

Computer tutor

Before he was elected in 1997, Tony Blair gave a famous speech in which he said his three priorities were "education, education and education". The electoral promise was to raise a technically literate generation that would make Britain the powerhouse of Europe in the new info-economy of the 21st century. And that speech was made a year before the dotcom boom years of 1998 to 2000.

New Labour's quasi-socialists grasped the internet as being a great democratic force in education. Poor schools will have the same access to intellectual resources as wealthy schools because these materials will be online – or so the theory goes – and, hey presto! The web offered instant redistribution of resources without the need for messy, expensive, ideological and often unwanted government interference: socialism over IP. Third-way governments across Europe were echoing these sentiments.

When the 'education, education, education' speech was given, the general level of IT provision in Britain's primary and comprehensive schools was laughable. Primary schools typically shared a handful of ancient desktop PCs between 300 pupils. Less than one in 10 pupils belonged to a family that had a Windows-capable PC at home. Computer-literate teachers were even rarer, often confined to the head of maths or a member of staff who happened to be a computer enthusiast in their own right.

IT, if it existed at all, was taught as an academic subject, rather than used as a tool. The concept of using computers for,

say, English, history, art or drama, was alien to the teachers of those subjects.

And the NGfL (National Grid for Learning), the government organisation charged with implementing basic infrastructure in the shape of internet-connected school computer networks and commercially viable web-based teaching content, didn't even exist. (As an aside, the NGfL has just been renamed the Schools Programme.)

Sledgehammer approach

Despite the backwardness of schools' IT infrastructure, the lack of knowledge among teachers and the cultural obstacles built into the education system, New Labour promised it would all change. Governments of any flavour are not renowned for fulfilling their promises but, by 2004, the government will have pumped £1.6bn into IT for schools over six years, much of it channelled through NGfL funds.

Finance is a blunt instrument: in terms of providing IT infrastructure for schools, the bigger the wedge, the better. Government ministers including Estelle Morris, the current education secretary, have made it clear that this won't be repeated – opportunities to create a computer-literate generation come around less frequently than Halley's Comet.

The message to schools is spend the funds now while they're available – a strange position for teachers to be in since they are used to struggling with inadequate resources. But schools have taken the message to heart. According to the DFES (Department for Education and

Thanks to increased reliance on computers, classrooms and teaching methods have undergone radical changes since most of *PC Advisor's* readers (and staff, for that matter) were at school. Andrew Charlesworth puts on his blazer and tie and plucks up the courage to ask Sir what it's all about

Skills), school spending on ICT (information and communications technology) has dramatically increased year on year for the past five years. Primary schools now spend on average £10,300 a year on ICT; secondary schools spend £60,300 annually.

Back to the blackboard?

But it takes more than a large sum of money to change the teaching culture, built up over 100 years or so, of doing, on the whole, a damn fine job with little resources and for a near-nonexistent financial reward.

Often the government acts as though teachers are resistant to technology in the classroom. This isn't the case. Those teachers who aren't out-and-out evangelists for technology aren't resistant to it, they are just bewildered as to how they can use it in lessons and they don't have the time to find out. Why is a PC necessary for doing history? Where does a digital camcorder fit into the science lesson? What has graphics software got to do with drama? And what's wrong with a blackboard?

In her opening speech at the Bett (British Education and Teaching with Technology) show in January, Morris ran a video showing the government's vision of the school of the future. Docile pupils sat in communal airy atriums, shafts of sunlight falling on their wireless notepad computers. Teachers held seminars in glass-walled theatres, mixing presentation slides, student input and ad-hoc instructions on interactive whiteboards. Remembering their sink-estate

Case study: St George's primary school

Vince Burke, head of St George's primary school in Southwark, central London, is something of an IT evangelist. All his teachers have been provided with PCs for use at home and Burke encourages his staff to develop at least rudimentary computer competency.

St George's has 300 pupils who share an ICT (information and communications technology) suite of 30 PCs and 100 other refurbished secondhand PCs in various classrooms. In the next few weeks he will be overseeing the installation of a new reception area that will house five PCs specifically for parental and community use in an attempt to bridge the digital divide between the IT haves and have-nots. Around 40 parents a week are expected to make use of this facility.

But the hardware is less important than Think.com, Oracle's web-based resource. St George's uses Think.com to create an online community involving pupils, teachers and parents from St George's and other schools – including a school in Los Angeles – and an increasing network of associates, including a theatre company.

