Editorial

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The Road Ahead (Image copyright Paul Heinrich)

In which your editor muses on the future of the curriculum and debates over personal technologies in schools.

In mid-October I spent three glorious days in the Harz riding vintage steam trains through the golden leaved forests in glorious sunshine. Magnificent scenery, majestic technology, and a railway that in its day was a critical tool for regional communications.

So what has this to do with ICT? Well, for a start the railway uses a radio signalling system linked to computer control. Secondly, the visit was booked, maps and other information gathered, Eurostar, Thalys, ICE etc times and routes checked quickly and easily online including via a smartphone. Using such technologies is a normal part of life for us now yet even 10 years ago was still something of a novelty for many. Today anyone who cannot use these technologies effectively is seriously disadvantaged. But are schools teaching effective use, indeed, will they be able to?

There are two main challenges facing the advancement of education through technology over the next 12 to 18 months. The first is the review of the National Curriculum, where the mistakes of the 1980's are being repeated by handing the field to specialist interest groups not connected with school level education. The second is the debate regarding BYOD (Bring Your Own Device) and BYOT (the much broader Bring Your Own Technology) the natural next step in ICT provision but one in danger from increasing paranoia over perceived health and safety and cyber bullying dangers. There is a linkage between these two challenges that may not be immediately apparent. However, if we get one or both wrong we could further divorce schools from the reality of the world that we all actually inhabit, a world where technology is ubiquitous and at our fingertips whenever we want or need it.

The immediate concern is the likely outcome of the review of the programmes of study. Can teachers have any confidence in a review led by computer scientists and engineers, where teachers, industrial and commercial users of ICT are merely consulted and I suspect may potentially be ignored. In particular the needs of primary schools are overlooked – the focus appears to be on KS3 to KS5, yet so much innovative use of ICT has been at primary level where in the best schools ICT has been a major driver towards high standards. For those of us who believe in a broad and balanced ICT curriculum (and yes, one that includes some computational thinking and coding) and above all one that can respond to the rapid changes in both technologies and the way in which we use them the dangers are obvious.

However, there are positive signs. Naace has of course made its views very clear and there has recently been a major roundtable debate with industry and other groups hosted by the DfE and BIS. This appears to have been very productive and one hopes that the key messages get through to ministers. A full report can be found on Edfutures at http://tinyurl.com/d2hfppk. Then the draft of the final draft of the working group's recommendations went to DfE on 22nd October and was published on the BCS site at http://academy.bcs.org/category/17301 almost immediately. These new draft proposals represent a very significant advance on the initial thinking and now properly address the educational and economic/societal importance of ICT. There is, in my view, still too much emphasis on computer science aspects but the key stage programmes provide sufficient scope for innovative interpretation by schools though the need for good quality staff professional development will become even more important, especially in primary schools. The biggest challenges will be faced by key stage 3 where many schools will need to up their game considerably. There remains a need for overall refinement and detail development but even for an old cynic like me these draft proposals are much better than one might expect from such a diverse working party.

There is a growing body of research supporting the view that access to personal devices is critical if technology is to become an integral part of school learning (as it is increasingly outside school). On the one hand this might involve learners owning or leasing a tablet via the school – the classic BYOD approach as typified by schools such as Longfield Academy with their innovative approach to the use of iPads. From a school's point of view this has advantages as the type of tablet can be standardised, network security is simplified and tech support can be put in place. But, it is expensive for parents and ignores the fact that many, indeed most learners already own smartphones and tablets that could easily be used as learning devices in school – the BYOT approach.

Yet there is, in some quarters, a fear, indeed a terror of allowing learners to use the tools that they use everywhere else except at school. The basic argument appears to be that if young people have their phones etc in school they will use them for various non-educational purposes and potentially for cyber bullying. Some might – possibly the same ones that answer back to teachers, scribble on text books and generally abuse school property and their peers. In other words the disruptive minority that should be properly dealt with through good disciplinary processes.

Others, including legal minds, use arguments based on Health and Safety law and duty of care because some, again a tiny minority of pupils, may use their devices for cyber bullying purposes via 3G connections during school hours. Again this is a disciplinary issue and a good reason why e-safety and appropriate use of technology needs to be taught rigorously. Cnut could not turn back the sea, neither can fears over the misuse of technology turn back the reality that today's learners hold in their hands devices of a power my generation could only read about in science fiction novels. We need to learn to live with it an exploit the potential.

And so to the theme of this issue. We begin with a fascinating piece from Micheál Ó Dúill on what he terms 'Turing Teaching' that presumes the computer rather than the book as the base medium for learning. Very relevant when linked to the BYOT debate. Terry Freedman explores e-safety issues around BYOD/BYOT and matter taken further by David Holden and his team from Tribune Business Systems and also by Earnie Kramer of Lightspeed Systems who offers a 10-point guide for schools. Continuing with the theme of change and the impact of ICT on learning Mark Baker considers how we should take charge of the technological changes while David Kempster explores the impact of iPads at Casllwchwr Primary. The positive impact of educational technologies is amply illustrated by Dr Samuel King in is paper on their use in mathematics teaching and learning. We finish with some short sponsors articles on tablets and mobile learning.

All these articles demonstrate the huge and positive impact that technology has on learning when schools and individuals are allowed to innovate and explore the potentials. It is the freedom to innovate that is the driver and must continue whatever dogmatic politicians and self-interested groups try to inflict on schools.

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The views expressed in this editorial are those of the editor and do not necessarily reflect Naace policy.

An Introduction to Turing Teaching

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Some thirty years ago the now forgotten Microelectronics Education Programme (MEP) introduced primary schools to computers leading to the subject we now know as ICT with its own statutory status in the national Curriculum. It has retained its subject status despite Rose categorising it as a skill and Alexander's attempt to absorb it into language. The mess that was the ICT curriculum prompted Furber to descend from his engineering eyrie clothed in the cloak of the Royal Society to demand that 'real' computing be taken seriously. Current government policy open up the options, retaining the ICT curriculum whilst disapplying the programmes of study while in the trade ICT has become simply "technology," the usage preferred by the late unlamented Becta, NAACE and BETT. The computer is back where it was when it first came to school But, in 2012 children enter the reception class possessing greater skill with the computer than with the traditional text media that are the basis of education yet a notable aspect of computer use in primary school has been its exclusion from the teaching of literacy and numeracy. Current proposals for the primary curriculum continue this approach. Yet times have changed.

Some thirty years ago the now forgotten Microelectronics Education Programme (MEP) introduced primary schools to computers – mainly Steve Furber's BBC Micro. Very quickly, under the unfortunate aegis of the Department of Trade and Industry it became known as Information Technology (IT) and when the British Government imposed an English National Curriculum IT got its own statutory status. The arrival of the Internet on the commercial scene added a central 'C' for communications (though many thought it stood for cheating). ICT has retained its subject status through all the revisions of the curriculum, despite Rose categorising it as a skill and Alexander's attempt to absorb it into language. The mess that was the ICT curriculum prompted Furber to descend from his engineering eyrie clothed in the cloak of the Royal Society to demand that 'real' computing be taken seriously. Children should learn to Scratch in school, he opined. Secretary of State Michael Gove has now decided to open up the options by keeping the ICT curriculum whilst disapplying the programmes of study. In the interim, in the trade ICT has become simply "technology," the usage preferred by the late unlamented Becta, NAACE and BETT. The computer is back where it was when it first came to school. But of course it isn't. In 1982 primary schools awaited a single microcomputer for the whole school. In 2012 many a rising five arrives in the reception class possessing greater skill with the computer than with the traditional text media that are the basis of education. Throughout the past quarter century a notable aspect of computer use in primary school has been its exclusion from the teaching of literacy and numeracy, as documented in successive National Strategies. The current proposals for the primary curriculum continue this approach. Yet times have changed.

How we use language influences our perception of people and things, as feminists and anti-racists well understand. The same is true of the computer. Like a conjuror's trick of misdirection, the word 'technology' diverts attention from its relationship with the mind. Technology has no place in the world of reading, writing and arithmetic. This is weird because

only the most blinkered could fail to recognise the book and pencil as technology. Admittedly it is a very old technology, originating in Sumer, now Iraq, some six millennia ago as cuneiform clay tablets; tablets of stone. It is far better to think of the written, graphic record as a medium that has a very specific relationship with the human mind and which makes very specific demands of primary education. With the blinkers off, it should not be too difficult to view the computer in the same light. To help remove the blinkers and widen the conceptual field, let us recall Alan Turing's paper on computable numbers. In order to solve the question of whether all numbers are computable by mechanical means, he turned what he did as a logician into a machine. He had a notepad on which he wrote, read and erased symbols. As he read he would flip back and forth on the pad to read what was already written or add new text. What he did depended on his state of mind, which was determined by the problem he was working on. This is the Turing machine, the conceptual computer, which can read, write and, with a little instruction, do arithmetic. Sounds familiar?

Turing, in his 1950 "Mind" paper speculated on the relationship between a practical computer and the human mind. From this emerged the so-called Turing Test of artificial intelligence. This test was challenged indirectly by Dreyfus when he noted that computers were not good at visual tasks. This, in its turn, raises the somewhat embarrassing question of children's ability to draw: primary school walls are covered with children's drawings but psychology has no explanation of how they are able to do them. Even worse, it turns out that psychology has nothing to say about the 'how' of technology: how is it that the human is the only species with technology and why is it so powerful? The very real objects open to inspection that are the products of human technological ability are a conceptual chimera: no wonder the meaning of the word drifts with every technical novelty. The question concerning technology now has a proposed answer, which was presented at Constructionism2012 in Athens this August. This is not the place to rehearse the research that led to the proposition; interested readers are referred to the conference proceedings. The conclusion is that human technological capability is cognitively more powerful than language.

At first sight the notion that technology is cognitively more powerful than language is surprising. However, it quickly becomes clear that this is so obvious that we should have realised it long ago. Why would we bother to teach the technologies of writing and number if they were no more powerful than talk? Writing is no more speech written down than is number a representation of counting. This new understanding that literacy and numeracy are technologies facilitates a more objective analysis of the role of the computer in the primary school classroom. The table below summarises the three modes of learning that are now open to primary school children.

Talk	Text	Turing
Socio-verbal / observational	Textual	Computational

Shared with Neanderthal	Uniquely human	Uniquely human
No external medium	Externalised memory	Externalised processing
High memory load	Demanding apprenticeship	Assistive

Talk and chalk (or practical demonstration) has been the staple for passing knowledge (and myth) down the generations ever since speech evolved. As the Neanderthals had speech, this mode of education was open to them. It is probably how they transmitted the complex skill of Mousterian flint knapping. It is certainly how the Thracians and other non-literate societies transmitted knowledge and skill. Alexander's Cambridge Primary Review emphasised this discursive mode.

Text has been available only since writing was invented some six millennia ago in Sumer (Iraq). Initially pictographic, in the hands of literate scribes arbitrary symbolic forms rapidly emerged to be impressed into damp clay as cuneiform; later baked into the Biblical tablets of stone. This medium, whether language, computation, maps, music, or electronic circuits are encoded, demands a long apprenticeship in decryption before the information can be made available and the dead letters animated. Learning the skill of encryption is even more onerous. Much of primary school is devoted to this task and, its six millennia history notwithstanding, the ruling classes seek to tell teachers how it is best taught. But, the primary school years also see the neurological maturation of the brain. Its cognitive and affective connections are hugely influenced by experience. It is readily argued that the literacy and numeracy apprenticeship will significantly affect the final structure of the mind.

