ICT for Learning, Innovation and Creativity

POLICY BRIEF

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The mission of the IPTS is to provide customer-driven support to the EU policy-making process by researching science-based responses to policy challenges that have both a socio-economic and a scientific or technological dimension.

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PREFACE

This policy brief has been prepared by the Institute for Prospective Technological Studies (IPTS)[1] as part of an ongoing collaboration between DG Education and Culture, Directorate A (Lifelong Learning: horizontal Lisbon policy issues and international affairs), in particular Unit A2 (Lifelong learning: innovation and creativity). Under this collaboration, IPTS will contribute to the strategic policy work of DG EAC, by conducting focused techno-economic research and prospective analyses on the use of ICT for creativity, innovation and lifelong learning for all.

The goal of this policy brief is to summarize key messages from recent IPTS research on ICT for Learning, Creativity and Innovation. The research contributing to this brief has been carried out by Information Society Unit at IPTS under various research projects. More information on the research projects and results of the IPTS Information Society Unit can be found from the Unit website, http://is.jrc.ec.europa.eu/

[1] IPTS is one of the seven research institutes that make up the European Commission's Joint Research Centre.

IPTS POLICY BRIEF: ICT FOR LEARNING, INNOVATION AND CREATIVITY

Over the last decade, information and communication technologies have enabled changes in the way people live, work, interact and acquire knowledge. The take up of social computing and new participative approaches impact public services such as government, the health sector and education and training (Osimo, 2008; Ala-Mutka, 2008; Punie, 2008; Redecker, 2008). Collaborative development and sharing of media content (e.g. blogging, podcasting, Wikipedia, Flickr, YouTube) and social networking (e.g. MySpace, Facebook, SecondLife) are transforming social capital, which has implications for inclusion (Zinnbauer, 2007; Cachia et al, 2007; Cachia, 2008). Social computing take up has been fast especially among young learners, but is also increasing among older users (Pascu, 2008). Internet users are also using social computing for learning purposes on their own initiative (Redecker, 2008; Ala-Mutka, 2008). In 2006, 19% of Europeans declared that they used internet for educational purposes, although only 8% used it for formalized educational activities (Eurostat).

ICT has also been taken up in educational institutions, 96% of European schools have internet access and 80% of European teachers see advantages in using computers in school (Empirica, 2006). However, there are skill divides between older and younger teachers as, for example, 80% of younger teachers but only 56% of older teachers feel very competent in using text processors (Empirica, 2006). Despite the take up, ICT has not had a transformative impact on teaching and learning in education and training institutions (Punie et al, 2006b).[2] While many education institutions all over Europe are currently experimenting with diverse digital tools, the approaches developed are not always creative or innovative (Redecker, 2008). This is important, as the impact of ICT use on students is highly dependent on teaching approaches, and better skills result when student-centred guidance, group work and inquiry projects are used (Law et al, 2008).

Social computing tools and approaches can enhance learning outcomes by (Redecker, 2008):

- *Supporting different senses* with multimedia visualisations and representations, both in materials developed by teachers and by providing new opportunities for *creativity* for the students;
- Supporting *collaboration* with new online production, commenting and networking tools, improving both overall and individual performance;
- Supporting *differentiation and diversity* by supplying teachers with a wide variety of didactical and methodological tools that can be fitted to the respective learning objectives;
- *Empowering learners* to personalise their learning process in a supportive environment of mutual assistance, reflection and critique and in interaction with their teachers and peers, combining formal, non-formal and informal learning activities.

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2 See also Staff Working Paper on the use of ICT in innovation and lifelong learning for all, SEC(2008) 2629 final.

MAIN MESSAGE

New technologies, and especially social computing, provide new opportunities for education and training, as they enhance learning and teaching, and facilitate collaboration, innovation and creativity for individuals and organizations. The benefits of deploying social computing and ICT for learning depend on the learning approach used, emphasizing the role and the skills of the teacher and the need for supportive settings for both learners and teachers.

RECOMMENDATIONS

Support pedagogical innovation with new tools

- ***Encouraging experimentation.*** Innovations in the process of learning and teaching emerge from different actors, both learners and teachers. Policies should aim to empower educational actors and institutions in their local contexts to develop innovative approaches to learning with added value in their environment, (e.g. with different local languages, or by using digital tools and media creatively for specific learning topics).
- ***Networking and best practise exchanges***. Teachers should be encouraged and supported to document and share the innovative practices they have developed and encountered in their teaching, as knowledge of practical applications for new approaches in different environments is scarce. Incentives for the objective assessment of enabling and disabling factors should be implemented.
- ***Teacher Training and Support.*** ICT and social computing can improve the effectiveness of learning and the learning outcomes, but results depend on the approaches used. Hence, initial and in-service teacher training should disseminate insights and best practices with new innovative approaches, encouraging teachers to experiment with digital and media technologies and to reflect on the learning impacts of their own teaching practices. Establishing and participating in teacher networks and following innovative practice development of the field should become part of teacher training.

Support innovative organizations

- ***Open and networked institutions.*** Policies should encourage institutions to embrace the networking opportunities available. By opening their learning materials (open educational resources), institutions can attract learners and also support informal learning outside institutions. Networking between institutions can enrich the curricula provided for students and transfer subject-related knowledge between practitioners. Institutions should promote collaborative networks between teachers, researchers, and professional networks, in order to support the emergence and sharing of learning innovations.

- ***Develop and support favourable culture for ICT innovation and learning***. Using new tools for old processes does not create change or innovation. Institutions should facilitate emergence of innovative learning approaches by (i) ensuring that learners, teachers, managers and parents are aware of their potential and (ii) by supporting them in curricula, teaching guidelines, and teacher training. Institutions should acknowledge and encourage innovations coming from actors on different levels and develop their practices accordingly, thereby becoming reflective, learning organizations.
- ***Build a strong vision of ICT and innovation for lifelong learning in Europe***. Research shows that in many countries there is a need to coordinate education policies for innovative learning approaches with policies for ICT infrastructure and ICT skills, employment policies for developing and maintaining labour market skills and inclusion policies for accessing learning. Policymakers, researchers and practitioners should engage in developing a common vision of future learning for innovation, as a tool to guide their joint effort (see IPTS vision on Learning Spaces as an example, Punie et al, 2006a).

Support and benefit from technological innovations

- ***Co-development of tools for learning and teaching.*** Many innovations result from end-users adapting and developing tools for themselves (von Hippel, 2005). Involving learners and teachers in learning tool development processes could create innovative tools, which take into account both learner and teacher perspectives, and support personalization and scaffolding in new ways., Design for All and co-development approaches are crucial for improving the usability of technological innovations, especially for learners with disabilities or special needs.
- ***Research on ICT impacts on learning.*** More research is needed for finding evidence on how technology can enhance learning. Together, tool developers and educational researchers should study and develop models for embedding new tools such as computer-based assessment in teaching and learning approaches. This would provide institutions and teachers with proven practical models that support the take up of innovative tools.

Enhance equity in participation

Although ICT access, supply and skills in general have been considerably improved in Europe, these factors are still limiting take up in educational settings, especially in rural areas and for disadvantaged user groups. Furthermore, in some areas, educational institutions are lacking broadband connections and up-to-date equipment. In addition to basic ICT skills, advanced digital competence is important for preparing people to use participative communities and collaborative content for work, leisure and learning.[3] The Member States that have joined the EU since May, 2004, also have the opportunity to use structural funds to develop ICT take up in order to transform their education systems.

3 See IPTS policy brief: Digital Competence for Lifelong Learning

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Abstract

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