

Foresight

Making the future work for you

Information, Communications and Media (ICM) Panel



The Learning Process in 2020 Task Force

Point and Click: learners in the ICT driving seat

A Consultation Document

What is Foresight?

Foresight is about being ready for the future. No one can predict the future. What we can do is look ahead and think about what might happen so that we can begin to prepare for it.

The future is shaped by the decisions we make today. If we wait for the future to happen to us the UK will miss out on opportunities for wealth creation and a better quality of life. The UK's Foresight programme is about making sure that we are ready for what lies ahead.

Foresight brings together the voices of business, government, the science base and others to identify the threats and opportunities that we are likely to face over the next ten to twenty years. In doing so, Foresight aims to bring about a culture of change in the way business, academia and government relate to each other and to the future.

The programme was launched in 1993 following the white paper on science, engineering and technology, *Realising our Potential*. It has a panel-based structure and operates on a five-year cycle. The current round of Foresight began in April 1999.

Work is being taken forward through three thematic and ten sectoral panels, each looking at the future for a particular area. All panels have been asked to consider the implications of their findings for education, skills and training and sustainable development.

Foresight panels

Thematic panels: Ageing Population, Crime Prevention and Manufacturing 2020.

Sectoral panels: Built Environment & Transport, Chemicals, Defence, Aerospace & Systems, Energy & Natural Environment, Financial Services, Food Chain & Crops for Industry, Healthcare, Information, Communications & Media, Materials, Retail & Consumer Services.

A further industry-led panel is looking at Marine issues and there is a task force addressing the impact of E-commerce on business processes and supply chains.

All Panels will be seeking views on their initial ideas and proposals in the period up to October. They are due to report in November 2000.

For further information on the Foresight programme, panels' emerging findings and Foresight news and events, please visit the Foresight website on www.foresight.gov.uk or fax us on 020 7215 6715.

The views expressed in this report are the personal opinions of panel and sub group members and do not represent the official views of the organisations they represent.

This report is intended to spark discussion and debate and readers should not rely on the information reported to make investment decisions.

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Foreword

The next twenty years will see unprecedented growth in the use in every area of our lives of digital information and communication technologies (ICT) such as digital TV, the Internet and mobile devices. This trend will be coupled with the development of an economy built on the exploitation of knowledge and increasing wealth, generating an array of new opportunities for education and learning as well as presenting some formidable challenges.

The global education market is expected to grow rapidly over the next 20 years. This growth, combined with rapid technological development, will redefine the market and have a profound effect on many of our learning institutions. It will also change the roles of the people who work in them.

Success in the future will depend on adopting innovative approaches to education and adapting to this new environment. "Point and Click - learners in the ICT driving seat" outlines the initial views of the Foresight Information, Communications and Media Panel's Task Force on the "Learning Process in 2020". It is a preliminary view and is intended to be thought-provoking.

The Task Force was asked to consider the key themes for those involved in education and learning over the next twenty years. It was not expected to offer definitive answers to prescribed questions and is not therefore an evidence-based exercise. Rather, it draws on the broad range of expertise and experience of the Task Force members to highlight the strategic opportunities and challenges that education and learning will face.

This preliminary report is aimed at stimulating debate on the long-term future of education and learning, and we hope to incorporate a wide range of views and ideas in the final report later this year.

Phil Hemmings
RM Machines

Task Force objectives

The Task Force discussions were influenced by a fundamental belief in “excellence for all” and a conviction that every UK citizen should be given the opportunity to develop his or her abilities to the full.

A key emerging theme was that economic, social, and technological drivers will place individual learners, whatever their age, at the heart of the education and learning process. This concept is not new, but the Task Force believes that for the first time the developing environment and its dynamics will facilitate this change in a real sense.

Building on this foundation, the Task Force developed its thinking around six strands that are presented in this report together with related questions:

- ▶ Learner empowerment - the personalisation of education
- ▶ The impact of science on our understanding of learning
- ▶ The Knowledge Economy and learning
- ▶ The interrelationship between the learner and new technology
- ▶ The impact on educational systems and structures
- ▶ The new roles and responsibilities of education and learning professionals - opportunities and challenges

A CONSULTATIVE PROCESS

As this consultation document is designed to stimulate a debate on the future of education and learning, readers are invited to make a contribution to the debate. The Task Force welcomes views on the report’s general themes and in particular on the questions outlined at the end of each section and which are listed at Annex D.

The Task Force will consider all responses and publish its final report at the end of November 2000. Full details of how to participate in the consultation process are given in Annex C.

“It is an almost sine qua non of policies-for-learning that policy development processes themselves espouse a learning-for-policy approach. At whatever level - be it a locality or the EU - the engagement of all classes of stakeholders in an interactive policy discussion, has a strong impact on the effectiveness and relevance of the policies derived. Such so-called participative policy analysis constitutes an important learning experience for all involved, with further significant effect of appropriating the policies and visions to the stakeholders themselves as well as establishing new networks and linkages. Such approaches have characterised the strategic planning practices in several large firms for many years, but have only recently entered the public policy realm.

The most significant example of a learning-for-policy approach has been the rapid rise in the use of Foresight processes to inform research, technology and industrial development policies.”

The Futures Project, Knowledge and Learning, Towards a Learning Europe (EUR 19034 EN), December 1999, p12, James P Gavigan, Mathias Ottitsch and Sami Mahroum

THE TASK FORCE - THE FUTURE

The Task Force does not claim to have addressed every possible question regarding the future of education and learning. It has attempted to focus on a number of key issues and certainly does not know all the answers. The group recognises that its work is a continuing process and it is still developing new ideas.

In parallel with this consultation exercise, the Task Force is developing a set of future scenarios - its vision of the future. These will help the group to refine its ideas and test its recommendations. They will be published in the final report in November 2000.

Ultimately, the aim is to focus on the key priorities and policies for government, business and academia that will help to achieve the goal of “excellence for all” in education and learning.

1. Learner Empowerment - the personalisation of education

In the future there will be an ever greater focus on individuals and their needs and wants. Within society, people will want and demand more control over all aspects of their lives and many will have the disposable income to achieve their aspirations.

Learners of the future (or their guardians) will adopt the same attitudes to education and learning as they do to other areas of their lives. They will demand more direct control over their own education and learning experiences.

The Task Force has a strong conviction that new technologies (digital TV, internet, and mobile communications) will significantly enhance the education process. They will provide new ways of teaching and learning and allow greater levels of personalisation and customisation.

The combined effect of new technology, growing economic wealth and the demand for more control will provide learners with better choices and better opportunities.

