

Schoolnet Report UNITED KINGDOM

Schoolnets – what is being provided?

The UK has a national ICT strategy that is based on infrastructure, content and practice (Figure x.1). These aspects are inter-connected through the establishment of networks of schools and networks of computers. At the heart of this activity there have been a number of core schoolnet developments, which enable these three aspects to be delivered online throughout the country.

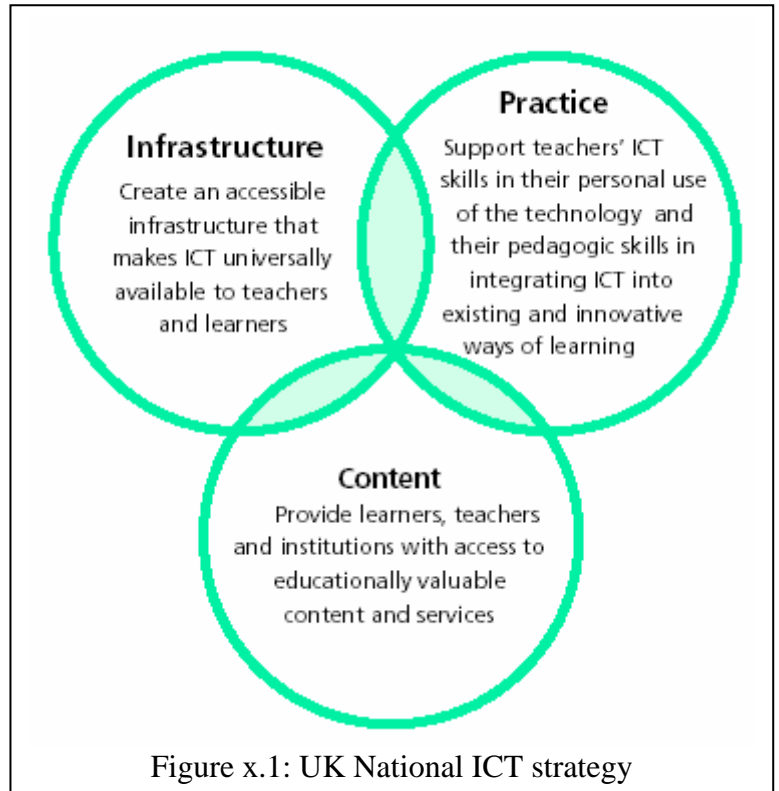
In 1998 the Government launched the National Grid for Learning (NGfL) (<http://www.ngfl.gov.uk>). It aimed to increase levels of ICT in schools, with target pupil to computer ratios for 2002 of 11:1 and 7:1 for primary and secondary schools respectively. By 31st March

2002, pupil to computer ratios had improved to 9.7:1 in primary and 6:1 in secondary schools (DfES, 2002). The NGfL strategy drives a programme of funding and support for education addressing the key areas of infrastructure, content and practice.

The NGfL strategy aims to:

- raise standards through the application of ICT across all areas of teaching and learning, particularly as part of national educational key priorities such as literacy, numeracy and Key Stage 3
- support innovation in schools, improving the effectiveness of schools and teachers, in particular, by using ICT to reduce the burdens placed on teachers and to modernise delivery
- equip school leavers with ICT, information and learning skills needed for employability and lifelong learning and enable them to engage in a technological society
- include all learners through ICT ability to provide access to learning.

The National Grid for Learning (NGfL) seeks to help learners and educators in the UK to benefit from ICT. For schools it focuses on improving awareness of and access to an effective ICT provision, developing a wide range of digital resources for teaching and learning (content), and equipping teachers to be effective users of ICT (training) while developing their professional practice.



The following challenges had been set out as the NGfL targets for 2002:

- Connecting all schools, colleges, universities, public libraries and as many community centres as possible to the Grid
- Ensuring that serving teachers feel confident and competent to teach using ICT within the curriculum, and that librarians are similarly trained
- Enabling school leavers to have a good understanding of ICT with measures in place for assessing their competence in it
- Ensuring that general administrative communications between educational bodies and the Government cease to be largely paper-based
- Making the UK a centre of excellence in the development of networked software content and a world leader in the export of learning services.

