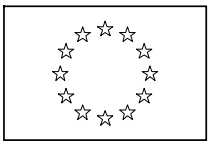

COMMISSION OF THE EUROPEAN COMMUNITIES

Brussels, 28.3.2001
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**COMMUNICATION FROM THE COMMISSION
TO THE COUNCIL AND THE EUROPEAN PARLIAMENT**

The *e*Learning Action Plan

Designing tomorrow's education

INTRODUCTION

The "*e*Learning: Designing tomorrow's education" initiative[1] was adopted by the European Commission on 24 May 2000. Following up the conclusions of the Lisbon European Council, it set out the principles, objectives and lines of action of *e*Learning, defined as the use of new multimedia technologies and the Internet to improve the quality of learning by facilitating access to resources and services as well as remote exchanges and collaboration. The *e*Learning initiative was welcomed by the Ministers of Education and by the Feira European Council in June 2000.

The *e*Learning initiative is part of the comprehensive *eEurope Action Plan*[2], the aim of which

1. *e*LEARNING: THE FRAMEWORK FOR IMPLEMENTATION

1.1 *e*Learning in the context of *e*Europe

The *e*Learning initiative, which complements the comprehensive *e*Europe Action Plan, groups together specific measures within an education-oriented framework, in line with the wishes expressed by the Lisbon Council. Within this framework the European Commission is setting ambitious objectives to encourage action by the Member States and the relevant players and is also moving to support and coordinate their efforts at European level.

The first aim of the *e*Learning initiative is to **accelerate the deployment in the European Union of a high-quality infrastructure at a reasonable cost**. With this in mind, it adopts and adds to the objectives of *e*Europe, namely:

– to provide all schools with access to the Internet and multimedia resources by the end of 2001, and to equip all classrooms with a fast Internet connection by the end of 2002;

– to connect all schools to research networks by the end of 2002;

– to achieve a ratio of 5-15 pupils per multimedia computer by 2004;

– to ensure the availability of support services and educational resources on the Internet, together with on-line learning platforms for teachers, pupils and parents, by the end of 2002;

– to support the evolution of school curricula with the aim of integrating new learning methods based on information and communication technologies by the end of 2002.

The *e*Learning initiative also aims to **step up the training drive** at all levels, especially by promoting universal **digital literacy** and the general availability of appropriate training for teachers and trainers, including technology training as well as courses on the **educational use** of technology and **management of change**.

Schools, universities and training centres are urged to become local knowledge acquisition centres which are versatile and accessible to everyone. Policy in this field will take account of the *European Employment Strategy* and national strategies for lifelong learning. Precise targets have also been laid down under *e*Europe:

– to ensure, by the end of 2003, that all school-leavers have had the chance to become digitally literate;

– to provide all teachers with appropriate training, to adapt teacher training programmes accordingly, and to introduce measures to encourage teachers to make real use of digital technology in their lessons, by the end of 2002;

– to offer every worker the opportunity to become digitally literate through the lifelong learning system, by the end of 2003.

The *e*Learning initiative places emphasis on creating appropriate conditions for the development of **content, services and learning environments** which are sufficiently advanced and relevant to education, in terms of both the market and the public sphere. The availability of **standards** is particularly important, as is the establishing of conditions

conducive to change and to adaptation of the ways in which education and training systems are organised.

The final aim of the *e*Learning initiative is to **strengthen cooperation and dialogue** and **improve links between measures and initiatives** at all levels — local, regional, national and European — and between all the players in the field: universities, schools, training centres, decision-makers and administrators responsible for selecting equipment, software, content or services (including the social partners). **Partnerships between the public and private sectors** will continue to be established, in order to encourage exchanges of experience, technology transfers and an improvement in the way in which businesses' skill needs are taken into account in conjunction with the measures advocated by the European Employment Strategy.

1.2 *e*Learning as a European cooperation platform

The contribution of *e*Learning towards achieving and developing the educational objectives of *e*Europe consists in establishing a framework and programme for cooperation between the relevant Community departments and the Member States. To this end, common recommendations and priorities will be established, education and training players involved, and Community instruments utilised.