The challenge will be to employ the new technologies so that students are able to gain control over their learning, empowering them to realise higher levels of educational achievement. At the same time, there is a need to minimise the potential for exclusion from technological and, therefore, educational opportunity.

It is therefore vital to consider the broader social, economic and political issues as they affect education and learning. These factors will have major implications for the individual learner and, therefore, for all those involved in the provision of education and learning.

If learners are destined to take an ever greater role and responsibility for their learning experience, there will be new pressures on them. The extent to which this may happen could depend on their stage of learning (primary, secondary etc.), but learners will generally have to be self-motivated, and able to manage their own learning experiences. They will increasingly have to make their own judgements over the provenance or importance of the information they use in their studies - and they will also need to learn when to seek help and from whom, as well as when to collaborate via a virtual learning community.

“Personalised scale is coming to education. Economies of scale will enable self-paced learning material to be produced at affordable prices, and kept up to date. Superstar teachers will post material on the Net to reach a global audience: individuals will download a mixture from different sites to meet their particular needs. Whole-class teaching will be used to support individualised study. Learning will no longer be standardised but customised to the individual.

Those at the forefront of this revolution champion the individual. The need to differentiate between people's learning styles is now received wisdom, but has proved very difficult to achieve in classes of 20 or 30. IT will make it a lot easier.”

‘Tomorrow: Using the future to understand the present’, p65, Michael Moynagh and Richard Worsley, The Tomorrow Project, May 2000

A real concern is for those individuals or groups who get left behind. The idea of the learner taking control may look very different if he or she does not have access to new technologies or does not have the economic power to purchase new or additional educational products or services.

“In general, the provision of education and learning which, in the past, has been packaged and managed within institutions such as schools and universities, will become more diffuse, informal and user-driven. This means in a divided society, those who are socially, economically and culturally ‘excluded’ will benefit from this less than others.”

‘Britain towards 2010’ p38, Richard Scase, Department of Trade and Industry (DTI/Pub 4579/3k/1/00/RP. URN 99/1095), August 1999

Overall, four issues emerge from the Task Force's preliminary discussions on the shift towards greater learner focus:

- ▶ re-engineering the learning process is required to focus on the individual learner's needs and wants;
- ▶ we will have to develop an individual learner-focused culture within organisations, institutions, business and government;
- ▶ we need to ensure access to all so that everyone is given the opportunity to engage in new learning environments;
- ▶ we need to make advances in teaching and learning through innovation.

RE-ENGINEERING THE LEARNING PROCESS

The Task Force suggests that the roots of the learning process and the systems that support it can be traced back to the needs and requirements of the industrial sector at the end of the 19th century. While there have been significant advances in the way we are taught and learn since then, many features in classroom or lecture theatre today are the same as they were over a century ago.

At the start of the 21st century we need to re-engineer the learning process. We have to consider to what extent our current educational and learning environment supports or hinders the growth of a knowledge driven economy. New systems or structures may also be needed to support new and improved ways of learning.

It is the view of the group - and research studies reinforce this - that effective learning takes place in a social environment. The Task Force believes, therefore, that many of our existing educational institutions such as schools and universities will remain. However, we suggest that they will look very different to those of today.

They will perform new functions and have different responsibilities, although it is still not clear what these new functions and responsibilities will be exactly. Inevitably, the blurring of boundaries between work, school and home will continue and in the future a more complex relationship will develop between educational entitlement and choice.

DEVELOPING AN INDIVIDUAL LEARNER-FOCUSED CULTURE

In these circumstances it will be necessary to develop effective mechanisms for creating and maintaining learning communities that share ideas and support the individual learner. These communities could be real or virtual and could be in a variety of locations, but they will use technology to enable learners to work together efficiently and effectively.

"We look for schooling which not only values and develops the unique abilities of every student, as a matter of principle, but which can do so in practice because the curriculum values all those abilities and education resources and practice are much better able to foster them on an individual basis than any school can now. This will be a flexible system which makes much more efficient and effective use of the investment in it, by exploiting the capacity of technology to enable young people to learn in places and at times other than the current conventional school times and classrooms; a system which encourages students from an early age to take responsibility for progressing their own learning, and offers the support to make this work successfully. It would be a system which uses the talents of its professional practitioners more effectively than we do now, and respects their judgements."

'Opening Minds: Education for the 21st Century', p13 The Final Report of the RSA Project 'Redefining The Curriculum' by Valerie Bayliss RSA 1999

There is also a need to cater for learning products and services that are delivered through channels and systems that have not been associated with education before. In the business sector the use of digital technologies has changed the way that people and processes interact with one another. In many cases physical intermediaries have been replaced with virtual ones.

This is happening both in service delivery sectors (e.g. Tesco and Thomas Cook) and in high value-added professions such as investment advisors, bankers, doctors or lawyers. In the longer term it is likely that the same forces will apply to organisations and individuals involved in the delivery of education and learning. But who is likely to be best equipped to undertake the necessary restructuring?

“The biggest opportunity for institutions is in the growing continuing professional development, lifelong learning and wider participation markets where universities have not gained as large a share as might have been expected. Some will continue to resist doing so, but for others (particularly non-research intensive institutions) there is a significant opportunity to collaborate with others in a post-16 framework. In the longer term our view is that the majority of continuing professional development is likely to become virtual, and if existing providers do not respond, may develop as an almost entirely private sector activity.”

‘The Business of Borderless Education: UK perspectives’ summary report p34, CVCP and HEFCE, March 2000

ACCESS FOR ALL

The expansion of the education and learning market will make it increasingly attractive for the private sector as an area for future involvement and investment. While public and private provision are not mutually exclusive, this may give rise to a debate around what constitutes state provision. Tensions could arise between state education, with its established concepts of entitlement, and the potential for diversity and choice in the private sector.

These forces are already in action. The development of the e-universities, the growth of corporate universities, and private sector involvement in school management are examples. These activities are a part of a trend and are just the first steps towards a restructured market in education and learning.

“Businesses through their approach to corporate learning are making a major contribution to the learning environment by experimenting with a variety of learning tools in the workplace. The pace of change in the workplace and the inability for employees to leave the workplace for training for prolonged periods of time is reflected in the greater emphasis on reducing the cycle time for learning and the implementation of knowledge - the rise of ‘just-in-time’ rather than ‘just-in-case’ learning.”