Within the NGfL, a number of key resources have been developed to help teachers and pupils to meet these goals. These include:

- The NGfL Web portal, which is a point of entry to educational content
- Online educational services such as Teachernet, the DfES' service for teachers, and other services provided by the government and its agencies, such as the Virtual Teacher Centre and the National Curriculum Site
- Locally developed content
- Content provided by publishers, museums and galleries and national bodies such as the Public Records Office
- Innovative services aimed at learners, such as the Grid Club which is an on-line, fun filled, safe environment for children aged between 7 and 11 years old, who register them through their schools, allowing them to e-mail each other, share ideas and play interactive games.

The NGfL portal is a network of web sites that provide content to support learning, teaching, training and administration in schools, colleges, universities, libraries, learning centres, the workplace and the home. Access to the educational materials and resources available via the NGfL is open to all.

The VTC (Virtual Teacher Centre) provides a focus for information, guidance, advice and materials for teachers, including lesson plans, subject resources, curriculum information (schemes of work and teaching frameworks), support for professional development, education policy guidance, school management, special educational needs and on-line discussion groups.

Any sites linked with the portal have to go through a registration and approval process, which includes meeting a set of quality criteria (the NGfL Ground Rules), so that users can be confident that any web site carrying the NGfL logo has pledged to maintain high standards. As a result a variety of specialised online networks were validated as an invaluable source of support and information, for example the Specialist Schools Trust (<http://www.specialistschools.org.uk>), the General Teaching Council (<http://www.gtc.org.uk>) and the Further Education Resources for Learning network (<http://www.ferl.becta.org.uk>). Peer collaboration, the sharing of ideas and practice can therefore be supported through these online networks.

A number of other networked based projects have been developed in tangent to the above government initiatives. These have included TescoNet and Schoolnet Global. Schoolnet Global followed from TescoNet, had more than 17,000 schools, over 3,500 teachers, and in excess of 60,000 pupils, registered and involved in the projects, in 2002. TescoNet2000 and SchoolNet Global eventually consisted of more than 50,000 published web pages (Table x.1).

	Active schools	Active teachers	Active pupils	Completed pages published
Totals	17041	3605	61340	52857

Table x.1: TescoNet and SchoolNet Global (December 2001)

TescoNet 2000 was a millennium project focused on only UK schools. The main aim for TescoNet 2000 was to broaden teacher interpretation of the National Curriculum in order to involve them and the pupils in using ICT in a creative way. At its time, TescoNet 2000 was very successful with large numbers of schools, teachers, pupils and classes involved throughout the UK through their local supermarkets. Between 1998 and 2002 more than half a million young people, aged 5 to 18 were involved. Many have recorded their thoughts and feelings about life in the 21st Century, on over 50,000 web pages. They wrote about their own lives, homes, interests, wild ideas, hopes and dreams and how they will make the world a better place. (SchoolNet Global, 2002)

The benefits for teachers in being involved in TescoNet 2000 were the creation of educational experiences that at that time were novel and exciting. They also helped with access to hardware, including laptops, help from advisory teachers in how to use hardware and software, participation in a nation-wide project to commemorate the millennium, the possibility of taking youngsters to see their work in the Millennium Dome in London and using the internet with a class probably for the first time. The local community was able to see children's work at the local Tesco store. Teachers and parents were thus able to see how pupils could become engaged in use of web-based resources. The involvement in a large web-site of pupil work attracted many teachers.

From a pedagogical point of view, teachers indicated that enabling children to relate from their own experiences was an important feature of the project. This enabled children to write easily on topics. Many teachers commented that they felt that the quality of children's work was improved by publishing to a worldwide audience. The effects on presentation and on having something to aim for were also noted.

The pupils generated highly creative outcomes, including poems and art work, as well as work in other forms including design and technology solutions. The enhancement of self-esteem and the benefits to reading, drafting and analysis skills were also noted. In many cases the pupils were able to choose their own projects and the involvement of parents in supporting research at home was also noted. The activities were supported through ready-made project ideas which were sent into school each term.

Many pages contained ideas and experiences produced by the pupils, they often looked at other places around the world and raising local environmental issues was often a theme. In a small number of cases, schools are working with those in other countries, even though this was not an aim of the project. Some teachers mentioned the impacts upon global understanding and knowledge of pupils.

So, TescoNet 2000 provided a base from which SchoolNet Global could evolve. SchoolNet Global was a different project, with a different focus. The major themes were international involvement, links with other schools and increasing parental involvement in some topic areas, but not in others. Teamwork was not often a feature even though more than 2750 pages were authored by a class. So the aims sought to address some of these issues.

