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**COMMUNICATION FROM THE COMMISSION TO THE COUNCIL, THE  
EUROPEAN PARLIAMENT, THE EUROPEAN ECONOMIC AND SOCIAL  
COMMITTEE AND THE COMMITTEE OF THE REGIONS**

**E-SKILLS FOR THE 21ST CENTURY:  
FOSTERING COMPETITIVENESS, GROWTH AND JOBS**

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## 1. INTRODUCTION

Innovation and the uptake of information and communication technologies (ICT) are two important components of the renewed Lisbon agenda for growth and jobs. The contribution of ICT to the European economy is fundamental for the development of productivity and knowledge-intensive products and services. There is an important need to address ICT-related skills (e-skills) issues in order to respond to the growing demand for highly-skilled ICT practitioners and users, meet the fast-changing requirements of industry, and ensure that every citizen is digitally literate in a lifelong learning context requiring the mobilisation of all stakeholders. These challenges can only be effectively addressed by a real mobilisation of Member States and industry. The European Union (EU) can provide a platform for exchange of best practices and well-focused solutions as identified through dialogue with stakeholders.

At the European level, following the European e-Skills Summit organised in October 2002 in cooperation with the Danish Presidency and Council Conclusions adopted in December 2002, the Commission established the European e-Skills Forum in 2003 to bring together relevant stakeholders. The forum released a report “e-Skills for Europe: Towards 2010 and Beyond” in 2004. Follow-up activities resulted in steady progress being made with a view to prepare a long-term e-skills agenda. An ICT Task Force was launched in 2006 under the Commission's industrial policy aiming to help create a more favourable environment for business in the EU. A number of recommendations were made regarding e-skills. These were incorporated in the Thessaloniki Declaration adopted at the European e-Skills Conference<sup>1</sup> of October 2006.

Three key messages emerged at the end of 2006. Firstly, it is crucial for the EU to rapidly adopt a long-term e-skills agenda to promote competitiveness, employability and workforce development, reduce e-skills gaps and be in a better position to address global competitive challenges. Secondly, strong efforts need to be made to improve cooperation between the public and private sectors on a long-term basis, in order to ensure a seamless framework linking basic e-skills training, vocational and higher education and professional development. Thirdly, industry and policy makers should act more decisively and consistently regarding their strategies to promote the professionalism, the image and attractiveness of ICT jobs and careers and to foster better work, employment conditions and perspectives.

This Communication provides a timely policy response to these important messages.

## 2. MAIN CHALLENGES

### 2.1. E-skills still not seen as a long-term policy issue

The growth of ICT has always been marked by fluctuations of activity and there has been an element of boom and bust. It is estimated that there are 4.2 million ICT practitioners within the EU and that approximately 180 million people are using ICT at work<sup>2</sup>. A study on the supply and demand of e-skills<sup>3</sup> over the period 1998-2004 reported an increase in the estimated number of employed IT practitioners during this period of about 48%. After a peak

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<sup>1</sup> Thessaloniki, Cedefop, 5-6 October 2006, see: [www.e-skills-conference.org](http://www.e-skills-conference.org)

<sup>2</sup> CEPIS, “Thinking Ahead on e-Skills for the ICT Industry in Europe”, February 2007

<sup>3</sup> Rand Europe, “The Supply and Demand of e-Skills in Europe”, September 2005

in 2001 a low point was reached in 2003. There is some evidence of a cycle, and the European e-Skills Forum warned that significant e-skills gaps will again appear and called for the preparation of a long-term e-skills agenda. A 2005 industry report predicted that there would be a shortage in 2008, across Europe, of up to half a million people with advanced networking technology skills<sup>4</sup>. A sectoral survey on e-business in 2006 reported that enterprises are anticipating skills shortfalls for ICT practitioners, particularly in ICT strategy, security and new business solutions<sup>5</sup>.

Shortages of ICT practitioner skills have been endemic due to technological innovation and the fast growth of ICT activity in comparison with the relatively low supply and availability of new employees and entrepreneurs with relevant educational qualifications. This was observed in particular with the uptake of the Internet. In response to industry pressure several Member States launched policy initiatives in the late nineties and at EU level a conference on the e-Economy was organised in March 2001. The bursting of the dotcom bubble and the recession of 2001 adversely affected investment in ICT and reduced temporarily the demand for ICT practitioners. Several industry-led initiatives were terminated while political interest and support decreased rapidly. Now e-skills shortages are increasing. The e-skills issue received attention from policy makers in peak times when the ICT sector was booming but suffered a loss of interest in difficult periods. This must alter if Europe is to anticipate and manage change effectively.

