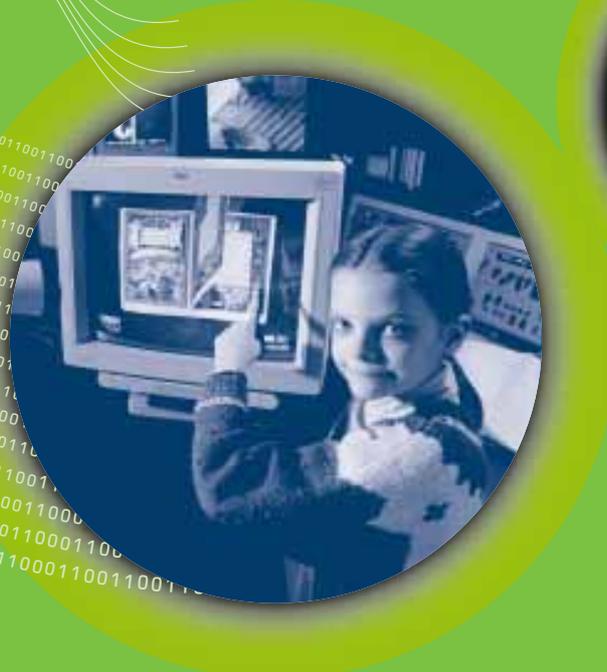# Connecting the Learning Society

National Grid for Learning

The Government's Consultation Paper

FOREWORD
by the Prime Minister

Education is the Government's number one priority. It is key to helping our businesses to compete and giving opportunities to all. That is why we intend to lift educational standards in Britain to the level of the best in the world.

This will mean making the most of technological change. Technology has revolutionised the way we work and is now set to transform education. Children cannot be effective in tomorrow's world if they are trained in yesterday's skills. Nor should teachers be denied the tools that other professionals take for granted.

That is why, two years ago, I said a Labour Government would connect every school in Britain to the information superhighway. This policy is now in place, with free connections and cheaper phone bills for schools. This will allow schools to connect to each other, and link them to all our learning institutions, whether libraries, colleges, universities, museums or galleries.

Last year, I announced that we would create a National Grid for Learning, to provide the content that would make these networks come to life. This consultation paper sets out our plans for creating that Grid.

The Grid will be a way of finding and using on-line learning and teaching materials. It will help users to find their way around the wealth of content available over the Internet. It will be a resource for everyone in our schools. For example, a teacher will be able to get advice on effective ways of teaching children how to read. Pupils will be able to revise for their GCSEs or explore the museums of the world for their project work. Standards, literacy, numeracy, subject knowledge – all will be enhanced by the Grid and the support it will give to our programme for school improvement set out in the White Paper Excellence in Schools, and similar initiatives in other parts of the UK.

The cover graphics illustrate changes in communications technology over four millennia, from hieroglyphs, manuscript and movable type, to digital computing. The largest picture shows the British Library's Turning Page prototype which enables rare manuscripts to be studied electronically, turning the page at the touch of a screen.

However, there is a hurdle to be overcome before this vision can be realised. Last year, I asked Dennis Stevenson, chairman of Pearson, to conduct an independent investigation into the potential of information and communications technology in schools. His report identified two main problems – the need to train teachers and to create a market for high-quality British educational software.

The funding for training teachers in IT skills, recently announced in the Lottery White Paper, will address the first problem. The Grid will be the tool by which we address the second problem – growing the size of the market for software. Currently, the UK market for education software is too small for many companies to invest in it. And the fragmented range of products on offer can confuse schools who have limited expertise in this area. This paper suggests possible solutions to kick-start investment from the private sector in educational services for schools, to give schools some seed-corn funding to buy those services and help them choose high-quality products. The benefits could then spread beyond schools, to those involved in lifelong learning.

We have great strengths in this area – with some world-beating companies from software to broadcasting, from films to computing. We have the asset of the English language. By pioneering this market at home, we aim to create markets for our companies abroad.

But the biggest difference will be in our schools. By 2002, all schools will be connected to the superhighway, free of charge; half a million teachers will be trained; and our children will be leaving school IT-literate, having been able to exploit the best that technology can offer.

We believe this strategy will be good for our children and our companies. I look forward to receiving your views and to working together to make the Grid a reality.

Tony Blair

EXECUTIVE SUMMARY

What is the Grid?

- A way of finding and using on-line learning and teaching materials.

- A mosaic of inter-connecting networks and education services based on the Internet which will support teaching, learning, training and administration in schools, colleges, universities, libraries, the workplace and homes.

What will the Grid do?

- It will provide a national focus and agenda for harnessing new technologies to raise educational standards, and improve quality of life and Britain's international competitiveness, especially the new literacy and numeracy targets.

- Remove barriers to learning, ensuring opportunities for access for all, including those in isolated areas and those with special needs.

- Provide high quality software, content and services which are relevant and differentiated according to needs.

- Stimulate public/private partnership, bringing together the best of private sector creativity and the highest standards of public service.

- Ensure that nothing is provided at public expense, which otherwise could be provided commercially of good quality and reasonable cost.

How will we make it work?

- We shall consult to raise levels of understanding, and to get right the design of the Grid.

- Agree and publicise targets for the Grid and ICT, related to other education and competitiveness objectives.

- Challenge industry to develop a range of competing managed ICT services aimed initially at schools, offering curricular, training and administrative facilities. These services would be kitemarked or franchised by Government to industry/education consortia.

- Offer incentives (including additional funding) to lever up schools' overall level of ICT spend and to encourage industry to invest.

- Open up the home and lifelong learning market to the managed services, thus enhancing both the customer base and content of the Grid.

- Lever down the cost of ICT managed services through economies of scale and competition.

- Provide linkage with new initiatives including the People's Lottery funding for ICT teacher and librarian training, and those outlined in the education White Papers.

- Provide independent guidance on decision-making by schools on ICT purchase and use, so as to help school budget holders become informed and discriminating customers of ICT.

- Evaluate emerging technologies and best practice in the classroom, to feed into the development of the Grid.

When will all this happen?

- Consultation from October to December 1997

- Launch of a model of the Grid early in 1998

- Managed services for the Grid should be available from Autumn 1998

- All schools, colleges, universities and libraries should be connected to the Grid by 2002

INTRODUCTION: THE LEARNING SOCIETY IN THE INFORMATION AGE

1 This paper explains the Government's proposals for securing the benefits of advanced networked technologies for education and lifelong learning and, through the creation of a National Grid for Learning, helping to bring about our vision of a Learning Society.

2 For the first time we have the opportunity to link all our learning institutions and training providers – including schools, colleges, universities, libraries, adult learning institutions, museums and galleries – and more, to link them purposefully to an agenda for developing the learning society. To achieve a learning society these links must also extend in an effective way to homes, the workplace, hospitals, the high street and the street corner in the same way that public utilities like the telephone are now universally available.

3 For a number of years the convergence of telephone, computer and television technologies has been predicted. It is now happening – the Internet has already brought together computing and telecommunications technologies, and interactive digital television is to be launched in Britain next year. Digital[1] technology can now be used to convey very large amounts of information – including video, sound, still images and text – through a variety of links. These range from telephone wires to fibre optic cable, and from terrestrial radio wave signals to signals transmitted to and from satellites.