Turing teaching has no history. It presumes the computer rather than the book as the base medium of learning. If the computer is used, it has the capacity to assist the learner in real time: no waiting for red ink in the exercise book. It can give immediate feedback to the learner on their level of understanding. The problem is that it can perform some of the operations that are intrinsic to traditional text-based education. This has been known for over a quarter century and traditionalists see it as a threat to cognitive development. Before outlining what Turing teaching entails, it is valuable to be clear about traditionalist method. The traditionalist approach to teaching method will be considered in two of its high profile aspects: the teaching of number and beginning reading, the realms of oral arithmetic and phonics.

Oral arithmetic hangs upon the language of number. In the early stages of learning this is given concrete support by counting: counters, bead frames, Dienes blocks, hundred squares, etc. Each of these methods works on the basis of ten (sometimes subdivided at five): count to ten, bundle up and begin again from one. The hundred square, the first and last rows of which are shown below, is a good example.

1	2	3	4	5	6	7	8	9	10
91	92	93	94	95	96	97	98	99	100

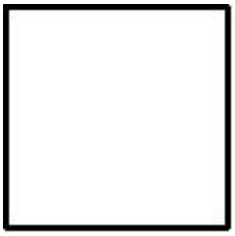
On inspection, an inconsistency becomes apparent. Consider number language: when working in base ten, humans count up to nine and then ‘shift register’ on the count of ten. This is masked in the units and teens but clear after twenty. The modern (Hindu-Arabic) place-value numeral system models this. The ‘10’ and ‘100’ are conceptually in the wrong place. Here we see cognitive conflict in traditional teaching method. If we truly want children to understand number as the human mind does, we would do better to give then a calculator and help them explore with it the way the mind handles number. Once the trustworthiness of the number system is understood; then is the time to apply it to organising a disorganised world.

The phonics issue is more subtle, but it nicely illustrates how computational thought has clarified our understanding of language. Phonics relies on learning a systematic relationship between spoken language and writing. The presumption is that children learn to read using their knowledge of spoken language. For those unfamiliar with primary education, synthetic phonics is a method of teaching reading which first teaches the letter sounds and then builds up to blending these sounds together to achieve full pronunciation of whole words. This obscures the fact that the so-called letter sounds are not those of the child’s own dialect but of Received Pronunciation as used in the OED. Thus, the word ‘England” is to be pronounced Inglnd, which is made up of the ‘ing’ word ending, an ‘l’, a neutral vowel for which English has no letter, and the ‘nd’ from ‘and’. It should come as little surprise that spelling errors in English tend to be speech-sound based, most notably neutral vowel substitutions. This reading-aloud method seeks to develop in children the capacity to synthesize speech from text. This has long been a major aspect of computational linguistics. One very important outcome of this work is the finding that there is complete disconnection of text from speech. The prosody, the rhythm and stress, of speech is unrepresented. The child has to reconstruct this from their own knowledge of speech patterns. In other words, learning to read is not about extracting and understanding the information stored in the text but training in the art of text-to-speech-synthesis.

Text-to-speech engineering concepts might well offer a better route to reading and writing. An outcome of research into the intelligibility of International English (English as a lingua franca) has shown that the full range of speech sounds used by a native speaker is unnecessary. The lingua franca core is commensurate with the letters of the alphabet. Now add in the consideration that synthetic phonics entails learning a ‘standard’ English pronunciation to supplement the learner’s own dialect. Let us turn this on its head. We can use the computer’s sound capability to generate a standard sound for each letter. We can then, with a suitable algorithm, blend then together into word-like units. These may then be strung together into sentences, respecting the space between words with a short silence. Punctuation might be named, as it is in dictation. We now have an accurate acoustic representation of the text. Every primary school teacher will recognise this as a stage that beginning readers go through. Let us now speculate what might happen if the beginning reader were given such a system on the

computer they were learning to read with (let us call it ‘audiotext,’ autex for short). Instead of having to learn how to add the prosody from their own mind, they would need to learn the mapping of autex to their own speech. This would be a bit like learning a foreign language, something that young children are known to be good at. How well it would assist the literacy process we have no idea: it has never been tried. But what is certain is that English speaking children the world over would have the same acoustic model of the word “England” that had an E at the beginning and an “a” in the middle; and consequently an accurate model for spelling. A computer can do this; neither a book nor a teacher can.

We are also becoming more aware of the cognitive paucity of language. For those who still believe that language is our species' crowning cognitive capacity, consider the drawing below:



It is a square. Now rotate the page by a one-eighth turn so that the edges of the figure are on the diagonal. The word “diamond”, unthinkable in the original orientation, comes suddenly to mind. Cognitively the shape is still a square but our perception, and our language, insists that it is a different object. This illustrates the difference between scientific and naïve thinking. It is obvious to anyone with eyes in their head that the sun and moon both revolve around the earth – don’t they?

The analysis of literacy and numeracy outlined above is twenty-five years old. At that time no child arrived in school from a computationally rich environment. They were as unprepared as their teachers for Turing teaching methods. The reverse is true today. There is now an urgent need to develop teaching method that will build upon what the children bring to school in terms of knowledge and skills. The very first, and most urgent, step is systematically to introduce them to all the possibilities of the computer in the context of the normal school activities for their age. There is one country that has taken a tentative step in this direction. Bulgaria, at the other end of Europe, has such a curriculum. The problem is that it leads to conflict with traditional teaching method so remains optional. Now that Gove has dissaplied the “ICT” programmes of study and attainment targets, this approach is also an option in England.

The second step is to thing very carefully about what Steve Furber and the gang at the Royal Society were up to. They never got to grips with primary education, looking only at the last year and the transition to secondary. What does “programming” mean for reception? Is a graphic environment like Scratch or LabVIEW as used by LEGO the best solution? What are children in reception learning? The answer is obvious. They are learning to construct words and sums letter-by-letter, symbol by symbol. There is a well established educational programming language that can complement this learning: Logo. Now that the charlatans who passed off turtle graphics

packages (remember them?) as the language, we are left with a few nice implementations. Two that are widely used are Imagine Logo (from Comenius University) and Microworlds (from LCSI in Canada). They both offer a wide range of possibilities (but please do not try to teach turtle graphics in primary school; Papert got it wrong.) There is only one important thing about programming: the computer responds to the words the children write at the keyboard. Here is another route to literacy; and one that does not involve speech. It is also an environment in which children can creatively explore number. It is an integral part of Turing teaching: using the Turing machine in native mode.

The transition from Traditional to Turing teaching is becoming overdue. Children are already becoming more difficult in school as they inarticulately perceive the conflict between the old and new media. Given that the primary school phase is neurologically so critical, it is time to begin the R&D necessary for an effective transition. Curricula such as that currently proposed for primary literacy and literacy are not helpful. Why stop at twelve times tables? Lets go the whole hog and reintroduce pounds, stones and hundredweights to exercise their little grey cells with the fourteen times table! And when the children spot the calculator in their teacher's handbag? This is Neanderthal thinking. We are a technological species with the opportunity to tune our technology to the neurological development of childhood. We need to drop the 'technology' word and take the standpoint that we are using a medium with assistive capacity. It is past time to start thinking about the healthy development of children's minds rather than attainment targets used to measure mastery of an unhelpful and obsolescent medium. In this his Centenary year, it's Turing teaching time.

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E-Safety And Bring Your Own Device

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What are BYOD and BYOT and how do they differ? Both have significant e-safety implications for schools. In this article Terry Freedman explores the issues.

The Bring Your Own Device (BYOD) phenomenon has started to be talked about more and more in the context of education. While it is not exactly common, it is certainly an idea that is being increasingly explored. But first, what does the term "Bring Your Own Device" actually mean?

According to EdFutures,

"Bring Your Own Device (BYOD) refers learners being able bring any mobile computing device in

to school and connect it to the school network, so long as they have registered the device in advance with the school. This usually involves registering the MAC address of the device with the school. The school restricts access to the network and manages which facilities the pupil/device can utilise." (EDFutures 2012a), and

"Bring Your Own Technology (BYOT) refers to learners being able to bring any mobile computing device in to school and connect it to the school network, without having to register the device in advance. In practice this usually involves connecting the device to the internet via the school wifi connection." (EdFutures 2012b)

According to Mal Lee, in his article The BYOT-BYOD difference,

"Bring your own technology (BYOT) is an educational development and a supplementary school technology resourcing model, where the home and the school collaborate in arranging for students' 24/7/365 use of their own digital technology/ies to be extended into the classroom, and in so doing to assist their teaching and learning and the organisation of their schooling and, where relevant, the complementary education outside the classroom."

As you can see, the Edfutures definition of BYOT is rather more cautious than Lee's, which does not mention going through the school's wi-fi connection. In theory the most useful and easiest approach would be to allow students to connect to the internet however they like. In practice, at least in the UK at the present time, fears over e-safety prevents such a situation from receiving the school's blessing.

Before exploring the dark and murky waters of e-safety, let's look at the **benefits** of BYOD/BYOT. I think this is both interesting and important, because what appears to be the easiest way to deal with the potential problems associated with BYOD/BYOT is to ban students' own mobile devices altogether. Unfortunately, doing so does not guarantee e-safety for students, but **does** guarantee that they won't enjoy the potential benefits of using their own kit.

I have been carrying out research in this area, and the schools I've come across that are exploring the idea of BYOD/BYOT are not doing so purely for the reason you might expect, namely the cutting of ICT-specific funding for schools, although that has been a factor. Just as prevalent have been the expected benefits of students' being able to use a device wherever they happen to be, familiarity with their own device and the applications on it, flexibility, and the ability to carry out research immediately, as the need arises.

In the corporate world, where BYOD is being experimented with despite the potential data security hazards, several studies have reported that employees are happier using their own kit than that provided by the company. There is no reason to believe that students' reactions would be any different.

But the e-safety-related fears do need to be addressed. As UNESCO (2012a) reports,

"Many parents and educators ... worry that mobile phones enable inappropriate behaviours like cheating and cyberbullying."

However, as another UNESCO report states:

"... while many educators and parents cite online safety concerns as a reason to ban mobile devices from schools, mobile learning actually provides an opportunity to promote student safety, both through teaching students to navigate online environments responsibly, and by using the communication features on mobile phones to provide learners with safety-related information quickly, efficiently and privately." (UNESCO 2012b).

The report goes on to ask the incisive question:

" ... if teachers do not engage these issues, who will?".

Lisa Nielsen (2010) asks the same question:

"If schools are not preparing students to operate in these environments, who is? Are we going to continue to pass the buck and say, "not my problem?""

So what are the potential risks of BYOD/BYOT? Some of these are not unique to BYOD, but we might itemise the following:

- Low-level disruption caused by phones making noises.
- Cheating in tests.
- Cyber-bullying by texting.
- Sexting.
- Taking inappropriate photographs.
- Accessing inappropriate websites.
- Privacy concerns.
- The potential to by-pass the school's wi-fi network and associated filtering via a 3G connection.

These behaviours are, of course, extremely worrying, but this needs to be put into perspective: as yet another UNESCO report makes clear,

"... it is important to review them in the context of similar behaviour that is happening offline or via other ICT, rather than simply condemning mobile devices as unsafe. Online behaviour usually mirrors offline behaviour in the physical world, and children at risk of abuse in the real world are at risk in the virtual world." (UNESCO 2012c)

It would be unrealistic to expect schools and teachers to do nothing to mitigate the risks associated with students using their own mobile devices. So, assuming they don't simply ban them altogether, what can they do?

The first step, I think, is to make themselves aware of the e-safety legal position. There is an excellent discussion at http://uk.linkedin.com/groups?gid=3881040 which it would be worth looking at, especially as a legal expert, Dr Brian Bandey, has set out what needs to be considered.