‘The Future of Corporate Learning’ p9, Department of Trade and Industry (DTI/Pub 4849/15k/5/00/NP. URN 00/846) May 2000

In this changing environment, technology will increasingly facilitate learning. Indeed, the Task Force believes that the aim of achieving “excellence for all” in education and learning is only realistically achievable through the full exploitation of ICT.

Given the importance of technology in the future delivery of education and learning, it is essential that we address the challenges presented by technology-rich or even technology-dependent learning environments. If the existing organisations do not address these challenges then others in the form of new market entrants will. Additionally, we may be unable to achieve all we desire socially, culturally and economically if we have to adopt mechanisms or systems that do not reflect our educational philosophies and priorities for the future.

This raises the question of the extent to which the state should be involved in order to ensure access for all so that everyone has the opportunity to benefit from the new learning environment and no-one is excluded.

INNOVATION IN EDUCATION

Innovation in the business sector is driven by the potential of future rewards, i.e. profit, and is balanced against business risk. The drivers of innovation in education are less clear.

The Task Force believes that innovation in education can bring significant benefits in terms of learning improvements. Given the increased diversity of education and learning choices in the future, as well as the rapid pace of change, it will be important to develop new and more dynamic responses to the innovation process within education and learning.

It is open to question, however, how the possible adverse effects of innovation (i.e. failure) could be ameliorated in the education and learning sectors so that the performance of the learner is not adversely affected.

“ There will be a reluctance to take risks with children or provoke a parental backlash by proceeding too quickly. It will take time to refine tools to measure the impact of new technology on learning. With today's emphasis on evidence-based learning, lack of proof of effectiveness may slow change.”

'Tomorrow: Using the future to understand the present', p62, Michael Moynagh and Richard Worsley, The Tomorrow Project, May 2000

The Task Force recognises that there will always be a tension between the desire to teach and learn using proven techniques and the need to make advances in teaching and learning through innovative approaches. How and to what extent the education and learning sectors employ innovative ideas and concepts will dictate how quickly new ideas can be appraised for their ability to improve learning effectiveness and efficiency.

There are significant benefits from the exploitation of ICT in delivering new forms of learning. Given this, the Task Force believes it is particularly important that we develop new responsive mechanisms and build an evidential base for the use of new technology in education and learning.

CONSULTATION QUESTIONS

- 1.1 Does the introduction of new technology in education inevitably lead to a greater learner focus, i.e. more customisation to individual learning styles, and is this desirable?
- 1.2 Given economic growth, how will increases in disposable income affect educational and learning choices?
- 1.3 What civic roles, culture and values should be preserved in a re-engineered 'public' education system?
- 1.4 What issues arise as the distinction between commercial and public providers of education and learning blurs?
- 1.5 What issues are raised by the potential use of educational products and services developed from different cultural, ethical and social perspectives?
- 1.6 What are the main challenges in encouraging greater innovation in education and learning?
- 1.7 Which education and learning sectors are taking the lead in learning innovations and how transferable are these to other sectors?
- 1.8 How can we develop a culture that supports innovation and change whilst raising educational standards and improving efficiency and effectiveness?
- 1.9 What new policy planning and implementation strategies are required to deal with new dynamic learning environments characterised by rapid change and uncertainty?

2. The impact of science on our understanding of learning

"I do not think the central question at present is *What are the implications of neuroscience for education?* because we have too little in the way of an answer to that question. The current question, I suggest, is *Given the potential of neuroscience to contribute to the knowledge-base on which educational practices are based, what action do we need to take to ensure a fruitful outcome to this aspiration?*"

'Neuroscience and its value for education', paper presented at the Royal Institution 'Learning and the Brain: a Public Enquiry' conference 23 November 1999, by David H Hargreaves

The Task Force recognises the emerging impact of neuroscience on our understanding of learning, especially in areas of language acquisition and special needs. It also recognises that this is a rapidly developing area that overlaps and interacts with other scientific discoveries that may have the potential to improve our understanding of the cognitive basis of learning.

Nevertheless, it is the view of the group that any increase in our understanding of the learning process based on new scientific advances is unlikely to have a significant impact on practice within a twenty-year period. However, the Task Force acknowledges that this is not its primary field of expertise and would welcome views on this topic.

"It is worth remembering that a whole range of new technologies could affect learning. Genetics and advances in brain science will produce a variety of mind-enhancing aids. These will include 'Functional foods' that reduce hyperactivity and aid concentration and memory. Various other 'soft technologies', such as meditation and mind/body control techniques, will become more popular and sophisticated. Large flat wall screens that change colour through the day could be popular by 2020. Virtual reality will eventually enable people to learn in their preferred style - visual, acoustic, tactile or kinaesthetic. Learning will become more individualised."

'Tomorrow: Using the future to understand the present', p60, Michael Moynagh and Richard Worsley, The Tomorrow Project, May 2000

A substantial view within the group is of a fairly stable picture of our understanding of learning, built on existing research in education and supported by current practice. This shows education as learner centred and primarily, although not exclusively, socially constructed.

“The challenge that faces us in making best use of current knowledge about learning is that of knowledge transformation - how to convert knowledge about learning into effective practices of educators and trainers or of integrated learning systems. It should be possible, from an understanding of the processes of learning and of the institutional and managerial processes which promote and impede them to write a design specification for ICT devices necessary for learning enhancement.”

“Key enabling developments in our understanding of the learning process” Charles Desforges, ESRC, May 2000

One area for consideration is educational research and development. While the Task Force has not directly addressed this issue, it would welcome views on the appropriateness of existing mechanisms that encourage multidisciplinary research and development. Additionally, the Task Force would be interested in views on the key fertile areas for future educational research and development, particularly areas related to the utilisation of new technologies.

CONSULTATION QUESTIONS

- 2.1 How do you envisage developments in sciences such as genetics and neuroscience affecting our views on how we learn?
- 2.2 What technologies, other than Information and Communication Technologies (ICTs), will have a significant impact on the way we learn in the future?
- 2.3 How could technology increase individual motivation to learn?
- 2.4 What are the strengths and weaknesses of existing educational research initiatives?
- 2.5 What are the most important drivers in the design, development and implementation of ICT systems to support learning?

3. The knowledge economy and learning

"In today's innovation-driven world, learning and the command of knowledge have become the key success factors of international competitiveness. 70-80% of economic growth is said to be due to new and better knowledge, while the stock market value of most firms exceeding net fixed assets by a factor of three to four, is largely ascribed to the value of knowledge capital. This puts people at the centre of attention, since knowledge resides primarily in individuals."

