD in the

USA (I had to tell him I was only 14). I got really involved and spent about 12 hours on this [about a half term's work] over the weekend, but I was really pleased when I took your end of unit test and got a level 8 so I printed off my certificate to prove it"

How does the teacher respond? Is this a challenge to authority? Is this a cause for concern because there is no work prepared for the next six weeks of lessons? Or is this the opportunity that this teacher came into the teaching profession for, and (as one teacher reported) "I can now take children to levels of understanding and learning that I have never been able to achieve before".

The challenge for such concurrent and distributed learning opportunities is how teachers across the system and the schools as institutions will react to this. How schools cope with learning in the 85%+ of potential learning time that is outside their immediate control will be increasingly be debated. We know that schools often complain that they have difficulty building on past learning – but this will prove even more challenging. How do we train our professionals both teachers and support workers for this new (to them) world?

What this does lead to though is a real understanding that our discussions now are not about technology. The debate is not about what technology can do, but what do we want to do with learning – because very probably technology can enable it.

Personalized learning in the 21st century is inextricably linked to the use of technology. The technology should be transparent – and often is – to the learner; but we are not yet at the point where the use of the technology is assumed by the teacher – and thus we still have not achieved the ability for our institutional learning to match the personalized learning that happens in the 'real' world.

But we should be positive – more and more professionals involved in education understand the issues, and in the examples we have where it is working we can say that not only is this the future – but it is a promising future.