4 As technology advances, links are becoming faster. Connection to networks including the Internet (the world-wide network of networks) is already possible through computers, and it will soon be possible to interact with them through the television. High speed networks (information superhighways) are becoming increasingly available and, as their capacity increases, so we are seeing dramatic growth in the richness and diversity of the material they convey. This offers enormous potential for education, just as it does for business and other sectors of society.

5 The recently published White Paper 'Excellence in Schools' in England, and its counterpart in Wales, built on our UK-wide manifesto commitment to ICT in education. They put forward proposals designed to modernise education for the next century, for example, by integrating the deployment of new technologies into an agenda for raising standards including new targets for literacy and numeracy, the professional development of teachers including laboratory schools, a new national database of best practice, after school hours learning activities and our programme of Education Action Zones.

[1] Digital' information is represented by sequences of binary digits (0 or 1), which would be transmitted (for example within a computer) as pulses of electricity. Digital technology opens the way to high speed, high quality transmission and broadcasting of information and services.

6   Underpinning these proposals will be the development of a new National Grid for Learning as an infrastructure and service for networked learning. The Grid will not be provided by any one company but will be the framework for a mosaic of interconnected networks and services. We intend that the Grid will focus initially on teacher development and the school sector and extend to lifelong learning – whether home-based learning, further and higher education, or training for employment. It will link closely with our plans for ICT training funded through the National Lottery and for the University for Industry. National and local museums, galleries and other content providers will have an important part to play. We intend that libraries, with their vast stores of information and accessibility to the public, will be an integral part of the Grid. **In this way the Grid will make available to all learners the riches of the world's intellectual, cultural and scientific heritage.** Because information can be distributed virtually free over the Internet, the Grid will open up learning to the individual and take it beyond the confines of institutional walls. Clearly, this will need to be done in a way which is compatible with the protection of copyright and intellectual property rights, so as to ensure that the legitimate interests of the originators and publishers of content are protected, and so that there is incentive to the development of high-quality resources.

7   **A vital part of the programme for implementing the Grid will be the development of teachers' and librarians' skills.** We propose to support these through funding from the National Lottery. Our proposals for these are set out in 'The People's Lottery' consultation paper[2] in more detail. We envisage action, complementary to that proposed in this consultation paper, which will ensure that teachers are given the best possible training in the specialist use of ICT in subject areas across the curriculum. This will go beyond the introductory levels of basic ICT training, for example in IT awareness and in the use of packages such as word-processing, and into applications which will help teachers discover ways in which to use ICT appropriately and successfully in the classroom for the delivery of their subjects, including opportunities to differentiate education for children with special needs. Ultimately this training could be delivered through the medium of the Grid. Similar arrangements will be made for librarians.

Taking full account of the evidence

8   In developing our plans we have taken careful account of the evaluation of the 25 publicly and privately funded projects piloting advanced networked technologies in schools and colleges around the country. This work, commissioned by the UK Education Departments in 1995, is now nearing publication. We have also carefully considered the review of public libraries by the Libraries and Information Commission, and are considering the Commission's report on how public libraries can together respond to the challenge of new technology. This consultation, and the measures proposed in it, represent a major step towards a comprehensive information and lifelong learning policy, with a strong emphasis on the role of public libraries.

9   Also important is evidence on the use and effectiveness of ICTs in higher education, particularly the JANET (Joint Academic Network) and SuperJANET networks which have pioneered networking in education and now connect all higher education institutions, most publicly-funded research institutions, and extend into Metropolitan Area Networks with links to the commercial research sector. The recent report 'Higher Education in the Learning Society', prepared by a national committee of inquiry under the chairmanship of Sir Ron Dearing[3], offers a vital perspective on the use of ICT in higher education, and its potential contribution to the Grid. For example, the report draws attention to evidence that 98% of academic staff connected to JANET use electronic mail

[2] The People's Lottery. DCMS. July 1997. [3] Higher Education in the Learning Society. The National Committee of Inquiry into Higher Education. July 1997.

at least one a week, and 92% find it 'essential' or 'very useful'. Similarly the report of the committee on widening participation in Further Education[4], chaired by Helena Kennedy QC, has made a number of points which have a bearing on the Grid, including the importance of exploiting television and new technologies in combination to support a 'new learning pathway'.

The task before us

10 We must not underestimate the scale of the work involved in creating a truly national grid for learning. In the UK there are some 32,000 state maintained and independent schools, with over 450,000 teachers and over 9 million pupils. There are some 540 further education sector colleges and 360 other institutions providing further education, which together employ some 250,000 staff and serve some four million students. There are some 380,000 people employed in higher education, and over 1.6 million students. There are over 4,300 libraries employing over 6,000 professional librarians and 16,000 other staff, and used by over 60% of the adult population each year. In addition there are thousands of institutions and public and private bodies, including museums and galleries, broadcasters, local authorities, Training and Enterprise Councils, Local Enterprise Companies in Scotland, Industry Training Organisations and National Training Organisations, charitable bodies and special needs support groups, whose presence could enrich the Grid.

11 The scope of this consultation paper is the whole of the UK – because it is already clear that to be truly effective the National Grid for Learning must contribute both to school-based and lifelong learning on the widest possible basis. It must also contribute to a wide range of educational, lifelong learning and social initiatives, including the University for Industry and our Welfare to Work programme. It must be comprehensive, relevant, differentiated according to needs, and readily accessible.

We intend that all learners should be able to benefit in the medium to long term, whether at school, in further education, in higher education, in training, in – or seeking – work, and at home. Of course, schools and other bodies cannot expect the Grid immediately to provide a solution to all their ICT needs. They should continue to invest wisely in ICT training, software, support and networking in preparation for its development.

12 We shall develop the Grid in a way consistent with the particular characteristics of each of the home countries of the UK, and their linguistic and cultural heritage, while at the same time taking advantage of a fully national approach. This paper attempts where possible to reflect the different interests. We have assumed, for the sake of brevity, that references to bodies in England and other home countries apply where appropriate to their counterparts in other parts of the UK. But we recognise that such an approach cannot fully reflect the diversity of structures and approaches which exist, for example the organisational structure of statutory boards which combine education and library functions in Northern Ireland and the non-statutory curriculum in Scotland.

13 The specific actions which we propose and which are described in detail in this paper are to:

■ consult widely about the principles and mechanisms for delivering a National Grid for Learning. This we are now doing;

■ set challenging targets for ICT in education, which are focused also on helping to meet national targets for literacy and numeracy, to help ensure that as a resource the Grid is used to best effect;

■ set up a prototype of the Grid based initially on the needs of teachers and schools to test our ideas in practice, and to stimulate the development of high quality content;

[4] Learning Works – Widening Participation in Further Education. Helena Kennedy QC. FEFC June 1997.