## **2.2. Lack of EU-wide approach: fragmented approach prevails**

ICT is one of the most global and pervasive technologies. ICT products and services and the corresponding jobs are broadly the same everywhere, and the ICT industry is operating on a world-wide basis. The ICT Task Force complained that Europe is still a patchwork of countries functioning under different regulatory systems. In addition, the adoption of best practice is too slow and an EU-wide approach is still lacking.

The European e-Skills Forum identified solutions bringing added-value at EU level, but these have so far not been implemented. For example, developing and retaining skills required for business success is a necessity to ensure that enterprises have employees with the right skills in the right jobs at the right time. For this purpose, many of them are developing ICT competence catalogues, processes, tools and strategies. Several countries have already set up ICT competence frameworks<sup>6</sup>. Many enterprises operating in these countries have developed their competence inventories on them. Efforts to establish and update these proprietary inventories and systems are costly and could be shared for the benefice of enterprises and especially small and medium-sized enterprises (SMEs). Using a European e-competence framework would represent a useful solution in line with the ambitions of the single market.

## **2.3. Image problem and decline of supply of highly-skilled ICT practitioners**

The need to maintain and continuously upgrade e-skills stems from technological change and increasingly from Internet-enabled global sourcing. New sources of ICT talent in emerging economies, especially India and China, imply the need for the adaptation of the European workforce. Software programmers face commoditisation of their skills, and some low- and

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<sup>4</sup> IDC White Paper, "Networking Skills in Europe" September 2005

<sup>5</sup> E-Business Watch Survey 2006

<sup>6</sup> e.g. CIGREF (Club Informatique des Grandes Entreprises Françaises) in France, SFIA (Skills Framework for the Information Age) in the UK and AITTS (Advanced IT Training System) in Germany

middle-income workers face increasing risks to their jobs. The OECD estimates that around 20% of total employment could potentially be affected by offshoring<sup>7</sup>. At the lower end of the qualification spectrum, de-skilling of workers often takes place as their know-how becomes codified making it relatively easy to outsource. Higher-level e-skills cannot be so easily encoded, which puts a premium on these skills in a European workforce context. This issue is debated in the media as the emergence of a significant restructuring of the labour market.

Several sources report a deterioration of the image of the ICT sector and ICT work, which is reflected in the decline in the number of students starting ICT courses. Adding to the concerns related to the demographic decline, young people seem less and less interested in studying mathematics, sciences and technology, and the gender issue still remains. There is a need to communicate better with the public, especially young people, parents, teachers and women, and to adopt measures to facilitate the adaptation of the workforce. In its policy plan on legal migration<sup>8</sup>, the Commission underlined the importance of highly-skilled immigrants to contribute to fill gaps in the EU labour market. Member States, however, do not yet have a consistent approach: only twelve Member States offer facilitated procedures and/or attractive conditions for the admission of highly-skilled workers, including ICT practitioners. A common approach could render the EU more attractive, bringing the needed competences.

#### **2.4. Rise of “parallel universes” between formal and industry-based education**

The continuous development of ICT and changes in the corresponding e-skills requirements provides a complex, moving target for policy-makers. National educational and professional training systems are facing a huge challenge to deliver the skills needed by our economy and society. Despite their efforts, they still find it difficult to cope with the situation, and lifelong learning is still far from being a reality. New forms of partnerships and flexible approaches (such as those based on e-learning) need to be much more actively promoted.

Industry complains about growing gaps and mismatches between the supply and the demand of specific e-skills. The European e-Skills Forum and the ICT Task Force warned against the rise of “parallel universes” between industry-based and government-supported education in ICT. The experience of embedding ICT industry e-skills certifications within the national qualification framework, such as pioneered in the United Kingdom and some new Member States, provides interesting case-studies that should be reviewed and shared between Member States. Qualifications should increasingly be defined in terms of expected learning outcomes to encourage education and training providers to focus on the competence needs of individuals and employers, and not on the duration, location or organisation of the institutions. This approach is in line with the Commission’s proposal for a European Qualifications Framework<sup>9</sup>, which seeks to facilitate lifelong learning and mobility, and is fundamental to the development of national and sectoral qualifications frameworks.