'The Futures Project, Knowledge and Learning, Towards a Learning Europe' (EUR 19034 EN), December 1999, James P Gavigan, Mathias Ottitsch and Sami Mahroum

The growth of the knowledge driven economy will impact on every area of our lives, creating new priorities for education and learning as well as the requirement for individuals to continually upgrade their skills. The knowledge driven economy will be built on the exploitation of creativity in all its forms, by multi-skilled and adaptable people. This suggests that individuals in the future will be employed as much for their ability to acquire new skills and knowledge as for what they already know.

"The knowledge undergoing most rapid change and commanding highest premium, is mostly highly technical or tacit in nature. Unfortunately, this is also precisely where our present-day education, training and learning institutions fail us most. Adaptation to this change - an essential form of learning - is an imperative for all actors (individuals, organisations, public administrations and other structures within the wider community)."

'The Futures Project, Knowledge and Learning, Towards a Learning Europe' (EUR 19034 EN) December 1999, p4-5, James P Gavigan, Mathias Ottitsch and Sami Mahroum

The world of work will be more flexible, dynamic and disparate in the future. It is likely that an individual's educational and learning requirements will follow the same pattern. This in turn will place a greater emphasis on diversity for learning provision. Such diversity can be extensively facilitated through the adoption and use of new technology.

This new environment should not present significant problems to those organisations providing learning directly related to work, i.e. training providers. However, it does raise important questions in relation to the individual's entitlement to state education.

If the world of work is more dynamic, to what extent should this be reflected in public provision of education? And how could this be achieved while maintaining standards? And, at what age should entitlement to state education start and when should it finish? Indeed, at what age should individuals be offered a broader range of education, learning and work options?

It is clear that the development of the knowledge economy is going to lead to significant growth in demand for what we presently term lifelong learning. To meet this demand suppliers will have to adopt new techniques. We are already starting to see this with organisations introducing just-in-time training as well as developing flexible learning materials.

This trend is set to continue. In addition, the growth in informal learning, while less certain, clearly has an important role to play. In particular, by using new technology to develop virtual learning communities that enjoy high levels of interactivity. The development of such communities may play a significant role in achieving higher levels of inclusion in education and learning.

“In order to be competitive as an information economy, Britain will need to drastically restructure its provision of higher education. The capabilities of information technology allow this to happen so that there is a greater exploitation of the nation’s creative talents. This is vital for the development of innovative products and services upon which future economic growth, material prosperity and improvements in the quality of life will depend.”

‘The Future of Universities in an Information Society’ by Richard Scase in ‘Universities in the Future’ (Ed Michael Thorne) p187, Department of Trade and Industry (DTI/Pub 4263/5k/7/98/NP.URN 99/982) July 1999

CONSULTATION QUESTIONS

- 3.1 What forms or types of learning will be required to support the development of the knowledge economy?
- 3.2 What new learning systems or structures are required to support the knowledge economy and what will be their key features?
- 3.3 How will on-line systems support the acquisition of tacit knowledge and creativity?
- 3.4 How can we avoid knowledge-based social exclusion in terms of educated haves and have-nots?

4. Technology and the learner

It is vital that we make the most of the opportunities of new technology so as to facilitate improved learning. The important leap is to go beyond exploiting technology only to do the same things more effectively and consider how technology can allow the learner to do entirely new things.

New technology not only allows students to learn in entirely new ways, it releases them from constraints over where and when learning takes place. This will strengthen the need to re-engineer many aspects of teaching and learning support over the next twenty years.

The key will be to establish what should be achieved at each stage of the education and learning experience. This will differ at primary, secondary, tertiary and lifelong levels.

" There are currently 624,000 sixteen to twenty-four year olds - ten percent of the age group - who are not in work, or in full-time education or training, or claiming unemployment-related benefit. They have dropped out of the official statistics completely. The great majority under-achieved at school. Many played truant.

Concerns about this group will mount - if only because of their long-term cost to the state. Poor mental and physical health, crime, family trauma and poverty will bring them into contact with a variety of state services. Making education more attractive will be one way of keeping such youngsters in the mainstream."

'Tomorrow: Using the future to understand the present', p60, Michael Moynagh and Richard Worsley, The Tomorrow Project, May 2000

The Task Force has taken the view that given the predicted advances over the next twenty years, technology will be able to do whatever we want it to. Future technologies are likely to include full speech recognition; intuitive devices that recognise when assistance is needed; on-line continuous assessment; interactivity; and databases with complete education histories and learner preferences.

Whatever the context, whether at work, home, school or leisure, learning will remain, as already noted, primarily a social experience. Learners will positively seek human interaction in preference to solitary screen-based learning.

The Task Force believes that the best learning experiences are those that are specific to the individual learner and contain a mix of experiences. It is worth reflecting on predictions that said that the use of new technologies would mean a majority would work from home by the year 2000. In fact, we have adopted a range of flexible work patterns that include home working, the office and other locations. The world of learning, like the world of work will become less location specific.

The Task Force believes that, regardless of a learner's age, the future learning experience for the individual will be very different from today. As well as empowering the individual

to have a greater say in what and how they learn, the technology will result in less reliance on formal institutions and providers, although they will still play an important part.

Additionally, the learner will be faced with a multiplicity of education and learning choices from different providers. While this will offer a range of products to suit personal needs and wants, it may prove difficult in the virtual environment to judge the relative value of these learning products. In the educational market, as in many others, brands and their associated attributes will become increasingly important.

Further issues concern privacy and the growth of the so-called "attention economy", in which services and goods are made available to individuals in return for their attention. This may take the form of an agreement to disclose personal information, details of their on-line activity, or to watch targeted advertising and marketing. Learners will need to understand the value of their attention and control how this information is traded.

"The use of e-learning is also facilitating better monitoring and evaluation of learning underway in a business. Employees in some businesses, for example Unisys, now book all training via an intranet and their progress in the training is recorded on their personal profile. This has given people a better understanding of how the business is investing in their intellectual capital over time and therefore their employability. Unisys have gone further by putting all job profiles for the company world-wide on the intranet to enable individuals to plan their development in relation to their career plans by linking their learning to business' needs."

'The Future of Corporate Learning' p9, Department of Trade and Industry (DTI/Pub 4849/15k/5/00/NP. URN 00/846) May 2000

CONSULTATION QUESTIONS

- 4.1 What role do you see for new technologies (digital TV, mobile devices, internet) in delivering educational and learning products and services?
- 4.2 What will new technology allow the learner to do differently in the future?
- 4.3 How will the learner interact with intermediaries, peer groups and institutions in an on-line environment?
- 4.4 How will the learner navigate through the vast amount of on-line information and judge its provenance?
- 4.5 What kinds of feedback are required from ICT systems to assist the learner in managing their own learning?
- 4.6 What are the strengths and weaknesses of on-line assessment?
- 4.7 How will learners be aware of the audience for their work, for example the readers, editors, evaluators, collaborators or critical friends?
- 4.8 How can the benefits of group interaction through technology be encouraged?

