



# Education

# Access to education for all is perhaps the biggest challenge and the highest goal that governments have set for themselves.

When UK Prime Minister Tony Blair was elected, he was asked what his three top priorities were for his government. “Education, education, education”, he replied.

Traditional teaching methods have by and large confined education to the classroom – a method that has changed little in hundreds of years. Until now, that is.

The advent of the Internet has created a dramatic shift in how education can be organised and resourced. By using the Internet to access and share high quality materials, millions of learners around the world are discovering a whole new experience of education, and one that is fundamentally different from anything that has been possible in the past.

For many potential learners, both children and adults, physical access to schools, universities and other places of learning has been difficult if not impossible. The Internet means that education can now come to them.

The Internet turns many of the traditional concepts of education on their head. Classroom-based learning is controlled by the pace set by the teacher. With e-Learning tools, the student sets his or her own pace, using materials and following course modules to suit their own unique requirements. Because the Internet not only provides access to an almost unlimited amount of information

but is also a means of communication, students can interact with tutors and each other to form groups for learning that are unconstrained by traditional limitations of geography and time.

When the EU held an e-Learning summit in September 2001, one of the principal recommendations arising from the meeting was to “Connect everyone and everything from everywhere.” In essence this is both the great opportunity and the great challenge that governments face to deliver the promise of e-Learning.

Already, many governments in the EU have committed to making sure that all educational institutions, at all levels, have Internet access in one form or another – and many have already had some success in achieving this goal. But this is only the start. The introduction of high speed and wireless networks will see the benefits of e-Learning rapidly accelerate

In many universities in the US, for example, wireless networks operate across the campus providing students, teachers and administrators with fast access to the information that they need, when they need it.

The Internet in education is not just about e-Learning content – the same gains in efficiency and productivity that businesses have achieved from their use of network technology are also available to teachers and administrators.



## CHALLENGES FOR EDUCATION

### Learning to live with cost pressure

Investment in e-Learning is already well-advanced in many countries. In Europe many governments have committed substantial sums to creating e-Learning capability and ensuring that all schools have access to the Internet.

Cost is a significant barrier to the expansion of educational access. Building new schools and training and employing more teachers are not options that many education authorities are able to pursue in an environment of strict cost control and budgetary restraints

Nonetheless, schools, colleges and universities are under pressure to achieve increasingly high standards with little or no concomitant growth in their budgets. Most countries, for example, need to prepare their citizens for a future in which IT skills are paramount, and so training in these areas is vital.

### Faster, broader access to on-line resources

The type of content that can be used in e-Learning is a major determinant of the overall success of using the Internet in education. Where access to the Internet is limited to slow dial-up connections, it is likely that the quality of the e-Learning experience will be considerably reduced. The dilemma for schools and universities is to be able to ensure that any investment that they make in networking technology can be upgraded and expanded to keep pace with the growth in media-rich content such as video-on-demand. It is likely that wireless networks, that can be expanded as needs grow, will become a key

element of network provision for educational institutions.

### Making better content

Where, how and by whom content is created is a further challenge for educational institutions. Many of the mainstream publishers have moved into education, but there are other sources of material - and new ways of putting it together - that are part of the real excitement behind e-Learning.

The ability that the Internet offers for collaboration dispenses with the barriers of time and location. Virtual laboratories, for example, with researchers from across the world working together over the Internet, are just one manifestation of this ability. But, for these opportunities to be grasped, educators must have the tools at their disposal to understand how to capture them. That means training teachers to exploit fully the technology at their disposal, and to move them from the role of transmitting information to helping others to find and create their own information resources.

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## SOLUTIONS

### Wireless networks and mobility

Wireless technology allows educational institutions to bring the lab to the classroom, rather than making students move to separate classrooms when they need to use computers. It therefore saves costs and makes students more productive. For example, the Universidad Europea CEES, one of Spain's leading private universities, developed a local area network (LAN) with Cisco.

Students, faculty and staff can access courses, administrative and research services via the Internet and to each other via e-mail, anytime and anywhere on campus, using wireless laptop computers. Students can receive class assignments or virtual tutorials from their professors, communicate with each other and their instructors via e-mail, access research resources, and store files at a central server, while moving from the library, to the cafeteria, to an outdoor common area.