Since adoption of the *e*Learning initiative in May 2000, substantial progress has been made in terms of:

– stepping up **Member States' efforts** in this field, and building on the progress already achieved with regard to training strategies and infrastructure, content and services; certain objectives have already been achieved by certain Member States;

– continuing the **policy debate** on the essential aspects of *e*Learning in the Member States; launching of the debate on the initiative at the European Parliament and the Committee of the Regions; the **contribution made to this debate by European cooperation networks** in the fields of education and training;

– **involving businesses,** allowing them to participate in the discussion[7], and cooperation with the European Investment Bank;

– creation of three ***e*Learning working groups**: one with the Member States, one at the European Commission, and one with representatives of the industry;

– adoption by the Council of Education Ministers, meeting in Brussels on 12 February 2001, of the ***Report on the concrete future objectives of education systems***, which include the use of information and communication technology. This report, presented to the Stockholm European Council, constitutes the general policy framework for the Action Plan.

An initial inventory of current measures pursuing the objectives of the *e*Learning Action Plan reveals substantial **diversification** at both national and Community levels. **Common problems** are also emerging. There is growing recognition of the fact that technological innovations should not be separated from their social, economic or cultural contexts.

[7] Major firms in the telecommunications and content sectors have joined forces for the organisation in Brussels of an "eLearning summit" on public-private partnerships in the eLearning sector.

Separating the different fields and levels of education is at odds with the concept of lifelong learning.

The time has come to launch an *e*Learning Action Plan, as a tool to help practical players and decision-makers by presenting options and explaining the possible approaches on the basis of examples of experience from both Europe and beyond.

It is therefore essential to strengthen dialogue and cooperation between the Commission and the various players in order to define **common recommendations and priorities** relating to *e*Learning in the context of Community programmes such as the *framework programmes on research and technological development*. The goal must be to achieve **synergy between ongoing measures** at the various levels, as well as **greater effectiveness**.

The stepping up of dialogue and implementation of the common recommendations also imply **close cooperation with education ministries and employment and social affairs ministries** as part of the open method of coordination defined in the Lisbon conclusions. Through the Socrates and Leonardo da Vinci programmes, measures under the IST (Information Society Technology) programme on education and training[8], and projects funded via the *Education Multimedia Task Force*, thousands of students, teachers, trainers, businesses and organisations have taken part in projects on the use of information and communication technologies in education.

Such a major change requires the participation and support of all concerned. In this sense, the *e*Learning Action Plan is an information and awareness enhancement tool and necessitates a special communication effort. Contributions will take the form of encouraging a debate on the main issues of *e*Learning at all levels, providing support for events and activities to give general currency to the appropriate use of new technologies for learning purposes, and the construction of a high-quality *e*Learning site[9].

2. *e*LEARNING: LEVERS OF COMMUNITY ACTION

The European Community has at its disposal a wealth of resources, programmes and instruments which can contribute to achieving the objectives of *e*Learning. The ongoing measures clearly complement each other in a manner conducive to convergence and increased effectiveness, and they are fully consistent with the lines of action followed by *e*Learning.

The main Community levers for the implementation of *e*Learning are the following.

– *Education, training and youth programmes.* The Socrates, Leonardo da Vinci and Youth programmes are among the leading Community successes and have benefited hundreds of thousands of participants at all levels since the first cooperation measures were launched in 1976. Total funding for the second generation of these programmes, covering the period 2000-2006, amounts to € 3 520 million, of which some 10% is likely to be devoted to *e*Learning.

[8] Cf. measures under the 5th framework research and development programme and the three previous programmes.

[9] The Action Plan may also benefit from the support of the European Parliament, as envisaged in the context of Preparatory Actions (Line B3-1000).

From the outset, these programmes were open to the development of activities relating to new technologies, including their use in training teachers and instructors. The evidence is a very wide range of innovative projects and European networks. *e*Learning is now a priority in calls for proposals, and this will be reflected by **joint measures** involving the various programmes.

– The *framework programme on research and development* (1998-2002) is a second major lever. It deals with *e*Learning in the IST (Information Society Technology) programme and in socio-economic research:

  – the **IST**'s "***multimedia tools and content***" line, which continues the main programmes of research into the use of new technologies in education, has anticipated the lines of action proposed by *e*Learning and *e*Europe and developed research projects and pilot trials involving advanced technologies;

  – the ***RTD*** strand on "***targeted socio-economic research***" has funded advanced investigations, experiments and analysis concerning new learning environments and their social, economic and cultural implications.

