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EDUCATION AND TRAINING 2010 PROCESS

GROUP C (ICT WORKING GROUP)

Report on Mapping of recommendations

Synthetic presentation of contributions

Approved by Group C meeting on 19.11.04

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EXECUTIVE SUMMARY

In order to bring ICT integration into education to the best level of practice possible in each country, four recommendations had concluded the 2003 Report of the ICT Working Group ("Education & Training 2010" program) on "good policy" practices. Following a gathering of information in member countries, this document presents briefly a selection of concrete examples providing information on how to implement each of the recommendations:

(1) Linking ICT implementation to long-term education objectives

Whether ICT integration is done through large-scale inclusive policies that have a national and multi-year framework, and that aim to mainstream ICT, or through small-scale regional policies that can organise new partnerships, mobilise new stakeholders, as well as attend to the specific needs of local communities, fundamental educational goals are essential to ensure long lasting involvement of educational actors.

These goals, insufficiently present in ICT policies, concern, for example, the acquisition of basic skills and knowledge, such as reading, writing, arithmetic, critical thinking, or disciplinary skills and knowledge; but also more encompassing objectives such as developing responsible citizens, who have to cope with scientific challenges and ethical issues.

Fourteen examples of concrete actions from eight different countries are presented for the first recommendation.

(2) Attending to the needs and demands of educational actors involved with ICT by developing new services

Current ICT integration into education is focussing attention on the formal and non-formal contexts of learning, on their organisation, on the time and space environment as well as on the heart of learning, knowledge itself. New support services are required in order to ease the use of ICT and to multiply the achievable pedagogical gains, from services that facilitate the use of technological equipment, to services that ensure Internet security; and to services that provide a better personalisation of the learning process in guiding, coaching, and tutoring individual learners. Twenty-seven examples of concrete actions from twenty different countries illustrate this recommendation.

(3) Training educational actors for change with ICT

With the introduction of IC technology frequently preceding the training of teachers, most courses and workshops for teachers had initially focused exclusively on earnestly needed technical skills. But pedagogical and didactic issues rapidly came to the forefront and are now being addressed. Furthermore, training in the educational use of ICT is being offered not only to teachers, but also to headmasters and even to parents, as facilitators and peripatetic teachers are put into place. Twenty-three recommendations from seventeen countries provide concrete examples of ongoing actions.

(4) Developing evaluation, measuring results and linking ICT educational use with research.

Research, evaluation, sharing of results and promotion of best practices is essential if educational actors are to produce correct appreciation of good practices, evidence of improved academic and learning achievements and basically enlighten decisions, implementation choices and educational priorities. Three types of actions are particularly targeted in this recommendation: evaluation, dissemination and interaction with research. Twelve examples from ten different countries illustrate this last recommendation.

Each example was reformatted (and sometimes translated) to allow for a brief homogeneous presentation with titles, key words and hyperlinks to more extensive information. The choice was made to make these new contributions short and easy to read, so that they could be made available to a general public on the site of the European Commission.

I – INTRODUCTION

Following the 2003 Report of the ICT Working Group ("Education & Training 2010" program), the group explored how the four concluding recommendations could be implemented in different educational settings. ICT in education is under growing pressure to deliver the promised gains in terms of education quality, higher learners' achievements and improvements in academic results, as well as increased efficiency (better organization, reduced costs, etc.). It is therefore of the greatest importance to bring ICT integration to the best level of practice possible in each country and to provide educational actors with the most adequate environment. The recommendations have precisely this goal: to facilitate, for Ministries and educational actors, the understanding of crucial issues and the implementation of pertinent actions and decisions.

Each of the four recommendations:

(5) Embed ICT policies and strategies into long term educational objectives

(6) Ensure new support services for education

(7) Empower educational actors and train for the management of change

(8) Develop research, establish new indicators and provide access to results,

is introduced with a synthetic presentation and with reference to the different examples relating to it. Building on the previous report, these initial examples address new issues, and also issues that had been omitted, overlooked or underestimated.

As observed in several European countries, initial policies dealing with one issue, be it equipment or teacher training or resources, are generally giving way to more encompassing policies that attend to several of these components. Because emerging needs are greater than investment resources available, policies tend to organize one sector at a time - for example, attending to one type of actors involved, or one geographic area, or one school level - but take into account all the components - training, infrastructure, resources, services - , in order to maximize the probability of successful implementation.

Concrete examples of actions already corresponding to the recommendations were identified and are proposed in this document as an initial basis for a pool of cases for reference. Further work will involve the presentation of quality and evaluation criteria and meta-information on the relevance and transferability potential of the collected cases. The presentation of these initial examples was particularly discussed in order to achieve the best balance between providing all the pertinent information without overloading readers so as to maintain interest. In order to develop exchanges that will stimulate better educational ICT integration into the different countries, the information provided here has been organized in seven categories: reference number and title, key-words, origin, actors involved, description, website, and key informant.

[N.B.: The complete document is presently available as a Word file on CIRCA, intranet site of the European Commission: A paper document consisting of a general presentation and the executive summary is also available.]

http://forum.europa.eu.int/Members/irc/eac/accessict/library?

II - FOUR STRATEGIC RECOMMENDATIONS FOR INTEGRATING ICT INTO EDUCATION

Each recommendation is hereafter presented with references to some of the examples that can be found in the complete document on line (CIRCA)

1st recommendation: Embed ICT policies and strategies into long term educational objectives

As the third decade of ICT integration into education begins, inquiring minds – stakeholders, parents, decision makers and teachers – are wondering what are the goals pursued with the integration of ICT in education. It is increasingly recognised that the main challenge in the integration of ICT is not providing equipment, but developing educational uses that will effectively attend to fundamental improvements in education and to current or new learner needs. Embedding ICT policies and strategies in long-term educational visions is becoming more and more urgent as educational actors are asked to account for the important investments made in time, energy and money for equipment, training of teachers, for production of resources and in mastering the use of this technology.

The general rationale for integrating ICT in education often lies with the growing importance of ICT based resources and services in society as a whole, the complexity of the tools available, and the pressure to make education more cost effective and employment compliant. Nevertheless, the role that ICT plays in fostering production in the economic system should not obscure the role that ICT can play in citizenship and personality building in education systems. In order to play this cultural role in education, IC technology needs to be embedded in long term educational goals, such as the preparation of students to live in a complex society, capable as citizens of making informed scientific choices; and of being responsible consumers and producers in this society. The transformations in the access and the production of information brought about in society by the use of digital technology calls for rethinking the role of media and technology in education, and possibly revisiting the very foundations of knowledge, its transmission and acquisition.

Whether ICT integration is done through large-scale inclusive policies that have a national and multi-year framework, and that aim to mainstream ICT, or through small-scale regional policies that can organise new partnerships, mobilise new stakeholders, as well as attend to the specific needs of the local communities, fundamental educational goals are essential to ensure long lasting involvement of educational actors. These goals, all too seldom present in ICT policies, concern for example the acquisition of basic skills and knowledge: reading, writing, arithmetic, critical thinking, etc.; of disciplinary skills and knowledge; but also more encompassing objectives such as developing responsible citizens, actors who can cope with scientific challenges and ethical issues, and politically conscious voters.[1]

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[1] "Classic or basic goals" in the presentation of long term educational objectives that could fruitfully be revisited are the "four pillars" – learning to know, learning to do, learning to live together, learning to be- of the *Learning, The Treasure Within*, (1996) Report of the UNESCO International Commission for the Twenty-first Century, chaired by Jacques Delors, or The Seven Fundamental Issues that Education Must Address in the Future (Les sept savoirs nécessaires à l'éducation du futur", par Edgar Morin, (1999), UNESCO.

Long-term educational goals are usually implicit and as such are rarely questioned, in order not to disrupt the assumption that there is a general adherence to them. Making them explicit in order to establish ICT objectives and priorities is no easy task. Some countries have however produced such a basis for their ICT policies and exploring their action can facilitate the work to be done by others.

Besides these fundamental educational goals, there are three types of educational objectives that can be specifically facilitated by the integration of ICT:

- Objectives that implement new learning paradigms, such as learner centred and constructivist approach to knowledge, life-long learning, multicultural and multi-lingual approach to knowledge, active learning through simulation, micro-worlds and multimedia; collaborative learning through networking;
- Objectives that attend to new educational needs such as providing a basic scientific knowledge and critical awareness for all, developing special needs education, or answering the needs of learners whose situation require individualised online learning, such as high level sportsman or hospitalised persons;
- Objectives that foster employability in an information society through the development of digital literacy for all learners, competences which need to be defined not only according to the needs and requirements of the IT industry, but also meeting the requirements of managing technologically based information in all professional sectors.

These new educational objectives need to be recognized and validated with national standards adequate to the kind of objectives the new learning situation implies.

Some policies are already providing the long term vision, translated into large-scale objectives: [Austrian policy 'efit-Austria', is implemented through 180 specific projects, covering eight fields of activity, such as "new media for teaching and learning, IT-vocational qualifications, 'infoportals' and e-content providing, IT at universities, IT in adult education, IT and culture, IT-administration, IT-infrastructure"]. The use of ICT needs to be assigned to top priority missions such as training of teachers, and developing knowledgeable users of ICT.

More policies are needed to move education towards an active learning and knowledge construction approach, to foster digital literacy for an information society, (1.13: ICT as a compulsory discipline for 12-14 year old students or 1.4. LizzyNet for girls to overcome gender bias in IT professions), or to develop learning for a multicultural society through online learning (1.5.Tackling innovative intercultural contents and approaches, 1.7 focused on foreign language acquisition), while helping to raise academic standards (1.12, Deploying ICT in clusters of educational institutions).

2nd recommendation: Ensure new support services for education

The development of computers – as their name indicates – was due to the possibility and necessity of calculating numbers by automata, and not due to the aim of teaching and learning. Even when by technological progress computing was widened to handle digital multimedia interactively, computers didn't change automatically into pedagogical tools. The development of the educational potential of these very promising machines cannot be achieved by merely buying computers for students and teachers.

Teachers are to be prepared for making use of the new opportunities in their classrooms. While recognising that computers do not – by themselves and by some miracle – change

the way we learn, current innovations bring further attention to the formal or non-formal contexts of learning, to their organisation, time and space as well as attention to the focus of learning, knowledge itself.

Given these challenges, new support services are to be installed in order to lighten the use of ICT and to multiply the achievable pedagogical bargain. But whereas the need for teacher education is very well admitted, new supplementary support services required are not sufficiently taken into account and in the focus of decision-makers. Therefore necessary contributions of teacher education programmes which foster ICT in classrooms are not discussed here. The following sections are limited to brief characterisations of necessary additional facilities and point out good examples for such services implemented in member states.

What is meant by new support services?
It seems adequate to differentiate between five types of support services:

- facilitating the use of technological equipment;
- providing for contents or 'contexts' which foster educational uses or projects;
- ensuring or at least improving security while using ICT;
- providing a better personalisation of the learning process in guiding, coaching, tutoring individual learners (teachers or students) through educational pathways which are made specific to their needs.
- Organising local polyvalent centres that assure access and availability of learning environments and resources (school libraries, Competence Centres, nodes (Holland), universities.

1) Services facilitating the use of ICT

As far as it is not an aim of classroom activities to learn about ICT but to teach and learn with help of ICT, teaching and learning processes must not be harmed by technical problems. Teachers and students who cannot rely on equipment ready for operation won't like to make use of it:

- A procedure or strategy has to be defined and maintained which takes care of the implementation of ICT into the educational programme of each school. The preparation for defining such a strategy is less a teacher's than a headmaster's task - together with the ICT coordinator at school. It is also, in some cases, a local or regional strategy, as the school may design its ICT-related strategies together with the local authority or with Universities or cultural institutions nearby. Therefore it is mentioned here ("strategy-support").
- An intranet is in general indispensable for supplying all computers of a school with access to the internet. But provisions are to be defined and to be installed ("intranet-support") professionally so that:
    - the computers and additional hardware-components are in a well defined state at the beginning of each lesson ("availability-support");
    - ad-hoc-problems can be discussed with and - if necessary - transferred to competent partners ("help-desk-support");
    - additional hardware and software is embedded into the school-intranet professionally ("consistency- and compatibility-support");

- the logical structure of the school-intranet is defined according to pedagogical demands and not vice versa ("pedagogical-privilege-support").