- ensure that the Grid is opened up rapidly to the wider lifelong learning community including learners in colleges of further and higher education, libraries, homes and the workplace, complementing plans for the University for Industry;

- promote industry partnerships to develop the Grid through the creation of competing managed services, offering schools comprehensive curricular, training and administrative facilities;

- kick-start the Grid by designating 1998 as UK NetYear and by raising and focusing schools' overall level of expenditure on ICT;

- build in mechanisms to ensure the renewal of equipment and services under the Grid, in the light of technological advance;

- promote public awareness and discussion about the Grid and its benefits.

14 Several key factors will contribute to the Grid's success. The Government will provide **leadership** through a clear vision, and a clear but flexible policy framework in which the Grid can flourish. Through **partnership,** we shall bring together the best of private sector drive and creativity and the highest standards of public service. We shall be open in our **communication** starting with this consultation paper, so that all potential contributors to the Grid and users of its services have a voice in how it is shaped, and a sense of shared ownership. Most important will be **quality** – of the content and services that are available on the Grid – so that users are attracted to the Grid for the relevance, richness and diversity of what it can offer them, and in turn contribute to similarly high standards.

2 THE NEED AND THE POTENTIAL

Making the most of what we have

15 The numbers and diversity of those potentially using and contributing to the Grid should however be an asset. This will call for leadership by Government in defining a way forward, providing a framework, and in providing the necessary financial and other incentives to ensure quality. It will require commitment by all those involved to working in partnership with a sense of shared ownership. Schools and the education service have a long tradition of working together and turning apparent weaknesses into strengths as, for example, by combining shortage curriculum expertise within clusters of isolated schools, or building partnerships in inner cities. The co-operation between libraries in obtaining books and other resources for a diverse and demanding readership is also well-established.

16 As regards ICT provision in schools, it is clear from international comparisons that our early lead in world terms has been eroded. The Stevenson report[5] and the DfEE's 1996 Survey of IT in Schools[6] revealed significant problems in terms of the age of ICT equipment, the availability of software directly related to the curriculum, and the confidence of teaching staff in the use of ICT to teach. But significant strengths exist in terms of schools' experience of incorporating improvements in technology. In primary schools for example, the percentage of teachers making regular use of computers in teaching and learning has increased markedly, as has the percentage of lesson time in which computers are used by pupils. This increase is likely to be in part attributable to the increasing adoption of CD-ROM technology by primary schools. Furthermore, a substantial core of enthusiasm and expertise continues to exist within many local authority advisory services, and within schools in the form of designated IT co-ordinators. Schools themselves are beginning to perceive the value of connecting to the Internet. Already some 6,000 schools have connected, and some 4,000 have installed local area networks of varying extent.

Teacher skills and confidence

17 The prime importance of developing teacher skills and confidence in the use of ICT is now widely recognised and was recently reflected in the Council conclusions of EC Education Ministers. The DfEE's 1996 survey however reveals a decline in both primary and secondary schools in the percentage of staff fully confident to teach using ICT. In secondary schools the highest levels of confidence remain in subjects traditionally associated with IT, such as

[5] Information and Communications Technology in UK Schools: an Independent Inquiry. March 1997.
[6] Survey of Information Technology in Schools 1996. DfEE. March 1997.

business studies and mathematics, with only about 60% confident in IT use in English, geography, history, modern foreign languages and science.

18 Last year, for the first time, primary schools revealed a decline in the percentage of teachers who attended more than one short in-service course (i.e. more specialised or curriculum-based ICT training). The percentage who had received no training increased. Secondary schools did not fare much better, the percentage who had no training remaining static at 14%. Encouragingly the statistics revealed that in those subjects for which staff had attended specialist curriculum ICT courses, confidence in ICT use in teaching was highest, confirming the value of following up basic awareness training with more in-depth work.

Identifying and building on best practice – education

19 Further evidence about the best approaches to teaching and learning with networked technologies will shortly be available with the separate publication of pilot project evaluation under the Education Departments' Superhighways Initiative (EDSI). Some 1000 schools and 30 colleges of further education across the UK have been involved, and projects have been as diverse as the provision of Internet-capable multimedia portable computers for teachers (including some working towards the National Professional Qualification for Headship), fully networked projects involving the provision of a wide variety of educational content and substantial numbers of computers to schools, projects involving individual schools specialising in using advanced networked technology to enhance particular areas of the curriculum, and projects involving home-school links. Some examples of its outcomes are set out below.

Superhighways Teams Across Rural Schools (STARS)

Eighteen small primary schools, with four teachers or fewer, and two

secondary schools took part in this project based at Northern College of Education in Aberdeen and Dundee. The project aimed to enhance provision for able pupils and made use of electronic communications technology including a conference system. All tasks aimed to promote problem-solving and critical and creative thinking skills. There was a wide range of benefits for able pupils, including:

■ increased confidence and enthusiasm;

■ opportunity to share ideas with high ability pupils in other schools;

■ new awareness that peers from other schools could out-perform them;

■ greater attentiveness to the needs of others;

■ taking greater responsibility for their own learning.

Students Across Europe

Monkseaton Community High School, Whitley Bay, has undertaken a project on the development of modern language skills, with pupils communicating with their French, German and Spanish counterparts through the use of wideband (ISDN2) and narrowband technology, including video-conferencing links. The benefits have been considerable and include:

■ improved results at A level;

■ improved motivation of pupils;

■ improved conversational skills in languages;

■ development of cultural understanding.

Bristol Education On-line Project

A group of primary schools, one secondary school and a special school have trialled a managed service network that enabled schools to have remote access to on-line interactive education services and applications, a 'walled garden' Internet environment, and point-to-point video conferencing. The project had a major impact on the culture of the schools and the motivation and confidence of the children. Some schools reported gains in literacy, oracy and communication skills, as well as improved social skills. The majority of both pupils and teachers became highly computer and network-literate. The model of a managed service was particularly effective, allowing teachers to concentrate on curriculum, rather than technical concerns.

20 The EDSI projects have been funded by both public and private sectors, and point the way towards the development of public/private partnerships in this area. We wish to build on this. As well as publishing the results of the independent evaluations, we shall focus on the outcomes of the programme so that schools can gain the maximum benefit. In terms of learning, six main effects were observed:

■ improved subject learning;

■ improved vocational training;

■ improved motivation and attitudes to learning;

■ the development of independent learning and research skills;

■ social development;

■ the development of network literacy.

21 Importantly the evaluation provides a definition of network literacy as the **capacity to use electronic networks to access resources, to create resources, and to communicate with others.** These elements of network literacy can be seen as extensions of the traditional skills of reading, writing, speaking and listening. This is of central importance and provides a link with the Government's focus on improving standards of literacy.

22 Guidance on good practice in the use and purchasing of superhighway technologies is in preparation, based on the pilot projects, and will be published soon with the aim of helping schools become **informed customers** and users of the increasingly wide range of powerful networked technologies and services now available. This will be augmented, in time, by the outcomes of a major research project commissioned by the Teacher Training Agency into effective pedagogy for the use of ICT in literacy and numeracy, and other research.