SchoolNet Global was an international project, with the aims of enhancing pupils' cultural awareness, to expose them much more to the thoughts of children around the world, and to increase their international understanding. So SchoolNet Global sought to provide a stimulus for children overseas to publish in the English language, as well as in their native tongue.

The SchoolNet Global project was concerned with work that pupils undertake away from the computer and internet, as well as that which they do using ICT. Of the range of projects that were developed for pupils in TescoNet, 12 were retained on the updated web-site

By August 2002, Intuitive Media (who managed the portal) reported that the total number of pupils involved had risen to 134,045, the total number of schools involved had risen to 17,459, and the total number of pages published had risen to 53,423. By March 2003 the number of schools was reported to have risen to 17,847, and the total number of published pages to 54,418. So, the web pages and statistics show that there was an increasing involvement from schools abroad, and the number of pages being published from pupils in a range of foreign countries. In January 2003, SchoolNet Global was launched to overseas schools at the BETT show.

In February the project was launched into Europe in a keynote presentation at the European SchoolNet conference in Brussels, which led to the initiation of pilot projects in 11 countries, including candidate EC countries. In two months from its international launch, the project received registrations from 53 new pilot schools in 19 non-English-speaking countries: Denmark, Finland, Germany, Iceland, Indonesia, Italy, Latvia, Lithuania, Norway, Poland, Portugal, Romania, Russia, Slovakia, Spain, Sweden, Switzerland, Thailand, and Uganda.

These national projects and initiatives, many of them are promoted and supported by business and industry, have demonstrated very clearly the power of publishing on the Internet and the use of networking technologies. The situation in the UK is complex in that Scotland has had a number of specific initiatives which are different to England, Wales and Northern Ireland, however in all cases there is an increasing emphasis on networked learning. Some of these are described and discussed here.

The English education system has regularly been involved through networking in encouraging schools to collaborate. The Department for Education and Skills *Five Year Strategy for Children and Learners* (2004) and the *Every Child Matters* (2004) agenda place an emphasis upon public service reform centred on the personalisation of learning and the improvement of the delivery of services to all children.

Teachers and schools will need to work together to achieve this and Internet-based school-to-school networks which are focused on learning offer a foundation for genuine learning transformation based on the knowledge embedded in teaching practice (DfES, 2004).

In Scotland, there is a national hierarchy of intelligent and powerful servers that facilitate the fast flow of data across the country, with servers and content distribution engines working at school, local authority and national levels (<http://www.LTScotland.org.uk/connected/>). This allows for online resources to be accessed by teachers and pupils. Therefore teachers are able to pre-select material to suit their own teaching plans and arrange to have it delivered to their school server in time to use during the lesson.

This allows access to major repositories of online material. So, for example there is rapid access to Pathe News materials, the SCRAN database of cultural artefacts and the BBC Digital Curriculum. To allow this, a fairly simple software interface has been created to allow users to identify and download content. Learning and Teaching Scotland will create a software tool that will map high quality learning resources against every element of the Scottish curriculum, allowing teachers to search for material appropriate to the age, stage and curriculum area.

Other specific networking initiatives are also worth noting, for example there has been a national Digital Inclusion Policy, where schools in deprived areas will be given free computers as part of a government scheme to bridge the digital divide. The 'Wired Up Communities' project hopes to raise computer pupil ratios to well above the average.

In the UK, the DfES has been providing advice to schools in relation to safe use of the Internet since 1998. They also provide updated advice and information through the Superhighway Safety web site, which was launched in September 2000 (<http://ispsafety.ngfl.gov.uk/>). The Internet Proficiency Scheme for Key Stage 2 pupils (ages 7-11) was launched at the Education Show 2003. The scheme has been developed by three government agencies, Becta, the Department for Education and Skills (DfES) and the Qualifications and Curriculum Authority (QCA) to help teachers educate children to stay safe on the Internet.