- Good examples of services facilitating the use of ICT are implemented in different Member States

Concerning "strategy-support":

- ICT ABC for school leaders - A Norwegian service built on a guidance package to enable schools to develop their own ICT strategy. Norway, example 2.21.

  Nónio Competence Centres - Portuguese educational centres acting as research units with expertise in the pedagogical integration of ICT and as advisors of schools to implement projects based on ICT. Portugal, example 2.22, Under this strategy-support, one should bear in mind specific regulations, as developed in Sweden for inviting any school that was wishing to get funding for ICT to think about the educational integration of ICT

- Concerning "intranet-support":

School networks should support - not annoy teachers: the challenge of installing a LAN to answer pedagogic demands. Germany (Baden-Wurttemberg), example 2.6.

2) Services providing for educational contents or 'contexts'

Of course for most of the topics relevant at school the internet offers more materials than can be dealt with in classrooms – but concerning "pedagogical economy" most of those materials are too unspecific. Therefore there is a clear demand for pedagogically defined services which should either be provided nationwide or even European wide (for economic reasons, negotiation with content providers may be easier at this level) or be adapted to the local and regional educational contexts. It is interesting noting that 'small portals' are, in some cases, more successful than 'big portals'. In a same way that there are many radio stations, one must bear in mind the importance of content diversity. In terms of portals, this may involve:

- Big portals where of common interest are offered, and where the quality of resources is guaranteed by public or private publishers of educational resources. ("information-support");
- Smaller portals which are based on the inputs provided by teachers themselves and by free exchange or resources, for example under disciplinary or sectorial groupings;
- Chat-rooms and forums for synchronous and asynchronous guided discussions about pedagogical and educational topics ("communication-and-collaboration-support"); this remains difficult to sustain if there is no collaboration framework and possible related funding;
- Platforms where results of teaching and learning processes can be presented and discussed – both by teachers and by students ("presentation-support").

In this area of services, there is more and more evidence that basic information is not enough and that teachers should be given some guidance (pedagogical outlines or 'fiches') in order to provide an educational framing of the given information, for example through showcases. This is why emphasis has to be given on 'contexts' of learning as

much as on ‘contents’. The better these context-oriented supports are the more in-service-training of teachers is lightened.

Good examples of *services providing for educational contents for* the use of ICT in classrooms are implemented in different Member States, concerning "information-support":

- A pedagogical server for information and resources. Belgium (French Community), example 2.5;
- Digital Knowledge Space - A French initiative associating private and public educational resource providers with online access. France, example 2.6;
- Icelandic Educational Gateway. Iceland, example 2.7;
- Services offered by the Swedish Schoolnet: information centre, library and news agency. Sweden, example 2.2;

Concerning "communication-and-collaboration-support":

- Sektornet: supplying all schools with high-speed connections to the internet and a national conferencing system, SkoleKom. Denmark, example 2.16;
- Sharing information to build a community: the Digital Class Book. Hungary, example 2.26.

3) Support improving security while using ICT

With respect to teaching and learning processes "security" has different dimensions:

Of course teachers ask for security concerning the "availability" of those ICT-components which are known to be installed at their school and which should work when they and their students want to use them in classroom.

Another demand for security results from the fact that one never can be sure what findings an internet-oriented research will offer – concerning sex, crime, violence, fascism, racism and so on. Therefore a qualified variety of filters should be offered which can be installed according to pedagogically defined decision-making ("filter-support") on national or local basis.

Teaching and learning by using an intranet bring up the question of how privacy of individual and group-work can be protected without installing undue obstacles to cooperation and communication ("privacy-support").

These indispensable requests for security should and could be coped with by defining intelligent installations of intranets at school. Nevertheless methods and tools have to be developed and offered which fit for the specific pedagogical demands.

Good examples of *services improving security while using ICT* implemented in different Member States are:

Concerning “filter-support”:

1) Creation of School Network. Greece, example 2.19.

Concerning “privacy-support”:

Examples are not yet provided here but many projects within the Safe Internet Programme of DG INFSO (http://www.saferinternet.org/) do include such services.

4) Services providing a better personalisation of the learning process

Such services should help educational pathways become more specific to individual needs of children or teachers. There are still too few examples, such as 2.29 KICK, a Swedish help programme providing service to teachers and headmasters concerning development of competence.

This fourth type of services develops new sorts of pedagogical activities, such as individual learning activities, guidance and coaching activities, virtual meetings of students with teachers, pedagogical follow-ups, twinning with experts, activities that organise social interactions between educational actors. The new environments that are being established with the integration of ICT plead for inventiveness, open minds and renewal of pedagogical situations.

5) Services organising local polyvalent centres that assure access and availability of learning resources and environments.

These services attend to the new needs of lifelong learners who need to find educational resources online but also locally and easy to manage. Access to local existing resources such as municipal libraries, museums, associations, experts, needs to be organised and facilitated for the learner. Bringing in the learning environment new actors and new competences can potentially enrich the learning experiences of all educational actors.

Third recommendation: Empower educational actors and train for the management of change

1) Training teachers:

In most countries, introduction of ICT (mainly technology provision) in public and higher education was initiated before teacher-training courses on *methodological issues* of using ICT in education had been established. In the nineties, when multimedia computers made it possible to teach in a variety of disciplines, non-IT teachers received basic training in computer skills only. As a consequence, many of them decided to use ICT for information search and personal communication but not for teaching and assessment or school management. By the turn of the century, most EU countries observed and satisfied the need for a constant and up-to-date training in *"digital didactics"* – means and methods of computer-supported education.

While post graduate and in-service courses on ICT use are abundant and often compulsory, ICT-related pre-service courses are still restricted to ICT skills in many EU countries. In others, examination in computer-supported, discipline-based teaching is one of the graduation requirements for future teachers. In service training courses include the following components:

- License for ICT competency;
- Courses for trainers or head teachers
- E-learning methodology courses for teachers

Features of successful courses include high quality, tried and tested teaching materials, a wide interregional group of on-line tutors, training paths (available on-line) for new professional profiles, and development of a set of adaptable didactical models.

Concerning roles, peer support and working in teams (1.2. Sweden ITis), facilitators (3.3 DK) are other success factors of training courses for teachers. By providing continuous support within the school such as *peripatetic* teachers (2.8. Malta example), and teaching assistants (England) long term effects in enhancing learning and teaching by ICT and changes over time are also more probable.

Danish and Hungarian surveys show that teachers are ready to change their methodology as a consequence of taking school based, intensive course, and even senior teachers are motivated by opportunities opening up with this new technology.

Examples: Pedagogical ICT Drivers License (3.3. Denmark), FADOL and initiative, SOLe project (1.8. Italy), discipline-based pre- and in-service training (1.13. Hungary), Information Technology in Education for School IT Coordinators (3.14), Supporting the quality use of ICT in schools (3.4. Estonia, Teach to the future), Distributed learning – computers in teaching (3.6.Iceland), ICT Support for Learning and Teaching (3.7. Sweden), Education for the Information-based Lithuania (private-public partnership, 3.18. Lithuania)., pre-service training programme of the UNESCO Centre for ICT in Education, Hungary and in-service training programmes of the Hungarian Schoolnet.

2) Equipping educational actors to cope with the changes involved in the implementation of ICT:

Practically all EU educational systems have national ICT infrastructure diffusion policies (national school nets providing Internet connection and validated content, distribution of school laboratories, innovation grants to support new models of teaching etc.)

According to the OECD studies and SITES2, key actor in ICT implementation is the school leadership. In many EU countries, campaigns regularly target school heads in two ways. Involving them in the ICT culture as active users ("laptop donation"), and inviting them to apply for grants to improve their school's ICT-related infrastructure and Internet connectivity. Their willingness to innovate through the use of computers seems to be dependent more on the general innovatory potential of the school than the quality of equipment available. In-service training courses, messages delivered at conferences and, more convincingly than anything else, growing demand of parents seem to have persuaded many of them to integrate in their pedagogical work some use of ICT.

School staff members in general education in most EU countries seem to be offered an abundant selection of in-service courses on educational computing. Comprehensive programmes leading to certificates are also available in most training systems.

Research suggests that after a long period of ICT penetration and integration in schools there is also a widening gap between teachers. Differences in the adaptation of ICT and the use of it among teachers are becoming more and more visible. Some teachers still have basic ICT needs whereas other teachers have developed a high level of expertise, also through their own efforts. They make innovative use of ICT and engage in project related work. (Ofsted report, 2004, e-watch report)

Some training services provided in the European countries attract specific target groups (3.16. LeaNet for women teacher and student teacher, Germany) or aimed to ensure the same (basic) level for all teachers in the country to guarantee equal standards for all students (3.2. Finland, Ope.fi)

A crucial goal, that is still to be reached, is the shift from the current "teaching paradigm" towards a "learning paradigm". There is also a need of official recognition of the new pedagogical roles introduced by ICT in teaching and training, as: on-line tutor,

on-line teacher, distance learning resource developer, technical staff for laboratories, etc. An analysis of the situation as far as the contracts in education in the various EU members could be interesting to understand how this new roles are gaining "space".

Examples: PUNTO EDU and EXEMPLO projects, Schoolnet Express project, Hungary, SCOOL LIFE initiative, Italian school heads' train on-line, (Italy), Polish Senate Resolution: Regarding Indispensable Movements Preparing Poland for Accession into the Global Information Society, Interkl@sa Programme (Poland), Pedagogical ICT Themes and Facilitators (3.3. Denmark), 3.2. Ope.fi: Three levels of competencies: basic, teaching ICT skills and advanced ICT skills (Finland), Digital Literacy/Competence for all learners (1.2. Norway), Teacher's Computer Literacy (3.5. Lithuania).

***3) Making actors aware of the different issues involved in implementing ICT**:*

Problematic issues have come up with the integration of ICT: finances, regulations, ethical and privacy issues, standards and reusability, intellectual property rights and copying, "quality" contents, brand vs. 'open source' software, health risks, etc Actors are made aware of these ICT-related issues mostly through web sites of national school nets, professional journals (paper-based and digital), and regular conferences on educational computing. Unfortunately, the topics listed in this question do not belong to the often discussed issues in these organs. National regulations are communicated to schools through official documents of educational ministries but rarely feature in a forum of communication where their content may be elaborated and discussed.

Most of these issues are complex and educational actors are often not aware of, or not involved in, the decision making process. The standards and reusability issues are typical of these difficulties. Because of the high investment required for the production of educational multimedia contents, it is highly commendable that such contents be re-used and capable of being integrated in different technological settings. However, experience has shown that most standards are not developed in an educational context and are not easy to abide by when producing educational contents. Furthermore, the 'reusability' of learning objects varies from rather obvious, when dealing with simple learning objects such as simulations of physical processes or geographical images, but becomes quite complex when dealing with the humanities, where cultural, linguistic, 'curricular" or even 'aesthetic' backgrounds bring into play value judgements, schools of thought or other ideological frameworks.

The use of Open Source software in schools has not yet been taken up by Ministries of education in Europe as a cost efficient and flexible way of implementing ICT in schools. However, in many schools in Europe there are grassroots actions taken (for use cases in schools or regions see special Insight Report http://www.eun.org/insight-pdf/special_reports/Why_Europe_needs_foss_Insight_2004.pdf) However, e-learning programs on these issues often lack official certification.

Examples: Center for Technology in Education (Denmark), post graduate programme for school IT co-ordinators (Poland), Implementing "Internet and Children's Rights" (3.19. Bulgaria); E-learning-Cluster schools (3.17. Austria), WebGUIDES: Empowering teachers for the use of ICT in the classroom (3.10. Germany), SLICT: Strategic Leadership for ICT (3.12. U.K.), Development of media competence (Thuringia, Germany).

4th Recommendation: Develop research, establish new indicators and provide access to results

Educational actors need guidance in integrating ICT into education. They want to benefit from previous and ongoing experience and to develop the best pedagogical practices possible.