23 In further education we shall seek to learn from the implementation of the major staff development programme – Quality in Information and Learning Technologies (QUILT). This far-reaching programme is directed at governors, chief executives, teachers and lecturers, support staff and managers. It is on target to reach over 50,000 staff in all colleges within the FE sector during the next five years. The aim of the programme is to promote organisational efficiency and effectiveness through the development of individuals and teams concerned with the learning process in colleges. The key components include: staff development; executive briefings for senior managers; curriculum development; consultancy; dissemination and promotion of best practice; and action based on research and development projects. Further lessons will be available from projects such as the Glasgow Telecolleges Network where a sophisticated network is currently being installed across ten colleges as a pilot for the eventual linking of all Scottish colleges of further education.

24 In higher education the JANET and SuperJANET networks have already shown the great potential of networked technologies in education. SuperJANET now connects over 200 higher education and research institutions and provides a valuable basis of experience. Pilot services have demonstrated that SuperJANET has the potential to deliver collaborative teaching across several sites through shared interactive lectures and jointly prepared courseware. It can also provide access to remote information sources for both learning and research purposes and enable limited computing and experimental facilities to be shared more widely. In Scotland under the University of the Highlands and Islands, a wide area network, including video-conferencing, links the 13 partner institutions. We shall also wish to learn from the experience of higher education in dealing with network security issues, and from the testing of applications for emerging technologies, particularly in electronic libraries and campus management. Institutions facing change as they introduce ICT need strategies to address organisational issues, staff training, and technical and pedagogical support. Universities and colleges have experience of devising strategies which may be of interest to others now facing similar challenges, and as the Dearing report on higher education has indicated, the development of a world market in learning materials, based on ICT, will provide scope for higher education institutions themselves to become major participants.

Identifying and building on best practice – libraries and museums

25 Public libraries provide a largely free means of accessing, harnessing, sharing and developing knowledge. They complement formal education provision by providing a resource base and a platform for people of all ages to participate in lifelong learning. They have a key role in stimulating a personal thirst for knowledge and self-improvement, and help to create an informed and ICT literate society. The most significant changes to the public libraries sector in the future will arise from the development of ICT. They will be transformed by the quality and quantity of new and existing information and knowledge that can be made readily and speedily available to the public.

26 The British Library and the other national libraries in the UK have a key role in spreading the benefits of ICT through the library system in the UK. The Library's magnificent collection of historic books and documents is already being digitised and the Library plans to work in partnership with the private sector in order to improve access to their collections by schools, universities, the general public and the world-wide research community. These benefits will quickly filter down to the level of local public libraries, which already provide important learning and study services through local history and heritage collections, and will complement the work already undertaken both by individual libraries and collectively to harness ICT.

27 Collectively, initiatives such as project EARL (Electronic Access to Resources in Libraries) and SLAINTE (Scottish Libraries Across the Internet), which provide advice and support on library Internet services, are doing much to encourage the development of a national networked public library service. EARL performs a range of functions including negotiating with Internet access providers, providing information and home pages for each subscriber, encouraging professional networking and collaborative ventures, and establishing subject specific task groups. At present more than 100 library authorities subscribe to EARL.

28 Despite these initiatives, the general level of ICT provision in public libraries is variable. Although some library authorities have sophisticated ICT systems available for public use, the majority are only now making the first steps towards a system of

integrated provision. A survey of public library authorities undertaken at the end of 1995 indicated that only 3% of the 3,800 public libraries in England and of the 700 in Scotland had public Internet access points. Even now the total is likely to be well under 20%.

29 The position of museums and galleries is similar. But the collections of museums and galleries will become increasingly available electronically to the whole world. Museums are already using the new technologies in exciting ways. In Scotland, for example, the Scottish Cultural Resources Access Network (SCRAN), a Millennium-funded project, is building a huge multimedia resource base which will provide easy Internet access to 1.5 million text records and over 100,000 digitised images of related resources held by museums, galleries and archives. Elsewhere, the micro-gallery at the National Gallery in London is an innovative computerised information system containing 12 work stations which provides background information on every painting in the Gallery's collection, and enables visitors to explore particular areas of interest, including individual paintings, artists, periods, subject matter or genre. This is complemented by a CD-ROM version of the micro-Gallery, along with another of the gallery's illustrated catalogue. The Tullie House Museum and Art Gallery in Carlisle has pioneered a multimedia package which comprises a tape, video and CD-ROM programme. This has reached more than half a million school children and has played a major part in attracting new visitors to the museum.

30 As with libraries, the museums sector offers considerable opportunities for collaborative projects, joint ventures and new forms of partnership with other bodies involved in information provision and business. Libraries and museums are important sources of information and learning, and new technologies will significantly extend the scope for access to the material which they contain, and for linkages with the

libraries of schools and other education institutions. It is precisely for this reason that the Government's proposals for the Grid are designed to include libraries and museums as part of the integrated network of provision.

Identifying and building on best practice – broadcasting

31 The opportunities presented by the convergence of digital media mean that educational broadcasters and publishers are increasingly recognising the potential of providing their content on-line. The BBC and Channel 4, for instance, have major archives of educational programming much of which, once digitised, could provide as valuable a resource for the Grid as our major museums. The programme-making skills of the BBC and of independent television and radio producers could also be used to create new high quality interactive on-line products. Advanced network access by schools and homes to interactive television media has already been explored under the Education Departments' Superhighways Initiative, demonstrating their potential.

32 Broadcasters, like the BBC, ITV and Channel 4, because of their reach and motivational potential will also have a significant role to play in driving demand for the learning resources made available via the Grid. Ensuring access to the Grid via digital TV in our homes may go a long way towards overcoming problems of access and exclusion in the context of the information age. Such an approach may well also find application in schools.

The European Dimension

33 The European Community is prioritising ICT through support for projects with a clear European dimension. The European Commission plans to work alongside the Member States to promote the connection

of all schools in the European Union to information and knowledge networks as the information age develops.

34 Through publication of its recent action plan 'Learning in the Information Society' the Commission will bring together local, regional and national initiatives and contribute a European dimension to education through the use of electronic communications, stimulating the development of a European market for educational multimedia. There is scope for Commission-funded research to be made available on the Internet as a guide for Member State development.

35 UK educational institutions are already involved in a number of EC pilot projects, for example within the EC SOCRATES and Telematics for Education and Training Programmes. The UK has played a significant part in developing the Lingu@NET project, within the framework of a programme by the G7 countries, to develop virtual language centres to support language teaching and learning. The UK will be a major player in the proposed wider European Schools Network linking up national school networks.

3 DESIGNING THE GRID

36 It is against this existing background that we need to design and develop the Grid. The Grid must be useful. It must lead to the improvement of the skills and confidence of teachers, librarians and other key intermediaries; and to the motivation of pupils and other learners. It must produce learning gains. It is already clear that the Grid must provide:

■ a valuable resource for teachers, librarians and trainers in their daily work, and for their own continuing professional development in ICT, for example through remote tutorials or helpline facilities;

■ a resource to help deliver improved performance by pupils and other learners, particularly in literacy and numeracy;

■ a facility which offers timely access to expertise and resources;

■ a structure which stimulates the development and dissemination and use of high-quality educational content, including software, on-line services and subsequently, perhaps, interactive digital TV-based programming;

■ equality of access for learners, whether at school, college, at home or in libraries; those in rural and urban areas; the employed and those seeking work; those for whom English is not the first language; and those with special needs;

■ a means of supporting and streamlining the administration and management of schools, colleges, libraries and other institutions, in conjunction with developments in local and national government ;

■ a framework for the equipping, local networking and external connection of schools, colleges and other points of lifelong learning provision, including the involvement of off-site education centres and youth organisations and agencies;

■ inter-connectivity between networks and a means of ensuring that existing equipment and networks are put to as effective use as is possible;

■ a stimulus to a wide range of industries to participate and invest;

■ a link between many diverse spheres of life including commerce, culture and sport, education and lifelong learning, health, charitable endeavour and politics;

■ affordable access through lowering the cost of connection, equipping and use;

■ a mechanism for the renewal of its services, equipment and systems as technology develops.