– The proposal for the framework programme 2002-2006 on research and development identifies amongst the proposed priorities for community action "information society technologies" (with specific references to the knowledge based society and technologies for learning) and "citizens and governance in the European knowledge society" (with specific references to education and training).*Programmes to foster technological development and competitiveness:* **TEN-Telecom**, promoting the deployment of trans-European services based on advanced telecommunications networks; ***e*Content**, supporting for the development of the digital content market and, more specifically, public-sector information resources and language technology; **Go Digital**, supporting small and medium-sized enterprises in their '*e*-business' strategies, by using existing community programmes and initiatives; and an action plan in the field of **standardisation**, dealing with *e*Learning-related issues and accessibility for everyone.

– The *Structural Funds*, the principal financial instruments for regional development, investment in human resources and social cohesion:

  – the **European Regional Development Fund (ERDF)**[10] (€ 120 billion for 2000-2006) in cases of proven market deficencies, will help with infrastructure creation and sectoral developments, e.g. digital networks for universities The provision of computers and software for educational purposes is also eligible for funding under regional development programmes. Within the ERDF, some € 400 million is earmarked for innovative measures, where one of the three themes is "the information society and regional development"[11];

  – the **European Social Fund (ESF)**[12] has at its disposal a substantial amount of resources (€ 60 billion for the period 2000-2006) for **adapting education and**

[10] http://europa.eu.int/comm/regional_policy/activity/erdf/erdf_en.htm
[11] Cf. eEurope-regio. http://www.inforegio.org
[12] http://europa.eu.int/comm/employment_social/esf2000/index.htm. However, it is not possible at the moment to calculate the exact percentage of Structural Fund resources allocated to eLearning initiative objectives,

training systems and giving general currency to the best models developed at national or European level. Lifelong learning measures encompass many of the priorities set out in the plans financed by the ESF, which covers all the EU Member States and finances measures designed to develop information technology skills, with the emphasis on persons vulnerable to employment or social exclusion problems, as well as those on the training priority list, such as teachers and instructors. Specific resources have been earmarked for promoting lifelong learning and developing skills in SMEs.

– The ***employment guidelines***. In the context of the *European Employment Strategy* (Luxembourg process) and in follow-up to the conclusions of the Lisbon European Council, the *employment guidelines for 2001*[13] reinforce the horizontal role of lifelong learning in a knowledge-based economy. Member States are urged to develop, in their *national action plans for employment,* comprehensive and coherent strategies, together with the public-sector and/or private-sector players. The role of the social partners is also strengthened.

  As regards employability, the *guidelines for 2001* lay down qualitative and quantitative objectives and short-term target dates for the development of knowledge, skills and qualifications, especially *e*Learning, for all citizens. As for adaptability, the guidelines urge the social partners to enter into agreements on action to make every worker digitally literate by 2003 and on more flexible forms of work to facilitate participation in learning.

– The ***European Investment Bank (EIB)***[14] regards the development of human and intellectual capital as a high priority within the context of its **Innovation 2000** initiative. This is reflected by the provision of funding for innovative projects, amounting to approximately € 15 billion over three years. For example, the EIB can finance infrastructure and equipment allowing the use of information technology in schools and universities, as well as for teacher training, creating educational multimedia and virtual libraries or universities, or the networking of research centres.

  Such financing can take the form of conventional loans (with different arrangements depending on project size), individual loans or global loans (credit lines administered by commercial banks). In the context of the activities of the EIB group, the European Investment Fund (EIF)[15] also supports the development of risk capital for innovative business start-ups - including in the education field - by investing in venture capital funds. The EIF may also finance science parks and business incubators.

A synopsis of these Community programmes and instruments is appended to this Communication as an aid to understanding the different programmes, how they work and the arrangements for participation.

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as allocations are decided at national or regional level on the basis of a broader definition of objectives adopted in 1999.

[13] Council Decision 2000/63/EC of 19 January 2001 on guidelines for Member States' employment policies for the year 2001 (http://europa.eu.int/comm/employment_social/empl&esf/ees_en.htm)

[14] http://www.eib.org.

[15] http://www.eif.org.

3. *e*LEARNING: KEY MEASURES

Four main lines of action are identified, covering infrastructure, training, high-quality multimedia
Coordintion follow-up tailorin to educationl communitiesnd exloitation will involve close cooeration with the Member States.