This results in an agenda for research, evaluation, sharing of results and promotion of best practices. This work is essential if educational actors are to produce correct appreciation of good practices, evidence of improved academic and learning achievements and basically enlighten decisions, implementation choices and educational priorities.

Evaluation is a longstanding issue with educational ICT. Comparative research (with ICT versus without ICT) has not provided the expected results because of the complexity of human action always involving many factors and because of the inherent differences between pedagogical activities resorting to oral communication and written exercises and ICT based pedagogical activities. There is consequently much work to be done to clarify goals and objectives and establish pertinent criteria and indicators that will help to produce an informed and argument-based appreciation of what is being accomplished.

Three types of actions are particularly targeted in this recommendation:

1. Developing new evaluation paradigms through sharing of methodology, criteria, grids, indicators and results;
2. Stimulating identification, dissemination and adaptation of good models and approaches;
3. Fostering interaction with research.

An initial mapping of some of the examples leads to the above categorisation and to the following examples:

1) Actions that develop new evaluation paradigms through sharing of methodology, criteria, grids, indicators and results

Actions that contribute to a benchmarking framework for evaluation & comparative analysis of cases, ie. policies, projects and integrated actions for ICT in education and training.

Actions that adopt a limited and pilot set of indicators, through a policy oriented dialogue and filtering process, to be relevant to the on-going measuring of progress towards the Common Objectives, while supporting consistency and comparability of results coming out of surveys by European and international institutions – like Eurostat and/or OECD - as well as national authorities and agencies (surveys with schools, households, higher education institutions, lifelong learning providers and companies).

For example, 4.1. A program developing a special evaluation concept for New media in higher education

2) Stimulating identification, dissemination and adaptation of good models and approaches

Actions that cover short-term needs with European surveys addressing the penetration and use of ICT in learning, in a variety of contexts – schools, universities, training centers, cultural and scientific institutions, libraries and museums, home and the corporate sector –, or with surveys that are run by the European Commission's services and agencies.

Actions that develop innovative approaches to promoting good practices, such as 4.2. Competition with prizes, 4.9. ICT Schoolportraits as international evidence of good practice.

3) Fostering interaction with research

Actions that provide an updated insight of European state-of-the-art regarding research, observation and analysis as well as policy evaluation, dealing with ICT and e-learning. For example, 4.3. A Luxembourg Report developing in-depth case studies in schools, 4.5. Developing and action research network for teachers, 4.12. LearnIT, a research programme with doctoral students.

In order to stimulate the implementation of the ICT Report recommendations and to facilitate for educational actors the necessary steps involved in ICT integration, a series of initial examples, of what is being done in the different Europeans countries, has been brought together.

This paper provides information through **concrete examples.** These are "good or best practices", that implement one of the four recommendations. The activities are presented briefly and can be further explored through the provided hyperlink references.

The aim of this document is to disseminate innovative and stimulating ideas, actions, initiatives and solutions that have been experimented in one or more European country and that can contribute to the qualitative and enriching integration of information and communication technology into education and training.

III – INITIAL EXAMPLES FOR MAPPING RECOMMENDATIONS

1. ST RECOMMENDATION: EMBED ICT POLICIES AND STRATEGIES INTO LONG TERM EDUCATIONAL OBJECTIVES

Following are 12 examples of linking ICT implementation into education with long term educational objectives. For each example, the objectives pursued have been explicitly specified. For more information, a website address (usually in national language) is provided, as well as email addresses of informed persons that can be contacted for information in English.

1.1 "eFit-Austria", the Austrian ICT- Policy in education

Key-words: Inclusive, long-term policy, national, pluri-annual, E-Education, E-Science, E-Culture, E-Training and E-Administration

Origin: Austrian Government

Actors involved: All educational actors

Description: In the year 2000, soon after the Lisbon Council, a long-term policy with a sustainable and broad effectiveness, aiming at the integration of IT in the fields of education, culture and science was launched in Austria. This policy is called **"eFit-Austria"**.

In this context, E-Education was given a key-position as a cooperative schema to make educational institutions and all people who are involved in the Austrian educational system fit for the knowledge society and information technology. Based on ICT and the powerful services of the Internet the following long term objectives are perused:

- enlarging access to education for all,
- raising the quality of education,
- reshaping the organisation and management of educational processes,
- enabling lifelong learning,
- enhancing ICT competencies of pupils, students, teachers and administrative staff,
- raising the efficiency of school-administration.

eFit-Austria focuses on five central fields of appliance: E-Education, E-Science, E-Culture, E-Training and E-Administration and on three cross-cut areas: E-Content management, the education portal and provision of ICT-Infrastructure. For a sound implementation of efit-Austria a steering-group of field-managers has been set up which is directly responsible to the minister of education, science and culture.

The educational IT-strategy covers the whole educational system from primary schools till universities, training centres of teachers, institutions for adult education, science and research and the sites of culture like museums, libraries, galleries. About 180 specific projects, mostly for students, teachers and school/university-partners have already been launched since 2001.

Now in the third year of the programme a frame of sustainable structures, allowing successful projects to continue, will be developed. The focus on technology, previously dominant, has now changed towards educational driven approaches. ICT is considered from a holistic point of view with the issue to raising the quality of educational systems at a whole.

In the years 2001 to 2003 the Austrian government donated € 72 Million for educational IT-activities. From the beginning of the year 2004 explicit funding within the normal budget is provided.

Website: http://www.eFit-Austria.at. This website contains many other Internet addresses of IT supported educational projects in Austria.

Key informant: Rudolf.Apflauer@bmbwk.gv.at

1.2 ITiS-IT in Schools, the Swedish national Action Plan

Key-words: National objectives, curricula, education plan, organization of work.

Origin: The Swedish Ministry of Education and Science, The Swedish Parliament

Actors involved: All educational actors in pre-school, compulsory school, special school, sami school and upper secondary school.

Description: The National Programme for ICT in Schools (1998-2002) was designed to give teachers support in acquiring and exploiting the opportunities provided by ICT.

This investment was made by the State for a series of reasons that can be summarised as follows: using the potential of the tool to support pupils´ learning; creating opportunities to carry out activities that could not be accomplished without difficulties, or could not be done at all. The paramount aim of the programme is not increased efficiency.

The programme was an ICT project as well as a school development project and consisted of seven components: - in-service training for 75 000 teachers (~60% of all) in teams, - a computer for participants, - state grants to improve the schools accessibility to the Internet, - e-mail addresses for all teachers and pupils, - support for developing the Swedish Schoolnet and the European Schoolnet, - measures for pupils with special needs, - awards for excellent pedagogical contributions.

The in-service training programme was designed and organised on the basis of pedagogical approaches set out in the national curricula and based on decentralisation of responsibility and thus varied between schools and municipalities depending on the participants´ pre-knowledge, interest and local pre-conditions.

The participants were assumed to take an important part of the responsibility for their own learning and development. The programme was implemented primarily as ‘learning at work’.

To ensure quality in the in-service training, a number of specific programmes were implemented such as basic use of computers and training for facilitators. The facilitator should serve as models of excellence for the new role of the teacher in promoting

learning, training for head teachers and seminars for local administrative heads and politicians.

ITiS covered all schools in the country: pre-school classes, compulsory school and upper secondary school. More than 75 000 pedagogues, about 60% of all pedagogues, have participated in the in-service training.

At least one head teacher in all schools has participated in the training for head teachers

Context within which the programme was launched

The responsibility for schools in Sweden has been decentralized to the 290 local authorities, municipalities, in Sweden. This responsibility includes for example, staffing, all further and in-service training of teachers as well as buildings and investments in new technology.

Curricula, national objectives and guidelines for state schooling are defined by Parliament and the Government. Within these goals and frameworks, each individual municipality is free to decide how its schools should be run. The principal of each school has the task of drawing up a local working plan based on the curricula, national objectives and the education plan. This must take place in consultation with teachers and other staff.

The national curricula prescribe a change of focus in schools from teaching to learning. This implies that the traditional organisation of work in schools; one teacher, one classroom and some 25 pupils, will be replaced by teams of teachers working together with a larger group of pupils.

Teachers in Swedish schools have 104 hours of in-service training per school year as a part of their work. There is an agreement between employers and teachers´ unions which states that teachers working hours are not synonymous with teaching hours. Every teacher has 35 hours of pedagogical work in school every week. This means it is possible to organise work in a variety of different ways.

Website: http://www.logos-net.net/ilo/150_base/en/init/swe_7.htm
http://www.skolutveckling.se/it_i_skolan/itis/english/index.html

Key informant: Lena Nydahl: lena.nydahl@cfl.se

1.3 Agency for Flexible Learning (Swedish organisation opening adult education to new learners CFL).

Key-words: Flexible learning, higher education, on line learning, blended learning, adult education, project

Origin: The Swedish Ministry of education and science

Actors involved: Teachers and students in higher education

Description: The Ministry has recently set as an overall target to dramatically increase the numbers of students in higher education. The ambition is to recruit 50% of each age

group into higher education. With that goal, different parts of the education systems are being redesigned to attract and supply a very varied group of students. Moving the systems towards what is called flexible learning is seen as the major tool for implementing the policy.

The Swedish Agency for Flexible Learning (CFL), an agency of more than 100 persons, set up in 2001 by the Ministry for Education and Science and working in three different locations in Sweden, is playing an important role in the change processes. CFL allocates funding and support to projects, develops methods for using various media to support flexible learning, provides further training for teachers, head teachers´ and administrators and acts as a networked information agency for IT-supported distance education

Almost all institutions for higher education work in a common framework with offering students web based courses, on line learning or blended learning. The different systems for adult formal and informal education are successively adapted to organisations for flexible learning, also in this case the major focus in the solutions are blended learning.

With the goal of increasing the number of students in higher education in view, systems are redesigned by introducing more effective use of IT, promoting use of more varied competencies in the design and running of education and making the most of research results.

One of the tasks of CFL is to support adult education institutions with money and advice around development projects. Presently CFL is supporting 25 projects (17 started 2002 and in 2003, 8 started) in municipal adult education. The dominating themes related to these projects concerns the organisation of flexible learning and building of networks between different providers. In popular education (folk high schools and study organisations) 41 projects (17 started 2002 and 24 year 2003) have started. The guiding key words for those investments are to increase readiness for change and sustainability of the introduced changes.

Website: http://www.cfl.se/?sid=60 (in English)

Key informants: Hans-Inge Persson, Director General, E-mail: hans-inge.person@cfl.se

Lena Nydahl, Vice Director General, E-mail: lena.nydahl@cfl.se

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1.4 LizzyNet: a platform conceived for making IT and new media more attractive for girls and young women. (A German Schulen ans Netz project)

Key-words: Learning platform, Self study, online learning, professional orientation, community building, online courses, gender issues

Origin: Schulen ans Netz, the German school network

Actors involved: Girls and young women

Description: Women are still largely underrepresented in IT and technical careers: Often their approach to technology is different from that of their male peers.

This is why Schulen ans Netz has set up in 2000 a specific offer for them: LizzyNet, a platform and an online community for girls and young women. The guiding principle is to involve girls in the creation of the Internet world. At this goal LizzyNet combines

opportunities for qualification as well as incentives to participate actively in net activities. Today there are almost 55,000 registered Lizzys.

Online courses and learning materials offered by LizzyNet can be used for self study, but also can be integrated in classroom teaching or in free working groups in all educational institutions. The courses and materials are dedicated to a broad range subjects from HTML, php, hardware, online research to website design. Also free web space is provided for members so that "Lizzys" can easily publish their websites. On the other hand Lizzy members can edit their own texts in the online magazine LizzyPress. In doing so they are supported by professional journalists and the editorial staff of LizzyNet. A range of forums and chats allow the exchange on topics that particularly interest young women. Like-minded members can also start their own special interest clubs.

An evaluation of LizzyNet in 2003 conducted by a team of independent researchers gave interesting insights on what attracts girls to the Internet, which activities they prefer and which social groups were involved with LizzyNet.