Affordability to schools, colleges, libraries and homes

37 The costs of connection and telecommunications have long been recognised as fundamental barriers to the development of the educational use of advanced network technologies. That is why in Opposition we pioneered agreement with BT and the cable industry aimed at securing free connection for schools and keeping on-line costs as low as possible. Oftel last year set up an Education and Public Access Points Task Force, involving

a wide range of providers and customers of network services. This has now made considerable progress in reducing costs, particularly for wideband (ISDN2) connection, currently a technical baseline at which schools can begin to use advanced services effectively. We commend Oftel, its taskforce, the cable industry, BT and the rest of the communications industry for responding promptly to the needs of schools. As the taskforce has indicated, the needs of users vary, and while the current technical baseline is ISDN2, it will need to be upgraded over time as technology improves.

Equality of access

38 The arrangements made by Oftel and the telecommunications industry will go far towards promoting equality of access to the Grid by ensuring that schools who subscribe to ISDN in rural areas are not disadvantaged by comparison with their urban counterparts (Oftel and BT are currently considering the position of the small minority of schools in isolated areas which for technical reasons will be unable to connect to ISDN). The arrangements should also enable all schools served by BT ISDN links to access the Internet Service Provider of their choice. The Oftel Task Force is considering new developments and the scope and need for extending special packages to FE colleges, libraries and other public institutions. Equality of access to lifelong learning will increasingly depend on the extent to which the widest possible range of institutions are able to offer ICT services and connections to the Grid, particularly for disadvantaged members of society who are unable to afford Internet connections themselves.

39 Learners with **special needs** also stand to gain from the development of the Grid, providing their particular and individual requirements are taken into account from the outset. For example attention needs to be given to the requirements of learners with a range of visual impairments. The Grid has the potential to make available additional support for special schools, pupils and students with special needs within mainstream schools and FE, those being educated in hospital, and teachers of learners with special needs. The Grid should also offer valuable facilities for very able children.

4

THE CONTENT OF THE GRID

40 In developing the Grid it will be essential for schools, colleges, libraries and others to build from existing good content and practice. Developing a nucleus of good-quality content will be our prime concern. In particular the Grid offers the potential to create specialist resources for professionals involved in education and lifelong learning, as well as for learners themselves. Obvious examples of professional groups include:

■ the teaching profession in schools;

■ teacher trainers and educational researchers;

■ LEA advisory staff;

■ Ofsted inspectors;

■ further education staff;

■ librarians;

■ educators in museums and galleries;

■ departmental and faculty staff in higher education;

■ trainers involved in vocational and workplace education;

■ specialists in career guidance;

■ educational consultants;

■ educational administrators.

41 In the longer term it will be essential to develop facilities on the Grid for all these groups, and many more, **and particularly for learners themselves** and those such as parents and school and college governors who play a vital role in the education service. The fully developed Grid might for example:

■ enable pupils at school or from home, and other learners, to work on networked facilities to improve their literacy and numeracy, providing feedback on their performance;

■ allow children to participate remotely in science experiments, for example those involving space technology, which would otherwise be too expensive for the school to carry out; or to work together through video-conferencing with pupils in other schools in French, or as a design team on technology projects;

■ help children doing history or geography homework to gain access to worldwide sources and data, for example, up-to-the-minute information on weather systems;

■ enable parents to access general school information, and send messages to the school; and to participate more fully in their parent-teacher associations;

■ give busy school governors access to guidance on their role and responsibilities; link them to each other electronically; and allow them to communicate with their headteacher through electronic mail;

■ help aspiring learners readily to identify those courses which they wanted to follow, either for work or as leisure activities; and

to undertake courses on-line, allowing them to study at times of the day which suited them;

■ open up new horizons for people at home whose curiosity had been aroused by a television programme and could instantly to follow up aspects of it through interactive services.

42 We propose initially to develop and pilot a formative model of the Grid as a prototype to focus on **teacher development**, providing content for schools and linking existing networks of teachers across the country, so that we can rapidly gain a practical understanding of the advantages, constraints and potential of a nation-wide facility of this kind in the largest sector of need, and extend its facilities swiftly into such other sectors as further education and libraries.

43 Creating the prototype Grid will call for action at two main levels: **infrastructure** and content. We shall seek the involvement of schools participating in a number of existing pilot projects across the UK to provide the **infrastructure** base for the prototype Grid. These will include current projects piloting the use of multimedia portable computers by teachers, and the use of educational Internet services. This will create a pilot base of well over 1,500 teachers and 1,000 schools in which to evaluate the use of the prototype Grid. The schools and teachers are already equipped at a level to participate, and some can provide e-mail addresses for all pupils. Other schools participating in the Education Departments' Superhighways Initiative, Schools Online and other networks, including those of specialist schools, will be encouraged to join the prototype project.

44 The main initial focus will be on the creation of a virtual Teacher Centre to stimulate the development of appropriate **content** for the Grid by teachers themselves. Content for the prototype grid will be accessible through a specially

designed interface, and is likely to focus on the needs of the following:

■ infant teachers;

■ primary school teachers;

■ subject specialists;

■ heads of primary, secondary and special schools;

■ senior school management and school budget holders;

■ special needs co-ordinators;

■ teachers engaged on classroom action research;

■ teachers and school management preparing for Ofsted inspections;

■ teachers developing home-school, and school-industry links;

■ careers guidance teachers;

■ staff responsible for library and resource management.

45 The content would be drawn together centrally into a coherent and logically organised package, with links into other sites and, particularly, space for discussion by teachers and school management – both open and structured – for example on **benchmarking and target setting, development planning, sharing of schemes of work, lesson planning, timetabling, peer reviews of software and other resources, reviews and co-ordination of external school visits and training activities, a forum for creative ideas in the use of ICT in teaching, professional development and administration, and other facilities.**

46 Examples of the sort of content the Teacher Centre might initially include are:

■ the on-line versions of the curricula operating in various parts of the UK;

■ a bulletin board for senior school managers;

■ links to the network of SEN co-ordinators;

■ Curriculum IT Support Project Web sites (pointing to well-targeted teacher guidance and materials on ICT in all curriculum subjects produced by specialist subject associations; and providing opportunities for on-line exchanges between subject teachers);

■ Lingu@NET – a virtual languages centre providing guidance for teachers and students and courseware with links to European sites;

■ Ofsted inspection reports;

■ links to the websites of specialist schools and ICT beacon schools;

■ links to DfEE, QCA, TTA, NCET, and other key Web sites in England providing advice and guidance, and particularly the Standards and Effectiveness Unit's planned national database of best practice;

■ similar developments in the other home countries, including the SOEID, SCCC, SQA, and SCET sites in Scotland;

■ the Web version of the forthcoming superhighways good practice and purchasing guidance, linked to the evaluation evidence and related sites including the SOEID 'Research in Education' and 'Superhighways Task Force' sites.