5. Impact on systems and structures - more clicks, fewer bricks?

As the boundaries between primary, secondary, tertiary, leisure, home and work become increasingly irrelevant in a more dynamic age, the use of new technology will radically alter the range of learning opportunities at each stage of the education process.

The impact will differ according to the stage but, as already noted, learning will be less location specific. This will have long-term implications for our existing educational institutions and structures (schools, colleges, Universities etc.). The Task Force suggests that while these traditional institutions will continue in the future, their roles and responsibilities are bound to change radically.

The Task Force believes that in relative terms the most significant changes in structures will happen in post-school organisations. The proportion of those entering the Further and Higher education sectors is expected to expand from about one third of school leavers to over half by 2010. The lifelong learning and training market is expected to achieve even higher growth rates.

The use of new technology to provide new forms of non-location specific learning thus seems inevitable. The developments in e-learning and just-in-time training are early examples of this trend. Effectively, the traditional bricks and mortar infrastructure provided by educational institutions is being replaced by distance learning via the computer and the Internet - i.e. more clicks, fewer bricks.

This is not to say that schools themselves will not change or that the debate regarding the potential scope of compulsory education will not continue. The school day, class attendance, the mix of age and abilities, the interaction between teacher and pupil (and many other factors) are all likely to be re-organised in some form as a result of new technology.

The Task Force believes that government policy is moving in the right direction in relation to the use of technology to create new learning environments. The establishment of technology enabled 'organisations' such the University for Industry (Ufi), Learndirect and the National Grid for Learning (NGfL) are all positive developments.

It is important to recognise that this is only the beginning. The Task Force suggests that these new systems, while welcome, are essentially incremental developments, largely derived or associated with existing education and learning structures.

“ The use of university intranets is already a common learning methodology in the United States and Australia. Learning materials are distributed in this way and students prepare their projects working in ‘virtual teams’. Students like this method of studying because they can learn flexibly and in a manner compatible with their other commitments. It is also much cheaper than traditional higher education methods. One objection is that face-to-face interaction between students and teachers is vital for developing personal creativity. But, for the overwhelming majority of students, this simply does not happen under traditional teaching methods.”

‘Britain towards 2010’ p37, Richard Scase, Department of Trade and Industry (DTI/Pub 4579/3k/1/00/RP. URN 99/1095), August 1999

The next developments in e-learning will be far more challenging. They will be concerned with entirely new structural models of education and learning based on the open dynamics of on-line environments. These new models may, in some circumstances, challenge the existing educational systems and structures. For example, new virtual learning communities may grow and gain widespread acceptance by individuals and organisations independent from state funded provision.

The overall expansion of the education market and the lowering of information distribution costs via new technology will present opportunities for businesses to enter new educational sectors. At the same time it will present challenges to the existing education providers.

As previously noted, the private sector is already increasingly involved in what is traditionally seen as the province of the state. A trend that looks set to continue with new tie-ups between business and schools or universities as well as corporate and e-universities.

“ By year 2005, we expect all US universities and colleges, public or private, as well as many schools in other nations to employ distributed learning courses. To help them in this large endeavour, we believe schools will solicit the assistance of outside technology and service providers.

We think these technology, software and service providers could become an attractive investment opportunity down the road. Several innovative (mostly still private) companies have emerged to serve the distributed learning requirements of colleges and universities, such as Caliber Learning Network, Blackboard.com, Real Education, Pensare and OnlineLearning.net. Realizing the tremendous opportunity, companies that have typically served corporate and IT training markets, have also entered the scene, expanding their offerings to serve post-secondary institutions.”

‘Distributed Learning: Building Schools Without Walls, Education and Training’, 8 April 1999, Merrill Lynch & Co.

This raises a series of questions around the appropriate balance between public and private investment in education and learning provision, as well as how it will affect educational access, privacy and entitlements. Additionally, it raises fundamental issues about the linear progression in education and learning at school, college or university, followed by work training.

The linear model is likely to be replaced by a system characterised by a basic entitlement (probably primarily school-based) followed by range of diverse educational and learning options. The learner will then be responsible for revising and revisiting these options throughout their lives.

CONSULTATION QUESTIONS

- 5.1 What are the main challenges facing formal education institutions as a result of the increasing use of on-line learning?
- 5.2 How will new technology affect traditional geographic, age and ability boundaries within formal education?
- 5.3 In an on-line environment, how do you envisage any redefinition of the functions and responsibilities of schools, colleges and universities?
- 5.4 What will the management and organisational structures of schools, colleges and universities look like in twenty years?
- 5.5 If more learning takes place outside formal institutions, how will this impact on concepts such as entitlement?
- 5.6 How can on-line learning improve both quality and access?
- 5.7 What evidence is there that on-line learning enhances the performance of individuals or groups?
- 5.8 What is the likelihood and what are the consequences of education markets becoming dominated by a few global players?
- 5.9 To what extent will educational brands be important in the future and what education and learning sectors will be attractive to new entrants?
- 5.10 How do you see the boundaries between private and publicly funded education being redefined over the next twenty years?

6. New roles for education professionals

"The University of Phoenix has estimated that the entire US higher education system could be supported by around 250,000 course assistants (as opposed to 750,000 fully tenured professors at the present time) with bought-in performances from 1,000 'star performers' - the leading researchers and teachers who actually appear in front of camera.

Taken to its extreme one can envisage a university operating more like a commissioning agency for teaching and learning, putting together the necessary production facilities and, crucially, ensuring quality control. There is, after all, virtually nothing that is currently taking place in a university which could not, and is not, taking place elsewhere."

'Higher education in the twenty-first century - some possible futures', Perspectives, vol 3, number 4, Winter 1999, Howard Newby

The Task Force believes that a learner centred perspective in relation to the delivery of education does not imply the absence of all physical intermediaries (teachers/trainers/Professors etc.). The role of 'teacher' will still be critical to the learning process and the learners' educational experience.

However, we are likely to move towards a broader description of human resources that support the learner. These resources will comprise a range or group of individuals, such as designers and other specialists, rather than a single individual or 'teacher' with a multiplicity of roles.