#### **2.5. Persistence of digital illiteracy**

The traditional notion of literacy needs to embrace the complete set of e-skills and media competences required in a knowledge-based economy and society. Eurostat figures<sup>10</sup> indicate

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<sup>7</sup> Offshoring includes both international outsourcing where activities are contracted out to independent third parties abroad and international in sourcing (to foreign affiliates).

<sup>8</sup> COM(2005) 669 of 21.12.2005

<sup>9</sup> COM(2006) 479 of 5.9.2006

<sup>10</sup> Eurostat, Statistics in Focus, 17/2006

that 37% of the EU population has no computer skills whatsoever and that more than 60% of people not educated beyond lower secondary level have no basic e-skills. A lack of e-skills will prevent these people from using e-commerce and e-government applications and participating fully in the information society. Furthermore, the lack of e-skills exacerbates social and educational disadvantages, inhibiting lifelong learning and up-skilling.

The market on its own cannot close the digital divide. Innovative public measures and multi-stakeholder partnerships are at the heart of both the Recommendation<sup>11</sup> of the European Parliament and of the Council on key competences for lifelong learning and also of the Riga Declaration<sup>12</sup> which was adopted at the Ministerial Conference on e-Inclusion in June 2006.

### 3. LONG-TERM E-SKILLS AGENDA

Most actions contributing to the implementation of a long-term e-skills agenda are clearly the responsibility of the Member States. Some of them have already launched dedicated e-skills initiatives, as reported by the European e-Skills Forum. The Commission will encourage them to further develop their policies in line with a long-term e-skills agenda and encourage others to do the same, in particular by facilitating the exchange of good practices.

To complement their activities, the Commission will concentrate its own efforts on actions bringing added value at EU level, in line with the subsidiarity principle. It is recognised that some actions strongly advocated by stakeholders have a clear EU dimension. These will be promoted by the Commission in close cooperation with Member States and stakeholders.

#### 3.1. Key components of the long-term agenda

The European e-Skills Forum, the ICT Task Force and the Thessaloniki Declaration called for a long-term e-skills agenda. They also made detailed proposals for this agenda. These were delivered at a time when there was a general recognition that there is need to move up a gear. The long-term e-skills agenda for Member States and stakeholders includes the following key components:

- **Longer term cooperation:** strengthening cooperation between public authorities and the private sector, academia, unions and associations through the promotion of multi-stakeholder partnerships and joint initiatives including monitoring supply and demand, anticipating change, adapting curricula, attracting foreign students and highly-skilled ICT workers and promoting ICT education on a long-term basis.
- **Human resources investment:** ensuring sufficient public and private investment in human resources and e-skills and appropriate financial support and fiscal incentives, in full respect of State aid rules, as well as developing an e-competence framework and tools facilitating mobility, transparency of qualifications, and promoting recognition and credit transfer between formal, non-formal and industry ICT education and certifications.

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<sup>11</sup> 2006/962/EC of 18.12.2006

<sup>12</sup> See: [http://europa.eu.int/information\\_society/events/ict\\_riga\\_2006/doc/declaration\\_riga.pdf](http://europa.eu.int/information_society/events/ict_riga_2006/doc/declaration_riga.pdf)

- **Attractiveness:** promoting science, maths, ICT, e-skills, job profiles, role models, and career perspectives<sup>13</sup> with a particular focus on young people, especially girls, and providing parents, teachers and pupils, with an accurate understanding of opportunities arising from an ICT education and an ICT career to counter the alarming decline in young people's interest for science and technology careers<sup>14</sup> in Europe.
- **Employability and e-inclusion:** developing digital literacy and e-competence actions tailored to the needs of the workforce both in the public and the private sector, with a particular emphasis on SMEs and also to the needs of the unemployed, elderly people, people with low education levels, people with disabilities and marginalised young people.
- **Lifelong acquisition of e-skills:** ensuring that workers can regularly update their e-skills and encouraging better and more user-centric ICT-enhanced learning and training approaches (e-learning). Government should promote good practices for the training of employees using e-learning, with a particular emphasis on SMEs, and should publicise successful solutions and business models.