As a result, a specific new challenge was taken up in trying to reach girls with lower levels of formal education who do not participate in the same extent as their peers in Lizzy learning activities. In order to counteract the increasing knowledge gap, a pilot project aiming at implementing LizzyNet at Hauptschulen[2] was realized for the first time in the current school year 2003/2004. During a 6 month period groups of girls were trained weekly in using the features of LizzyNet in connection with “Berufsorientierung” (professional orientation). The results which can be seen up to now are impressively positive. The project was developed in cooperation with the partner project LeaNet and one of the results is the conception of an Internet course for girls – based on LizzyNet – which is distributed in institutions of teachers training. Further information on the course is available at LeaNet (HYPERLINK), the online platform for women teachers and gender- issues from Schulen ans Netz.

HYPERLINK

Website : http:// www.lizzynet.de

Key informant : HYPERLINK Regina Eichen regina.eichen@schulen-ans-netz.de

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1.5 Exil-Club, New media in learning for a multicultural society: an online learning environment that engages with the subjects of exile, migration and intercultural education. (A German Schulen ans Netz project)

Key-words: Multicultural society, online learning, migrant, integration, learning platform, learning station.

Origin: Exil-Club is a Schulen ans Netz project., an initiative of the Federal Ministry for Education and Research and Deutschen Telekom AG.

Actors involved: Secondary school students and teachers

Description: Falling borders and migration have led to an increasing multicultural society in Europe. The situation in German classes also reflects this development and

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[2] Secondary schools from class 5 to class 9 or 10. Students attending *Hauptschulen* achieve the lowest level of formal education.

several issues have been raised:: What makes people leave their home countries for an uncertain future? What do migrants experience in everyday life? How do people from different backgrounds live together in one society?

These are some of the issues the Exil-Club is dealing with. The online learning environment consists of learning stations, a variety of material such as Internet rallies, questionnaires, quizzes and texts for further information and reading. Students can work independently on subjects, such as "Multicultural Society in America", "Nazi Dictatorship and Exile", "Human Rights" or "Afro-Germans today".

However, the online platform Exil-Club does not only aim to making students aware of the above-mentioned topics but also to increasing their skills in the use of new media. They learn to use the Internet as a means of investigation and can actively contribute to the project by publishing their results with the homepage generator. Thus the range of topics and information offered by the learning environment is constantly being increased.

Furthermore, Exil-Club organizes events such as work camps and school projects in order to combine online and "real life" activities across national and cultural borders. The Exil-Club specifically aims to promoting European growing together with a focus on integrating students from the new member countries of the EU. To achieve this, co-operation was established with the Brücke/Most foundation for German-Czech co-operation. The first joint workshop on online journalism for young people from Germany and the new Members States took place in August 2004.

The Exil-Club also holds something for teachers: complete and ready–to-use material for lessons and project-work. Methodical and didactical comments and descriptions regarding the learning stations are available. In addition, there are tips on how to integrate the online learning platform and into everyday teaching.

Website: http://www.exil-club.de/ with examples of projects realized in the Exil-Club

Key informant: kerstin.ciba@schulen-ans-netz.deNicole Tiemann HYPERLINK, Christof Köhler christof.koehler@schulen-ans-netz.de

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1.6 Digital Literacy/Competence for all learners. (A Norwegian programme 2004-2008)

Key-words: National strategy, new learning paradigms, digital literacy, digital resources, digital services.

Origin: Norwegian Ministry of Education and Research

Actors involved: Teachers and students of all levels of compulsory schooling

Description: The new "Programme for Digital Literacy"/Competence (2004- 2008) (version 0.7) builds on experience and research from earlier actions plans. The second plan for ICT in Norwegian education for the period 2000-2003 stated as its main goal: "ICT is to be used in education in order to contribute to better organisation, greater skills and pedagogical competence within an education system that develops and exploits ICT as a subject. The potential of ICT is to be exploited within teaching and learning so that the skills requirements of the individual and the society as a whole can be met." This plan also took into account the need for professional development of teachers, especially

in the field of basic skills in pedagogic use of ICT in education in the compulsory school. The government put up a lot of effort and money to upgrade the teachers.

The policy framework for the Programme for Digital Literacy"/Competence is the following: "*An innovative and quality based educational system must put digital literacy (competence) on the agenda*". Digital literacy is defined as:

- the ability to locate, evaluate, manipulate, manage, and communicate information from different sources.

- the ability to appreciate the potential of ICT to support innovation in industrial, business and creative processes. Learners need to gain the confidence, skills, and discrimination to adopt ICT in appropriate ways.

As learners become increasingly digital-literate, they develop skills in discrimination, interpretation, and critical analysis. ICT offers opportunities for higher-order thinking and creativity in processing, constructing, and conveying knowledge. The program reflects the notion of digital literacy as a continuum, which allows the measurement of various aspects of literacy, from daily life skills to the transformative benefits of ICT proficiency.

Website: http///odin.dep.no/ufd/engelsk

Key informant: oystein.johannessen@ufd.dep.no

1.7 LOGOS: conversations, languages, ways of speaking. (An Italian projet to develop the integration of young foreigners in the Friuli Venezia Giulia region.)

Key-words: Conversation, languages, cultural integration, foreigner**,**

Origin: ENAIP, (Ente Nazionale ACLI per l'Istruzione Professionale), Italian member of EVTA - European Vocational Training Association

Actors involved: Secondary school teachers and students

Description: Built with regional and FSE funds, the LOGOS project aims at developing the integration of young foreigners in the Friuli Venezia Giulia region of Italy. The difficulties of integration are connected not only to the low knowledge of Italian language or to the social context of immigration but also to "physical-emotional" aspects due to different styles of life or different eating habits. These aspects can create a situation of confusion that is typical in the experience of young migrants.

"LOGOS: conversations, languages, ways of speaking" is a course which offers foreign students the necessary tools to reach a better cultural integration. Another aim is helping them recover their native tongue and the culture of their native country. During the lessons the students use personal computers, with Internet, electronic mail, and are also involved in manual activities.

The course is conducted by the vocational training operators in several primary and secondary schools within a region that has many immigrant students in the classrooms. The method used creates an "autobiographical situation" through accessing information using internet research coupled with basic editing programs (or something simple like a blackboard) on which it is possible to write or to think up several stories or present

information or exchange opinions. With access to mass media they can have a reference about the image of their own countries in other parts of the world or in Italy too and they can compare their own experiences and their own knowledge of their countries with stereotypes. They can also become more aware of the rules that govern information society. New technologies can help, in an innovative use, to build a net in multicultural society too.

Website: http://www.enaip.fvg.it/html/estero/inglese.asp

Key informant: Dott.ssa Paola Alessandrini, ENAIP Centro Servizi Formativi del Friuli

e-mail: p.alessandrini@enaip.fvg.it

1.8 SOLe (Sistema per open learning) (An Italian methodological research project about the use of ICT and Distance learning to support micro enterprise owners competence enhancement.)

Key-words: Vocational training, self competence enhancement, blended learning, on-line learning, micro enterprise, interregional,

Origin: Interregional vocational training project of the Friuli, Venezia, Giulia, Veneto and Piemonte regions.

Actors involved: Trainers, tutors and entrepreneurs of small and micro enterprises.

Description: SOLe (Sistema per Open Learning) is a system for self competence enhancement through blended learning. It proposes on-line access to catalogues of training units for blended and on-line learning, an archive of professional profiles described in terms of competencies to which the training units are linked, and an on line testing service. The system also supplies: training units for those who will have to manage it (tutoring, orientation and teaching); sets up a reference to the structure of the training units; gives for those who don't have specific platforms and tools for managing on-line activities a simplified group of tools.

The methodological research project based on SOLe is about the use of ICT and distance learning to support micro enterprises owners' competence enhancement. The project defined a performance/competence model on which has been based the development of learning units to be delivered in blended (presence + distance) or distance mode. Each learning unit is based on a scheme through which each work process is analysed in reference to professional performances and articulated with a training unit.

The interesting characteristics of the activities carried out in the experimental phase of the project are:

- the project is interregional (Friuli Venezia Giulia, Veneto and Piemonte are participating);
- there has been an involvement of the personnel of the associations of entrepreneurs as participants to the tutor-on line courses, to foster their ability to propose also this kind of services to their associates;
- the on-line (blended) modules aimed to train the tutors, trainers, and people responsible for guiding others on to use the model have been developed and tested;

– a set of on-line and blended modules about issues of interest to small and micro enterprises owners are under development and testing with pilot groups of entrepreneurs (the research project will end in march 2004).

Website:

Key informant: Ms Antonella Van den Heuvel who speaks both French and English

0039 0432 693 718 (direct), 0039 0432 693 611,

1.9 Schoolife, an educational project for developing communication between schools and families (An Italian technological and methodological internet platform)

Key-words: School website, community, online register, platform, parents, family, chat.

Origin: Project is developed by EDULIFE, a permanent learning community company

Actors involved: Parents, students and teachers of primary and secondary schools.

Description: Schoolife is a technological and methodological internet platform where schools present for parents their programs and activities, including forum, chat, on-line library and electronic school register. The aim is to encourage families to come closer to the world of their children, to let them take part in school activities and to facilitate communication, creating communities of students, teachers and parents. This educational project is developed by EDULIFE, a permanent learning community company, with a long experience of youth education derived from the Salesian tradition, that has developed a methodological and technological system to integrate educational processes with long-distance learning with the use of latest technology.

This platform consists of an internet site through which schools can present their programs and activities, a system for distance learning that includes forum, chat, an on-line library and an electronic school register. The on-line register has all the features of a regular school register. It permits the parents to be constantly informed about the children's schedule, notes, programs, absences, etc., while remaining in constant contact with the teachers. Thanks to extra exercises and small on-line units students can catch up with their studies. Students can constantly consult documents, exercises, notes about lessons and links. They can take part in forum and share knowledge, information and opinions about school issues. Even children that for many reasons cannot be in school, thanks to this system have the chance to see what the others are doing and to see any material teachers have used in class. The platform is experimented in more than 20 schools to assess whether such a system improves communications with families, and facilitates use of documentation that students can easily access through internet.

Website: http://www.edulife.it/Altri/home.htm

Key informant: Ms. Emilia Leopardi, Edulife Tel 0039045 8070 174

e.leopardi@edulife.it

1.10 Pupils' ICT Licence (A Danish initiative where educators explicitly link their use of ICT to long term educational goals)

Key-words: ICT and media competencies, operational competence, comprehension competence, reflection competence.

Origin: Danish government

Actors involved: Teachers and students in primary and lower secondary schools

Description: The new Danish government initiative, Pupils' ICT Licence, aims at providing pupils in primary and lower secondary schools with qualifications concerning ICT and media competencies and with respect to their all-round personal development. Through this undertaking, teachers are expected to 'guarantee' the long-term national educational objectives.

The key component of the concept is a description of final and intermediate goals for the ICT and media competences. A guide has been developed for every intermediate goal suggesting how the pupils can work with the media.

The competencies are described at three levels, depending upon when they are expected to be mastered, including 3 elements that form part of all stages and all subject areas: Operational competence, Comprehension competence and Reflection competence.

The IT and media competences of the Pupils' ICT Licence are divided into 5 key areas: IT and media supported learning processes, Information collection, Production and analyses, Communication, and Computers and networks.

In other words, the pupils must develop knowledge and attitudes, enabling them to act and to make decisions in the network society, where IT and media play a central role. The pupils must know the possibilities of the digital tools and be able to consider critically, when they are appropriate to use.

The Pupils' ICT Licence comes with teachers' guidelines on the 5 competency areas at the 3 levels, descriptions, materials and cases for evaluation and documentation of ICT and media competencies, materials for introduction courses for Licence-schools, and descriptions of operational procedures for issuing a licence.

The licence has been introduced centrally, nationwide, in 2004.

Website: http://junior-pc-koerekort.dk/

For more detailed information on the concept and the background for the initiative, in English: http://www.itmf.dk/it-beviset/040426_UK_JPCK_info.pdf

Key Informant: "Leo Højsholt-Poulsen" <leo.hojsholt-poulsen@uni-c.dk>

1.11 Transformation of education with ICT: Becta. (UK national agency for the integration of ICT into learning and teaching, educational institutions and systems.)