I am not a legal expert, so the standard disclaimer applies here, but a summary of the advice is that schools, and indeed individual teachers, need to carry out a risk assessment regarding the use of students' own devices, and then take all reasonable steps to minimise the risk of anything awful happening. The e-Safety Advisor Blog has a good example of a risk assessment approach you might wish to consider. See http://www.esafety-adviser.com/blog/2012/03/21/bring-your-own-device-to-school-and-e-safety/)

Lest anyone reading this suddenly panics and decides to impose an immediate ban on anything smaller than a laptop, I think it's worth bearing in mind that anything can be a potential risk in the classroom, not least pencils and pens. However, mobile devices do differ from many other sorts of objects in that the student can engage in inappropriate behaviour while appearing to be doing authentic work or even, to the untrained eye, nothing at all, which makes it necessary for schools to explicitly address classroom management approaches as far as mobile phones are concerned, more of which later.

Unfortunately, as is often the case, the term "reasonable" (as in "reasonable steps", above) is not defined. But it may be worth considering what might be considered to be unreasonable. I'd suggest that no attempt at filtering might be seen as unreasonable in a court of law. However, at the other extreme, so would blocking the 3G signal around the school, assuming it was even technically possible or legal.

I would also suggest that not addressing the e-safety issues associated with mobile devices directly with students – such as, for example, the potentially dire consequences of sexting – is also a risk. Can we foresee a time when a student or ex-student sues his school for not educating him adequately in these respects?

The schools I have been researching have taken a number of approaches to deal with the potential risks of BYOD/BYOT. Several of them have set up a system by which students' devices have to be registered in order to be able to access the school's wi-fi system. At Sale Grammar School, for example,

"[Students] would not be able to connect to the wireless system even if they did have the

encryption key as the MAC address filtering stops them from doing that so they would not be able to access the internet through the school system.”, according to ICT Manager Simon Rowlands. Rowlands acknowledges that in theory a student with a 3G device (which includes Kindles and some iPads, not only mobile phones) could bypass the system and access what they like. He points out that:

“The only way you can try and enforce this is by the use of a strict User Acceptable Use Policy, which we have.”

This is borne out by the other schools I’ve been in contact with. All have, or are devising, an Acceptable Use Policy which takes BYOD/BYOT into account. Some have gone further and have adopted Responsible Use Policies, and at least two have gone even further by asking the students themselves to draft the policy, on the grounds that students are sometimes more tech-savvy in some respects than adults, and almost always more draconian in their approach. All of the policies I’ve seen make it clear that mobiles and other devices are only to be used in the classroom with the teacher’s permission or, conversely, that they must all be switched off when the teacher says so.

The issue of tech-savviness needs to be explored a little. If a student does something inappropriate with their phone, the teacher cannot fall back on the excuse that they didn’t know that that activity was possible or how to recognise it happening. To take a different scenario, would a school allow an unqualified person to supervise a PE lesson in the gym, with the equipment being used?

By the same token, I think it’s important for schools to recognise the potential dangers of mobile devices, and make sure their teachers know about them. That would make it easier to spot the signs. As Ian Guest, ICT Development Manager at Sheffield High School told me,

“Students who are not on task or who are bent on mischief give off signs most teachers can spot. This is then a classroom management issue."

Guest and others also make the important point, however, that students need to be actively taught about the issues. Guest puts it like this:

“We need to take care in laying the groundwork prior to launch i.e. we need to engage the students in discussion about what constitutes inappropriate behaviour, draw up a code of conduct incorporating their ideas and what they feel the outcomes of breaches of that code should entail. We’re not so naïve as to think this will prevent inappropriate behaviour, but at least we should all be aware of what is and isn’t acceptable.”

This is echoed by Paul Hynes, Vice Principal of the George Spencer Academy. After describing the technological barriers in place, he says:

“The rest of it is down to education which is not about hiding from the issues but using things that crop up as a learning point for the students. We do e-Safety in ICT lessons (Y7 and Y8) as well as during assemblies across all years. We also have a ‘challenge’ day with students off timetable where Year 8 focus more on digital footprint etc.”

Hynes also makes the important point that parents need to be brought into the equation. He says:

“I think the key link is with parents as they are ones who need to know what their child can access. We will be doing this through e-safety evenings for parents (led by Student Digital Leaders).”

The UNESCO 2012a report states that for parents and others,

“Mobile phones are widely considered to be disruptive to education.” (UNESCO 2012a)

This was a sentiment expressed by John Thorp, Headteacher of Les Quennevais School in Jersey. He said that parents were not keen on BYOD/BYOT because they see mobile phones as “distractors”.

It seems obvious, therefore, that involving parents, both in the initial discussions and once the initiative has been launched, is crucial. Hynes’ statement also points out something else, however, in his throw-away reference to student digital leaders. All of the schools who are approaching BYOD/BYOT successfully are not doing so in isolation. They typically have several other programmes in place, some technology-based and others to do with people and approaches.

It is worth bearing in mind that if a school permits students to use their phones in the classroom, this has the potential to change the situation in that it then becomes easier to spot the miscreant using it when he shouldn’t be. That is achieved by adopting simple but effective classroom management strategies such as requiring students to keep their phones in their cases or on the desk in front of them.

It is well-known that students will sometimes be able to get around internet filters, or that some websites will slip through the net, if only temporarily. In addition, as already noted, preventing web access via 3G is not a feasible option. It is clear, therefore, that a purely technological approach cannot be relied upon to guarantee e-safety for students. A more comprehensive approach is required, one that involves educating students, discussion with students and their parents, trust, using the devices for purposeful activities, a school policy and classroom behavioural strategies. Some excellent suggestions in these areas may be found in the Chapman’s (2012) CloudLearn report, and the summary document on “Handhelds and Mobile Devices”, and in Barbara Amann-Hechenberger, Barbara Buchegger, Sonja Schwarz (Eds)(2010).

In their recently published book, Lee and Levins (2012) state:

"BYOT is already appearing to be part of the suite of dividends flowing seemingly naturally to those pathfinding schools operating within the networked mode that have normalised the use of the digital, are collaborating closely with their homes and have adopted a more collaborative mode of teaching and learning. BYOT involves the home and the school genuinely working together."

My research would certainly bear that out.

In conclusion, it would be foolhardy to ignore the potential e-safety issues associated with phones and other mobile devices. However, recognising the issues, and dealing with them though an open, systematic and whole-school approach would seem to be advisable.

Terry Freedman is a Fellow of Naace, an ICT Consultant and freelance journalist. He publishes the ICT in Education website at www.ictineducation.org, where he is publishing a series of BYOD/BYOT and mobile learning case studies. He is currently working on the UK variant of "Bring Your Own Technology: The BYOT guide for schools and parents". Terry can be contacted at terry@terry-freedman.org.uk

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The statements by John Thorp, Ian Guest, Paul Hynes and Simon Rowlands have been taken from private emails, with their permission. I should like to thank them, the other respondents to my questionnaire, Stephen Heppell (www.heppell.net) for pointing me towards the Cloudlearn and Handhelds & Mobiles documents, and Russell Prue (http://www.andertontiger.com/) for the link to the Amann-Hechenberger (et al) handbook.

Delivering secure ICT in a devolved and user led environment

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- Advancing Education Autumn 2012

Managing the risks and improving attainment through rapid adoption of new technologies is becoming a real challenge for schools as the move to Bring Your Own device (BYOD) and similar solutions to the provision of technology.

Few professions love a good acronym as much as those of us involved in education, and when we are discussing anything to do with ICT - it becomes something bordering on compulsion! Perhaps the most popular new acronyms to venture from the techno 'clued-up' into the foothills of common school parlance are those of BYOT and its descendants, BYOD and BYOB, quickly becoming just BYO. To explain, these refer to students (B)ringing (Y)our (O)wn (T)echnology, (D)evice or (B)rowser into school in order to use them in learning and educational ways rather than purely social and recreational ones.

The debate rages within schools (both strategically and technically) and the wider educational Twittersphere regarding whether, how and why BYO solutions could and should be considered and introduced into a school. The mere contemplation of this approach to ICT in schools tends to elicit some very generalised (and opposite) reactions such as open-mouthed fear from teachers, red-faced apoplexy from the Network Manager and jigs of glee from the Bursar, and all in fairly equal measure!

Budget, BYO and risks

The inescapable likelihood is that unless a school has a bottomless budget then at some point in the future BYO will become the norm in schools. Perhaps then we'll all look back and wonder what the fuss was about. The cast iron certainty is that widespread BYO usage in education will be years behind widespread BYO usage use in any other sector you care to think of. Few businesses make their employees file their laptops or work phones into the office safe at 5pm each night, nor do schools make staff do the same. It should be said that BYO does not necessarily or exclusively refer to devices paid for by parents, out of pocket money or just delivered by Santa; it also refers to devices that may be financed, at least initially, by school. The key is that BYO refers to devices over which the individual student has a modicum of control and ownership, and that it is used outside of the school building and school-day, on 'alien' networks, and then also used inside the school as well.

The issue for education is double-edged; schools have a responsibility to educate young people and enhance their chances of future prosperity, which operates in parallel to a responsibility to safeguard them. The former means that BYO is a necessity, the latter that it should be treated with caution.

As parents, we drive our children to places. We accept that there are risks associated with doing this, but seek to minimise the risks both before and during the journey. We also understand that statistically something could happen on any journey which compromises their safety, this could be the fault of another and happen regardless of the caution we employ. However, we still take them in the car because the benefits of doing so, in our judgement, outweigh the risks; the day out, a holiday, trips to the supermarket or incessant ferrying to and from various clubs and friends are all made quicker, more conveniently, efficiently, directly and more luggage-laden than they otherwise would be. We also use other modes of transport such as buses, trains, planes and ferries, both instead of and as well as the car, where these are appropriate, so the car is not the sole vehicle.

The analogy is clear; BYO does have risks attached and is by no means the sole way that our students and children should be learning. This article will argue, however, that BYO should now be a fundamental part of any discussions around any school's ICT vision and strategy. We will seek to identify a number of points, related to both benefit and risk, for consideration in such discussions.

Why give BYO the nod?

We learn with and through technology, and are often frustrated by it, that is a given. We are all more comfortable with what we know than what we don't. Learning is about knowing what you didn't know before, being able to do something you couldn't do before, or doing something better or differently than you did before. No one ever said that learning was supposed to be a comfortable experience yet there are factors which can at times make learning too 'uncomfortable' to be effective.

The authors all have personal experiences that illustrate this; in particular, Matt as a former history teacher, quickly became aware that asking students to use a piece of software or hardware they'd never used before to produce a piece of work on the 'class consciousness of fourteenth-century peasants', would result in them leaving the lesson with varying degrees of competence and mastery of the new ICT, but little clue about the machinations of baronial feudalism! Using familiar kit or programmes resulted in wholesome dialogue as to whether Black Death was the best thing to happen to the peasantry since the invention of irrigation! David, also a qualified cricket coach, now uses filming and video comparisons on an IPad to assist aspiring cricketers with their skill development plans, it may not be comfortable for a 14 year old to compare themselves to an England Test player but the camera does not lie! In short, it is incredibly difficult to learn new knowledge or skills effectively whilst simultaneously learning to use new software or hardware, but easy to use technology used by experts and available to the students can enhance learning and development exponentially. This in no way suggests that students should not be exposed to new kit, programmes and ways of doing things. It does, however, mean that if they are using 'tools' that they are familiar with, or better still have chosen to use, then the intended learning will be more effective than it would with tools that they rarely use or are difficult. The other key facet of modern technology is that it is intuitive, with every technology development the user handbook becomes smaller; to put it another way, familiarity breeds content.

Teachers, technology and future developments

Teachers are subject experts, they will never be able to effectively keep abreast of the insanely exponential development of apps and devices as well as developing lessons, marking, planning and attending departmental self-evaluation meetings. So, to limit the tools at a learner's disposal to those known by the teacher, or those the school can afford to buy will just limit the learning potential. An analogy would be to employ a builder to renovate your house, but restrict them to using your own tool bag from the garage populated only with tools that you know how to use.