Burke believes one of the main benefits of internet connectivity for St George's has been the ability to foster a sense of community and that of an audience for pupils to express themselves. Think.com lets schoolchildren communicate with each other, with teaching staff and with approved external guests in a safe online environment. Users can share ideas, join clubs and communities, receive feedback on schoolwork and gain information and pictures relating to topics of interest published on the public area of the service.

In place of email, communication is via 'stickies' – an electronic Post-It note equivalent. Access rights are heavily defined to ensure student safety and the easily navigable



colour-coded pages are divided into public and private areas: Home, Site, File Cabinet, Email and World. In the World section, students can access content from approved charities and Channel 4's Grid Club.

Think about it

Think.com currently has 80,000 UK users across 900-plus schools. A number of educational organisations and interested individuals provide scholastic support and encouragement.

Think.com has put pupils from inner city schools in London and LA (among other locations) in touch and asked them to be proactive about finding out about each other's lives, neighbourhoods and schools. The result will be a play staged on both sides of the Atlantic.

In February and March, the first of these plays was aired at Polka Children's Theatre in Wimbledon, south west London. Pupils involved in the project were invited to provide their own input, review the play, help devise scenes and discuss their staging ideas with real actors.

comprehensives, the audience of teachers and LEA (local education authority) officials sniggered. "Maybe you consider this a bit far-fetched?" suggested Morris.

"At least that's one thing the minister has said we can agree with," muttered one of the teachers. "But," continued Morris, "nothing shown here isn't happening in a school somewhere in Britain."

It's a good point. The government's school-of-the-future vision may not have all been pulled together under one translucent roof; the glass partition has been decorated with some unsavoury graffiti; and the boy who is always playing truant has traded the memory from his PC for the latest Eminem album. But visit any school in Britain and you'll probably be surprised at the sophistication of the technology in use.



PC possibilities

The focus of school spending has already moved on from simply trying to achieve high PC-to-pupil ratios and is now about making sure that the teachers and students are making the best possible use of the computers they have.

This means not just teaching ICT as a subject in its own right, but employing computers for English, history, geography, biology and all subjects where teachers not used to PCs in the classroom tend to scratch their heads and wonder how a PC can be of use other than as a word processor to write essays.

"Two to three years ago, the school ICT budget went mainly on PCs, with some software," says Lorna Mitchell, marketing director for Avantis, a supplier of multimedia CD/DVD network servers to the education sector.

"More recently, schools began investing in networking infrastructure and typically run two networks – one for curriculum and one for administration. Now schools are looking at adding peripherals to their networks – for example, interactive whiteboards, CD/DVD servers and digital cameras, as well as purchasing managed services and training packages."

The next phase is to run one network, an MLE (managed learning environment), which integrates administration tasks with the content for preparing and delivering lessons. It makes more efficient use of computer resources for each school to run a single network, but it doesn't account for the practical issues of having an admin system that could be hacked by pupils who know more about PCs than their teachers.

But then the government is after root and branch restructuring of education, not

➤ School groups visiting the BT Challenger Learning Centre at the National Space Centre in Leicester use computers and communication headsets to recreate the experience of controlling a spacecraft. This requires them to use skills that reinforce their maths and science learning



updating schools by adding a few PCs here and there. The government's vision doesn't just replace pen and paper with a computer, a textbook with the internet or a blackboard with a whiteboard; it's about fundamentally changing the nature of teaching.

To be fair, these changes were already well under way at the beginning of the last decade. The traditional teaching approach is to instil in the pupil, forcibly if necessary, a basic set of tools (reading, writing and maths) and a body of factual information representing subjects such as history, geography and science. The relevance or otherwise of these facts is only learned later, when applied once the pupil has entered the workforce.



Cross-curricular learning

Modern lessons are much more project based. A class of 10-year-olds doing a project on, say, the Victorians, will range across many subjects. First, there's geography – students will look at the extent of the British Empire the Victorians commanded. Next, there's science, the technological discoveries of the age. Sociology is another subject the project would cover, by examining the relationship between the classes in Victorian society. Of course there's also the obvious historical facts that the project would cover – wars, laws, prime ministers and Queen Victoria herself.

Each pupil who undertakes the project will come up with a slightly different set of information, depending on his or her

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the way pupils learn, encouraging them to take responsibility for their own development and engaging those who have lost, or never had, interest in traditional learning methods.

For example, a DV (digital video) camera can be used in science lessons to record laboratory experiments carried out by the class. Suddenly a passive observer becomes a cameraman; those conducting the experiment become actors.