These key components should serve as an inspiration for the development and the implementation by each Member State of a consistent long-term e-skills strategy within the framework of their respective political, legal, budgeting, educational and training systems. It is their responsibility. The Commission will regularly monitor and report on progress.

### **3.2. Action lines at the European level**

Taking into account stakeholder recommendations, the Commission proposes five action lines at the EU level. The activities covered by these action lines will be initiated in 2007 and aim at complete implementation by 2010. They will be implemented through EU instruments such as the Lifelong Learning Programme, the Competitiveness and Innovation Framework Programme and the Seventh Framework Programme for Research and Technological Development as well as Structural Funds available for the promotion of Employment and Regional Cohesion and the European Agricultural Fund for Rural Development in the framework of the approved rural development programmes of Members States/Regions for the promotion of ICT, employment and growth in rural areas. Cooperation with the European Centre for the Development of Vocational Training (Cedefop) will be strengthened in order to actively link e-skills activities to vocational education and training and to lifelong learning. They will be monitored on a regular basis to ensure their effectiveness.

#### ***3.2.1. Promoting long-term cooperation and monitoring progress***

The Commission will promote dialogue and cooperation on e-skills between Member States and stakeholders and ensure a regular monitoring of progress. In this context, the setting up in June 2007 by leading ICT companies of the “e-Skills Industry Leadership Board” is welcomed. The Commission sees also a need for dialogue between social partners and public authorities on finding ways of combining employment flexibility with security for employees in the ICT sector.

The following activities will be initiated in 2007:

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<sup>13</sup> These career perspectives should not only cover vertical mobility but also horizontal career paths and suggestions how to combine professional and private life.

<sup>14</sup> “Science Education Now: A Renewed Pedagogy for the Future of Europe”. Rocard Report, 12.06.2007

- Promoting a regular dialogue on e-skills with Member States and stakeholders (industry, associations and trade unions, civil society, academia and training institutions) and maintaining an online virtual community in partnership with Cedefop;
- Monitoring the supply and demand of e-skills in partnership with Eurostat and stakeholders and assessing the impact of global sourcing. An annual report will be released presenting a synthesis of the situation based on existing indicators, focusing mainly on ICT practitioner skills, and on e-business skills surveys.

### **3.2.2. *Developing supporting actions and tools***

As recommended by stakeholders, specific actions can be pursued at the EU level to improve the availability of e-skills. They will be launched by the Commission starting in 2007:

- Supporting the development of a European e-Competence Framework based on the requirements of stakeholders and the results of preparatory work within the European Committee for Standardisation<sup>15</sup> in line with the proposal for a European Qualifications Framework. Results should be available before the end of 2008;
- Further promoting the Europass<sup>16</sup> initiative in cooperation with Cedefop, including the development of an online e-skills self-assessment tool and undertaking a feasibility study on a European e-skills and career portal. This portal to be launched and maintained by stakeholders should be available by the end of 2008;
- Producing a European handbook on e-skills multi-stakeholder partnerships, including best practices, and recommendations on appropriate legal and financial frameworks. This should be available in 2008 and promoted at workshops in Member States;
- Setting up fast-track and attractive admission schemes for third-country ICT practitioners to the EU. The Commission will put forward in September 2007 a proposal for a Directive on the admission of highly skilled third-country workers to help to respond to skills gaps;
- Encouraging women to choose ICT careers by further promoting the “IT girls shadowing exercise”<sup>17</sup> in cooperation with ICT companies and launching a best practice study focusing on the retaining factors for women working in ICT.
- Promoting e-training in the field of agriculture and in rural areas<sup>18</sup> in the context of approved rural development programmes for the period 2007-2013.

In addition, the following actions will be launched in 2008:

- Supporting the development of e-competence curriculum guidelines to strengthen the quality and the relevance of ICT education and promote efficient cooperation between industry and academia. The proposal by the ICT Task Force for a new discipline covering services sciences, management and engineering will be explored. The guidelines should be available in 2009;

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<sup>15</sup> See: <http://www.cenorm.be/cenorm/businessdomains/businessdomains/iss/activity/wsict-skills.asp>

<sup>16</sup> See: <http://europass.cedefop.europa.eu/>

<sup>17</sup> See: <http://ec.europa.eu/itgirls>

<sup>18</sup> The results of a study on best practices in support of take-up and maximising the benefits of ICT in rural areas will be available before the end of 2007.