The traditional (or do we mean old?) ICT model of having software and applications physically installed onto a device will soon become something we will tell our grandchildren about. Mobile devices will continue to run small stand-alone apps instead of large suites of software as

smartphones currently do, as will MacBooks and Netbooks. In addition, the larger PC and laptop networks will move increasingly towards Virtual Desktop Infrastructure (VDI) solutions where applications are accessed remotely rather than from the local hard drive on the device. Again, the risks caused by schools shackling students and teachers, to tools and technology which 'someone in authority' has mandated they may possibly use at some point during the year must be seen as an anathema to effective, powerful, independent learning.

OK, so what about the "Cloud"?

The advent of 'The Cloud' is a further compelling argument for loosening the shackles. In a few years the concept and risk of saving content onto an actual device will seem ludicrous to the masses. This phenomenon will not just be limited to content; applications and software will largely be installed 'on', and then accessed 'in' the Cloud. Our ways of working, our productivity, our learning as well as our social media, will likely all be cloud-based. Surely, even now, it makes little sense to preclude our youngsters from this when it is how they already access communication, social media and entertainment as well as it is already operating in many businesses. As an example Tribune already offers a fully integrated VDI (Virtual Desktop Infrastructure) solution to schools which delivers a full array of desktop applications through a familiar desktop (e.g. Windows7, and soon Windows 8) cloud-based operating system.

These developments are not 'space-age' futurism; they are how employees in government and commerce increasingly operate now. If one of the key purposes of education is to provide young people with the knowledge, skills and attitude to thrive in the economic landscape of their adulthood, then they need to be exposed to the tools, methods and practicalities of how they will be expected to do so. One of the chief criticisms from teachers of Michael Gove's proposals for the introduction of the linear, final exam-based English Baccalaureate Certificate has been that cramming knowledge into students' heads ready for a three-hour 'dump' onto an exam paper after two years is not how they will work in future employment and so doesn't ready them for it. Whilst we might have empathy with this criticism we would also argue that forcing students to use certain ICT resources and tools in a single geographical location between stringently stipulated times on specified calendared days for less than 40 weeks a year, may, in the long term have a more negative effect to their development.

Adopting a BYO strategy

The adoption of BYO should also enhance, rather than disrupt, the cognitive acts of teaching and learning. At its base-level it is a startlingly straightforward process; stuff goes in, it is thought about and understood, and then a piece of work is completed to evidence the level of understanding. All this should be underpinned by good teaching. Programmers and Engineers would refer to this as Input-Process-Output in different contexts. In reality, anyone who teaches knows that when young people and minds are involved it is a lot messier than this, but at the risk of over simplifying, this is, in essence, what is happening. When used well and appropriately, ICT can help make each stage of learning more effective. When the ICT used is

directed and chosen by learners themselves it becomes more effective still. Going back to the renovation analogy, we would show and tell the builder what we wanted, how we expected the house to look and when we wanted it completed; after that we would have no interest in how it was done and what tools he used. BYO isn't about relinquishing control over teaching or learning; it is about creating a climate whereby thirty similar pieces of work might be produced, at the same time, using thirty different devices and a range of many different applications and methodologies.

Finally, if these arguments are not compelling enough for school leaders to contemplate adopting a BYO model of ICT vision and provision, then maybe the thought of ££££ saved on the basis of a Total Cost of Ownership (TCO) model might. Admittedly, any school moving towards a BYO model will need costly network audits, server upgrades and a level of investment to ensure the network is robust and secure to handle a plethora of different devices arriving from outside school every day. But these are generally one-off expenditures undertaken at the outset. Also, schools will need to be mindful of necessary expenditure on devices required by those from less socio-economically comfortable backgrounds to ensure that they do not get left behind in any BYO model, these are generally the children who can least afford to be left behind. This cost will be year-on-year as new cohorts join the school. The encouragement in ££££ is that these devices are fast becoming a commodity purchase or one that already exists in students' pockets. We were told recently by a schools' Network Manager that he was not considering BYO as 'none of the children in his school could afford them.' The school fields and outside the school gates at 3.30pm told a very different story - iPhones, BlackBerrys and many other Smartphones were everywhere!! A school providing the environment and support would still represent significantly less expenditure than ongoing procurement and maintenance of school-owned devices. It's like throwing a party and telling your guests to 'BYO' (bottle!); it costs you less as you only pay for food and carpet-cleaner, and your guests are happy as they have drinks that they have chosen.

How to avoid a BYOdy nightmare

There is very little, if any, resistance to the notion that using ICT within education can enhance and improve learning and a growing body of evidence to quantify it, even without the vast amount of anecdotal evidence from teachers, youngsters and parents. What is more contentious are the comparative studies on the various models of delivery, implementation and sustainability and their varying impacts on learning.

As we have already explained, the existing school network will need to be audited, modified and enhanced to ensure that it can cope with the amount of concurrent traffic that a whole-school BYO model will entail. The upgrade plan will need to be determined and detailed for potential contractors to ensure that they understand the relationship between the new ICT Strategy and the vision for teaching and learning at the school; it is vital that pedagogical vision drives the implementation of infrastructure, rather than the other way around. It is also worth

considering that in schools where teachers use mobile devices such as laptops, that a separate network might need to be created to avoid any bottlenecking through excessive student usage.

ICT strategy and the digital divide

It is also vital that a clear and comprehensive strategy is built around any BYO model to ensure that any digital divide which exists within the school is reduced through adoption of the BYO model, rather than widened. The school should procure a number of devices for students whose backgrounds mean that parents or carers are unable, or unwilling, to fund device ownership.[1] It is often the case that those most in danger of becoming left behind by a widening digital divide are those who can least afford to be. Schools must survey and audit levels and types of device ownership amongst the student body to inform their policy and strategy on ICT provision. If and when a BYO model is introduced with this level of background information, then the digital divide within the school should reduce as device "access" becomes ubiquitous as opposed to the privileged.

Elephants and e-safety

There is a big elephant in the BYO room which commentators and opinion-formers rarely mention, but which many teachers may think of first when BYO is mentioned - this is off-task behaviour. There is no escaping from the fact that without some control, BYO could disrupt learning within a lesson in a less than positive way. There is no doubt that many fourteen year-olds across our green and pleasant land would happily sit on BlackBerry Messenger or Facebook for an entire lesson if they were allowed to. It is also the case that the stock response from the curmudgeonly brigade of "well you evidently aren't engaging them then" is ill-informed rubbish which belies a distinct lack of understanding of the realities of the 3rd Millennium classroom. There is no secret formula or magic dust to sprinkle over this; BYO will fail if it is not backed-up with robust, relentless classroom management and consequences.

The other inevitable concern that schools face is e-safety and their broader safeguarding responsibilities. The temptation is often for ICT devices and web access within school to be as locked down and 'protected' as possible, often resulting in an inherently inflexible solution in which the default position is 'NO' as opposed to 'Yes if'. This default position is then a real challenge to those with a BYO model of ICT provision. Of course, the Internet fosters undesirable elements (to put it mildly) and robust measures must be taken to minimise the risk to children and teenagers, but how does this balance against the expense of learning? Schools must decide whether their primary purpose is to educate or to protect. There can be few more demotivating experiences than needing to access a tool, mode of communication or piece of information in order to complete a genuine task, only to be blocked from doing so because some website has been blocked using the default 'NO' principle. Modern network safeguarding technologies now have the option to monitor as opposed to block, which together with teachers' 'sixth-sense' regarding young people – most can tell when someone is doing something they shouldn't be from across a classroom – and without electronic aid!

The final issue for schools contemplating a BYO infrastructure is that of security from electronic harm, in the various forms of virus and malware. Mention BYO to most Network Managers in schools and they will foresee immediate Armageddon. A totally secured network may be a fantastic notion but not for schools if it detracts from learning. Reasonable measures of protection mixed with informed education on network safety and human diligence can go a long way, ensuring enough 'controlled flexibility' to protect a network, whilst freeing learning from its traditional e-shackles.

In conclusion on BYO

There are compelling arguments in favour of adopting a BYO policy and strategy within schools in pursuit of enhancing learning and teaching. Then there are factors which need considering in terms of how the model could and should be implemented and managed. It (almost) goes without saying that allowing unfettered network access and in-class usage without any clear vision, detailed strategy and managed ICT would result in carnage. Teaching staff, students and parents must understand clearly the vision in order to ensure their 'buy-in'. A successfully implemented BYO model will result in greater, deeper and more independent learning but, certainly at the onset, opportunities to exploit the potential must be carefully planned and built into the curriculum. Clear guidelines must be set regarding who can use what, when, where and for what reason. Then as learners attain increasing levels of e-maturity, so can their wings be unclipped. Crucially, it is of fundamental importance that undertaking BYO does not result in a simple process of digitising what has always been done, but that it sees a pedagogical step-change in the process of teaching and learning at the school.

[1] The e-Learning Foundation helps schools and families provide computers, educational software and Internet access to all school children, especially those from disadvantaged backgrounds and with special learning needs. See www.e-learningfoundation.com

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Bring Your Own Device in your school - a 10-point guide

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Thinking about embracing Bring Your Own Device in your school? Earnie Kramer, Director at Lightspeed Systems offers a 10-point guide.

Mobile learning lets pupils move toward personalised, anytime/anywhere learning, with access to the wealth of information and resources on the Web at their fingertips. But budget concerns often leave schools without the ability to provide every student with his or her own device. And research increasingly shows that students already own those devices anyway.

Largely in response to these budget concerns, more and more schools are implementing Bring Your Own Device (BYOD) programs, which allow students to bring their own smart phone, iPod touch, iPad, tablet or other device into school.

An obvious benefit of BYOD programs is the lower cost for implementing a mobile learning program than a traditional school-supplied device roll-out. But giving pupils the ability to choose and use the device they're most comfortable with can also promote personalised learning and problem solving; it can also create a multi-device classroom where students work collaboratively to choose the best device for a given task, often switching between devices.

As BYOD has grown in popularity over the past few years, it has also brought some challenges: equity, compatibility, security, management – to name a few. But there is also such promise in the approach that it might just be the most realistic way to get powerful computers into the hands of every student.

Some tips to help ensure a successful BYOD program in your school:

1. **Cover the whys**. What makes BYOD a good fit for your school? You'll need to think through the options and outline the benefits and goals. What educational goals are being met by BYOD? Once you understand your educational goals, you'll be in a better position to determine how technology can help you meet them—and to measure progress.
2. **Get buy-in**. You'll need a solid, written plan to get approval from your board and buy-in from parents and teachers. Especially with a BYOD program (where teachers need to support multiple devices in their classrooms and parents often need to provide the device), support from key stakeholders is critical. Sharing information, statistics, and benefits—and addressing concerns—is a good start.
3. **Determine the devices**. Determine what you will allow on campus, including whether you'll only allow devices with wifi connectivity or also those with 3G/4G connectivity. Will those requirements change depending on the age of the students? Many schools opt for a list of their preferred devices "allow devices" and devices that are not appropriate for learning.