The Task Force considers that Government policy in this area is moving in the right direction. Schemes to equip and train school teachers in the use of personal computers, a reduction in student-PC ratios and digital TV trials are all positive steps. However, the challenge will come when intermediaries, in collaboration with learners, begin to interact in totally new ways and develop new learning experiences outside of the formal systems.

The Task Force suggests that the teaching professions will increasingly operate in areas of higher added value. They will concentrate substantially more of their time and energy on aspects of learning concerned with skills development and fostering creativity.

As new technology changes the roles and responsibilities of teaching professionals, they themselves will need training. In a technology-enabled learner-centred process they will work in collaboration with others, while the learners operate within a real or virtual team. This will affect the skills they require in a dramatic way.

How they will be trained, and how they view their responsibilities and careers will change too. As with all new technology, some may view such change with apprehension. The Task Force believes, however, that overall these developments, if properly managed and supported, will enable and empower intermediaries to do what they do best, that is support the individual learner.

“ Greater use of technology opens opportunities for new pedagogies, new approaches to where learning is done, more flexible adaptation of curriculum to individual learning styles. These will prompt reappraisal of physical organisation and patterns of attendance, of the school day and the school year. A new approach to assessment would be needed. In this model, the professional demands on teachers would be greater than in the current system, and important questions will emerge about their training and development, the level of support they will require, and the balance between professional and para-professional resource.”

'Opening Minds: Education for the 21st Century', p10-11, The Final Report of the RSA Project 'Redefining The Curriculum' by Valerie Bayliss RSA 1999

In this changing professional context, it will be important to ensure that all intermediaries are clear as to their new roles and responsibilities. As new learning models develop, it will be vital that intermediaries are allocated sufficient resources of time and money to adapt to and exploit the new on-line environments. This will be necessary to help maximise the potential benefits for themselves and, more importantly, for the individual learner.

Last but not least is the question of the assessment of education and learning. The use of technologies in this area will have a profound effect on the way assessment is handled.

Within the twenty year time frame of this report, it is likely that the complete track record or history of a learner's education and learning experiences will be captured from on-line activities - in a similar way that today's dotcoms are able to track every action or decision taken on-line.

The learner's track record will be treated as a comprehensive real-time assessment of an individual's capabilities, preferences and experiences. This will challenge many of our existing assessment systems. Additionally, the potential for a highly diverse range of learning experiences will make it difficult to achieve parity of assessment between different modes of learning.

The Task Force believes that in the next twenty years this kind of continuous on-line assessment will become the norm. New and flexible responses will therefore be required to deal with the challenge of ensuring a fair and equitable assessment system.

CONSULTATION QUESTIONS

- 6.1 Given the impact of new technology, what will be the future roles and responsibilities of intermediaries: teachers, professors, trainers etc.?
- 6.2 What will the education service that takes advantage of technology look like and what relationships will exist between the various educational bodies?
- 6.3 How will on-line assessment impact on the role of intermediaries?
- 6.4 Given the likelihood of an increasingly diverse range of learning experiences, how will we be able to achieve parity of assessment?
- 6.5 What mix of on-line and face-to-face tutorial teaching will predominate in the future?
- 6.6 What are the challenges of on-line learning content provision being dominated by a few global gurus?

This paper has attempted to focus on the key issues regarding the future of education and learning. It has only touched on some of the issues and does not pretend to provide a comprehensive view of the changing educational and learning environment.

Information and Communication Technologies are having a dramatic impact on education, both in terms of the services provided and the way that they are delivered. Education and learning is becoming a lifelong process over which the individual can exercise much more control than in the past.

But this customisation of education using new technologies raises many issues, some of which we have outlined for debate. These concern, among others, such areas as state versus private sector involvement; access to continuing education for everyone; the impact of new technologies on learners and on education professionals; and the need for innovation in education.

As noted at the beginning, this consultation document is aimed at stimulating the debate on the future of education and learning. We look forward to receiving views on the general themes and issues raised in the report and, in particular, on the questions outlined at the end of each section.

Annex A: Task Force remit

The Foresight Information, Communications and Media (ICM) Panel established the Task Force to consider the impact of new information technologies on and the implications for the educational and learning process, over the next 10 - 20 years. The Task Force is primarily concerned with how individuals and organisations will learn and be taught, rather than what is being taught or learnt.

The Task Force remit is to make recommendations designed to help the UK exploit the potential business and academic opportunities and overcome any possible barriers to development.

THE TASK FORCE WILL SPECIFICALLY CONSIDER:

- ▶ How and to what extent will the development of an interactive and globally based educational sector impact on the process of education, learning, and teaching. The Task Force will consider what new roles and functions will be required by those involved in the development, delivery and exploitation of new educational products and services.
- ▶ The potential negative impact this may have in terms of social exclusion and access to high quality education and learning. The Task Force will also consider other barriers (such as language, culture etc.) that may inhibit development.
- ▶ The implications of the internet (or other new technologies) becoming the prime means for providing new interactive products, and the potential for the development of new learning communities. It will also consider the extent to which individualisation and personalisation of learning will be balanced against business and social requirements.
- ▶ How traditional educational and training boundaries may be restructured, along with those between education, home, business and entertainment.

THE TASK FORCE WILL DELIVER THE FOLLOWING:

- ▶ It will envision the future of education and learning by producing a set of scenarios, taking into consideration the Universities in the Future, Britain Towards 2010 publications, and the IEE Associate Programme on IT and Education.
- ▶ Produce recommendations for action by business, Government and academia (either jointly or separately). This will include consideration of the future requirements of the sector in terms of skills and training, together with views on the long-term sustainability of the recommendations.

Annex B: Task Force membership

Phil Hemmings, Chair
Research Machines Plc

Professor David Ashton

Paul Ashton
Channel Four Television

Mandy Barrie
DCMS

Tom Bentley
DEMOS

Professor Eric Bolton

Stewart Bruyn
Nortel Networks

Camilla Cavendish
Pearson Group Plc

Chris Fowler
BT

Kathy Ham
ESRC

Professor Stephen
Heppell
Ultralab

Professor Diana Laurillard
The Open University

Owen Lynch
BECTA

Professor Fred McBride
Queens University, Belfast

Dick Palmer
DfEE

Helen Quigley
The Nuffield Foundation

Michael Stevenson
BBC

Peter Stibbons
Anglia Multimedia

Caroline St. John Brooks
The Times

Ralph Tabberer
Teacher Training Agency

Professor Michael Thorne
Napier University

Professor David Wood
University of Nottingham

Ben Dickey, Secretariat

Annex C: The consultation process

WHAT DO I DO NEXT?