47 The Teacher Centre would form the nucleus of the grid, and would be available free to all teachers through the Internet. The Centre would seek to complement other relevant facilities and initiatives such as the UK NetYear, the BBC Internet site for teachers, European SchoolNet, and UK TeacherNet initiatives as and when they came on stream.

48 Access to the Internet is dependent on subscription (by institutions and individuals) to Internet Access Providers (IAPs) and Internet Service Providers (ISPs). The former provide electronic mail and facilities to search the Internet and access data rapidly through the use of 'search engines'. The latter additionally provide some pre-packaged structural organisation of content, including in some cases specific educational content. The evaluation of educational Internet Service Providers is already taking place, and can be expected to identify later this year areas of service provision with particular potential for development. The evaluation will provide valuable pointers to ways in which additional commercially-driven facilities could supplement provision around the public service nucleus of the Grid. Properly managed, the nucleus and these additional facilities should complement each other. In the longer term, no services would be provided by public funding which could be offered on a successful and affordable basis commercially, and which were open to all.

49 Subject to this consultation, we intend to launch the prototype Grid early next year. The prototype project will be evaluated by independent experts so as to identify gaps, areas of potential for further development, and review which functions are most useful. The evaluation will continue as the Grid is extended so as to provide formative advice on good practice and managed service development.

BUILDING UP THE GRID

50 Beyond the prototype it will be important to proceed on the basis of what can be afforded. But we must avoid loss of momentum due to schools having insufficient infrastructure in terms of equipment and local networking to access the Grid. Without 'lift off' to a commercially-driven but co-ordinated programme the Grid would depend in the main on the free nucleus and would rely on schools and other education institutions joining on a piecemeal basis.

51 We therefore propose that the second stage of the development of the Grid should involve a shift from an essentially public service prototype, with some enhancement by the private sector, to a real public/private partnership enabling access nation-wide to a much wider range of services which could, for example, include new added-value content provided on a demonstration and subscription basis. In the light of this consultation we propose to issue a **Challenge** early next year to provide a clear practical focus on achieving our full targets for the Grid.

Competing managed services

52 The Challenge would set out a vision of the potential of a fully developed grid for offering schools **comprehensive curricular, training and administrative services,** maximising the use of home-school links, and extending into services for further education, higher education, libraries, community centres and to support lifelong learning, including the services which will in due course be offered by the University for Industry. Its purpose would be to trigger the development of **competing managed services** to which schools or LEAs individually or in groups (school clusters or joint LEA purchasing groups) would subscribe, and which would meet the great majority of their ICT needs. On the basis of discussion with the relevant industries and interests, we envisage that the managed services would generally need to be provided by **consortia** because the combination of facilities required is on the whole beyond the range of single commercial companies. The consortia would be **kitemarked or franchised** as approved suppliers to the Grid. Such consortia might consist of Internet Service Providers, hardware suppliers, providers of quality technical and pedagogical support (e.g. LEA centres, universities, and commercial training organisations), software developers and other content providers such as broadcasters. But some companies and current commercial groups already provide many of these facilities, and for these there will be less need for extensive liaison with other interests.

53 Software and content providers may choose to market their products and services to more than one consortium, or to all consortia. This is likely to depend on the nature of the product. In general software and content is likely to fall into four areas:

- educational software packages, professionally produced by expert programmers;

- software and content produced by teachers, lecturers and trainers, including both products intended for use by their pupils and students, and the teaching, administrative and planning material that professionals themselves might share;

- published resources available via networks. These include both resources available free from agencies with a role to disseminate information and those from commercial publishers;

- TV and film media resources, again including both commercially and non-commercially provided material.

54 To these may be added other models as yet not fully developed, such as software and content which is not paid for directly but by advertising on the network. Whatever the model, we are clear that there must be adequate means of reimbursing the producers for investment in developing content, and of protecting the intellectual property and copyright of the creators and owners of material, so as to sustain and develop a vibrant and creative market for educational content. We shall be monitoring the development of the Grid closely to ensure that appropriate means of achieving this are in place. In this respect the implementation of the EC Directive on the legal protection of databases, on which the Patent Office has been consulting over the summer, is likely to play an important part.

55 Connection to the Grid through a choice of telecommunications companies would be paid for separately by schools, and cost levels are being addressed through the arrangements which Oftel, BT and the cable industry are introducing. To qualify for franchises, consortia would be expected to demonstrate that, within the overall package, schools were free to choose, and if necessary change, the telecommunications operator providing their connections to the

Grid. In this way the competitive mechanism established already by Oftel would continue independently to drive telecommunication costs down. We propose that the Challenge document should be issued to potential Grid consortia participants in both the public and private sectors. It would specify target levels of service provision, including:

- Internet service provision;

- local networking, equipping;

- servicing and technical support;

- introductory ICT training for staff.

56 The Challenge document would invite consortia to respond with competitive prices for providing these, **and require them to indicate what value they would add through network service, content and educational and other software provision beyond the nucleus Grid developed under the prototype project.** Consortia would be invited to establish links with content providers such as libraries and museums in order to expand the quality and range of services on offer. The Challenge would specify that the services offered by the consortia should be inter-operable and that they should each provide an 'umbrella' allowing institutions to continue to access, within the overall managed service, those facilities which they may find valuable (such as established ISPs, existing LEA intranets and those for specialist schools and families of schools, and the JANET and SuperJANET networks). Consortia might also be encouraged to co-operate with each other in developing as part of their services closed networks for certain client groups, and to develop means of increasing speed of access for groups of users which required it. Consideration would need to be given to the role of SuperJANET, the broadband network for Higher Education, to ensure that if wider access to its facilities were enabled through the Grid, the current levels of service to the higher education and research communities were unimpaired. Consortia would be required to make clear

the extent to which they proposed to incorporate and extend the use of existing computing equipment in schools.

57 The aim would be for schools to subscribe to a consortium's managed service at a choice of levels for a specified period (perhaps four years) during which there would be review points enabling the schools to continue subscription to the service (or parts of it), negotiate enhancements, or switch to a competing service. Competition would keep costs to a market level, and schools would have opportunities to consider at review points whether to move to more advanced services and equipment as they came on stream. Criteria for the consortia would be set to ensure that technical or software developments introduced subsequently did not lock schools into a particular service.