- Encouraging the development of European quality criteria for existing e-skills industry-based certifications, taking into account the upcoming European Qualifications Framework and industry self-regulation initiatives. These criteria should be available in 2009;
- Investigating appropriate financial and fiscal incentives, in full respect of State aid rules, related to e-skills training, especially for SMEs, and studying the potential of a human capital investment tax credit for individuals. A report will be released in 2009.

### **3.2.3. Raising awareness**

There are two ways in which raising awareness can be facilitated at the EU level, starting in 2007 in particular under the Seventh Framework Programme for Research and Technological Development and the Lifelong Learning Programme in coherence with the Education and Training 2010 open method of coordination:

- Exchanging information and good practices on Member States initiatives for the promotion of science, maths and ICT, role models, job and career profiles and perspectives as well as teacher training in the area of ICT skills and addressing gender issues in the technical and scientific areas;
- Promoting awareness and information campaigns at EU and national level to provide parents, teachers and pupils with an accurate understanding of opportunities arising from an ICT education and the pursuit of a career as an ICT professional in the EU.

### **3.2.4. Fostering employability and social inclusion**

The Commission will launch an initiative on e-Inclusion in 2008. Its characteristics will be defined in a forthcoming Communication. As part of the Riga Declaration commitments, during 2007-2008 the Commission will review Member State policies on the basis of a thorough measurement of digital literacy with a view to identifying the most successful policies, and proposing new initiatives if necessary. The ambition is to halve the digital divide between the groups at risk of exclusion and the average population by 2010. Progress will be measured in the context of i2010. The Eurostat ICT household survey will provide specific data in 2007 on digital literacy.

Significant partners within the ICT industry already launched in 2006 the “European Alliance on Skills for Employability” aiming to make possible the training of 20 million people from disadvantaged groups by 2010. Professional organisations of SMEs would like to develop similar education programmes for user skills, with a specific focus on SME needs. Promising activities and initiatives will be further supported by the Commission, including:

- Promoting corporate social responsibility initiatives and partnerships between providers of e-skills training, civil society, providers of business skills training, and job placement support services in order to help connect trainees to new jobs and to foster digital literacy;
- Investigating, in liaison with ongoing industry initiatives, how public and private funding instruments can efficiently support successful multi-stakeholder initiatives<sup>19</sup> in improving the employability of job seekers and low-skilled workers.

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<sup>19</sup> In line with the Guidelines for the Employment Policies of Member States (2005/600/EC, 12 July 2005)

### ***3.2.5. Promoting better and greater use of e-learning***

Based on the achievements of the e-Learning Programme (2004-2006) and the conclusions of a benchmarking initiative of policies in support of e-learning for enterprises and of the e-Learning conference<sup>20</sup> organised in October 2007 in Lisbon, the Commission will release a report in 2008 with recommendations for targeted e-learning initiatives and the promotion of successful strategies. In addition, the Commission will support two activities:

- Promoting the development of e-learning courses and exchange mechanisms of e-skills training resources for the workforce. These mechanisms should be available in 2009;
- Supporting the networking of training centres and research<sup>21</sup> that contributes to a better understanding of future e-skills needs. This network should be operational in 2009.

## **4. CONCLUSION**

For the European Union and its Member States to remain successful in a global economy characterised by rapid technological change, more efforts will be needed to raise and widen the level of e-skills of our workforce and our citizens, which is one of the foundations of a knowledge-based society. This will require major, sustained efforts by both Member States and stakeholders applied to a range of policy issues.

The long-term e-skills agenda proposed in this Communication includes key components to serve as an inspiration for the development and implementation by Member States and stakeholders of consistent and long-term e-skills policies and measures. The Commission will support the implementation of five action lines by concentrating on activities bringing added-value at EU level.

The Commission will organise a major conference in 2008 to report on progress, present the results of the actions and discuss the way forward. It will also release a report in 2010 based on the results of an independent evaluation and the assessment of the stakeholders.

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<sup>20</sup> See: <http://www.elearninglisboa.com>

<sup>21</sup> e.g. the “Network of Living Labs”, see: <http://www.ami-communities.eu/wiki/CORELABS>