3.1. Key measure relating to infrastructure and eent

As the Member States — sometimes with support from Community instruments — are stepping up their efforts to create the necessary infrastructure and provide educationlnd training establishments with new-technology equipment, there is a pressing need fo joint assessment ofnd follow-up to, the action taken and experience acquired in connection with the use of ICT for educationl purposes.

This Action Pln proposes rending to this need by mens of three specific measures.

3.1.1 Development of tool to assist decision-3(9(maki)-4(ng)]TJ˚ł/F5 1 Tf˚ł0 -2.16 TD˚ł-0.003 Tc˚ł[(I)-11(n
lopitatiendlitatie indicators andet up a strategic
tion bse. This will form part of the follow-up to the Ret o the
s of education systems in the European Union.

ed on the work undertaken by Eurostat and Eurydice and will also
nder th OECD.inks will b establishd with Eurbometer
ociety Statiss sueys initiated b Eusat, the stues launchd
DG as pt of thollow-3(9(u)-3(p)-3846 *eEurope 2002 global*
ojectsnder the Socratend IST programmes. A further bsis
d in connection with the *European Employmentategy*

[16] and the work ofe Empoyent Committee i ordr to dfi idiatos and to estab a comparison of performances for the specific guidelnes.

Thiseasure will also help lay the fondios fo recomendios infrastructure and contribteo establishing ratios for blancing expenditure between equipment, conten, training and human reurces. For want of considering all the necessary expenditure, there are many obstacles in the way of developinge use of ICT. Athoughis questions mainly the rensibility of the Member State it is certainly an area in which the European Union's contrbution may be paricularly usefulhanks to economies of scale and mutual enichment.

[16] On 19 January
(ESDIS), appoid to monior and iplement eEurope
based socety" and "Pticpaton for everyone in te knowledge-based society", adopted a benchmarking report as part of the follow- to the report on "Strategis for jobs i the Information Society".

Measures 2001 – 2002

Report on the development of **eLearning indicators** and identification of **sources** and **methods** in order to monitor progress in the use of ICT in formal and informal education, in the context of the *Report on the concrete future objectives of education systems in the European Union*. This report will contain an analysis of the **quantified objectives** already adopted with a view to their improvement and organisation on a systematic basis, and it will propose recommendations on the introduction of a follow-up and forward studies tool at European level.	European Commission: Education and Culture DG; Research DG; Information Society DG; Employment DG; Eurostat Eurydice CEDEFOP
Publication of the report "Key figures in *e*Learning"	European Commission: Education and Culture DG

3.1.2 A European research area for new learning environments

The aim here is to step up research — educational, socio-economic and technological — in the field of *e*Learning and the use of ICT in education and vocational training. A further intention is to develop a "virtual centre of excellence" which, on the basis of the Member States' existing structures, will make it possible to exploit the results of current projects and build upon knowledge acquired on the subject of new models and learning environments. An informal structure supported by the Commission, this laboratory will function as a European platform for meetings and exchanges, a bridge between education and research.

Three subjects will be explored in detail:

– **Development of systems**. Research into, testing of, and forward studies on new learning environments, from the educational and technological viewpoints. Special attention will be devoted to using emerging technologies (GRID, satellite, digital radio and television, etc.) for the development of **innovative applications for education and training**. Education methods, organisation (learning communities, regions and organisations) and management of change are essential aspects in this context.

– **Virtual models**. The concept of **virtual campus**; the new prospects for European **universities**; **virtual mobility** to complement and support physical mobility; access to education resources without constraints in terms of time or space[17]; **virtual networks** for cooperation and collaboration.

– Taking account of **individual differences** in learning, and **special needs education**. Exploiting the potential of new technology to provide remedial measures in the case of disability, exclusion, difficulty in gaining access to learning, or where conventional education does not work. Special attention will be given to the promotion of gender equality.

[17] One of the six "key messages" of the Memorandum on lifelong learning.