Key-words: Embedded use of ICT, ICT infrastructure, educational content, standards, special needs, innovation.

Origin: DfES, Department for Education and Skills of the Ministry of Education.

Actors involved: Students, teachers, school leaders, ICT co-ordinators in schools, and local education authority support staff.

Description: Becta (British Educational Communications and Technology Agency) is the UK national agency for ICT in education. Becta's purpose is to support the transformation of education through the integration of ICT into learning and teaching, educational institutions and systems. It was set up and funded by the ministry of education (DfES, Depart. for Education and Skills). It is for all actors in education (although in practice higher education is separately supported) and services are targeted at specific segments, e.g. school leaders, subject teachers, ICT co-ordinators in schools, local education authority support staff. Until recently the work of Becta was determined by the DfES, but increasingly Becta will have more autonomy and responsibility for its actions, receiving a core grant from the DfES annually. The Chief Executive of Becta reports to a Board of governors.

Becta works with all four UK education departments in their strategic ICT developments, facilitating knowledge transfer among them in order to encourage innovation and improvement, and bring coherence and synergy to UK-wide developments.

It has five strategic aims:

- improve learning and teaching through the effective and embedded use of ICT
- increase the number of educational organisations making effective, innovative and sustainable use of ICT
- improve the availability and use of high quality educational content
- develop a coherent, sustainable and dependable ICT infrastructure for education
- continuously improve Becta's ability to deliver

Becta recognises the needs of different phases of education and works to develop coherence in the ICT initiatives across them. Becta's work endeavours to be inclusive, aimed at using the potential of ICT to create educational opportunities and remove barriers to learning.

Most appreciated, according to customer surveys are:

- Specific technical advice
- Setting and maintaining standards, e.g. in ISPs, laptops and whiteboard provision
- Special educational needs advice and support
- Working with other agencies, e.g. National College of School Leadership, Qualifications and Assessment Authority

Website: http://www.becta.org.uk

For a recent presentation of BECTA’s mission and role:

http://www.becta.org.uk/corporate/publications/documents/remit.pdf

Key Informant: Pravin.JETHWA2@dfes.gsi.gov.uk

1.12 Deploying ICT in clusters of educational institutions: UK ICT Test Bed project

Key-words: Transformational change, standards, information management systems, technical support, measurable improvements

Origin: The project is managed by BECTA and funded by the DfES ICT in Schools Division

Actors involved: Education actors in three separate clusters of schools and one college.

Description: The main aims of the Test Bed project are to determine how the use of ICT can raise standards in schools and colleges, gather evidence about how ICT can bring about significant improvements in all aspects of educational endeavour, and successfully disseminate the lessons learnt from the project.

The project will enable transformational change in all the schools and colleges involved in the project and thus demonstrate that effective deployment of ICT in clusters of educational institutions, coupled with appropriate support, can raise standards by providing a significant improvement in:

– teaching and learning

– institutional leadership and management

– teacher workforce issues

– inter school/college collaboration

– the relationship between schools and colleges and their students' home and community.

This approach builds on the work funded by the DfES in the NGfL Pathfinders, Regional Broadband Consortia, Becta's research on the impact of ICT, the Transforming Secondary Education agenda, Transforming the School Workforce Pathfinder, the Whiteboards in Literacy and Numeracy Project, development of Advanced Skills Teachers and other Pathfinder work being undertaken in the Standards and Effectiveness Unit, the strategy for London and work on innovation in schools.

The project is managed by Becta and funded by the DfES ICT in Schools Division. It started in September 2002 and is planned to last four years, finishing in August 2006, with an initial investment in the first two years of around £27 million. The activity is focused in three separate clusters, each with a post-16 college and a slightly different mix of schools; there are 31 Test Bed institutions; 28 schools, and 3 colleges. An independent evaluation has been commissioned to evaluate the project.

The emphasis is on a holistic approach to ICT implementations where the institutions will not only have access to high levels of ICT, but also will have funding provided towards the costs of the support required to make the most effective use of this investment. This will include enhanced levels of technical support, a comprehensive continuing professional development programme for teachers and support staff and access to leading experts. The project is also providing access to effective practice in a broad range of ICT use from the advanced use of management information systems to the most effective use of curriculum ICT resources. Information about effective practice is being sought from institutions across the country, nominated by their LEAs and the JISC Regional Support Centres (RSCs) to be Test Bed associate institutions.

Measurable improvements and changes are expected in the following broad areas:

– whole institution improvement
– the quality of teaching and learning
– institution leadership, management and organisation
– evaluation, practice sharing and collective review
– staff training and continuous professional development
– pupil attendance, behaviour and pastoral care
– collaboration between institutions
– the institution's environment and infrastructure
– parental and community involvement
– links with local post-16 educational providers.

Website: http://www.becta.org.uk/corporate/display.cfm?section=15&id=3086

Key Informant: communications@becta.org.uk

1.13 Developing the learners' knowledge and skills for the information society: a Hungarian compulsory discipline for 12-14 years old students.

Key-words: ICT competences, self-directed learning, co-operation, team work, creativity, moral rules, legal regulations

Origin: Compulsory discipline of Hungarian Ministry of Education

Actors involved: Students and teachers in primary and secondary schools

Description: "*Information Technology" is a compulsory discipline* in Hungarian education for grades 6-8 (student ages 12-14) in the primary and 6-grade secondary school and grade 9 (age 15) in the 4-grade secondary school. The most important aims of ICT instruction during the compulsory schooling, according to the National Core Curriculum and the Frame Curriculum are:

- *Acquisition of "user knowledge and skills":* students have to be taught the appropriate and effective use of computers in order to access, present and construct information and engage in *self-directed learning*;
- *Development of algorithmic thinking*: is another objective, very relevant for a range of disciplines.
- *Educating students for co-operation and team work:* project method, pair and group work are ideally suitable for ICT-based learning environment; and a regular and routine application of ICT knowledge and skills for solving a variety of learning tasks are also included in the curriculum.
- *Fostering creativity*: to encourage original production in all computer-supported media and tasks has profoundly transferred art and design education in this country and resulted in "Visual Communications" – an ICT-related art discipline in the curriculum.
- *Familiarisation of students with moral rules and legal regulations of ICT culture*: students should be familiar with personality rights, copyrights and other rules of

acquiring, processing and applying information has been added as a teaching content to avoid software piracy and illegal use of text, sound and image – a frequent phenomenon in the pioneer times of Hungarian computer culture. Integration of library skills with PC skills: retrieval, filtering and processing of information, rules of quoting and utilisation of CD-ROM and Web publications complete ICT studies in Hungary.

Comparing these requirements with the Hungarian "Information Technology" curricula of the eighties, one realises that a big shift of emphasis from programming towards usage occurred. At the beginning of ICT education, programming was the central issue. Students were supposed to acquire between 1983-90 BASIC, from 1993 DOS, from 1996, LOGO programming skills and devise algorithms for given tasks. (Cf. Turcsányi-Szabó, 1997) At present, training of intelligent users seems to be at the focus of curricula. Elements of COMENIUS LOGO are still being taught and an introduction to the history of computing also contains information on programming languages, but students are supposed to make use of and not create applications - the same as they would do in "normal life".

Website:

Key informant: "Andrea Karpati" <karpatian@axelero.hu>

1.14 ICT-AES : national ICT programme (Reforming the Romanian education system to take into account, among other dimensions, ICT literacy for pupils/students and teachers)

Key-words: ICT literacy, project, problem solving, simulation software, management support.

Origin: A national program created and approved by the Romanian Government

Actors involved: Pupils/students and teachers of primary and secondary schools.

Description: Information and communication technologies (ICT), as aids for educational system (AES), named ICT-AES, is a national program, created and approved as part of Romanian Government Program, aiming a reform of the educational system, through:

- ICT literacy for pupils/students and teachers
- Emphasis in education on problem solving, searching, using information and cooperative or team work
- Stimulating creativity and competition
- Encouraging innovative teaching and learning
- Offering simulation software for didactic materials that cannot be afforded by all schools
- Offering management support for schools and Ministry of Education Research and Youth (MERY)
- Creation of dedicated teacher training centers, with structured approached and certification counts for teacher's career path (8 centers already are in place)

Consolidation and development of national software market for education and promoting digital educational content are main action lines. The ICT-AES Program is implemented by projects, which were approved, and are in different stages of development.

Website:

Key informant: mguran@sunu.rnc.ro

2. ND RECOMMENDATION: ENSURE NEW SUPPORT SERVICES FOR EDUCATION

Following are 27 examples of new services linked to ICT implementation into education. For each example, a concise presentation of the service is given with links to further information on who set up the service, for whom, for solving what problem, with what success. A website address (usually in the national language) is provided, as well as email addresses of informed persons that can be contacted for information in English.

2.1. mySchool!: national educational portal. (A Luxembourg multilingual educational online working environment)

Key-words: Portal, multilingualism, collaboration, lifelong learning, online resources, learning infrastructure.

Origin: Set up in 2000, by the "Centre de Technologie de l'Education", a department of the Ministry of National Education in Luxembourg,

Actors involved: Teachers, principals, students, office staff, parents and guests.

Description: The **national educational portal, mySchool!,** was set up in 2000, by the "Centre de Technologie de l'Education", a department of the Ministry of National Education in Luxembourg, for teachers, principals, students, office staff, parents and guests. Its purpose is to provide a multilingual educational working environment in order to ensure better communication, efficient collaboration, lifelong learning and to foster an understanding of the learning and knowledge society of the future.

This project addresses a large target group, and is accessible anytime and anywhere to anyone belonging to Luxembourg's school community. It attends to several needs such as

- the need for better communication and collaboration by providing e-mail and threaded discussions;
- the need to access evaluated pedagogical resources by providing the possibility of referring to high-quality on-line resources;
- the need to effectively integrate the use of computer technology into classroom curriculum in order to improve students' learning and achievement through defining mySchool! Education Web as a possibly-personalized single point-of-access desktop to major resources and applications;
- the need to access anytime, anywhere to evaluated high-quality information and knowledge by providing content syndications
- the need for cost-effective teacher-training by providing e-learning interfaces;
- the need for school administrations to access anytime, anywhere to daily administrative tasks through a web platform;
- the need to prepare all children to function effectively in the world of change and to think critically and creatively by providing a truly modern learning infrastructure accessible anywhere and anytime.

What is most appreciated in this service is the entirely transparent technology for the mySchool! user (the platform being entirely web based), the reliability of the document repository, the free access to encyclopedias, dictionaries and other works from anywhere at any time and, last but not least, the collaboration and communication facilities.

Website: http://n2.myschool.lu/Home/en/default.asp

Key informant: bertemes@men.lu

2.2. Services offered by the Swedish Schoolnet: information centre, library and news agency.

Key-words: Services, virtual dictionary, online resources, music and picture archive, municipal authorities.

Origin: Created in 1994 by the Swedish Ministry of Education and managed by the National Swedish Agency.

Actors involved: Teachers in Swedish schools on all levels

Description: The Swedish Schoolnet is a national resource created in 1994 and embedded in the overall strategy for the development of Swedish schools and financed by the government. Most of the development and daily management of the Schoolnet is done by the National Swedish Agency for school improvement. In some areas concerning new ICT development and research, the Royal Institute of Technology and other universities are involved. In other parts, mostly concerning web design, external consultants have been engaged.

The services are directed towards teachers in Swedish schools on all levels. The Schoolnet is intended to mainly serve as a guide for the teachers when integrating ICT in education, so the pupils are indirectly the target group.

The versatility and practical utility of the Schoolnet are best illustrated by a brief presentation of some of the services. The most popular individual services are Lexin, a virtual dictionary, the Link library (Länkskafferiet) and the Multimedia Bureau, which offers resources for publishing on the Internet. Lexin, produced by the National Agency for Education for use in language training for immigrants, is a combination of dictionary and encyclopaedia. The Link Library is a search-and-retrieve service developed for use in the day-to-day work of schools and is intended primarily for pupils between the ages of 10 and 15. The Link Library differs from conventional search services in that it contains only material that has been examined for quality. Eight specialist editors (teachers and librarians) check the quality of the links and keep the Library continuously updated. The Multimedia Bureau is a resource centre helping teachers and students to create their own multimedia products, i.e. to use images, sound and music in their own educational work. Among other things, the Bureau has a large sound, music and picture archive, a project hotel where you can book a room for publishing your own material, and a bank of ideas providing tips, ideas and experiences from teachers throughout Sweden.