### Content creation

When pupil:teacher ratios are on the increase, schools can make better use of resources by supplementing traditional classroom methods with electronically delivered education. The teacher can be attending to one individual or group while others work on-line; this makes it possible to cater for different educational levels and learning styles without anyone feeling left out. Research shows that computers in the classroom also promote effective collaboration between students – if there is good interactive content and students are given fulfilling tasks. For adult learners, too, e-Learning can be the ideal solution to the need to deliver education or training flexibly enough to fit alongside existing commitments, so equipping older members of the workforce with the updated skills they need to remain economically active.

In addition, moving to a digital curriculum, means less administration and marking for teachers. And access to real, live data enables students to make learning more meaningful – or “authentic” – and to have a greater choice about where and when they learn. Education can move to a more learner-centric approach.

### VIDEO, VOICE AND DATA INTEGRATION (AVVID)

#### Voice

Voice over IP allows institutes to place phones in every classroom without additional wiring. IP telephony can act as a terminal for class registration, provide a fast method for locating students and staff through an online timetable and give access to email. Coursework help can be introduced by using intelligent call handling software so that teachers on duty can be contacted no matter where they are and data on student attendance can be collated and



sent to the management information system with minimum effort and error.

### **Video**

Smart use of the Internet allows students to work with teachers and fellow-students in other establishments than their own – even in other countries – through facilities like on-line conferencing as well as e-mail. With these methods a teacher can bring in a specialist on a particular subject to fill in the gaps in the school's local knowledge. Multimedia presentation methods such as video on demand can supplement conventional teaching whenever needed.

Open universities can provide more interactive methods of learning to long-distant students, so the resources available to a particular educational institution need not limit the topics that a student can learn and how it is delivered.

Unequal opportunities between rural and urban schools that have beset some countries can be a thing of the past.

A teacher can work simultaneously with a virtual class distributed over several schools via videoconferencing, providing they have access to a broadband network.

### **NETWORKING IN ACTION**

#### **British Columbia builds wireless campus**

The University of British Columbia, in Vancouver Canada is creating one of the largest wireless networks in North America to provide high speed connections to more than 40,000 students and staff across its one million square feet campus.

The university's wireless LAN is based on the Cisco Aironet 1100 and 1200 solutions, and when complete will provide 1200 wireless access points throughout the campus. The network will be powerful enough to support advanced research applications such



as video-streaming, advanced engineering capabilities and online collaboration through virtual laboratories

#### **Slovak Academic Networks speeds up connections**

The Slovak academic network is upgrading its network to allow universities, schools and research institutes to share information and content at speeds of up to 100 times faster than the present system allows.

The speed and capacity of the new network, based on Cisco's Catalyst switching platform, will allow students and academics throughout the country to benefit from content-rich e-Learning applications using multimedia, video on demand and distance learning resources.

### **Tipperary Institute used AVVID to forge academic community**

The Tipperary Institute in the Republic of Ireland is not only split between two locations some forty-five kilometres apart, but it is also responsible for many off site students. Using Cisco's AVVID solution, the Institute offers its students the chance to interact and learn together even though they may be in quite separate physical locations. Video conferencing through an IP network provides the key.

Lectures can be delivered from one site to another, or from one to many, thanks to the high performance network. The network also handles data and voice communications, making it an ideal platform for the development of advanced educational applications in the future.

### **Using Wireless to Connect More and Cost Less**

King Edward VII school in Melton Mowbray, UK has been an enthusiastic 'early adopter' of e-Learning. The school installed a leased line to provide broadband internet access. However, the service became a victim of its own success as more and more departments and students sought to make use of the Internet in their studies.

The prohibitive practical and financial implications of extending a wired network through the school meant that an alternative had to be found. Cisco's Aironet 340 series wireless solution was used to create a wireless network that now provides almost ubiquitous broadband access throughout the school's area. The use of IT is now totally integrated into the daily life of the school.

### **Bridges across the River Mersey**

A fast-growing college in the North-west of England, Halton College was fast outgrowing its premises on the north side of the River Mersey. The decision to create a second campus on a greenfield site south of the river meant that the college needed to find a way to operate seamless communications between two separate sites.

The college wanted to expand on their existing network investment, yet were conscious of the costs involved. They decided to implement an integrated voice and data system, using Cisco IP Telephony. Staff now have access to email and voice mail regardless of which campus they happen to be at. Enhanced accessibility, though, is just the start. With more than 200 IP phones already installed, the college plans to take advantage of the scaleable nature of the Cisco IP solution and plans to introduce unified messaging (ie access to voicemail via email) videoconferencing so that lectures can be shared across the two campuses and to use the IP phone screens to provide administrative services such as timetables and student registration.

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