The Group wants your views of any aspect of its work. Specific questions to which we are especially interested in finding answers appear throughout the document (they are grouped together in Annex D for ease of reference).

HOW TO RESPOND

Responses are welcome and should be directed to the Panel Secretariat in the first instance:

Russell Moss
Room 5109, Foresight Directorate
Office of Science and Technology
Department of Trade and Industry
1 Victoria Street
London, SW1H 0ET

Fax: 020 7215 6753, e-mail russell.moss@dti.gsi.gov.uk

Please note that the closing date for comments is **20 October 2000**

Please note that your response to this consultation exercise may be made publicly available in whole or part at the Department's discretion. If you do not wish all or part of your response (including your identity) to be made public, you must state in the response which parts you wish us to keep confidential. Where confidentiality is not requested, responses may be made available to any enquirer, including enquirers outside the UK, or published by any means, including on the Internet.

The views expressed in this report are the personal opinions of Panel and Task Force members and do not represent the official views of the organisations they represent.

This report is intended to spark discussion and debate and readers should not rely on the information reported to make investment decisions.

Annex D: Consultation questions

1. LEARNER EMPOWERMENT - THE PERSONALISATION OF EDUCATION

- 1.1 Does the introduction of new technology in education inevitably lead to a greater learner focus, i.e. more customisation to individual learning styles, and is this desirable?
- 1.2 Given economic growth, how will increases in disposable income affect educational and learning choices?
- 1.3 What civic roles, culture and values should be preserved in a re-engineered 'public' education system?
- 1.4 What issues arise as the distinction between commercial and public providers of education and learning blurs?
- 1.5 What issues are raised by the potential use of educational products and services developed from different cultural, ethical and social perspectives?
- 1.6 What are the main challenges in encouraging greater innovation in education and learning?
- 1.7 Which education and learning sectors are taking the lead in learning innovations and how transferable are these to other sectors?
- 1.8 How can we develop a culture that supports innovation and change whilst raising educational standards and improving efficiency and effectiveness?
- 1.9 What new policy planning and implementation strategies are required to deal with new dynamic learning environments characterised by rapid change and uncertainty?

2. THE IMPACT OF SCIENCE ON OUR UNDERSTANDING OF LEARNING

- 2.1 How do you envisage developments in sciences such as genetics and neuroscience affecting our views on how we learn?
- 2.2 What technologies, other than Information and Communication Technologies (ICTs), will have a significant impact on the way we learn in the future?
- 2.3 How could technology increase individual motivation to learn?
- 2.4 What are the strengths and weaknesses of existing educational research initiatives?
- 2.5 What are the most important drivers in the design, development and implementation of ICT systems to support learning?

3. THE KNOWLEDGE ECONOMY AND LEARNING

- 3.1 What forms or types of learning will be required to support the development of the knowledge economy?
- 3.2 What new learning systems or structures are required to support the knowledge economy and what will be their key features?
- 3.3 How will on-line systems support the acquisition of tacit knowledge and creativity?
- 3.4 How can we avoid knowledge-based social exclusion in terms of educated haves and have-nots?

4. TECHNOLOGY AND THE LEARNER

- 4.1 What role do you see for new technologies (digital TV, mobile devices, internet) in delivering educational and learning products and services?
- 4.2 What will new technology allow the learner to do differently in the future?
- 4.3 How will the learner interact with intermediaries, peer groups and institutions in an on-line environment?
- 4.4 How will the learner navigate through the vast amount of on-line information and judge its provenance?
- 4.5 What kinds of feedback are required from ICT systems to assist the learner in managing their own learning?
- 4.6 What are the strengths and weaknesses of on-line assessment?
- 4.7 How will learners be aware of the audience for their work, for example the readers, editors, evaluators, collaborators or critical friends?
- 4.8 How can the benefits of group interaction through technology be encouraged?

5. IMPACT ON SYSTEMS AND STRUCTURES - MORE CLICKS, FEWER BRICKS?

- 5.1 What are the main challenges facing formal education institutions as a result of the increasing use of on-line learning?
- 5.2 How will new technology affect traditional geographic, age and ability boundaries within formal education?
- 5.3 In an on-line environment, how do you envisage any redefinition of the functions and responsibilities of schools, colleges and universities?
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- 5.6 How can on-line learning improve both quality and access?
- 5.7 What evidence is there that on-line learning enhances the performance of individuals or groups?
- 5.8 What is the likelihood and what are the consequences of education markets becoming dominated by a few global players?
- 5.9 To what extent will educational brands be important in the future and what education and learning sectors will be attractive to new entrants?
- 5.10 How do you see the boundaries between private and publicly funded education being redefined over the next twenty years?

6. NEW ROLES FOR EDUCATION PROFESSIONALS

- 6.1 Given the impact of new technology, what will be the future roles and responsibilities of intermediaries: teachers, professors, trainers etc.?
- 6.2 What will the education service that takes advantage of technology look like and what relationships will exist between the various educational bodies?
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- 6.4 Given the likelihood of an increasingly diverse range of learning experiences, how will we be able to achieve parity of assessment?
- 6.5 What mix of on-line and face-to-face tutorial teaching will predominate in the future?
- 6.6 What are the challenges of on-line learning content provision being dominated by a few global gurus?

Annex E: Government on-line schemes/ICT initiatives which support learning and teaching

- ▶ **The ITEC skills strategy** addresses the skill needs of the IT, Electronics and Communications industries. It aims to ensure UK businesses have access to a plentiful supply of people with the knowledge and skills for ITEC occupations. A strategic forum of the ITEC National Training organisations will co-ordinate the development and promotion of the new skills strategy for ITEC.
<http://www.dfes.gov.uk/skillsforce/>
- ▶ **National Grid for Learning (NGfL)** is the national focal point for learning using the Internet. The NGfL programme, established in 1997, provides both learning content and a means of access for schools and colleges. It includes support for the purchase and development of content for teaching, learning and management of education. Funding: £657m (Standards Fund) over 4 years (shared with LEAs). Target: All schools Internet connected by 2002. Currently 93% secondaries connected (cf. 83% 1998) and 62% primaries connected (cf. 17% 1998). Pupil:computer ratio: 8:1 secondaries (cf. 9:1 1998) and 13:1 primaries (cf. 18:1 1998).
<http://www.ngfl.gov.uk/>
- ▶ **ICT training for teachers.** £230m NOF funding has been committed for training teachers in ICT skills. It will ensure teachers are competent at using ICT to deliver the curriculum.
<http://www.teach-tta.gov.uk/ict/index.htm>
- ▶ **Computers for Teachers** is a £20 Million initiative from the Department for Education and Employment to assist teachers in England to buy their own computer.
<http://cft.ngfl.gov.uk/user/>
- ▶ **National College for School Leadership.** This is due to open in September 2000, and it will have a wide national impact. It will encourage educational leaders to develop their skills. From autumn 2000, a virtual arm of the college will open. The virtual presence will allow interactive discussion and exchange, on-line mentoring and master classes, and access to up to date research evidence.
http://www.dfes.gov.uk/teachingreforms/le_ncsl.htm