58 Our aim is for every school to have access to the Grid. This raises the issue of whether franchises (excluding telecommunications provision) should be awarded on a nation-wide basis only, or on a narrower one – for example to regional consortia. Some of the main advantages and disadvantages are set out below:

■ under a **nation-wide franchising approach** consortia would be obliged to offer the same level of service at the same cost to all schools, regardless of location, in order to qualify for a franchise. Consortia could be formed of partnerships covering the UK in a complementary way, or could sub-contract at local level in order to provide some of the components of the managed service, such as basic training. However, nation-wide franchises could become over-dominant in the Grid, with only those consortia consisting of the largest companies able to offer a full UK coverage. This could be a deterrent to potential new entrants to the supply market;

■ **a regional or local franchising approach** might be more attractive to smaller companies and potential new entrants to

the market, and present less risk of an over-dominant supply position developing. On the other hand, this approach could well lead to difficulties of supply for schools in areas too isolated to be attractive to consortia. It could also have implications for economies of scale, universal compatibility of provision, and competition at local level (for example, were only one consortium to apply for a particular regional or local franchise);

■ a **combination of nationwide, regional and local franchises** is a third option, with each consortium choosing the area it wanted to cover, but the combination of all the consortia ensuring national coverage. Incentives could be given to franchisees offering to serve uneconomic customers, if any such existed. However this might imply a highly regulated approach given the spread of services required, and the wide range of customers for the fully-developed Grid.

59 Ideally, more than one managed service should be available in the area of each school and institution, in order to allow scope for choice and competition. LEAs should play a part in monitoring how effectively schools use the Grid and the quality of the services as compared with needs.

60 Commercial and other incentives to the development of consortia will be vital from the start. Apart from the incentive of Government franchising or kitemarking as an approved Grid consortium, those providing the services will need assurance that schools will be able to afford such services if they are to assume the risk of developing them. At present schools' annual spend on ICT hardware and software (in England) is some £130m per annum, which is a level which cannot be relied on to generate the commercial investment required. If the consortia are to provide for a productive level of equipping and connectivity, the following are likely to be necessary:

■ **a clear expectation that the annual level of school spend on ICT from all sources would expand substantially.** The funding might come from a number of sources, including Government grant, re-prioritisation of school budgets, funds raised by PTAs and industry sponsorship. Realistically, a substantial increase in expenditure on ICT, particularly by primary schools, is unlikely to be reached without additional seed-corn public funding, given other pressures on school budgets. Appropriately targeted seed-corn funding will make it easier for schools to subscribe whose budgets are under greater pressure and may be less well supported by PTAs and sponsorship;

■ **a requirement for schools and LEAs to demonstrate, through their planning, their commitment to using ICT effectively in the context of the Grid, as a condition for receiving funding**. The requirements might also specify that favourable consideration would be given to schools/LEAs which developed plans for the use of the Grid to target literacy and numeracy, and for its use on school premises after hours for homework and community purposes;

■ **a well-defined route into the home market.** We propose that as part of the Challenge, consortia would be encouraged to develop **home learning centres** (packages of equipment, connectivity, software, services and support which would be marketed to parents and individuals as compatible with the Grid). These would also offer potential for use as remote learning centres, for example in hospitals and in study support centres. The advantage to the industry would be an increase in sales, and to schools the consequential reduction of costs as well as compatibility, for example for homework purposes;

■ **opening up the Grid (and opportunities to purchase managed services and home learning centres from the franchised consortia) in connection with activities after schools hours, to the wider** education and training market, including public libraries, colleges of further education, higher education, the clients of the University for Industry and others. This would provide a broadening of the market and thus a further incentive to industry. Care would be required to ensure that the needs of school pupils and clients of further education, higher education and the training market could be met in compatible ways and did not, for example, result in inappropriate packages for either end of the spectrum;

■ **a commitment to introduce further incentives to the use of the Grid once it is firmly established.** These include the mandatory use of the Grid for the dissemination of information to the education service from the Departments, and for the collection of statistical data, to achieve a reduction in paper-based communication from 2002.

61 All these issues would be carefully negotiated with consortia participants and the education service, especially LEAs, and might include discussion of geared funding (or pricing of services) to assist small schools (especially primary and special schools) to meet the proportionately higher cost of their connection to the Grid.

62 The precise mechanism for extending the Grid would need to be refined in the light of negotiation and discussion with the consortia and the education service. However the intention would be for schools to have sufficient time to consider the merits of the competing managed services, and choose between them, so as to allow for initial installations in the 1998-99 financial year. The terms of the awards of franchises for Grid consortia would also be conditioned by the experience of the pilot of the prototype Grid, which should become apparent by Summer 1998.

63 Subject to the outcome of this consultation, the proposals for competing managed services would be expected to meet most of the needs of schools in terms of

equipping, internal and external network connections, technical support and basic ICT awareness training. In-depth teacher training in the subject-specific use of ICT would be supported through action envisaged under the National Lottery ('The People's Lottery' consultation paper published in July).

64 In approaching the development of the Grid, and related access by schools, three broad options for the deployment of underlying resources are available:

■ to set up the prototype Grid, encourage Internet Service Providers to add value through the provision of commercial services, and **leave schools free to spend whatever they choose on ICT** (with guidance based on the experience of the Superhighways Initiative, and other encouragement). This approach would imply the continuation of current public funding. Managed services would develop as the market allowed leaving it largely to the private sector to develop creative solutions to meet schools needs. This would maintain schools' freedom of choice, but would run the risk that the Grid would develop slowly especially in the primary sector;

■ to set up the prototype Grid, franchise a number of managed services **and provide additional seed-corn funding specifically for ICT.** Schools would be left to choose whether to spend the money on the franchised managed services, or on other ICT products, which conformed to Government's requirements. This would allow managed services to be trialled by those schools who chose to do so, while at the same time encouraging all schools to invest in ICT products and services. This would maintain schools' freedom of choice and the competition created by new entrants into the market. On the other hand, it might not realise the economies of scale available from a more managed approach, and schools would still need to exercise a high level of purchasing expertise;

■ to set up the prototype Grid and **require that the additional funding be spent on the franchised managed services.** By increasing the market size and limiting the number of franchises on which the additional funding could be spent, this would offer the maximum incentive for the consortia to offer attractively priced services, through exploiting economies of scale. Hence this option could offer the greatest likelihood of widescale school networking and potentially the greatest value for public funds. On the other hand, schools would be less free to choose how to spend the seed-corn funding, and the effects on competition would have to be carefully monitored to ensure that restricting entry did not reduce innovation or price competition. Schools would of course still be free to spend resources other than the earmarked funding on ICT provision according to their local needs.