Material facts

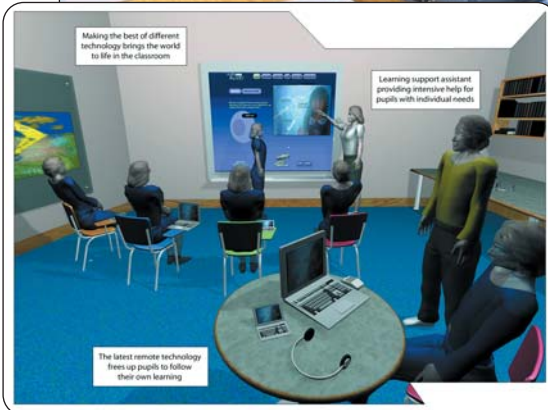
The problem is getting from where we are now to the government's vision of schools in the future. Much of the infrastructure is in place, but the vision requires a degree of digital literacy among both pupils and teachers backed up by reliable online content.

End of year report

So how has New Labour performed in producing the IT-literate generation of tomorrow? Read on for the government's end of year report.

Subject	Grade	Comments
Vision	A	They may have nicked the ideas from the Scandinavians, the USA, forward-thinking British teachers, industrialists and even the Tories, but their heart – assuming they have one – is in the right place.
Finance	B	An extra half-billion would have got them an A grade but, overall, solid financial provision.
Cultural change	C	Helping teachers come to terms with the technology should have come before rather than after the majority of the infrastructure was in place.
Diplomacy	D	A succession of education secretaries telling teachers they must change or else is not the best way to get the full co-operation of the profession.
Managing expectations	E	That's the problem with an A-grade Utopian vision – everyone expects you to deliver on it. Summoning up all your sincerity and saying "we know it won't be easy..." in every speech isn't enough.

➤ Specialist technology colleges, such as Seven Kings High School in Redbridge, have a headstart in ICT. Canon is in the process of installing a wireless network throughout the school ready for the new term



✗ Futuristic images of docile pupils sat in communal airy atriums might not quite ring true, but visit any school in Britain and you'll probably be surprised at the sophistication of the technology in use

websites is intended to include learning materials from all the educational software publishers that want to participate, with quality vetted by the QCA

(Qualifications and Curriculum Authority).



Digital divisions

Digital literacy among pupils is not so much of an issue: they grow up with microprocessors imbedded in everything. Fifty percent of students will have a PC at home and those that don't will be used the high-speed graphics of a PlayStation or similar games console. What's more, over 50 percent of pupils will have mobile phones and be more than familiar with text messaging.

But teachers, especially those over 30, won't have grown up with the technology, so teacher training is vital. However, the training has to be of a particular kind – to show them what IT is capable of and allow them to apply it to the way they prepare and deliver lessons.

Online content shouldn't be a problem; after all, publishers produced textbooks for years because they knew schools would buy them, so just repeat the same formula for the online medium. But it isn't quite so simple. Books were being printed a few hundred years before compulsory curriculum-based education created a convenient mass market for educational titles whereas the web is only 10 years old. The DfES' plan is to create Curriculum Online (see the boxout on the opposite page), a plethora of web-based learning materials for every subject with the emphasis on interactivity.

Curriculum Online is due to launch in September, in time for the new academic year. Each school will have e-learning credits so they can access the materials they require. The massive network of

Glossary

- Becta **Stands for British Educational Communications and Technology Agency.**
- BESA **Stands for British Educational Suppliers Association.**
- BETT **Stands for British Education and Teaching with Technology. Annual show where Becta suppliers show off their wares to teachers and LEA buyers.**
- DfES **Stands for Department for Education and Skills.**
- ICT **Stands for information and communications technology; PCs and peripherals on a school network connected to the internet.**
- LEA **Stands for local education authority.**
- MLE **Stands for managed learning environment, an information management system which the teacher can use to organise resources, plan lessons and manage their pupils' learning. It can also help the teacher monitor and track pupil progress and personalise elements of the lesson being presented to each student.**
- NGfL **Stands for National Grid for Learning. The government organisation that implements basic infrastructure, in the shape of internet-connected school ICT networks, and usable commercially viable web-based teaching content. Recently renamed Schools Programme.**
- QCA **Stands for Qualifications and Curriculum Authority.**

"Personally I am sceptical about teaching teachers what a hard disk is and how to change the memory in a PC. Trying to make them into technicians will put many off," says Ulf Lundin, director of the European Schoolsnet, a pan-European governmental resource for schools.

"We ran a training programme in Sweden and nowhere was it about the technology. It was about getting teachers to work together, to think about how they could use the technology to enhance learning."