4. **Update all AUPs**. Set and share policies for what, when, and how students can use their own devices on campus and determine how you'll enforce them. One school that implemented a BYOD program changed the name of their Acceptable Use Policy to Responsible Use Policy, reflecting the new responsibility the students were trusted with in allowing them to bring their devices. Among the things to cover in this AUP is whether or not students will be required to connect through the filtered school Internet. Other schools make it a requirement that in order to bring a device to school, a student must have a mobile filter or mobile device management solution allowed on it, so the school can control and manage access during school hours.
5. **Plan your IT support protoco**ls. Determine what IT will and won't do on personal devices, and what hours IT support will be available. Many schools leave maintenance of the student-owned devices to the students and their parents. But what happens when something goes wrong during school hours and the device is needed for a project? Often, student-run help desks provide an easy way to provide basic device support without additional staff or budget. (This has the added benefit of giving pupils valuable experience.)
6. **Educate teachers**. Give them basic advice to support lessons across multiple platforms. This professional development can include outlining the different devices pupils might be expected to bring and their abilities and limitations; basic troubleshooting information; and ideas for integrating devices into lessons.
7. **Address equity**. What will you do about students who don't have a device? Many schools keep a stock of additional devices that students without a personal device can use—still a fraction of the cost of a true one-to-one. One particularly innovative idea: a school allowed students to purchase their own device through a work program, earning money toward the purchase by working at the school, sports events and other jobs.
8. **Prepare your network**. Get your wireless infrastructure ready for BYOD demands, determine how you will secure your primary network, force personally owned devices onto a separate LAN, and provide filtered access through that LAN. BYOD can put strain on the network and the bandwidth, so it's essential to have an infrastructure that supports it. Personal devices can also pose a security risk to assets on the school network, so a separate guest network is a smart idea.
9. **Provide a platform**. BYOD encourages anytime, anywhere, any device learning — so make sure you have a safe, mobile, collaborative platform compatible with any device that students and teachers can access for schoolwork, discussions, resources, assignments, and more. Without a mobile learning platform, BYOD programs run the risk of devices simply being "toys" that are suddenly allowed inside the classroom. A learning platform gives the devices an educational purpose.
10. **Be prepared, but flexible**. BYOD is a big change for many schools. Prepare yourself by reading and listening to schools who have done it — but also be flexible and ready to adapt to unexpected surprises (good and bad). Technology staff, teachers, administrators, and students are bound to discover things during a BYOD roll-out that they never anticipated; but then, isn't learning what it's all about?

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Lightspeed Systems www.lightspeedsystems.com/uk

The 'Bring Your Own Device (BYOD)' revolution

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Gareth Davies, Managing Director, Frog, provides a snapshot of how the latest developments in technology are changing the shape of UK and global education. Some 2.8 million children have a smartphone, including almost one million 8-12 year olds (that's 25 per cent) and it's a technology that young people have totally embraced and one that they find engaging.

In 2010 a study by the National Literacy Trust found that children were more likely to own a mobile than a book. Out of 17,000 school children aged seven to 16 surveyed, 85.5 per cent of pupils owned their own mobile phone. Two years on, the figure is likely to be even higher.

It’s a situation that many cash-strapped schools are keen to capitalise on. In the digital age, having a mobile phone or tablet device at your disposal in the classroom can be beneficial. It allows teachers and students to tap into a wealth of information, and is great for promoting independent learning. Tablets and mobile devices are the perfect medium to support learning, no matter where you are.

Bring Your Own Device (BYOD) however is a contentious issue with opinion sharply divided on whether iPads or smartphones should be let loose in the classroom. The key considerations for any schools thinking about adopting this policy is what value it will add both financially and educationally set against issues like security, theft etc. Schools need to weigh up the costs versus benefits to see whether introducing student owned devices is the best option.

Implementing BYOD

The less exciting but essential processing side needs very careful consideration too. User roles and procedures need to be clearly laid down, acceptable use

policies need agreeing, network security needs looking at and there needs to be access to a wireless network so there is no confusion for staff or pupils.
To safeguard schools against any liability from damage or loss of these devices, many are choosing to use resellers which provide iPads for teachers and pupils

and bundle insurance at a competitive price. This allows peace of mind for both schools and students.

Introducing BYOD

It is important that teachers feel confident with the technology they are using. A day's training for those teachers who are wary of ICT always goes down well. As does a small budget of say £10, which allows teachers to purchase and test out apps to get an indication of what’s out there for students.

It is not just about the technology though, it’s about meeting a need and taking learning forward. Teachers can set up ‘Show And Tell’ forums on the learning platform where students can upload videos taken on their devices for everyone to see and discuss. Staff can also set up wikis or communal blogs where they can post tips and students can share their knowledge, with the less confident dipping in to get some fresh ideas.

Mobile devices are fantastic for collaborative group work. It doesn't have to be one pupil recording something just for their own use. Sometimes the best learning comes from sharing, refining, and peer to peer discussion. This is great preparation for work life in the 21st century as well.

There’s no doubt the debate will continue around the Bring Your Own Device revolution. Some will see it as an exciting opportunity while others will feel threatened and see only negative consequences.

Schools already making the move

Some schools are already exploring possibilities. We have worked closely over a number of years with different schools including Ninestiles, a large mixed comprehensive Academy in Birmingham, who are moving to more mobile devices. Chris Silverton, their e-Learning Manager, says, "We want to replicate the experience that students have of using technology in the real world. “

The school has extensive provision of ICT with 400 laptops and 600 desktop machines for 1400 students. Obviously one big issue is that equipment soon becomes out of date and obsolete. Mr Silverton conducted a survey and found that 24% of children already had iPads and 62% had Smartphones. It makes sense if students have powerful mobile equipment such as iPads, a Blackberry or iphone to tap into that technology to raise the bar.

With a growing trend toward students owning their own tablet devices, using the technology they are already familiar with makes complete sense. The flexibility of this technology takes creativity to the next level as they can take pictures and videos and use them in PowerPoints, cartoons and comic strips instead of just writing essays.

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Shift happening - taking charge

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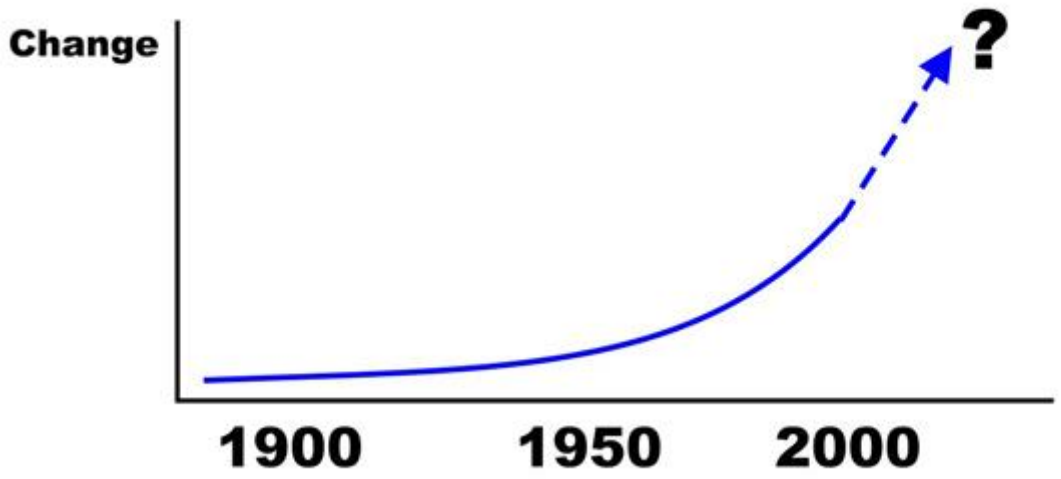
The title of this article is derived from the thought-provoking Shift Happens presentation, many variants of which are widely available from the internet. It reflects on the period of unprecedented technological change that we are living through.

Around the time of The Millennium there was a news article reporting the death of an elderly lady, perhaps Britain's oldest citizen at the time, aged about 110 years. It prompted me to reflect on the incredible changes that had taken place during her lifetime. Transport developed from being predominantly wind, steam and animal powered to the point at which astronauts were successfully landed on the Moon and returned to Earth, an international space station was being constructed and countless satellites orbited the planet. Countries merged, fractured, were created and disappeared. Empires grew and disintegrated and the balance of world power ebbed and flowed, a process punctuated by many different conflicts, both global and local. Medical science took massive leaps forward, as did technology, especially in the field of electronics.

I imagined her lifetime represented by a graph with a ski-slope profile, with change increasing exponentially and reflected on this with a sense of awe. It was not until later that I started to consider my own place on the latter half of that graph, where the slope was increasing rapidly. I tried to extrapolate mentally where the graph would get to, should I live to a similar age – what changes would I end up living through? Will the rate of change eventually start to slow?



It is easy to think back on some of the changes seen already – mobile phones, the birth of the internet, the end of the Berlin Wall, the emergence of AIDs, a growing awareness of global warming and the need for sustainable living and so on. It is less easy to identify the changes that I am living through now, let alone predict those yet to come, but one thing seems certain. I am likely to live to see far greater change than the Millennium Lady.

Whilst technology can change very rapidly indeed, our ability to fully exploit new developments and ideas can lag behind significantly. This will continue to provide fuel for future change as new applications of older technologies emerge.

In the face of rapid change, it is easy to drift towards one of two possible extremes. One involves sticking your head in the sand and refusing to accept new ideas, whilst clinging desperately to increasingly outmoded ideas and customs. The other extreme is enthusiastically rushing to adopt every new idea and trend with little thought about the consequences. Perhaps one of the greatest challenges is trying to decide what we should grab hold of with determination and what we should just let go.

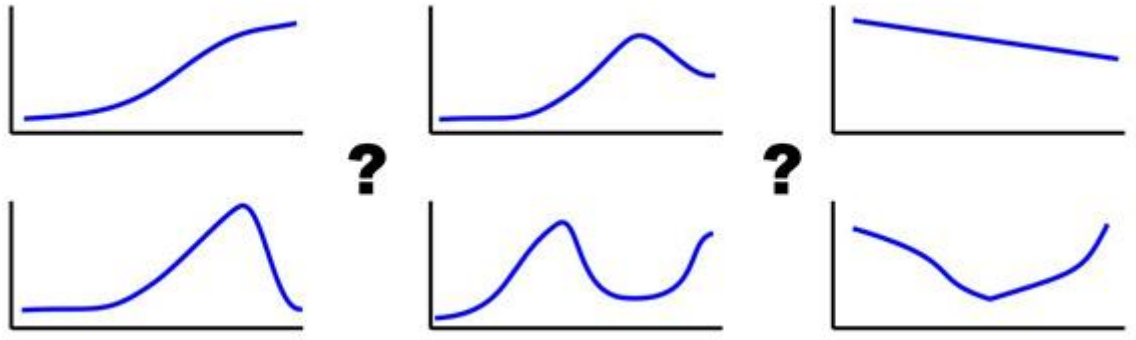
Taking just one example, I tend to guard my privacy zealously, whilst others seem content to share all sorts of intimate details and photographs with the world, via numerous social networking and other outlets. Is one way better than the other? Is this trend an unstoppable cultural change and my approach that of an increasingly obsolete older generation? Or does being older give me the benefit of wisdom and should we in education do our best to encourage younger learners to treat their personal privacy with greater respect? I won't pretend to have the answer to this. I am confident of one thing however, we cannot hang on to all the "old ways" and that trying to maintain a focus on an evolving vision of what we want the future to be like will give us greater control over the eventual outcomes.

Developing technology and increasing rates of change point towards growing international competition for jobs and the likelihood that today's learners will be changing roles, jobs and careers, far more than previous generations. This highlights the importance of developing relevant and readily transferable skills, as well as associated attitudes and characteristics, such as greater flexibility and resilience. The importance of developing life-long learning capability seems clear. These ideas have been circulating for some time.

The changes will bring further challenges. For example we have access to ever-growing oceans of data and information, to the extent that it becomes increasingly difficult to find what we need the most, in order to achieve the greatest impact. The crucial is lost, all too often, within the mundane. New tools and services will help with this, but we will need work smarter too.

Not all aspects of life are changing with increasing rapidity, following the ski-slope profile.