Measures 2001 – 2002

Launch of a specific measure **"*e*Learning futures"** under the IST programme, to contribute to the development of future learning environments, taking account of cognitive processes	European Commission: Information Society DG
Launch of a specific measure **"*e*Learning for European youth in a digital age"** under the IST programme, involving all the key players in different fields in large-scale pilot experiments with a view to improving *e*Learning in schools, universities and other educational establishments.	European Commission: Information Society DG
Organisation of an "***e*Learning Summit**" together with the industry (information and communication technology; audiovisual; publishing), on the theme of public-private partnerships.	European Commission: Education and Culture DG; Enterprise DG; Employment DG; Information Society DG CEDEFOP
Feasibility study relating to a **European "Technology and Education" laboratory** based on bodies of this type in the Member States; joint work on **scenarios** for the development of education and training systems and the integration of *e*Learning.	European Commission: Education and Culture DG; Research DG; Information society DG
Study on the measures taken in the Member States and other countries to promote and **encourage the use of ICT** for educational purposes.	European Commission: Education and Culture DG Eurydice
In the context of ***e*Accessibility**, recording and analysis of the results of the various programmes in the field of special-needs education; exchange of best practices to help disadvantaged people use ICT to learn (*e*-Inclusion).	European Commission: Employment DG; Information Society DG; Education and Culture DG
Exploitation of **European know-how** in this field.	European Commission: Education and Culture DG

3.1.3 Encouraging the development of infrastructure

The *e*Learning Action Plan is consistent with efforts to **improve infrastructure** quality in the Member States. This will be undertaken as from 2001 in support of the efforts of the Member States, giving priority to less-favoured regions, and with financial assistance from the ERDF. The financial instruments provided by the European Investment Bank will be used to develop the necessary infrastructure[18]. The construction of a European Research Area will contribute

[18] Use of these instruments will, of course, have to conform with Community telecommunications policy. It will be advisable to ensure that there is no distorsion of competition and that financial instruments are used, as much as possible, in a neutral manner from a technological point of view. Furthermore, it will be advisable to take into account, in infrastructures and purchases of equipment, the gradual transition towards a new Internet IPv6 protocol.

to improving the links between research and teaching and to the development of infrastructure.

Access to infrastructure will be facilitated by the development of **multipurpose places of learning accessible to all**, and by the development of **virtual infrastructure**. The creation of multilingual portals on the Internet will be encouraged, in order to allow **structured and user-friendly access to existing resources.**

Measures 2001 – 2002

Establishing of **financial instruments** for infrastructure development.	European Investment Bank
Recommendations for the development and networking of **multipurpose places of learning accessible to all** based on the inventory of experiences in the Member States produced by the ESDIS high-level group.	Member States European Commission: Employment DG; Education and Culture DG; Regional Policy DG
Use of **emerging technologies** (GRID, satellite, digital radio and television, etc) to develop innovative applications for education and training.	European Commission: Information Society DG
Support for multilingual portals on the Internet to allow **structured and user-friendly access to existing resources.**	European Commission Member States
Launch of the *European learning opportunities database project.*	European Commission: Education and Culture DG; Employment DG

3.2 Key measures on training

These are of two types: the first intended to identify new basic skills in connection with the use of *e*Learning and to improve access to training to rectify the skills shortage, and the second focussing on training for teachers and trainers:

3.2.1 New skills and eLearning

New skills — technical, intellectual and social — are becoming essential for living, working and participating actively in a knowledge society. While their scope extends well beyond "**digital literacy**", they are the basis on which it depends. They fall into the broader category of "new basic skills" (foreign languages, entrepreneurship etc.) to be acquired in a process of lifelong learning. Discriminating and responsible use of the new technologies constitutes one of these new basic skills.

Specific vocational skills are also vital. Firm foundations must be laid to counterbalance the observed **failure of supply to meet demand for a skilled workforce**. Europe already has a significant skills shortage which could hamper the development of the European economy. In the information technology sector, this shortfall was estimated at 800 000 unfilled posts in 1999, and could rise to as many as 1 700 000[19]. The ability to use information and

[19] Source: IDC 1999.