The main challenge in the Swedish Schoolnet's work is to find the right balance between the government's general ambition on the use and impact of ICT in education and the concrete responsibility of the local municipal authorities in implementing it.

Website:

Key informant: Christina Szekely, Director of Education, Project manager for The Swedish Schoolnet; E-mail: christina.szekely@skolutveckling.se

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2.5 National virtual school project providing networked teaching and studying in basic education, at the upper. Finland

Key-words: Virtual school, networked teaching, networked learning, portal, online resources, tutoring, distance learning

Origin: Cooperation between the National Board of Education and different producers (teachers, coordinators, publishers etc). The service is supported by the National Board of Education (NBE) and financed by the Government.

Actors involved: Students and teachers in basic education, at the upper secondary school level, in basic and further vocational education, and in liberal adult education.

Description: In Finland, the Virtual School Project (a service called EDU.fi), aims to develop and provide learning materials and courses of high pedagogical quality. It also provides pedagogical, counselling and guidance resources for teachers and students. The portal is also used to disseminate good practices. All digital materials support the national curricula. The portal contains learning and support materials selected and sorted by the level of education, by different subjects and by curriculum areas.

The content include support materials for local curriculum development, development of educational use of ICT, sharing of new innovative ideas in teaching and training, information about current national and international projects and competitions in the field. Regularly, different themes are introduced (e.g. special education, pluralism in education). It contains both traditional teaching materials and experimental material or material intended for narrow specialist fields. In addition, various types of digital material based on different media is also offered. The targeted schools are in basic education, upper secondary, basic and further vocational education, and in liberal adult education.

The core of the virtual school is its own user interface - a portal, which is developed as a tool for both students and teachers. The portal offers study modules, courses and other learning materials, as well as tools for communication, networking and tutoring. The new portal was opened in April, 2002 at http://www.edu.fi. The service attracts an average of 123 000 users/month (11/2003). The internet based service is free of charge for the schools. The service is supported by the National Board of Education (NBE) and funded by the national and regional entities.

Students studying with the help of digital learning materials can take their qualifications and courses as distance learning. Teachers have a right to use all materials freely. One important aspect of the edu.fi service is that it enables educational institutions to cooperate more efficiently in the area of networking, even internationally. It also helps to promote the use of ICT in support for contact education at all schools in both official languages in Finland; Finnish and Swedish.

Also, there is a small number of materials in other languages (English, German and French) The materials contain mainly information about the Finnish education system

and current issues in education. Limited number of learning materials and information is produced and exchanged internationally. The exchange is based on bilateral agreements.

The NBE is responsible for the administration, maintenance and production of the Edu.fi service. The service employs six persons working full (3) or part time (3). The project based service is planned to be developed to a fixed service by the end of 2006. The Virtual School Project is expected to devise its development plan by the end of 2004.

Website: http:// www.edu.fi

Key informant: Ella Kiesi, National Board of Education: <ella.kiesi@oph.fi>

2.5 Supporting students with special educational needs: the information service of the UK's National Grid for Learning.

Key-words: Special educational needs, inclusion, resources for teachers, schools managers, students.

Origin: BECTA on behalf of the Department for education and skills.

Actors involved: Kindergarten to grade 12.

Description: The UK's National Grid for Learning – NGfL- (http://www.ngfl.gov.uk/) has a number of on-line resource areas and information services. One of these is the *Inclusion* site, which provides information, resources links and advice about supporting students with special educational needs in different educational settings.

The Inclusion website is a particularly good example of a centrally co-ordinated information resource for teachers, school managers, workers as well as students themselves. The website provides information, guidance and advice on special needs and inclusive education through a catalogue of resources to develop strategies to support individual learning needs and an SEN and Inclusion advice area.

The content is particularly interesting as, although the site aims to promote inclusive education (hence the title), this is done by providing information support that would be of use in both mainstream as well as special (segregated) schools and settings. This very much fits in with the general SEN policy of the UK Government i.e. that inclusion is an aim for all pupils, but that a range of provisions maybe necessary to meet all individual needs.

It is innovative firstly due of the range of information it provides. This includes an interactive advice service - "ask a question" and "ask the experts" forums - news facilities, an on-line database of resources collated by professionals and producers themselves as well as links and information about local, regional and national level information providers. All of this information is provided in a very user friendly and accessible way (meeting accepted 3WC guidelines).

The web site is managed by a dedicated team of SNE and inclusion specialists within the NGfL and specifically Becta (www.becta.org.uk) on behalf of the Department for Education and Skills (www.dfes.gov.uk/index.htm). This team works in an extremely collaborative way with their target audiences using focus groups and different methods of eliciting constant feedback to evaluate and inform the development of the site as well as the information provided within it.

Website: http://inclusion.ngfl.gov.uk

Key informant: Terry Waller, Technology and Inclusion Advisor:
terry.waller@becta.org.uk

2.5 A pedagogical server for information and resources (A Belgian French Community server for parents, students and teachers to help implement the strategic plan for the integration of ICT in schools.)

Key-words: Server, website, online information, online resources.

Origin: Created in 1999 by the Central Management Cell of the Belgian French Community

Actors involved:

Description: The Belgian French Community pedagogical server has been created in 1999 by the Central Management Cell (cyberécole, http://www.cyberecole.be/) of the Ministry of Belgian French Community, in charge of the follow-up of the strategic plan for the integration for ICT in schools. It presents on a constantly updated website a large array of information and pedagogical tools for a large public (parents and students) and educational professionals, including:

- general information on the school system, structure, agenda, recent acquisitions, etc,
- information useful for all citizens, directories, calendars, etc,
- information geared to teachers: pedagogical resources, references, documents, etc.

Working papers of notable interest and daily accessed by hundreds of persons are 1) Information technology, 2) Research in education, 3) Didactic resources, 4) Evaluation tools, 5) Area for fundamental training with disciplinary and thematic files, 6) Area for secondary training also with disciplinary, thematic and transversal files and 7) Website repertory. The service also includes discussion lists.

Website : http://www.enseignement.be/index.asp

Key informant : Etienne Gilliard etienne.gilliard@cfwb.be

2.6 Digital Knowledge Space - Espace Numérique des Savoirs: A French initiative for providing schools with an online access to private and public digital educational resource

Key-words: Online resources, portal, European resources, educational use.

Origin: French Ministry of Education

Actors involved: Learners, students, teachers and professors of all levels, schools, colleges, high schools and universities

Description: The Digital Knowledge Space has been set up by the French Ministry of Education to provide educational institutions with online resources. It addresses needs of. It offers essential data in the main knowledge domains, through texts, fixed and animated pictures, and sound resources, all free of copyright for an academic use.

Users can freely access the Digital Knowledge Space. One can extract a literary text, a geographical map, an artistic masterpiece, a medical image, a newspaper article, a film sequence, or a musical recording, and included quite legally in a pedagogical production.

The European dimension is present from the beginning, as the project includes the possibility of accessing, not only French, but also European productions and offers access to other academic institutions within the European Union and even beyond.

Currently, a prefiguration version is being tested (2003-2004 academic year) by a panel of 1 500 voluntary institutions. This panel comprises about 130 IUFM (Instituts Universitaires de Formation des Maîtres) or training centers for primary school teachers, about 170 pedagogical resource centers, about 550 primary schools, about 390 colleges or secondary schools, and about 330 upper secondary schools.

A permanent team (equivalent of 3,5 persons full time) is piloting the project, monitoring the integration of the resources in the portal, providing access to the different institutions, assistance and maintenance, and organising the evaluation of the uses.

Website: http://www.educnet.education.fr/ENS/default.htm

Key informant: Gilles Braun, gilles.braun@education.gouv.fr

2.7 Icelandic Educational Gateway: a public and private partners collaborative project to provide schools with access to online information and services

Key-words: Database, curriculum, IMS-LOM standard, online resources.

Origin: Icelandic Ministry of Education, Science and Culture.

Actors involved: Teachers and students of primary and secondary schools.

Description: The Icelandic Educational Gateway is a collaborative project between the Ministry of Education, Science and Culture and Hugur ltd. Following a tender offer, an agreement was signed delegating the construction and operation of Educational Gateway to Hugur ltd.

The goal of the Ministry of Education, Science and Culture in building up Educational Gateway is to provide schools ready access to information and services accessible on the Internet. The recording of content is currently in progress as well as linking it with courses, academic subjects and curriculum goals. A database of curricula has been prepared in order to facilitate preparation of school curricula as well as curricula aimed at individuals.

Educational Gateway emphasises providing comprehensive information regarding schooling, course offerings for all actors involved, foreign collaboration, content from teachers' professional associations and other things of interest to school people. Schools and teachers are invited to collaborate with Educational Gateway on innovations in schooling, as they develop. Teachers can use the curriculum database to search for educational content that is related to the objectives of the curriculum. Also, a number of teachers all over Iceland will be on the "Educational Gateway Team", which works on recording, monitoring, quality evaluation, writing of news, etc.

The Educational Gateway provides new ways of using and linking the curriculum with educational material. What has been most appreciated by teachers is having participated in discussion on teaching and the development of teaching material with input from experts.

Website: http://www.menntagatt.is/default.aspx?pageid=148

Key informant: arnor.gudmundsson@mrn.stjr.is

2.8 Online Support and Resources. Malta

Key-words: Online support, online resources, curriculum, lesson plans, themepacks, website, peripatetic teachers.

Origin: Education Division of the Government of Malta.

Actors involved: Administrators, teachers, learners and parents of primary and secondary schools

Description: Having set up mandatory and voluntary in-service training for regular teachers, as well as a Peripatetic service offering assistance to teachers, the next step for the Education Division (Government of Malta) was to provide online resources for teachers in order to promote the best possible use of the hardware and software available in schools.

As part of the more encompassing website for the Department, the Primary Section has launched its own website, aimed to promote the proper use of ICT across the Curriculum and to serve as a communication link between schools and Department. It contains sections targeted at administrators, teachers, learners and parents. Its highlight consists of a number of ready-made lesson plans covering the use of ICT in all Curriculum subjects. The aim of these lesson plans is to provide class teachers with the necessary material to encourage them to embed ICT into the regular lessons. The lesson plans include various resources created with the software available for teachers. All material can be downloaded and used on the teachers' laptops or classroom computers. The lesson plans were created by the ICT Support and Peripatetic Teachers, and additional lesson plans are being projected.

The ThemePacks concept: This year the Primary Section has also launched the first six of a series of online ThemePacks. Complementing the lesson plans available on the Primary Section website, the ThemePacks are fully-fledged websites containing material based around themes. In this way, online material is available for teachers to use across a number of subjects across the Curriculum. The ThemePacks target different age groups and were created by the teaching staff at the Department as well as class teachers. Apart from providing project and lesson material, the ThemePacks also offer schools the opportunity to communicate with one another on various levels (individual, class, school), making use of the networking and e-mail services available. There are six ThemePacks currently online, and others are being prepared.

Although the launch of the websites is relatively recent (September 2003) there has been a good response and ICT Peripatetic Teachers are promoting the sites and have reported a positive feedback from most teachers.

Websites: The ThemePacks concept: http://schoolnet.gov.mt/primarythemes/

Official website of the ICT Primary Section: http://schoolnet.gov.mt/ictprimary/

Key informant: Lawrence D. Zammit lawrence.zammit@gov.mt

2.9 Educational multimedia contents. Portugal

Key-Words: Development of resources, multimedia contents, online resources.

Origin: Portuguese Ministry of Education.

Actors involved: Teachers and headmasters of primary and secondary schools, developers of educational contents.

Description: The Ministry of Education, through Nónio Programme, has launched calls for proposals to promote the creation and development of educational software and curricula Web contents.