Cultural change tends to be slower. What would the graphs of health and happiness look like? The graph of world peacefulness or fairness?



Whilst guessing the future is fraught with difficulty and error, we do appear to have a clear choice. We can sit back and allow technological changes to drive what we do. Alternatively we can develop a vision of what we want the future to look like and take charge of technology to try and make sure it delivers what we want from it. This whilst educating our learners so that they have the skills and the confidence to do the same in their turn.

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A Breath of Fresh Air - iPads at Casllwchwr Primary

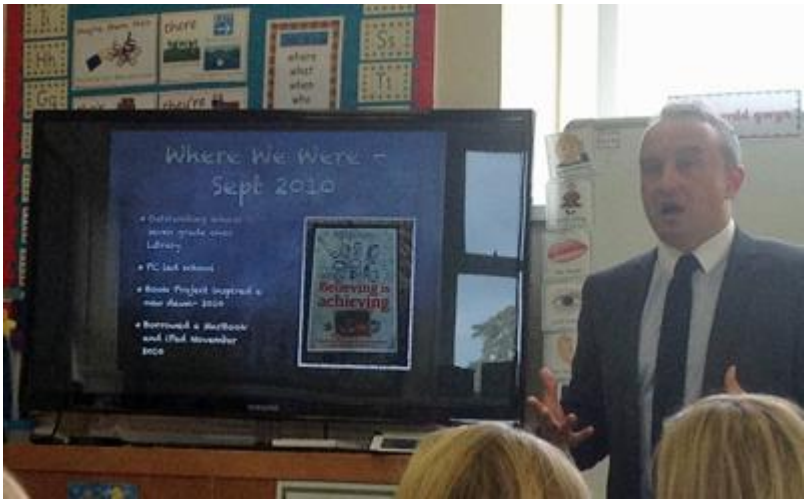
Cited in:

- Advancing Education Autumn 2012

David Kempster presents a personal view on the use of iPads at Casllwchwr Primary near Swansea.

Moving to Wales was a big decision in my life. Having trudged the streets of London for twenty-five years it was certainly going to be a change. One of my challenges when I got here was how was I going to connect with the Welsh learning community? The obvious way for me was via Twitter. I had already taken part many times on the #addcym chat on Tuesday evenings even before deciding to move and knew there was a thriving community already established.

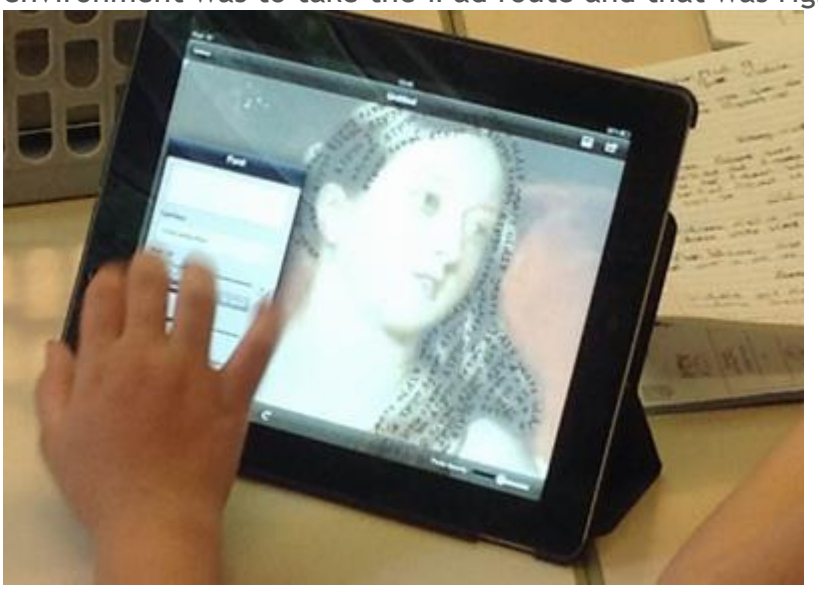
One particular school near Llanelli in South Wales did catch my eye. Not only were they one of the first to receive Naace's prestigious 3rd Millennium Learning Award but they had an exciting array of plans for the future in the school.



The head teacher, Simon Pridham, is a visionary and a brilliantly strong leader. He has created at his school, Casllwchwr Primary in Loughor, a school in which the learning of pupils is paramount but where he and the staff and Governors understand the huge benefits technology can offer when used effectively and efficiently.

The journey to get to this point has not been easy though. Since taking up the role of head in 2009, Simon has had to battle against a variety of obstacles put in his way, some of those from the very people you would have thought were there to support him. The school had to battle with the Local Authority at first but now has a strong working relationship with them at board level and have forged a great working partnership through the LIFE programme (more of which later).

Perhaps it's these battles that defeat most heads who want to try something new and therefore they give up? Simon, however, believed in his vision of developing the use of the iPad for learning in his school. There is much discussion amongst Naace members and beyond about 'which is the best tablet' but leaving that discussion aside, Simon chose the Apple route for what he wanted to achieve as he saw it was a way that pupils, staff and most adults were familiar with or could become familiar very quickly. His vision for a more mobile learning environment was to take the iPad route and that was right for his school.



This decision wasn't taken lightly and, rightly so, he began to garner evidence from other schools such the Cedars School in Scotland and Essa Academy in Bolton. Some of the questions he began to ask were how did they roll out iPads to a large number of pupils and why?, what were the pitfalls he should avoid? and most of all, what was the impact on learning and development in the school and beyond?

Connecting with the other schools strengthened Simon's belief that he wanted 1:1 provision for staff and pupils in his school. He could see that using a variety of Apps that pupils could take control of their own learning, collaborate more and share what they are learning with a wider audience.

What to do next? Simon is not a head who does these things in isolation. In fact, head teachers that do will quickly find that they run into all sorts of problems with the 'blockers'. The Governors, teaching staff and parents all needed to see and share his vision. They all needed to feel they understood what he wanted to do and why he wanted to do it. The inclusive nature of this development is crucial and, speaking to the one of his lead

Governors, David Brayley, it is quite evident that Simon has managed to share the understanding of how this impacts on learning very effectively. Not many Governors I have talked to over the years can give such a detailed description of why they are backing their head teacher in the use of technology. Usually I get, 'well, children use it all the time nowadays so we think it's important to have it in school!' but I got a much more in depth analysis of why they were doing it as a school and the impact it was having and would have on not only the pupils but the wider community.

Then there's the staff. If you haven't got the staff with you, you also struggle. The staff at Casllwchwr are 100% behind the strategy and the philosophy. The assistant head teacher, Sarah Reece, is an excellent example of the teacher being the learner and taking herself on a journey of discovery to ensure she fully understands the reasons behind the learning needed. All the staff are positive about the introduction of the new technologies and this ensures that the development moves on swiftly.

What about the impact? Many schools introduce new technologies without really assessing the need and indeed the impact but not Casllwchwr. Estyn rated the school as excellent in its last inspection in 2010 and also Estytn did a supplementary Case Study 'Developing Literacy Skills using digital technology' http://www.estyn.gov.uk/english/docViewer/253944.6/developing-literacy-skills-using-digital-technology/ In this document Estyn describe how the school has had significant impact on outcomes through the use of digital technology

"A wide range of pupil performance data shows that the school has been successful in improving standards over time. In particular:

* pupils' performance in English in Key Stage 2 has improved significantly over the past four years; the proportion of pupils achieving level 4 in writing in key stage 2 has increased from 71% in 2008 to 90% in 2011, while the performance of the family of schools has remained at 76%; and
* pupils have improved their ability to learn independently..

In the recent inspection of the school, inspectors noted that:
'reading skills in both key stages are outstanding, with many pupils exhibiting a good wide vocabulary. Pupils enjoy reading and sharing their interests. Their writing skills are also good and become more advanced as they reach upper key stage 2 where some examples of outstanding poetry were seen.'"

Hard to ignore this evidence and a recent visit to the school I saw this integrated, independent and inspiring learning taking place in all the classrooms. There was an ethos of sharing and collaboration amongst the children that is rarely seen. All pupils are encouraged to not just ask the teacher for assistance but to try and find out for themselves. Can another pupil help out? Is the answer to the problem somewhere else? Can you reflect on the problem sufficiently enough to enable you to solve it? All these opportunities are given to the children and they understand that 'being stuck' is just the beginning and not the end to learning. Learning isn't being given the answer but knowing how to find and solve the problem.

So where next? The school is the first school in Wales to introduce a 1:1 ratio of iPads to its Key Stage 2 pupils. This has been part of that vision to make learning much more mobile and provide a more fluid and flexible learning environment. Of course there are technical problems that have cropped up along the way but trusted technical support from people who understand the process is critical for any school. Box shifters please step aside!

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Swansea council have now seen the huge benefits for learning that Simon's school has demonstrated and he is now working in close partnership with them to develop the LIFE (Lifelong Intergenerational Furthering Education) programme. http://life1881.co.uk/ @life1881 This is taking the learning into the local community and beyond. The Welsh Government is very interested and Simon is a member of the National Digital Learning Council and Education Ministers Practitioners Panel. This has led to a successful partnership with a local school, Seaview Primary, which have now embarked on the iPad route that Casllwchwr have taken and they are sharing and collaborating on every level.

What next? The school is taking the school's successes all over the country and Simon and his team are in great demand. Simon's passion is infectious and he is spreading the news with gusto. Watch this space.

David Kempster can be contacted at davidkr@open2learn.com

For more about Casllwchwr Primary School see http://www.casllwchwrprimary.com/

A Concise Review of the Impact of Educational Technologies on Mathematics Teaching and Learning

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Abstract

This article is a concise review of how the use of educational technologies has positively impacted the nature, teaching, practice and learning of mathematics at both school and university levels. This includes the influence of educational technologies in facilitating the emergence of new fields and mathematical practices, change in the role of the mathematics instructor, real time and responsive feedback, increased efficiency with mathematical problem solving, and beneficial student emotional engagement, including increased student interest and motivation. This article is a contribution to the research evidence on the impact of the use of educational technologies on mathematics teaching and learning, which could help in informing educational policy initiatives.

Introduction

In 2007, the US Department of Education released the findings of a study into the impact of selected software products on student achievement in mathematics and reading. One of the main findings was that student use of the software products did not appear to lead to any significant learning gains (Dynarski et al, 2007). Although there have been many objections to the conclusions of the initial study (e.g. Nagel, 2007), the report did raise a fundamental issue: *The need to evaluate the impact of educational technologies on student learning in specific disciplinary contexts.*

Too frequently, educational technologies (ETs) are promoted and adopted for use without compelling evidence about their impact on teaching and learning outcomes. The promotion and use of technology in education is often analogous to the scenario of a dancing bear. Yes, the bear is dancing, but is it dancing well? For example, Highfield and Goodwin (2008, p. 1) claimed that 'the proliferation of technological tools in Australian mathematical classrooms has not been well-supported by evidence-based research...'. Similarly, Hoyles and Noss (2003) posited that 'the impact of 'puzzle-style software', which in the UK is possibly the most ubiquitous application of technology in mathematics classrooms…remains largely unresearched' (p. 3).

The realisation that the proliferation in the use of specific ETs is not necessarily linked to evidence of the beneficial impact of such technologies leads to the question: What is the research evidence about the (positive) impact of technology on mathematics teaching and learning? In the next section therefore, I will present a concise research synthesis about the impact of ETs on mathematics teaching and learning.

This article is a contribution to the research evidence on the positive impact of the use of ETs on mathematics teaching and learning. Moreover, it is a contribution to the literature on the use of ETs in higher education, which is significant because of the reported paucity of research on the use of ETs at post-secondary levels (see Lavicza, 2010; Laborde & Strasser, 2010). Further, presentation of unbiased evidence based on rigorous research is necessary to inform education policy, especially in the wake of heightened prioritization of funding for educational tools and initiatives.