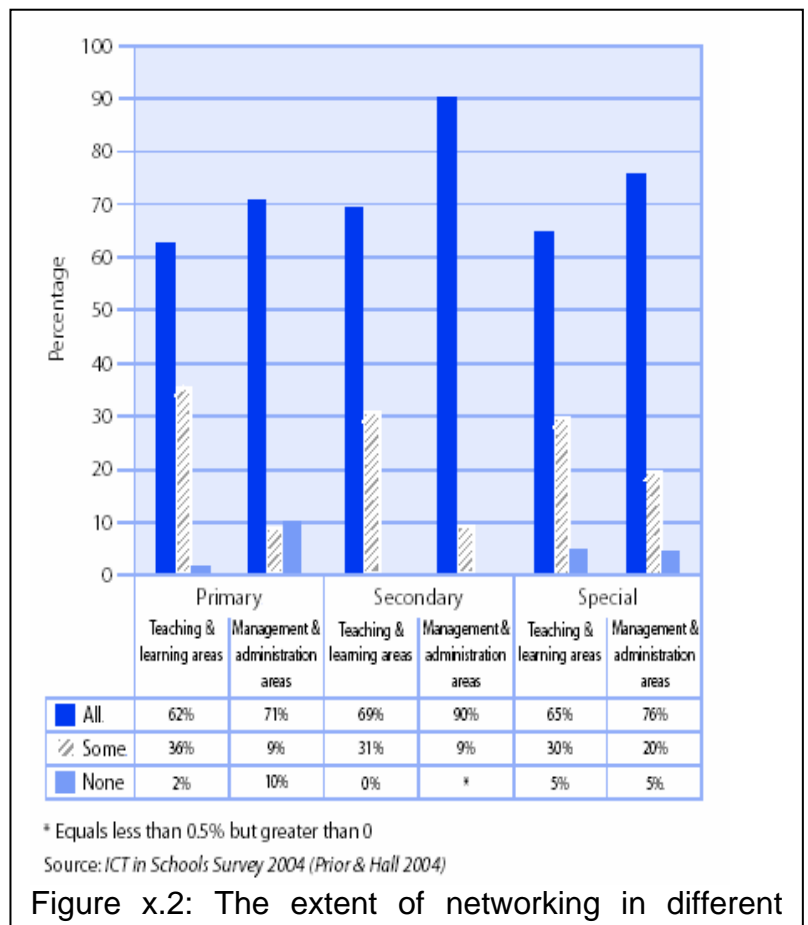
Local school networking foundations have been established in 2003 and are gaining momentum. There were 45 of them in England in 2004 based in schools or groups of schools and they are developing right across the country. Work is progressing on helping the foundations to use computing solutions that suits them best. These might include laptops, tablets, interactive whiteboards, pocket PCs and Personal Digital Assistants (PDAs). E-learning has been backed by many different ICT companies.

Regional Broadband Consortia (RBCs) have been set up in the UK (<http://broadband.ngfl.gov.uk/>). These are consortia of Local Education Authorities (LEAs) that were established to procure cost-effective broadband connectivity for schools and promote the development of content for broadband networks. They are currently linking together to form a National Education Network (<http://www.broadbanduk.org/>).

There are currently ten RBCs, of various sizes, covering all areas of England. These consortia are key players in the procurement of Internet services, broadband infrastructure and content for LEAs and schools in their regions.

School(s) - what is happening?

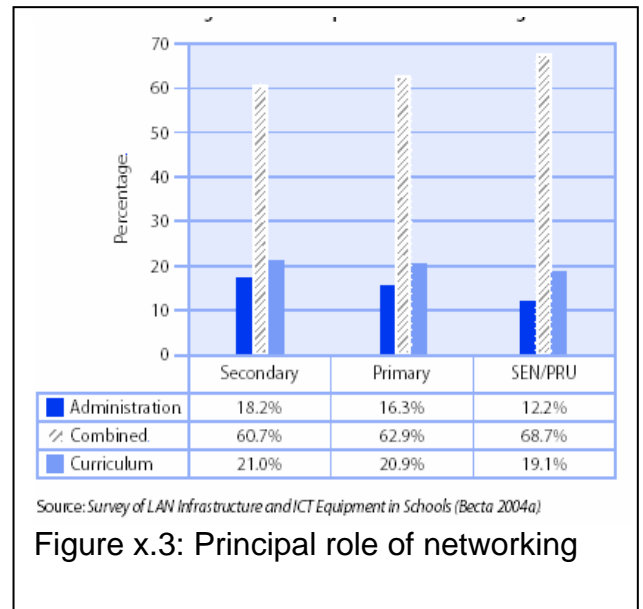
A recent Government report (Becta, 2005) reviews the state of networked classrooms and wireless networks. The pattern shows a marked infrastructure and networking improvement over recent years. An increasing number of institutions have access to classroom networks. However, as with other areas of infrastructure provision, there remains a minority of primary schools that have limited classroom networking who are starting from a low base in terms of embedding ICT.