The last set of calls took place in 2001 and financed 14 educational software titles and 37 web projects for primary and secondary Actors involved and for the different areas: biology, history, Portuguese language and literature, natural sciences, environment, chemistry, geology, astronomy, mathematics, ornithology, SNE, museums, music, on-line courses, school Intranets, etc.

The network of Nónio Competence Centres, created to support schools in the integration of ICT, have also produced many educational materials and pedagogical activities in their respective websites. All these resources can be found in Nónio website**.**

Website: http://www.nonioxxi.pt http://www.giase.min-edu.pt/nonio

Key informant: Ida Brandão, Email: ida.brandao@dapp.min-edu.pt

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2.10 Providing quality software. Czech Republic

Besides developing a state wide information and informatics policy in education, the Czech Ministry of Education, Youth and Sports is offering two new services to schools and teachers in order to ensure the use of quality software in the schools.

1) **Evaluation Web**. The software programmes available on the market for schools are of various quality. To assist the schools in acquiring the best quality products, a dedicated web site was opened running a dynamic system of software rating. This rating is based on the following principle. Every product (software) can be registered with the evaluation process by filling in a simple form. Then the submitting party must select two evaluators from the list of certified specialist maintained by the Ministry. Written evaluation reports must be added to the registration as well as opinion of at least of one school already using the particular software. All data are stored and presented so they can be easily understood on the evaluation web. Schools can freely search the evaluation web while planning their purchase of new software for education.

Web: http://web26.e-gram.cz/

2) **Licensing Center**. A small Licensing Center has been operating for over nine years under the House for International Services of the Ministry of Education, Youth and Sports. Its main task is to provide effective and dedicated software supply to the schools. The selected software is offered to the schools under a special contract signed with the particular software wender or its national distributor, as, for example, Novell, Corel, Microsoft, SUN Microsystems, Autodesk and others.

This active software offer is available to the schools on the web although twice a year classical "paper" mail is still sent to all schools. Beside there is once a year a school conference "Networks in Schools" is organised (2004 being the 7th year). The fundamental principle of the Licensing Center operation is to offer to the schools financial conditions not available anywhere else.

By the fact that it is a very small unit (2,5 people on the contracts) it is highly effective and widely used by the schools. During the operation of the Licensing Center, the number of schools-customers has grown to 3500 (this is more than 56% from the total number of schools in the Czech Republic).

Web: http://www.dzs.cz/sm/uvod.htm

2.11 Setting up a Training and Information Center (A Bulgarian project for educational use of ICT in primary and secondary education through collaboration with Dutch experts)

Key-words: Transfer, collaboration, cooperation, training of teachers, adapting methods and programs

Origin: Directorate of Education and Youth Activities of the city council of Dobrich

Actors involved: Teachers, students of schools and kindergartens and city council.

Description: Supported by an enthusiastic mayor and council, the Directorate of Education and Youth Activities of Dobrich, has equipped its 19 schools and 16 kindergartens (13 000 students in all) with 209 computers, giving access to 95% of the students.

However, to cope with the problems brought up by the use of computers in the teaching process, such as the training of teachers, the adapting of methods and programs, and the provision of resources, a Training and Information Center (TIC) has been established, headed by Mrs. Dimitrina Kamenova (director) and Mr. Tzvetan Chernev, ICT-expert.

Two Dutch experts have been associated, within a collaboration project, to transfer their know-how in using ICT in primary and secondary education, establish partnerships with Dutch institutions, and develop projects for EU educational programs. Main activities developed include training of teachers, advice and assistance on implementing training programs and on how to approach EC financing institutions and intensify cooperation with Dutch partners.

Website:

Key informant: s.kantcheva@minedu.government.bg

2.12 "ICT at School": a national online service for facilitating ICT in learning and teaching. Holland

Key-words: Co-operative networks, region, local government, business, ICT expertise.

Origin: The service is run under responsibility of the educational field and funded by the Ministry of education.

Actors involved: Teachers, headmasters and local authorities of primary and secondary schools.

Description: In the Netherlands in 2001 a service has been set up under the heading of "ICT at School". Objectives:

- Making accessible information and expertise in the field of ICT and education.
- Strengthening the market position of schools in the field of ICT.
- Creating and facilitating regional and local co-operative networks between schools, local government, business.
- Promote development of expertise on the integration if ICT in learning and teaching.

The service is run under responsibility of the educational field and funded by the Ministry of education.

It has helped school, especially smaller schools to strengthen their position in ICT-developments, thereby enabling them to make their own choices rather that to follow the routes presented by others.

Website: http://www.ictopschool.net/

Key informant: Ferry de Rijcke< fderijcke@planet.nl>

2.13 The Finnish Virtual University -

Key-words: University, virtual courses, research networks, support services

Origin: The project, based on a collaboration of the 20 Finnish universities, as well as the National Defense College, is financed by the Ministry of Education.

Actors involved: University students and teachers

Description: The Finnish Virtual University launched on 1 January 2000 is a project organization for promoting and developing networking in universities. Most of the activities take place in the universities and in their joint projects. All 20 Finnish universities, as well as the National Defence College, are members of the Finnish Virtual University.

They are jointly developing virtual learning environments. This co-operation will diversify teaching and strengthen research networks. The emphasis is on the educational use of technology in teaching and distance learning assignments. Therefore the emphasis is not only on producing digital learning materials for use in distance education settings, but also on strengthening teachers' capability to plan learning processes, which take partly place in a web-based environment. The Ministry of Education finances the

development projects of the Finnish Virtual University by an annual budget grant of about EURO 9.0 million.

The Ministry of Education finances three kinds of operations for this project:

1. The development unit responsible for co-ordination of the project,
2. University level development work (virtual courses, support services, staff development, information strategies at the university level),
3. Three kinds of networks between universities: the academic disciplines, service projects and regional networks.

Website: http://www.virtuaaliyliopisto.fi/

Key informant: Mr. Hannu Peltola, Finnish Virtual University, hannu.peltola@virtuaaliyliopisto.fi

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2.14 ICT training for unskilled workers:The Belgian Flemish VDAB project "Aangename kennismaking met de computer"

Key-words: ICT skills, worker, e-learning, professional use, key competences.

Origin: The Belgian Flemish Employment and Vocational Training Service (VDAB).

Actors involved: Workers, job-seekers, tutors and trainers.

Description: In the current information society it is crucial that job-seekers and workers be better prepared for the use of ICT in the execution of their tasks and for permanent acquirement of the knowledge and skills that are required for the job (LLL).

The Flemish Employment and Vocational Training Service (VDAB)'s ICT action plan defined in the framework of Lifelong Learning is specifically aimed at this new field of tension on the labour market and seeks to provide a large-scale answer to job-seekers' and workers' rising demand for training as quickly as possible. This can only be realized through efficient use of ICT as such in this training context, in particular for:

- Acquisition of the necessary 'basic ICT skills' on the appropriate level (personal skills or key competencies, functional use in the work environment, professional use in the work environment);
- Extension of the training offer (development of learning material for e-learning, increasing access to this offer in the different training centres);
- Enhancing the learning process as such through multimedia applications;
- Reinforcing individuals' self-activation in the field of lifelong learning (attitude).

The project 'Introduction to the computer' was started on 5 March 2001 in collaboration with the Flemish Minister of Employment, Mr Renaat Landuyt. This project is situated on the first action line and aims at the acquisition of basic ICT skills as part of the personal skills that also include key qualifications like reading, writing and calculating.

In this project, mobile computer networks (learning mobiles) are used to provide the training course at different locations (internally as well as externally). A learning mobile consists of a wireless computer network including a server, portable PCs for the participants (12) and the trainer and the required peripheral equipment such as a modem,

printer and data projector. These components are stored in two mobile racks (flight cases) that can be transported by a small van. There are 14 learning mobiles in total, which allows every LKC (=local service unit, 13) as well as the VDAB centre in Brussels to implement this project in their respective regions. In 2003, there were 8367 participants, 61,8 % of the participants were women, and 45,6 % low skilled.

In 2002 the Flemish Department of Employment has taken the initiative, in co-operation with the Minister of Employment, to increase the awareness of the sector organisations in regard to the need for basic ICT skills within the workforce. As a result of this, several sector organisations have already included the ICT skills as a policy target within the Collective Labour Agreements that have been negotiated since then. Three sectors have already taken steps to organise this training for their workers in co-operation with the VDAB.

Website: http://watis.vdab.be/en/

Key Informant: Gerd Goetschalckx, coordinator of ODL Unit within VDAB:

ggoetsch@vdab.be Tel 32 2 506 04 55

2.15 A flexible, modular proposal for apprenticeship external training. (Italian open learning space and web based information system for apprenticeship in Friuli Venezia Giulia region)

Key-words: Apprenticeship, flexibility, module, open class, information system.

Origin: Organised by the Friuli Venezia Giulia region, through a bid assigned to three different groups of vocational training centres and secondary upper schools; transferred by the Ministry of Labour to Sicily and Sardinia regions.

Actors involved: Apprentices, trainers and tutors.

Description: In order to answer the varied needs of the compulsory training (circa 120 hours per year) linked to apprenticeship contracts, the FVG region has organized, through a bid assigned to three different groups of vocational training centres and secondary upper schools, a flexible, modular proposal for the apprenticeships external training.

The model is based on short training units (16-40 hours) delivered in lessons of 8 hours (a full day) once a week with on "open class" scheme, in which the classrooms groups are not fixed but can change each lesson, through a very flexible planning. That allows the apprenticeship to choose which lesson to participate to, within the planned activities and following a personal training path, which is defined on the basis of his needs in terms of contents (obviously within the available offer) and workloads on the job.

One of the crucial points of this system (that was tested in the 2000-2003 period and now has been replayed by the regional government for the period 2004-2006, becoming a best practice reference in Italy) is the web based information system used by the tutors to manage all the continuous changes this approach generates in the every day activity planning. The system has proved to be very effective, with about 4.000 apprentices accessing the platform at least twice a year for the testing phases.

The web site (see address below) has two parts: information web pages, which are accessible to everybody (and where all the information about the contents of about 600

training units are available for free) and a reserved area accessible only to teachers, tutors, apprentices and clerks.

Being considered a good practice, easily adaptable also to other training situation where the personalization of the training paths is needed, the Minister of Labour financed a best-practice transfer project to the Sicily and Sardinia regions, running right now.

Website: http:// www.apprendistato.fvg.it

Key informant: Gilberto Collinassi g.collinassi@enaip.fvg.it

2.16 Sektornet: supplying all schools with high-speed connections to the Internet and a national electronic conferencing system, SkoleKom. (A Danish example)

Key-words: Internet, high speed connections, conferencing system, security, support network.

Origin: Danish Ministry of Education

Actors involved: Students and teachers of primary and secondary schools

Description: Several years ago the Danish government launched the Sektornet programme supplying all schools with high-speed connections to the Internet and a national electronic conferencing system, SkoleKom, build on FirstClass, and offering an internet mail address to all teachers and students.

The Ministry of Education offered free connection to Sektornet in order to encourage the schools to sign up. Furthermore for the first two years, the Ministry paid half of the subscription fee. The philosophy was to encourage the schools to start using it for education. However the financing was only meant to be a starter. Hereafter the schools could choose to continue to subscribe to Sektornet on marked based conditions or they could select another Internet provider or stop using Internet and ICT. Today about 80% of the schools have a connection to Sektornet.

Today, schools subscribe to this Sektornet service, which competes with other connection providers. UNI-C and regional pedagogical centres comprise a Sektornet support network for the schools, e.g. offering web-based technology support, which is highly appreciated together with its security tools. The services also include e.g. access to national databases (most newspapers, press photos, dictionaries etc.). UNI-C is also offering new types of connections and new services; e.g. the schools can change connection type to ADSL with up to 8 Mbit/s or Fiber with up to 100 Mbit/s. New services such as "home connection", meaning a connection from the teacher's home to both Internet and to the firewall protected net on the school, which makes their daily preparation for the next day education easier.