Measures 2001 – 2002

Continuation of work on **basic skills** in information and communication technologies in the context of the *Report on the concrete future objectives of education systems.*	European Commission: Education and Culture DG; Employment DG; Information Society DG CEDEFOP
In conjunction with the business and education spheres, improving definition of the skills required and **access to training**[22].	European Commission: Education and Culture DG; Information Society DG; Employment DG; Enterprise DG
Report and recommendations on a **European diploma for IT skills** with decentralised issuing procedures.	European Commission: Education and Culture DG; Information Society DG; Employment DG
An inventory of projects run at European level and **analysis of models** developed, **for initial and continuing teacher training**; recommendations for consolidation of the European networks.	European Commission: Education and Culture DG CEDEFOP Eurydice
Typology of online materials and services; a **guide to existing resources** and experts in the field.	European Commission: Education and Culture DG CEDEFOP
Seminar and activities on the theme of **skills for tomorrow's teachers and trainers** geared to the increasingly multidisciplinary nature of programmes and the integration of new contents and methods.	European Commission: Education and Culture DG; Research DG Eurydice

3.3 Key measures on services and content: favourable conditions and priority areas for innovation and development

3.3.1 A conducive environment

Various measures are envisaged with a view to creating an environment conducive to developing quality content and services:

– Development of recommendations to improve **consumer protection** in the face of products of highly variable quality. An inventory of **quality certification systems**

[22] For example, the Career Space project supported by the European Commission. This consortium comprises BT, Cisco Systems, IBM Europe, Intel, Microsoft Europe, Nokia, Nortel Networks, Philips Semiconductors, Siemens AG, Telefonica SA, Thales, EICTA (the European ICT Industry Association), CEN/ISSS and EUREL (convention of national societies of electrical engineers of Europe) http://www.career-space.com.

will be drawn up in cooperation with the Member States. Special attention will also be paid to recognition of qualifications and validation of knowledge acquired by new methods.

– Special attention will be given to **ethical aspects and to the issues of "Science and Society"**[23] in the use of *e*Learning and ICT in education. An action will be launched in conjunction with the *European Group on Ethics in Science and New Technologies.*

– Cooperation on finding solutions appropriate to the learning environment in terms of **security of educational and cultural sites**, in conjunction with measures under the Internet Action Plan[24].

– Development and promotion of **standards** adapted to education and training, and the definition of 'metadata', taking into account needs that are linked to maintaining quality and to collaborative learning processes, in conjunction with the various existing international initiatives in this field (CEN/ISSS – Comité Européen de Normalisation / Information Society Standardisation System).

– Matters concerning **intellectual property rights** and conditions governing payment of authors will be examined with a view to developing economic conditions conducive to content development and distribution, especially where teachers and trainers are involved in defining future content and services.

Measures 2001–2002

Work on **quality certification** issues; recommendations for users of online educational services.	Member States European Commission: Education and Culture DG
Implementation and promotion of the programme: "***e*Learning Standards**: towards a new knowledge-based Europe."	European Commission: Enterprise DG;Information Society DG; Education and Culture DG CEDEFOP
Working group on **ethical questions**; development of rules of conduct on content and services.	European Commission: Education and Culture DG; Information Society DG Internet Action Plan
Promotion of appropriate means of ensuring the **security of educational and cultural sites**.	European Commission: Education and Culture DG; Information Society DG

[23] Commission's working document of November 2000 on "Science, society and the public" SEC (2000) 1973

[24] Decision No 276/1999/EC of the European Parliament and of the Council of 25 January 1999 adopting a multiannual Community action plan on promoting safer use of the Internet by combating illegal and harmful content on global networks, OJ L 33 of 6.2.1999, p. 1 http://europa.eu.int /ISPO/iap/decision/fr.html and Council Recommendation of 24 September 1998 on the development of the competitiveness of the European audiovisual and information services industry by promoting national frameworks aimed at achieving a comparable and effective level of protection of minors and human dignity, OJ L 270 of 7.10.1998, p.48 http://europa.eu.int/comm/dg10/avpolicy/new_srv/recom-intro_fr.html

Work on questions concerning **intellectual property rights**.	European Commission: Education and Culture DG
Launching of a feasibility study to examine the possibilities for developing an online **coproduction, exchange and distribution system** for educational multimedia content between European universities	European Commission: Education and Culture DG

3.3.2. Priority areas for innovation and development

With a view to rectifying the shortage of quality European *e*Learning content and services and the lack of substantial experience in the use of these technologies in education and training, the ***e*Learning** action plan encompasses three subject areas of strategic importance for Europe:

1. Modern languages

2. Science, technology and society

3. Art, culture and citizenship.

These themes are essential for the development of the new knowledge society and economy and to ensure that, in this development, Europe's **cultural and linguistic diversity** is preserved and encouraged. They are strategic in their aim to **open up schools and universities** to partners outside the education system. And finally, they are growth areas of the future in both market and non-market terms.