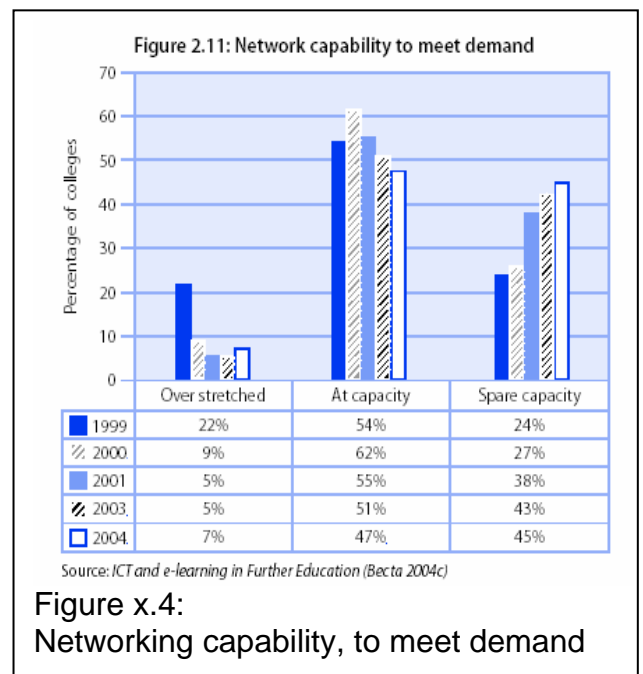
Though the design of some school buildings is a known barrier to ICT deployment, there is evidence of a recent improvement in networking of teaching and learning areas in primary and secondary schools. In terms of those who are not improving their networks, it seems that among both primary and secondary schools, the smallest schools are those that are least likely to be implementing networks across the school (see Figure x.2).

In the UK, more than one fifth (21 per cent) of primary and special schools and 54 per cent of secondary schools have some access to wireless networks, and this is growing (Prior and Hall, 2004). There are still particular technical challenges in this area, though, and schools require support to deal with these. For example, in 2003, 12 per cent of secondary, 20 per cent of primary and 25 per cent of special schools did not have sufficient security for operating wireless elements of their networks (Becta, 2004a).

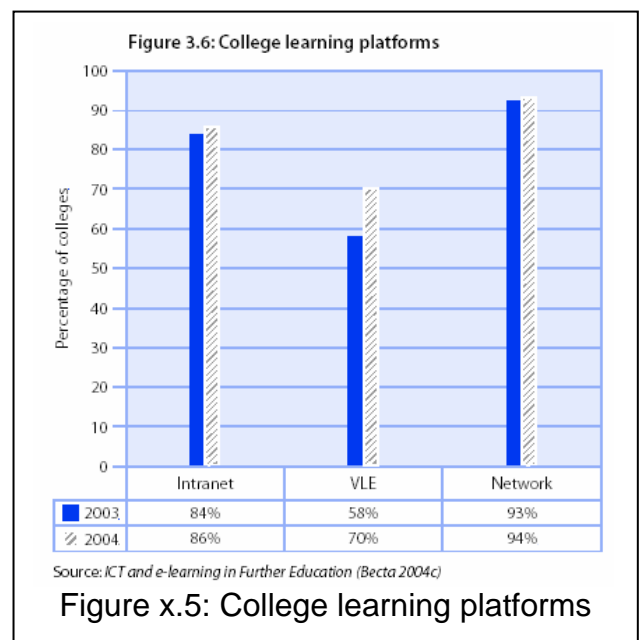
There is a critical networking barrier to the integration of curriculum and management information. In a significant minority of schools, the network does not support both curriculum and management functions (Becta, 2004a). In addition, some management and administrative computers in schools are not connected to the Internet, suggesting that the underpinning infrastructure is not in place for integrating learning and data services (Figure x.3).



According to Becta (2005), network capacity is the area in which the major improvements have been seen as most significant over the last few years. However, the institutions claiming that they are overstretched have remained fairly consistent over the last three years at between 5 per cent and 7 per cent (see Figure x.4).