Protocol for Research Evidence Synthesis

There have been many publications on the use of educational technologies for mathematics teaching and learning. To identify the articles to employ in order to conduct a synthesis of the impact of using ETs on mathematics teaching and learning, the following three criteria were adopted:

1. The articles had to be focused on describing the integration, use or effectiveness of a particular educational technolog(ies) for mathematics instruction;
2. The research evidence presented must be based on rigorous research undertaken via via national/international initiatives or agencies (e.g. NMAP 2008; Olive & Makar, 2009, Schacter, 1999). This was to ensure that the studies are of broad significance or relevance, that go beyond narrow or parochial interests;

3. Articles written by established scholars in the field of technology in mathematics education (e.g. Laborde & Strasser, 2010; Hoyles & Noss, 2003) were particularly accorded preference, based on the allusion that experts are adjudged to have more stable views about observed phenomena (e.g., Schunn & Anderson, 2001, pp. 83-84). We acknowledge that there could be inherent bias in this approach, but this is counterbalanced by the observation that policy makers, for instance, are more likely to be influenced by research evidence based on rigorous research or studies conducted by renowned experts in a field.

Using web-based portals, such as ERIC[1] and Google Scholar, and reference systems (e.g. RefWorks), 47 studies were identified as having met the initial criteria, i.e. articles describing the effectiveness of a particular educational technology in a mathematics teaching and learning context. However, many of these studies had either limited or narrow focus. Applying the second and third criteria, i.e. studies of broader, national or international significance which were written by established scholars in a field, (e.g., as evidenced by number of citations in the field, high visibility, etc), 11 studies were identified.

The research synthesis presented in this article is thus predicated on 11 studies, which met the criteria earlier highlighted. The synthesis of the evidence from these 11 studies indicates that the (positive) impact of ETs could be classified into five dimensions. These include the (I) impact of ETs in influencing change in the nature of mathematics, as evidenced by the emergence of new mathematics fields, novel mathematical practices, and change in the content of the mathematics being taught. Further, the use of ETs has also been instrumental in (II) facilitating a change in the role of the mathematics instructor, (III) the enabling of real time and responsive feedback, and (IV) increased efficiency with mathematical problem solving, as well as the (V) impact on affect or student emotional identification with the learning tool, and/or environment.

Impact on the Nature of Mathematics

The use of technologies in mathematics education appears to have changed the nature of mathematics itself, i.e. the adoption of technology often 'reshapes the cultures of mathematical learning' (Hoyles & Noss, 2003, p. 14). Olive and Makar (2009) posited that technology usage has influenced 'both the nature and construction of mathematical knowledge…in ways that create a new learning ecology' (p. 150). Examples of this emergence of a new learning ecology, i.e. new mathematical knowledge and practices, are evidenced by the following:

The emergence of new fields: The emergence and subsequent enhancement of new sub-disciplines or fields of enquiry such as computational mathematics, mathematical and statistical modelling, dynamic geometry, robotics and digital games, etc are partly attributable to the use of ETs (Lavicza, 2010, p. 106; Laborde & Strasser, p. 124; Olive & Makar, 2009, pp. 133, 168; Bransford et al, 2000). Olive and Makar (2009) posited that the emergence of the new learning ecology is a result of the accommodation of technology i.e. the adaptation of the mathematical learning environment for the incorporation of technology usage, such that technology can shape the knowledge and practices of the mathematics so produced (p. 135).

New mathematical practices: Olive and Makar (2009) posited that the 'most obvious new practice made possible by DGSs [i.e. Dynamic Geometry Systems] is the ability to drag elements within a construction

and thus rapidly visualise many possible examples of the construction' (p. 160). The use of the drag mode in DGSs enables students to make 'sense of functional relationships and graphs without the necessity of an algebraic representation' (Hoyles & Noss, 2003, p. 2; see also Arcavi & Hadas, 2000). In addition, Olive & Makar (2009) described how calculator usage enables students to perform 'microprocedures', so the student could focus on 'macroprocedures, which require higher level processing' (p. 159).

The mathematics being taught: This means that new courses are being taught that are directly attributable to the use of ETs. For example, many first year students in mathematics departments across the UK are required to take an introductory (or section of a) course on the relevant mathematical software: 'Learning about software [e.g. Maple, Cabri, GeoGebra, Latex, etc] increasingly becomes an integral part of learning mathematics' (Hoyles & Noss, 2003, p. 2).

Role of Instructor

The evidence suggests that the use of digital technologies leads to an alteration in the relationship between students and their instructor(s), such that the instructor becomes 'more of a leading team player than a sole dispenser of knowledge' (Becta, 2003; see also Lavicza, 2010, p. 107; Hoyles & Noss, 2003, p. 16). Laborde and Strasser (2010) expanded on the role an instructor has to assume when technology is used as being characterised by the teacher becoming more of a 'stimulant, a manager of learning, an orchestrator of the interactions between technology and students' (p. 125).

This 'redefinition of epistemological authority' (Bransford et al., 2000, p. 270) within the technology-facilitated classroom leads to a 'shift in empowerment (Olive & Makar, 2009, p. 133) away from the instructor and towards the students. This shift is often characterised by 'less lecturing' and more student involvement (Olive & Makar, 2009, p. 155; see also Schacter, 1999, p. 5). Olive and Makar (2009) described the shift to students thus: 'Control shifts more to the student in making decisions about how to utilise the technology in problems that do not "tell" which mathematics is needed upfront' (p. 155). However, this shift is not always positive, especially in instances where epistemological authority is merely transferred from instructor to the technological tool being used i.e. when students see 'technology as master' instead of viewing 'technology as partner [or] servant' (Olive & Makar, 2009, p. 156).

Feedback

A common reported benefit of the use of interactive technologies is the provision of feedback to students. Through the use of these technologies, students 'receive feedback [which they could then use]…to continually refine their understanding and build new knowledge' (Bransford et al, 2000, p. 206). The technologies that explicitly or implicitly provide students with feedback include electronic voting systems (also known as clickers or response systems), Computer-Aided Assessment (CAA) software, tutoring systems, graphing calculators, Computer Algebra Systems (CAS) and DGS tools. Feedback from the interactions of students with these tools has a 'strong impact on their mathematical understandings and practices' (Olive & Makar, 2009, p. 159; see also Bransford et al., 2000, p. 219).

An example of how this may be achieved is how feedback may facilitate a shift in student attention from 'micro-procedures (that the tool performs) towards macro-procedures that involve higher-level cognitive

processes' (Olive & Makar, 2009, p. 167; see also Becta, 2003, p. 2). Moreover, DGS and also CAS tools provide 'a kind of feedback that is not readily evident in paper-and-pencil construction, [one] that distinguishes between a result, a drawing, created without concern for the underlying geometrical relationships, and one, a figure, that has been constructed through the use of geometrical primitives and relationships' (Hoyles & Noss, 2003, p. 11).

Problem Solving

There is substantial evidence that technology enables students to improve their speed, accuracy and aptitude in solving mathematical problems. Laborde and Strasser (2010) stated that 'with technology, mathematics becomes more experimental and allows students to change the conditions of the problem, check strategies and receive feedback' (p. 124). Instructional technologies such as drill and practice software, tutoring systems and teaching computer programming such as Lego have been shown to have beneficial impact on student problem solving skills (NMAP, 2008, xxiii; see also Bransford et al., 2000, pp. 209, 213, 223; and Schacter, 1999). Heid (2003) also reported that the use of graphing technology helped students to do better work in 'interpreting and relating graphs to their symbolic representations' as well as enhanced their 'ability to think about function graphs without software (p. 4).

Affect

Perhaps the most recurring benefit of the incorporation of educational technologies into learning environments is the impact they have on affect or emotional well-being. The authors of the Becta (2003) study stated that 'maths curriculum software has been shown to motivate both teachers and pupils' … [and] 'to overcome pupils' apprehensions' (p. 2). The Becta review also posited that technology usage led to 'increased motivation (p1) and a feeling of 'pleasure' (p. 3). Similarly, Schacter (1999) reported that students in classes with computer-based instruction 'like their classes more and develop positive attitudes' (p4; see also Bransford et al., 2000, p. 209), and their 'self-concept improved consistently' (p. 5). In addition, Olive et al. (2009) provided evidence of the use of graphing calculators to stimulate student interest (p. 155), and the use of technology to motivate students (p. 154).

Conclusion

I have presented a concise review of how the use of ETs has positively impacted the nature, teaching, practice and learning of mathematics at both school and university levels. This has involved a description of the role of ETs in facilitating a change in the role of the mathematics instructor, the emergence of new fields and mathematical practices, real time and responsive feedback, increased efficiency with mathematical problem solving, and the beneficial impact on student emotional engagement, including increased student interest and motivation.

This article is a contribution to the research evidence on the impact of the use of ETs on mathematics teaching and learning. Moreover, it is a contribution to the literature on the use of ETs in higher education, which is significant because of the reported paucity of research on the use of ETs at post-secondary levels (see Lavicza, 2010; Laborde & Strasser, 2010). The research evidence presented could also help in informing educational policy initiatives, given the recent high selectivity in the allocation of resources for tools that effectively support teaching and learning in schools and universities.

[1] Education Resources Information Center (ERIC) – 'World's largest digital library of education literature'. http://www.eric.ed.gov/.

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What's in a badge?

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Badges mean lots of things to lots of people but to Tim Riches

"They have the power to motivate learners to produce work they are proud of and provide meaningful recognition for their achievements".

Badges mean lots of things to lots of people but Tim Riches, the man behind DigitalMe, https://www.radiowaves.co.uk/story/407321/title/areopenbadgesthefutureofaccreditation sums up their meaning:

"They have the power to motivate learners to produce work they are proud of and provide meaningful recognition for their achievements".

I met Tim at the recent Whole Education conference in Leeds and he filled me in on his journey so far.

Co-founder of the successful Radiowaves project, he is committed to supporting learners to make the transition “from content consumers to creators”. One of the first sets of Mozilla Open Badges is being developed out of the successful DigitalMe project “Supporter to Reporter” (S2R), a sports website created by young people.

To earn ‘S2R Medals’, learners progress from bronze to gold in three areas of learning: journalistic skills, live event production then coaching others.

The scheme gained Mozilla’ support through winning the international Digital Learning and Media Competition 2012 funded by the US MacArthur Foundation.

Participants will complete a series of challenges to unlock S2R Medals. Tasks range from writing a blog to conducting interviews and even managing a sports reporting team at a live event.

Once issued with a badge the learner chooses where to display it: on their school website, Facebook page or job sites such as Linkedin.

But why do we need badges? What is wrong with what we have now and how will these badges relate to formal qualifications and the National Curriculum?

“For us the key difference between badges and traditional assessment and accreditation is purpose. Rather than learning about creating media they are responding to a real-life challenge. That brings whole new set of challenges and risks for the learner. They work in teams to produce work which is seen and assessed by their peers. This leads to deeper engagement and

motivation which promote the development of a broader set of skills.

That doesn't mean to say the programme isn't complementary to the existing curriculum. Research, planning and interviewing can all be mapped to speaking and listening, for example. We're working with a group of teachers from ten schools and with leading academics to work out ways to mainstream the project within schools".

Well known blogger, former teacher and JISC researcher Doug Belshaw is now heading up the Open Badges team in the UK for Mozilla.

Doug feels the answer lies in the way data is so accessible and "we need a way to recognise learning wherever it takes place and then accredit it "says Doug. "CV's do not to give us the full story and the great thing about open badges is the data is embedded in the badge and builds as the learner progresses".