TARGETS FOR ICT

65 Developing a national resource on this scale will require commitment, effort and partnership. We propose setting challenging targets for ICT in education and lifelong learning to help ensure that as a resource the Grid is not wasted. These targets are:

■ **by 1998 plans for the Grid, based on the outcomes of this consultation, should be in process of implementation;**

■ **by 1999 all Newly Qualified Teachers would need to become ICT-literate to mandatory standards to receive the award of Qualified Teacher Status** (we have, for example, already asked the Teacher Training Agency to develop more specific requirements for ICT to be set out in the Initial Teacher Training National Curriculum for IT);

■ **by 2002 serving teachers should generally feel confident, and be competent to teach, using ICT within the curriculum. Competency in, and understanding of, the use of ICT should be seen, through initiatives such as the People's Lottery funding for ICT classroom training and the National Professional Qualification for Headship as of high value in the delivery of curriculum subjects and leading to career enhancement** (at present, as reported by schools, some 70% of primary school teachers and 60% of secondary school teachers feel confident in the use of IT);

■ **by 2002 all schools, colleges, universities and libraries and as many community centres as possible should be connected to the Grid, enabling perhaps 75%** of teachers and lecturers and 50% of pupils and students to use their own e-mail addresses by then (at present some 20-25% of schools, for example, are connected to the Internet, and in only a few of these do all teacher and pupils have their own e-mail addresses);

■ **by 2002 most school leavers should have a good understanding of ICT, based firmly on the standards prescribed in the curricula operating in the various parts of the UK, and there should be measures in place for assessing the level of school leavers' competence in ICT** (at present few students leave school with a specific qualification in ICT);

■ **by 2002 the UK should be a centre for excellence in the development of networked software content for education and lifelong learning, building upon a strong private sector educational software industry, and a world leader in the export of learning services** (at present the UK is in a strong position, but we need to maximise the opportunities available to us);

■ **from 2002 general administrative communications to schools and further and higher education bodies by the UK Education Departments, Ofsted, and non-departmental public bodies, and the collection of data from schools, should largely cease to be paper-based** (the benefits would consist of environmental gains through diminished reliance on paper copies, more rapid transfer of information, and savings in postage costs).

66 In addition we propose action on **outputs and output measures**, as follows:

■ schools should formulate plans for their use of ICT across the curriculum (and particularly for literacy and numeracy), for staff development and for administration. This would become a necessary pre-condition for the provision of public or lottery funding for the Grid to ensure that resources are deployed to best effect;

■ these plans should be available to school inspections, along with an audit of levels of equipping, network use and teacher development undertaken;

■ the collection of statistics by the UK Education Departments should be focused on assessing progress towards achieving the new targets for ICT and the implementation of the Grid; and avoiding false impressions based on obsolete equipment;

■ as measures are put in place to implement the Grid, the relevant national bodies should begin work on reassessing the place of ICT within the curricula operating in the various parts of the UK, and in the assessment and examination system; and on developing new arrangements for the use of ICT in assessment and examinations – particularly those leading to vocational qualifications;

■ all publicly-funded bodies, including museums, galleries, libraries, universities and research institutions and public service broadcasters should be strongly encouraged to record in their published plans and annual reports progress in making available information and content for the Grid.

The National Grid for Learning into the 21st Century

67 Technological developments will continue regardless of the implementation of the Grid. It is important that the Grid retains sufficient flexibility to be upgraded in the light of developments, and that schools and LEAs are able to have access to rigorous independent advice on new technologies in order to negotiate with supplying consortia as 'informed customers' at review points. Evaluations of innovations – for example the use of technologies based on digital broadcasting, digital video disc, use of the radio spectrum and broadband satellite communications – will also contribute to the cheaper and more efficient use of the Grid. Also important is the need to trial innovations with special needs groups.

68 To this end, we propose **a continuing programme of piloting and evaluating advanced emerging technologies** on a public/private partnership basis. As in the case of the Education Departments' Superhighways Initiative, Government would meet the costs of independent evaluation, and commercial developers the costs of the pilot projects themselves. Evaluation would be UK-wide, reflecting different local circumstances and would run alongside independent evaluation of the roll-out of the Grid itself.

69 We shall also welcome views as part of this consultation on how such a programme of continuing evaluation might best be managed, and what national support structures would best provide for schools, libraries and other areas of lifelong learning, as well as the assessment and franchising of the managed services likely to be offered in response to our challenge. The answers to these issues will depend in part on the overall shape of the arrangements to emerge from this consultation process, and we shall be giving them careful consideration in the light of your responses.

QUESTIONS FOR CONSULTATION

Under the code of practice of open government, any responses will be made available to the public on request, unless respondents indicate that they wish their response to remain confidential.

1 Do you welcome the concept of national targets for ICT in the Learning Society?

2 Do you agree with the targets proposed in this paper?

3 Do you share the Government's view that strong emphasis needs to be placed on the expertise and confidence of teachers, librarians and trainers in the use of ICT?

4 Do you share the Government's view of the importance of the development of learning software and content? What further measures should be taken?

5 Do you believe the Government is right to consider all areas of education and lifelong learning, taking into account first the needs of schools?

6 Do you share the Government's wish to see the Grid offering comprehensive curricular, training and administrative services to schools?

7 In designing the Grid, should further requirements be specified?

8 Are the proposed actions on outputs and output measures appropriate?

9 Is the action proposed in relation to connection and on-line costs appropriate? Are there particular categories of institution, or levels of connectivity, which require further consideration by the Oftel Task Force?

10 What further action, beyond action on telecommunications costs, would you like to see to improve equality of access to advanced networked services for learning?

11 In creating the prototype Grid, are there further projects under way which could usefully contribute? What further specific content and features could usefully be included, particularly in the Teachers' Centre?

12 Do you share the Government's view that the best way to create the Grid is through public/private partnership and franchised competing managed services; and if not, what alternative mechanisms would you propose?

13 Do you favour a nation-wide, regional/local franchising model or a combination of both, and why? Would you propose any other models?

14 Which of the three models for school expenditure on ICT would you favour, and why? Would you propose alternative models?

15 In developing facilities for schools and lifelong learning, what sort of services, content and support would best meet the requirements of the bottom 20% of achievers, those with special needs, very able children, and minority groups?

Responses to this consultation document are invited by 8 December.
All responses, irrespective of the originator's home country, should be in writing and addressed to:

Eve Trueman
Superhighways and Multimedia Unit
Level 3C
Department for Education and Employment
Caxton House
Tothill Street
London SW1H 9NA

or on the Internet to:

superhighways@dfee.gov.uk

Queries relating to specific issues in Scotland and Northern Ireland can be e-mailed respectively to:

superhighways@hmis.scotoff.gov.uk or deni@nics.gov.uk

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C GLOSSARY OF ACRONYMS

ACAC	Curriculum and Assessment Authority for Wales	PTA	Parent-Teacher Association
BT	British Telecommunications plc	QCA	Qualifications and Curriculum Agency
DCMS	Department for Culture, Media and Sport	QUILT	Quality in Information and Learning Technologies
DENI	Department for Education, Northern Ireland	SCCC	Scottish Consultative Council on the Curriculum
DfEE	Department for Education and Employment	SCRAN	Scottish Cultural Resources Access Network
EARL	Electronic Access to Resources in Libraries	SCET	Scottish Council for Educational Technology
EC	European Commission	SEN	Special Educational Needs
EDSI	Education Departments' Superhighways Initiative	SOEID	Scottish Office Education and Industry Department
FE	Further Education	SQA	Scottish Qualifications Authority
HE	Higher Education	TTA	Teacher Training Agency
IAP	Internet Access Provider	WOED	Welsh Office Education Department
ICT	Information and Communications Technology		
IT	Information Technology		
ISDN	Integrated Services Digital Network		
ISP	Internet Service Provider		
JANET	Joint Academic Network		
LEA	Local Education Authority		
NC	National Curriculum		
NCET	National Council for Educational Technology		
OFSTED	Office for Standards in Education		
OFTEL	Office of Telecommunications		