In terms of realising the potential for ICT to enable links between home and school/college, the ICT in Schools Survey 2004 found that 29 per cent of secondary schools and 12 per cent of primary schools operated networks that were accessible beyond the school premises. This seemed to be a fairly low figure. However, this type of facility appeared mainly related to school size. For example almost half of the large secondary schools provided remote access to the school network. It is likely that larger institutions are more likely than smaller ones to have the technical capability to deliver this. The use of virtual learning environments has also been on the increase as a means of encouraging networked-based learning (Figure x.5).



Networking between institutions is important in facilitating the spread of innovation in practice. Where it happens at the moment, innovation tends to be isolated and, though there are some networks and mechanisms in place for sharing practice, it is unlikely, owing to limited embedding of ICT.

Resources available on Schoolnets

A vast range of resources is available through national and regional networked sites. Many of these have been developed by professional organisations and publishers, but increasingly from media providers like television companies like the BBC and Channel 4. These result in highly interactive relevant materials targeted at pupils of different ages. The nationally approved providers normally offer an extensive range of Internet services, facilities and resources, integrated under one offer. An example of high bandwidth resources accessible to schools is the 'Community Intranet' from NTL. This allows access through PCs or digital television via the company's cable network.

It is claimed that this initiative confers the benefits of increased continuity in the learning experience between home and school, increased communication between schools and parents, the ability to work on projects out of school hours, and access to a greater range of electronic-based educational content (NTL 2000). Parents and students have been able to access the school Intranet from home by using authentication passwords. The servers storing the intranet are maintained centrally by the company, in addition to support services. The core service provides the school with intranet tools to publish material on its intranet, such as timetables, homework diaries, and a school directory. In addition to a core intranet subscription, schools can purchase additional services such as web hosting and e-mail filtering.

Training available for schools and teachers

ICT can also play a key role in supporting geographically spread networks of practitioners and in developing communities of professional practice. In the late 1990s training of all primary and secondary teachers was undertaken using lottery funds (National Opportunity Funds, NOF). Evaluation of this training found that teachers needed to have dialogue and interaction with other teachers to support and develop their understanding. There are some good examples of online forums which enable this, and evidence that, in the right circumstances, practitioners engage in sustained ways with these forums.

The focus of the staff development training has changed from a concentration on the New Opportunities Fund (NOF) training for teachers and school librarians to Continuing Professional Development (CPD) and the development of communities of interest supported by online collaborative working environments. In Scotland in 2002-2003 the Masterclass initiative and the Heads Together online community have been successfully created. In England and Wales, Teacher.net and Teachers Online have been established. However, the lack of appropriate training for teachers and trainers remains a major obstacle to the use of new technologies in education. Training teachers and trainers have concentrated on the use of new tools and not on the pedagogies which need to be developed to successfully use them. As a result, there has been little significant progress in ICT integration and improving learning

effectiveness. So, more efforts need to be made in this area as training in use of tools and technical know-how is not enough. New technologies must be applied along with innovative practical teaching methods which can be incorporated into different disciplines to promote an interdisciplinary approach. An approach might be the identification of best practice in introducing technologies for learning, then identifying how this can be introduced into training for teachers and trainers. So there needs to be research and studies of innovative approaches with a view to improving training systems.

Uses of ICT

In the UK, since 1998 there has been significant strategic investment by the Government in ICT in schools through the National Grid for Learning Programme. This has led to a position where ICT policy has now become a key aspect of an ambitious educational reform agenda. According to the DfES (2004), by 2003,

- Over 99% of schools were connected to the Internet, of which over 25% have a fast 'broadband' connection;
- The NGfL has been developed into the world's largest portal of indexed educational content while customised portals are being created for key groups such as young people, teachers, parents and school governors;
- The average number of computers in schools for teaching and learning has virtually doubled while the proportion over three years old has decreased by a third;
- Continuous professional development (CPD) and leadership programmes for ICT have been put in place with over 99% of schools having signed up for or completed training;
- Teacher confidence in the use of ICT in the curriculum has improved and over 100,000 teachers have received a computer through centrally-funded initiatives;
- Curriculum Online has been launched, providing teachers with a showcase of high quality digital resources from public and private sector suppliers;
- Over 6,000 UK online centres have been established to provide access to ICT in the community;
- Over 2,000 Learndirect centres are now in operation, some of them are based in schools and in the community.