We need to exploit the existing possibilities to the maximum, taking those applications which have proved most positive; develop concrete recommendations and measures at European, national and regional level and unite and motivate all those throughout Europe active in developing content and services. We need to develop and demonstrate in practical terms — in large scale, genuinely informative demonstration projects — how *e*Learning can improve the quality of education in schools, universities and industry.

These themes are also educational priorities for European-scale technological demonstration projects, intended not only to prepare the infrastructure (emerging technologies, mobile systems) but also to develop services and content relevant to teachers, trainers, students, workers and, more generally, the European public as a whole in the knowledge society. This could include, for example, testing and promoting virtual campus and virtual mobility initiatives in various settings, including the workplace. This kind of demonstration project will allow products and services to be more closely matched to teaching, knowledge representation and cooperative learning methods in the fields below.

3.3.2.1 Learning of modern languages

Language diversity is fundamental to the European model. Language learning is increasingly being promoted in the educational curricula of Member States and is essential to building a European identity and developing the new European labour market. Modern languages constitute one of the sectors in which the added value of new technologies for education is already significant. Online collaboration offers new opportunities for communication between learners and teachers or those providing support for language learning. Modern languages are increasingly a growth niche in the educational multimedia market which is attracting interest in the public and private sectors.

A measure of this nature must be used to expand the experience and results of existing projects under the education and training programmes. It could also be of value for activities in connection with the European Year of Languages. The time is ripe to pinpoint the aspects on which to base European-level proposals to provide guidelines for the many and various players in the field of modern languages.

3.3.2.2. Science, technology and society

Scientific and technical education is of prime importance for Europe. The Lisbon Council identified the development of a technological culture as one of the new basic skills to be acquired through lifelong learning. Research is the key for the development of sectors of vital importance for the future. Europe will not be able to achieve the agreed objectives if the lack of interest in tomorrow's careers among young people continues. Furthermore, in a knowledge society, all citizens must be in a position to understand the social implications of scientific and technical progress and make an informed choice on the possible options.

Multimedia tools help to make scientific and technical education more effective and more attractive, particularly through the possibilities they provide for modelling, simulation, remote experimentation or development of new kinds of resources, in addition to standard practical experimentation. New approaches are being developed using *e*Learning. They could help to open up communication between educational institutions and scientific and technical centres (scientific museums, research centres, technology transfer centres), and contribute to opening young people's minds to science and technology and developing a scientific and technical culture.

Specific action must be taken targeting women, as they are significantly under-represented in these occupational sectors. This raises the more general question of differences in attitude in these fields. Such a measure would also represent a continuation of the guidelines presented in the Commission's working document of November 2000 on "Science, society and the public".

3.3.2.3 Art, culture and citizenship

New approaches are being developed to bring schools and universities closer to arts and cultural institutions to promote arts and intercultural education. As well as playing an essential role in nurturing and preserving cultural diversity in Europe, art and culture — and the industries supporting them — are important sources of jobs in the new economy. They are estimated to represent over a million potential new jobs by 2005[25].

The new technologies are already a part of the cultural sphere (media, cinema, electronic publishing, digital music); they have become basic tools for the culture industries. Their use for creative purposes is of great educational value and they can also be used for education in citizenship. From this point of view, integration of the cultural institutions into new learning environments must be encouraged, while running specific projects in education in the visual image and the new media for the general public.

These actions would follow on from those already under way on this subject in the areas of cooperation in education, cultural and audiovisual programmes and technological research and *e*-commerce programmes. They will help to strengthen cooperation with publishers of educational software, with a view in particular to improving distribution circuits, the

[25] SEC (98)837 Study on "Culture, the cultural industries and employment".

production of innovative learning packages and materials which can be reused in different production contexts, and the use of open source software.

In all these areas, the European Commission has an important promotional role to play. Where *e*Learning is concerned, it can encourage exchange of experience and analysis which will benefit all the measures undertaken, from research and the design of new services to the generalisation of best practice.