It's important not to let the technology obscure what teachers are trying to

Curriculum online

The launch of Curriculum Online in September is central to the next phase of the government's plan for schools' ICT. It will contain a mass of content for all levels of the national curriculum and will evolve to become more interactive as broadband uptake increases among schools.

Curriculum Online was announced last year and has been developed after a long consultation period involving teachers, 'industry' insiders and a host of other interested parties. Aimed primarily at teachers providing resources for preparing and delivering lessons, there are also sections for parents, pupils, school leavers and anyone who wants a piece of the education action.

Curriculum Online is the great leveller, providing the same digital intellectual resources to all schools. However, at the same time it is also the great liberator, whereby ultra-bright pupils who are held back by the plodding rate of the rest of the class can explore and learn at their own pace. Well, that's the theory.

The chief advisor to the DfES (Department for Education and Skills) on Curriculum Online is Lord David Puttnam, best known as the director of *Chariots of Fire* and *The Killing Fields*. The DfES is handing out e-learning credits amounting to £150m this academic year – £5,000 for comprehensives

and between £1,000 and £2,000 for primary schools – so that schools can download the materials they need.

Curriculum critics

Not everyone is 100 percent happy with the way Curriculum Online is being set up. Education is an emotive subject and it would be unusual if there were unanimity among the interested parties. The NUT (National Union of Teachers), whose members Curriculum Online will affect the most says teachers have not been consulted enough over its creation and how it will fit with classroom practice, as opposed to the government's classroom theory.

The BBC, called in as the DfES' main partner, is ploughing in £150m worth of content over five years. The publishers of educational software (all private companies) say this effectively gives the BBC a government subsidy by virtue of the licence fee and therefore an unfair advantage in what should be an open market. The DfES' and the BBC's answer to this criticism is that the scope for digital curriculum materials is vast and, besides, the BBC will commission its content from outside parties – presumably the same educational software publishers. Find out more about Curriculum Online at www.dfes.gov.uk/curriculumonline.

achieve. For some tasks, ICT is not the answer. "ICT has to be used well to be effective," says Vince Burke, head of St George's Primary School in Southwark, central London. "I tell my teachers that if it can be done easily and better with a pen and paper, then do it with a pen and paper."

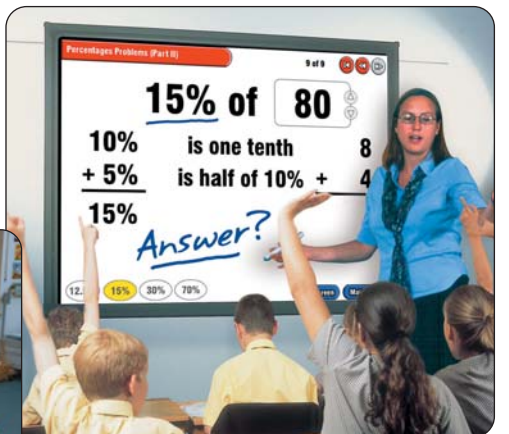


Hubs and harmony

There are two further practical problems to overcome: support and obsolescence. It's a well-known fact that where two or more PCs are gathered together, support becomes the major issue. Someone has to get the systems working together, install and update software, handhold users who need it and pick up the pieces when things go wrong. These are especially important issues in a school where few teachers will be IT-savvy and systems are tested to their limits – and beyond – by pupils.

Few schools can afford dedicated IT technicians and teachers themselves want to use ICT to raise teaching standards, not have it act as an encumbrance. Thus schools tend to opt for service agreements. According to BESA (British Educational Suppliers Association), one in five schools

➤➔ The government intends every classroom in the UK to house an interactive whiteboard such as Hitachi's StarBoard (right). The AlphaSmart 3000 (below) enables pupils to develop keyboard skills, type, edit and store documents that can later be transferred to a PC



now uses managed service providers for their ICT. Even at a wired-up school like St George's, a Becta (British Educational Communications and Technology Agency) supplier called Akhter purchases, installs and maintains the ICT equipment, running remote diagnostics via an ISDN line.

Obsolescence presents a different problem. The rate at which PCs develop means that what is bought this term is out of date next term. Smart schools have

adopted the same approach as businesses, investing in networks and web-based systems that can be accessed by relatively simple desktop or notebook PCs. This is one of the reasons why Burke uses Oracle's Think.com online resource for schools.

After the government's six-year spending spree, the use of computers in schools will be totally different to what it was in 1997. Lots of people – teachers, parents and partisan commercial parties – will complain about what the government has done. What they won't be able to say is that the government has done nothing. ■