The UK Government has set aims for the next stage of development. It will be to ensure that for all schools:

- ICT makes a significant contribution to teaching and learning across all subjects and ages, inside and outside the curriculum
- ICT is used to improve access to learning for pupils with a diverse range of individual needs, including those with special education needs and disabilities
- ICT is used as a tool for whole-school improvement;
- ICT is used as a means of enabling learning to take place more easily beyond the bounds of the formal school organisation and outside the school day; and
- ICT capabilities are developed as key skills essential for participation in today's society and economy.

ICT confidence among teachers appears to have improved and IT awareness and usability form a compulsory component of all Initial Teacher Training programmes. The levels of use in learning and teaching have shown considerable growth and the DfES (2004) suggest that there is evidence of a positive impact on standards. International comparisons now suggest that the UK is one of the leading nations when it comes to the development and use of ICT in education.

The last five years have seen the establishment of the foundations for fundamental changes within the education system through the use of ICT. However, the full range of opportunities offered by ICT have not been fully exploited (Teachernet, 2004). Furthermore, where significant change has taken place, it is not systemic, and often not embedded. It is now reasonable, and indeed necessary, to expect that by the end of the next five years there will be effective, embedded and systemic ICT practice which has transformed educational opportunities and achievements for all pupils, students and educators.

In 2003, the DfES established an e-Learning Strategy Unit. The Unit's overriding objective is to achieve coherence in Government ICT initiatives, which support learning and teaching, and in working with external partners. The e-learning strategy will take forward many of the issues for the future. The Unit is responsible for issues across all sectors of learning from pre-school, through school, college, further education and university to community-based lifelong learning. Issues concerning the digital divide, access to the Internet, and community-based e-learning initiatives are core strands of the unit's work. This initiative has led to a unified e-learning strategy being developed at every level in the four countries of the UK, in local authorities, institutions, agencies, and departments, as well as in private sector organisations. The Government agency Becta, with its new responsibilities, will support both the development and the delivery of this new strategy.

Needs of Teachers

According to a recent Government survey (Becta, 2004c), the most frequent individual factors which enable ICT use in UK schools were:

- Access to own personal laptop
- Availability of high quality resources
- Full access to software & hardware at all times
- High level of technical support
- Access to an interactive whiteboard
- availability of good quality training.

At a whole school level the main needs emphasised were:

- On-site technical support
- Programme of staff ICT training / CPD (continuing Professional Development) in place
- Support / ICT vision from senior management
- Whole school policies on using ICT across curriculum
- Provision of interactive whiteboards in all classrooms
- Effective timetabling of rooms & equipment / access to resources.

In the UK access to and availability of resources (hardware and software) is not the main issue for teachers. There are many new initiatives established each year and the plethora of local, regional and national initiatives is overwhelming. A visit to the BETT (British Education Technology) exhibition at Olympia in London each year in January offers teachers an unbelievable technological experience.

Barriers to the effective integration of ICT and the use of Schoolnets remains in the poor quality of training, lack of support and most significantly a heavily overloaded curriculum where exciting learning opportunities are not given the space or opportunity to develop.

Teachers are placed in a top-down stranglehold that does not encourage teachers to be innovative, or to express themselves through the technology. This happens despite the central support offered by Web sites such as TeacherNet (<http://www.teachernet.gov.uk/teachingandlearning/subjects/ict/>) which provide many ideas for busy teachers.

The ongoing focus remains associated with needs based on skills and knowledge about ICT. For example, the Scottish Office recommends teachers need:

- Appropriate training (appropriate in terms of skills, knowledge, relevance to educational goals and priorities, and delivery)
- Ready access to ICT and
- Ongoing support and advice to encourage progression beyond initial training

All set within a culture which encourages change but at a pace appropriate to teachers and schools.

There are clear needs for schools to have a clear view of how different course elements can be delivered via networked solutions. This is a management issue and a structure needs to be in place to co-ordinate any developments. Teachers face the challenge of getting pupils working together on a group task to make fuller use of networking capability. They need to use ICT offering pupils the ability to express themselves via a wide-range of media. Good subject specialists are not always able to address all aspects considered as ICT. So they need support from subject organisations.

There need to be ICT expert teachers in schools which can be promoted via industry and university links to produce centres of excellence in the use of ICT. It is likely that a project style approach will be needed. There need to be more technicians in schools providing support and professional development opportunities. This will be important here. Research is also needed to find out what makes ICT different and special.

Author: Karl Donert, Liverpool Hope University College (UK)