Doug and Tim spoke recently at a conference in Scotland about their exciting plans for the future "Are open badges the future for skills accreditation?"

http://glocast.com/here-be-dragons/player.php

For more information on S2R Medals go to www.digitalme.co.uk/supporter2reporter or follow @_s2r

Bob Harrison can be contacted at BobharrisonSET@aol.com

The future of tablets and mobile apps in the classroom – making it work for teachers

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- Advancing Education Autumn 2012

Tablets and mobile apps are the future in classrooms. But how do we make it work for teachers?

There is no denying that tablets and mobile apps are the future in classrooms. In the last few years there has been a lot of discussion surrounding the development of technology and how it

can be used as an innovative teaching tool. Many schools are now investing in tablets for both their students and staff, and new technologies specifically designed for education are emerging all the time.

Bring Your Own Device (BYOD) for students is also on the rise, so it's important that teachers know the different technologies they use. If a teacher is familiar with tablets and smartphones, and understands what's achievable, they can adapt their lessons and create an exciting and dynamic learning experience.

Saving valuable teaching time

As technology becomes more integrated into the classroom, teachers need to think about how they use tablets and mobile apps to help them do their job - not just use them as a teaching resource for their students.

Mobile technology doesn't mean that teachers should now be taking their work home with them. In fact, it should mean quite the opposite. The school day is busy enough, but once you throw in a school trip or have to cover a sick colleague's extra-curricular activity at short notice, it's easy to fall behind. Mobile devices can alleviate some of this pressure.

Leaving school during working hours no longer has to mean putting a stop on tasks which will then have to be completed at a later date, potentially resulting in longer working hours in order to catch up.

With a tablet, instead of sitting on a coach for two hours with nothing to do, teachers can create and upload lesson plans and assignments, mark homework and complete many day to day tasks. Accessing web-based technology that's used every day in school, such as a learning platform, also means teachers don't have to worry about losing or corrupting files when they switch from using a PC to a tablet.

Having the capacity

Good broadband capacity is central to the success of this type of technology, which is available across most of the UK, but certainly not everywhere. In some countries such as Malaysia, 4G has been rolled out to all of its 10,000 state schools, making working with tablets and handheld devices every day a reality. It is likely to be some time before we see this happening in the UK, but when 4G does arrive in force, teachers will witness a new era in mobile and hand held technology, giving anytime, anywhere access.

Apps designed for education

One of the best things about technology such as smartphones, is that there are literally thousands of apps out there designed specifically for education professionals. There are even websites dedicated to helping teachers find the best apps for them.

- Apps in Education (http://appsineducation.blogspot.co.uk/) has lists of apps for teachers, categorised by subject, such as Maths and English.
- The Online Education Database has a list of Top 50 iPhone Apps for Educators (http://oedb.org/library/features/top_50_iphones_for_educators).
- AppsSchool (http://www.facebook.com/AppsSchool) lets teachers ask for advice on what apps will be the most useful for them.

Most apps are platform specific and developed for the Apple, Android or Windows Mobile operating systems, so cannot be used across all devices. Browser-based solutions are the best option for schools who want to make learning fun and embrace the X-box generation, and with the latest technologies such as HTML5, there is no loss in quality.

The ideal app is one that caters specifically to a teacher or student's need, which is why teachers and students are now designing their own apps. It means teachers can really tailor technology and make it work for them.

Students from Devonport High School for Boys in Plymouth designed their own app and mobile site that integrated with the school's learning platform. The app has inspired other students to start coding and developing their own apps and sites. As a result of the students' success, the school now has 'App design' integrated into a new key stage 3 curriculum.

There is no question that technology will play a big part in the future of the classroom - it is up to teachers to make the most of it.

Gareth Davies is Managing Director of Frog, developers of the Frog Learning Platform. To learn more please visit http://www.frogtrade.com/ or call 01422 250 800.

Bring your own language lab

Cited in:

- Advancing Education Autumn 2012

How next generation language labs are accessible across multiple devices on campus and at home.

Bring your own language lab (BYOLL) is now a reality. Students and teachers can (via a web browser) play, interrogate, record and assess audio, video, text languages resources from anywhere and at anytime using a new online language lab programme called SANSSpace. SANSSpace with its unique browser driven technology allows 24/7 language lab access from any PC, Apple Computer and from January 2013 from iPads.

It is a matter of time whether your school or university adopts a 'bring your own device 'BYOD or 'bring your own technology' BYOT strategy now or in a few years time. However there is no doubt that the power of online access, mobile computing and the increasing use of free browser based technologies is changing and will change the way we teach and learn forever. SANSSpace compliments and supports this BYOT / BYOD process.

SANSSpace has been developed in the US by the team behind Sony Virtuoso language lab software, SANS INC and is already winning plaudits and customers across the globe, institutions like Hofstra University in New York have connected it to 11,000 of their languages students with amazing effect. 'SANSSpace is a way of delivering data to students and other users both on and off campus and with the online digital recorder, students have more time to speak, listen, and self-evaluate than in a traditional classroom, 'says Mustapha Masrour, Ph.D, Teaching Administrator and Director of both the Language Learning Center and Foreign Language Education at Hofstra.

Learning a language is about 4 key facets; speaking, listening, reading and writing. Many schools and universities have invested in software language labs like Sony Virtuoso to practice these facets via collective, group, pair and individual practice using a windows based local or wide

area network.

SANSSpace allows the student time to practice outside of the class, whether they are logging on to the internet on campus, on the move or from home. The student has a personalised access to a unique comparative recorder and player which then allows the practice, recording and quizzing of designated language learning resources. The resources in each student web space are pertinent and related to the student's course work and are controlled by the institution's centralised network admin team, which in turn gives teacher access to post and mark by individual, class or cohort grouping.

The SANSSpace recorder and player with designated learning resources that can be accessed from a student owned device.

In the UK Europe and the Middle East, ConnectED, as the exclusive distributors of SANSSpace are starting to roll out this BYOLL technology across a number of university and school web sites. 'This is an exciting time for language learning as we can give complete access to more students with the right teacher support and resources for practice and learning - 24/7', says Managing Director of ConnectED Mark Stimpfig. 'The unique web based architecture of SANSSpace also enables us to seamlessly link our online labs to any web space in terms of accessing data and retaining the branding and design of that site.'

For more information about SANSSpace or to contact ConnectED to organise a demonstration please contact info@connectededucation.com or www.connectededucation.com or www.sansspace.com

Using the Mobi View at The Sydney Russell School, Dagenham

Cited in:

- Advancing Education Autumn 2012

eInstruction
Simple Solutions. Real Results.

A case study of the Mobi View hand-held intractive whiteboard from einstruction innuse at The Sydney Russell School, Dagenham.

Background and Challenges

The Sydney Russell School is a forward-thinking secondary for students in Dagenham, London which continues to improve its results year on year to be a leading school in the borough. The school prides itself on its ICT facilities, and is committed to using the best of 21st century computer technology to support and drive teaching and learning.

Construction has recently finished on a new school building as part of the Building Schools for the Future (BSF) programme, and the blank canvas provided by the rooms presented a perfect opportunity to introduce new technology. Nikos Tsagkadakis, ICT teacher and vice principal, has the responsibility for developing ICT within the whole school environment, and had certain requirements in mind for equipping the new rooms: "The new classrooms were 8.52m and visibility of the whiteboard was a problem for the students at the far end of the room. Because of this, we chose to install large Supernova screens, and were looking for a device that would interact with the Supernova.

The school had previously used Promethean ActivSlates, but we had found the pen to be overly sensitive and staff did not get on with them very well; an alternative solution was needed."

Solution and Benefits

The school began using the Mobi View™ hand-held mobile interactive whiteboard from eInstruction in December 2011, and had a positive user experience right from the beginning as Nikos describes: "The transition from the traditional writing with an ink pen on paper to writing on the Mobi View was a positive one. The Mobi View™ pen is not over-sensitive, making it very easy to write with and use regularly. "

The Sydney Russell School has equipped each of the 40 staff using the new building with a Mobi View™, assigning each one to a teacher rather than a room as Nikos explains: "In a school day,

teachers will move around a lot and can now take their personal Mobi View™ set to their preferences with them for quick and easy use. This personal assignment of a device also helps to ensure they are not lost; each member of staff has to take responsibility for their own device, and they carry them around like you would a mobile phone!”

The school initially planned to use the Mobi View™ as a mobile interactive whiteboard to control the lesson, as well as annotating and adding notes to material. However, staff have since realised the potential of the product to transform learning with the range of tools that are available. Teachers are free to use the board as a tool in any lessons across the year groups to ensure that all students can benefit. Currently, the Mobi View™ is used by ICT, maths, physics, modern languages, as well as English and media. Nikos feels that a key function of the Mobi View™ is its flexibility of application, with each department able to tailor use to how is best suited: “For instance, modern languages uses the Mobi View™ extensively, but in a different way to how the ICT department does. While MFL uses the handwriting recognition tool more, maths may use it for demonstrating shapes and aiding accurate measurements but ICT uses it to record audio and visual demonstration clips.”

Within the ICT department for example, Nikos feels that the Mobi View™ is a powerful tool for administration and classroom management. He explains: “At the beginning of the lesson, I demonstrate the skills that will be developed, and how to achieve certain objectives. To do this, I use the recorder tool in the Mobi View™ before the lesson, sit down with a microphone, and record step-by-step the process to create a walk-through video. These can then be edited and saved in our central resources bank under the specific topic, and linked back to a lesson plan. This then enables other teachers within the department to use the recording in their own lessons, sharing resources between us and saving on the time and administration needed if each teacher had to create their own. This is a very powerful tool for the staff, as one day you might need to teach the same thing four times and it saves so much time being able to record it and store it!”

Nikos believes that the Mobi View™ is a tool that strongly supports the development of personalised learning across the school: “Because students can also access the resources created with the Mobi View™ in the central bank, if they are late, absent, or missed something or didn’t understand it, they can access the video and go back over it at any time and at their own pace, as often as they like. This concept supports higher ability students as well; if they

finish the assigned work, they can look at the work for next lesson in their own time, allowing them to progress at their own pace too. This is valuable for helping to give students options and to customise the learning process."

The mobility enabled by the Mobi View™ is a significant advantage in Nikos' opinion: "Using the Mobi View™ means I am not tied to the front; I can go to the back of the classroom, and mix with the students to watch the pre-recorded demonstrations. Because I am watching it too, they concentrate more, and I can monitor attentiveness as I do not have to turn my back to demonstrate."

Looking on a wider pedagogical basis, Nikos believes that the Mobi View™ is a catalyst that is revolutionising teaching at The Sydney Russell School, as he explains: "As teachers, we can now take learning and teaching to a whole new level that is more investigative than descriptive. Before, I was spending three quarters of my time answering low level questions on troubleshooting and how to do things. My lessons used to be dominated by 'sir, how do I do this again can you remind me?' Now I don't need to fulfil this role as students have the videos created with the Mobi View™ in the central resource bank to remind them. This frees me, the teacher, up to focus on knowledge and understanding – why they do this rather than how to do it. Across the school, staff now have more time to explain how skills can be developed in other areas, to provide transferable skills for the future."

Future plans

Following the success of the Mobi View™ with both staff and students, The Sydney Russell School is to equip the remaining 75 staff with a device each. The school plans to link the Mobi Views™ with the visualisers already in use, so that screenshots from the visualiser can be captured, manipulated and annotated using the Mobi View™. Nikos comments: "As the next step, each member of staff will go through full training on the Mobi View™ and will be encouraged to share best practice with each other to ensure that the many benefits of the Mobi View™ continue to be maximised throughout the school."

The MOBI View and other eInstruction products are available in the UK from Banxia Software Ltd. Email: info@banxia.com or see Web: www.banxia.com