Measures 2001 – 2002

Promoting **exchange of best practice** and pooling of Member States' efforts in areas such as language learning, scientific and technical education, arts and cultural education; organisation of media events such as the *e*Schola week.	European Commission: Education and Culture DG; Research DG; Information Society DG
Launching of a specific project to examine the **attitudes of women**, particularly female teachers, to using the new technologies in education. Launching of awareness actions to attract young people to science related professions	European Commission: Education and Culture DG; Research DG; Employment DG
Launching of a project on **image and media education**	European Commission: Education and Culture DG
Encouraging the development and distribution of **quality educational content** via the Socrates, Leonardo da Vinci, IST and *e*Content programmes.	European Commission: Education and Culture DG; Information Society DG
Support for adopting and developing production methods for **innovative educational packages** (including open source software).	European Commission: Information Society DG

3.4 Key measures to strengthen cooperation and dialogue

3.4.1 The eLearning site: a virtual cooperation platform

The creation of an ***e*Learning Internet site** by the end of 2001, in collaboration with the other parties active in this field, will provide a reference centre for all matters concerning *e*Learning in Europe. Based around the *e*Learning Action Plan, the site will also serve as a directory of innovative practice, a guide to educational resources, a platform for cooperation and a forum for contact and debate for all parties concerned.

3.4.2 Reinforcing the European education and training networks

This Action Plan will enable **exchange of experience** in the key areas of policy on the use of information and communication technology for education and training to be strengthened, e.g.: financing of infrastructure, equipment and network access; training strategies; support for the development of quality content and services; evaluation methods; monitoring of developments and forward studies.

All parties active in the field will be strongly encouraged to participate, especially partners from candidate countries. There will be special emphasis on ongoing dialogue with industry in order to anticipate training requirements and exploit the training models developed by companies. This will be supported by the **organisation of major events on *e*Learning** bringing together distinguished experts and decision-makers in education, culture and industry, in partnership with the Union Presidency.

In implementing the above, use will be made of the main channels existing at European level. These include the European Trade Union Committee for Education and CEDEFOP. Also concerned will be networks such as *EUN – European Schoolnet* [26], the *thematic networks* developed under Socrates, the European Parents Association, European teachers' and students' organisations and various European associations operating at different educational levels with experience in the use of information and communication technologies in education.

Measures 2001 – 2002

Construction of the ***e*Learning Internet** site	European Commission: Education and Culture DG
Creation of a **thematic network** on *e*Learning in higher education; conferences on "the school of tomorrow" and "the university of tomorrow".	European Commission: Education and Culture DG; Information Society DG
Development of the **PROMETEUS** partnership, a discussion forum for matters of common interest concerning the use of educational and training services, based on information and communication technologies, and concerning multimedia access to education and training in Europe, involving 500 signatory organisations and 1 800 people [27].	European Commission: Information Society DG
Organisation of an ***e*Learning conference** in cooperation with the successive European Union Presidencies.	European Commission: Education and Culture DG CEDEFOP
*e*Learning event at the IST 2001 conference, following on from the successful **eLearning minitrack** organised in Nice at the IST 2000 conference.	European Commission: Information Society DG

[26] http://www.eun.org/ a platform for dialogue in cooperation of the 26 Education Ministers which has developed a multilingual portal providing access to the resources of these Ministries along with networks for innovation and collaboration between schools in Europe.

[27] PROMETEUS – Promoting multimedia access to Education and Training in European Society – is an initiative established with the support of information society DG to discuss matters of common interest in

4. CONCLUSION

The new information and communication technologies are having a profound impact on the way in which we obtain information, communicate and undertake training. The challenges they present for education and training are many, and affect highly diverse sectors of society. Challenges for industry, a major user and producer of these technologies. Challenges for employment presented by the new jobs created and the new skills required. Challenges for the cultural environment brought about by the Internet-based development of new services which influence cultural patterns and are perceived sometimes as a threat to, sometimes as an opportunity for cultural and linguistic diversity in Europe.

Challenges for education, particularly that of ensuring that technological innovation really serves education and can be seen to be of genuine value in teaching and educational terms in highly diverse learning contexts, while respecting linguistic, cultural and social differences.

Financial challenges in education, to channel financial resources into the needs identified by society. The use of information and communication technologies must be seen in the context of the educational objectives and the financial means available. It must be adapted to the educational environment and the target groups concerned. This will mean adjusting distribution between infrastructures, training, content and human resources.

Education must always be the driving force behind these innovations. This Action Plan intends to ensure adherence to this principle throughout its implementation.