ICT in Further Education (FE)

- ▶ ICT in FE plays increasing role in re-skilling workforce.
- ▶ Colleges spend around £300m on computer equipment - further £74m committed (November spending review). Supports learning & raises standards.
- ▶ A National Learning Network linking all FE colleges with HE institutions (via SuperJanet) is currently being established.
- ▶ Technical support centres are being set up in each of the nine FEFC regions.
- ▶ Financial support available to update LANs and computer equipment.

<http://ferl/becta.org.uk>

ICT in Higher Industry (HE)

All HEIs and research communities linked by one of the fastest and most pervasive academic networks in the world, providing:

- ▶ effective and reliable communication links regionally, nationally and internationally; and
- ▶ co-ordinated access to a vast range of quality assured digital content available online from many sources.

<http://www.ja.net/connect/index.html>

http://www.jisc.ac.uk/pub99/dner_vision.html

ICT-based **e-universities** project, aimed both at revenue-generating international business market and also to reach those not able to gain access to a traditional campus, is in development. It will provide first class tuition and support online for complete degree courses.

<http://www.hefce.ac.uk/Partners/euniv>

- ▶ **University for Industry (Ufi)**. The Ufi is an exciting new initiative right at the heart of Government policy for lifelong learning. It will use innovative forms of delivery and support, which makes it easier for people to learn what they want, when and how they want. There are over 250 **learnirect** development centres; by spring 2001 there will be around 1000 **learnirect** centres.,
- ▶ The **learnirect** information and advice service provides a comprehensive and impartial service to adults on learning and careers.

It is estimated that by 2003, 2.5 million people or businesses a year will be using the **learnirect** information and advice service, and some 1.4m people a year will be pursuing learning opportunities as a result.

<http://www.learningdirect.org/>

► **ICT Learning Centres (UK Online Centres)** - DfEE are providing £252m of CMF funding to establish around 700 ICT learning centres across England. The centres will give people who are socially excluded or living in the most disadvantaged areas access to ICT and the opportunity to develop ICT skills. The Centres underpin wider ICT, lifelong learning, social inclusion, e-commerce and Information Age Government strategies. They focus on adults living in disadvantaged communities including the 2000 most deprived local authority wards, rural areas with deprivation or significant transport problems and pockets of deprivation within more prosperous areas, those from ethnic minorities and those with disabilities and aim to meet the needs of those with low or no ICT skills and who would not otherwise have the opportunity to use ICT facilities.

<http://www.dfes.gov.uk/ict-learning-centres/index1.htm>

► **City Learning Centres** are a key element for access to ICTs in the Excellence in Cities' initiative. Their purpose will be to improve education standards and skills levels by increasing access to ICTs and to promote use of ICT by pupils and adults.

The first CLCs (32) will be launched in September 2000, with 48 more to follow by September 2002.

Funding: £100m (CMF, 2000-2002) for CLCs: each CLC funded up to £1.2m setup (capital costs) and between £160k-£220k per annum (running costs).

Benefits: Using ICT, CLCs will improve pupil attainment levels, increase staying-on rates, reduce truancy and improve employment prospects.

► **Wired-up Communities.** The Wired Up Communities initiative is investing £10 million from the Capital Modernisation Fund to pilot the idea of wiring up communities (e.g. housing estates, tower blocks, villages) to assess how individual access to the Internet can transform opportunities for people living in the most disadvantaged communities by developing new ways of using education, work and leisure services. The initiative will link households to a local community website, the Internet, and local and national services (including schools, ICT Learning Centres, **learnirect** centres and Government services).

► **UK online Computer Training.** This is a £25m initiative which will provide 50,000 courses for people who are in receipt of benefits and have no recent ICT experience. The courses provide an introductory qualification in ICT and will help clients identify the route back to employment.

► **Computers Within Reach.** Following the announcement in the 1999 Budget, the Government is to introduce a pilot scheme to assist people looking for, training for, or seeking to retain, employment. This will enable about 100,000 low income learners and families to benefit from the use of reconditioned computers. Eligible recipients for computer packages under this scheme are expected to be those in receipt of a range of

benefits including Job Seekers Allowance, Income Support, Incapacity Benefit and Disability Living Allowance. The scheme will be designed to be self-sustaining if the pilot is successful. £15m pump-priming funding will be available up to 2002.

A prospectus for suppliers and community groups was published in November last year, and the initiative will run later this year.

- ▶ The **Modernising Employment** Service Programme will give Job Centre clients better access to job opportunities through touch-screen kiosks. Other initiatives within this modernisation programme include a single telephone number for employers to notify vacancies to the ES.
- ▶ ES vacancies and Ufi learndirect learning opportunities will become available through the **Learning and Work Bank** Internet portal. This will access the single national database of over 600,000 job vacancies, including vacancies from the EURES European database and others provided by private sector employment agencies. The Ufi learndirect database will contain over 300,000 learning opportunities from across the UK. The site will integrate access to these databases so that users can move easily between related jobs and learning. Access to this site will be where-ever Internet PCs are provided and the service will be promoted in all the major DfEE-funded initiatives where jobsearch, careers or learning guidance is provided (e.g. ES Programme Centres, ICT Learning Centres). Access will later include digital interactive TV, kiosks, and mobile technology as appropriate. Additional functionality will be added to the site after launch in early 2001 including integrated Childcare and benefit information and a CV bank.
- ▶ **EASEA website.** The EASEA project will allow efficient, cost-effective, electronic communication between DfEE and schools. A pilot is underway, and a national service will be introduced in September 2000. 'Push' technology enables teachers to get specific information they require, reducing bureaucracy, paperwork and administrative burden.

Funding: £1m over 3 years.

<http://www.dfes.gov.uk/easea/index.htm>

As of 28th June 2000

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Department of Trade and Industry



Printed in the UK on recycled paper with a minimum HMSO score of 40.

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DTI/Pub 5k/08/00/NP. URN 00/683