Marked surveys amongst the schools have been made twice. Both amongst schools still connected to Sektornet, and amongst schools that have decided to leave Sektornet. The schools are very pleased about Sektornet - and those that have left Sektornet are doing this, because the local municipality is wiring up the whole town both for schools, libraries, sports clubs etc.

Website: http://www.uni-c.dk/generelt/english/education/sektornet.html

Key informant: Leo Hojsholt-Poulsen <leo.hojsholt-poulsen@uni-c.dk>

2.17 School networks should support - not annoy teachers: the challenge of installing a LAN to answer pedagogic demands. Germany (Baden-Wuerttemberg)

Key-words: School intranet, technical support, helpdesk, troubleshooting

Origin: Ministry of Education, Youth and Sports Baden-Wuerttemberg, Germany

Actors involved: Primary and secondary schools

Description: In order to foster teaching and learning substantially LANs at school need to be installed professionally whereas in general professional enterprises - which should do the job - have a certain lack of knowledge about the demands of teachers, students, and schools.

Therefore by an initiative of the Ministry of Education in Baden-Wuerttemberg a network-environment has been defined - running on the basis of Novel Netware, Windows 2000 or Linux - which is sensitively adjusted to the educational and organizational requirements of schools providing thus for a standard which is independent of the enterprise which installs and maintains the LAN of a school.

This standard ensures that whoever is in charge for supplying an LAN for a school wherever in the country

- local authorities responsible for the equipment of schools are relieved of design-decisions about the implementation of LANs at their schools,
- professional enterprises can be trained to become "fit for LANs at school",
- in-service-training for teachers can be offered on how to use an LAN for internet-access and multimedia-software in classrooms,
- a central helpdesk can offer teachers support for trouble shooting, and
- the evaluation of experiences at schools can be used for a continuous improvement of the network-environment.

Thus with help of the project "Support-Netz" - carried out by the Landesmedienzentrum Baden-Wuerttemberg - the gap between pedagogical demands and professional technology could be bridged. Moreover "Support-Netz" encourages public-private-partnerships in order to improve teaching and learning by use of ICT offering new educational qualities by means of a new communication environment.

Website: http://www.support-netz.de

Key Informant: Achim Keru: KERN@LMZ-BW.DE

2.18 Attending to the Information Overload: the Slovenian Education Network Services

Key-words: Online catalogues, Catalogue building tool, bulletin board, forum, distance learning

Origin: Slovenian Ministry of Education.

Actors involved: Primary and secondary school teachers

Description: The Slovenian Education Network (SIO) Services are designed to ease the information overload of teachers. At the very heart of SIO are its catalogues of information – different collections of data: interesting websites, educational resources, educational institutions, educational events and more. To take care of it all a new tool has been developed: Trubar - a system of programs for Windows to build, search and maintain the catalogues. Trubar is freely available (see website address below). Applications like Trubar allow online catalogues to run automatically. Even inexperienced users can easily set up a catalogue containing data of their choice on their own server.

The main features are:

- *Ask the experts* – Do you have a technical problem or any other problem you don't know how to solve? Just send us an email on this address zanima.me@sio.edus.si and we will send you the answer as soon as possible.
- Bulletin board – Post any interesting news or questions on the web so everyone else can read them.
- Forum – Do you want to start or join a debate, or simply read up about old debates?
- Distance learning – A collection of educational materials: articles, online textbooks and manuals. You can read about our colleagues' achievements in distance learning

SIO is a member of EUN Schoolnet (www.eun.org) and we are collaborating in different projects on national and international level. Schools and individuals are encouraged to take part in actions like eSchola, Spring Day, Explora and others.

Website: http://www.educa.fmf.uni-lj.si/trubar/

Key informant: "Janez Cac" <janez.cac@gov.si>

2.19 Creation of School Network. Greece

Key-words: Network, teleconference, online resources, teaching scenarios, portal.

Origin: Greek Ministry of Education.

Actors involved: Students and teachers of primary and secondary schools.

Description: By the end of 2003, all the 10,000 Schools and Educational Administrative Units were connected to the Greek School Network (GSN)**,** and an important number of teachers as well. GSN provides ICT-related services, such as e-mail, web mail, caching, proxy, web, access, web filtering, web-page generator, web hosting, discussion forums, school network portal, personal calendar, personal address book, newsgroups, chat, helpdesk, voice over IP, network statistics, etc.

The school network is used by a large number of teachers, students and administrative staff, in order

- To communicate each other by exchanging experiences from the use of educational software in their every day work, scientific articles, exercises, pedagogical scenarios,

- To be informed from several web sites about their individual subject they teach (physics, math, language, history…),
- To be informed about administrative subjects,
- To download scenarios of educational use of ICT in their every day lessons, etc.

Also, advanced services such as teleconference, asynchronous open distance learning and Video on Demand should be provided in the coming months, in order to facilitate the work of Greek teachers.

Development of educational software titles and tools has already started and will be boosted by a new grant of 7.500.000 € for the production of new educational titles. The educational software is already distributed and will be used by the adequately trained teachers.

The daily teaching scenarios are begin to change in order to embedded educational software, related web sites, the use of ICT. A portal has been designed and is available. The visitors can be informed, participate in forums and get help and support on teaching with the use of ICT with the use of the produced educational software.

The majority of teachers of Primary and Secondary education have already been trained on ICTs. Consequently the trained teachers will obtain a skill certification. All participants have been endowed for the purchase or the upgrading of their personal computer systems.

Website: http://www.e-yliko.sch.gr

Key informant: Matzakos Petros <petros@kee.gr>

2.20 SIO - the Slovenian Education Network -

Key-words: Educational network, online catalogues, educational resources, bulletin board, forum.

Origin: The Slovenian Ministry for Education, Science and Sport,

Actors involved: Pupils, parents and teachers of primary and secondary schools

Description: SIO - the Slovenian Education Network - was founded in 1995 with the aim of providing public access to individual educational servers and the material they offer. Users need a safe online environment they can trust and we strive to create one.

Goals and Objectives:

- quality educational resources and activities in our mother tongue
- efficient technical support
- co-ordination with users and supporters
- collection and analysis of data regarding the use of our services
- promotion and animation

SIO can be used for a number of different activities. Pupils, teachers, parents and others can:

- communicate on a national and international level with colleagues, by joining projects and forums
- present their school's activities by publishing their websites

- search educational resources (information and material) and offer their own
- learn or teach from a distance.

SIO Services: Information Overload. At the very heart of SIO are its catalogues of information – different collections of data: interesting websites, educational resources, educational institutions, educational events and more. To take care of it all we developed Trubar - a system of programs for Windows to build, search and maintain the catalogues. Trubar is freely available. Applications like Trubar allow online catalogues to run automatically. Even inexperienced users can easily set up a catalogue containing data of their choice on their own server.

Features

- **Ask the experts** – Do you have a technical problem or any other problem you don't know how to solve? Just send us an email on this address zanima.me@sio.edus.si and we will send you the answer as soon as possible.
- **Bulletin board** – Post any interesting news or questions on the web so everyone else can read them.
- **Forum** – Do you want to start or join a debate, or simply read up about old debates?
- **Distance learning** – A collection of educational materials: articles, online textbooks and manuals. You can read about our colleagues' achievements in distance learning

SIO is a member of EUN Schoolnet (www.eun.org) and we are collaborating in different projects on national and international level. Schools and individuals are encouraged to take part in actions like eSchola, Spring Day, Explora and others.

Website: http://sio.edus.si/english.htm

Key informant: Janez Cac, Information Techonology Service,
E-mail : janez-cac@gov.si

2.21 ICT ABC for school leaders. (A Norwegian service built on a guidance package to enable schools to develop their own ICT strategy).

Key-words: School management, strategy support, ICT infrastructure**.**

Origin: Norwegian Network for IT Research and Competence In Education

Actors involved: Primary and secondary school administrators

Description: ICT ABC for school leaders is a service based on experiences and results from 5 years of R&D work in Norway. The ABCs of ICT is a national school development project intended to help schools in Norway to have an approved ICT strategic plan and is aimed at school administrators who want their schools to develop positively with the aid of ICT.

ICT ABC builds on an ICT strategy package for primary and secondary schools (the ICT ABC) set up by the Norwegian Network for IT Research and Competence In Education (ITU) and Making Waves. The school leaders use written material, participate in workshops and online discussions. The ICT ABC covers and develops strategies in five main areas: 1) ICT integrated in the learning process and environment, 2) development

of teachers' competence, 3) pupils' ICT competence, 4) organisation and adaptation, and 5) infrastructure and basic software.

The ICT ABC is based on a practical and pragmatic approach to strategy work, and it helps schools in their efforts to prepare their own ICT strategies, which are adapted to their own location conditions. It includes examples, templates and checklists that can be used throughout the process, and helps the school to work with ICT in a comprehensive and systematic manner. Its use should result in a better utilisation of the schools' ICT resources and an increase in the quality of the education by means of ICT in the long term.

Website: http://www.iktabc.no/

Key informant: vibeke.klovstad@itu.uio.no

2.22 Nónio Competence Centers (Portuguese educational centers acting as research units with expertise in the pedagogical integration of ICT and as advisors of schools to implement projects based on ICT.)

Key-words: Competence centers, research, support, training, resources production.

Origin: Prospective Evaluation and Planning Dept of the Portuguese Ministry of Education.

Actors involved: Teachers of primary and secondary schools and of Special Needs Education Associations.

Description: Building on a previous Minerva programme, the ICT Competence Centres of XXI Century Nónio Programme were certified by the Ministry of Education in 1997/98 and have been active since then. The mission of the ICT Competence Centres is to act as research units with expertise in the pedagogical integration of ICT and as advisors of schools to implement projects based on ICT.

The Nónio Competence Centres were certified in 1997 and 1998 (27 Centres) through a public call for proposals and their activity is monitored yearly. On the whole, the Competence Centres have supported circa 800 basic and secondary schools, around the country.

The Centres emerged as a central initiative of the Ministry of Education (Prospective Evaluation and Planning Dept. – programme Nónio XXI Century) but their activity was autonomous within the responsibility of the institutions certified. The nature of the centres is diversified - located in Teacher Training Centres, in Universities, in Polytechnics, in scientific societies, in special needs education institutions, etc. - and their expertise can focus on specific subjects (Maths, Biology, etc), on a more general support to schools; on training and on general support to schools; on subjects such as Physics and Chemistry or Special Needs Education Associations, while other ones would support, on a larger scale, primary schools.

The Competence Centres received both human and financial resources: they were financed to start-up and teachers were detached to constitute the respective teams. The number of teachers was determined according to the number of school projects they were in charge to supervise. The network of Competence Centres was distributed throughout

the country with predominance in the West coast, which follows the demographic trends of the country.

The best achievement has been to guarantee a network of experts with a field knowledge regarding the problems of schools, with the full capacity to give a quality contribution to the integration of ICT in Education.

Website: http://www.nonioxxi.pt

Key informant: Ida Brandão <ida.brandao@dapp.min-edu.pt>

2.23 KICK Competence and information centre. (Swedish help programme, providing service to teachers and headmasters concerning development of competence)

Key-words: Service, support, competence, remedial education, special needs, teacher training, reflection**.**

Origin: Centre run by the city of Kristianstad, Sweden**.**

Actors involved: School teachers and special needs teachers.

Description: KICK (Kunskaps-och informationscentrum i Kristianstad) is a competence and information centre in Kristianstad, a town in the south of Sweden of about 75 000 citizens, and 16 school areas. KICK is a part of Child care and school –administration, and our main task is to give service to teachers and headmasters concerning development of competence.

Development officers conduct activities in KICK including remedial education, education of mathematics, English, education of teachers that work with children who have dyslexia, pre-school education, how to use ICT as a pedagogic tool in teaching, use of school libraries, and nature school.

The development of one's competence is a process that takes time. It has to start in the teachers own experience and really concern him/her. Reflection is an important part of the development of competence into a new practice.

Website: http://www.buf.kristianstad.se/kick

Key informant: Susanne Dondesson, educational coordinator KICK
kick@utb.kristianstad.se

2.24 Simulation game: Hiking across Estonia, an online multimedia simulation for school teams.

Key-words: Problem solving, inquiry learning, web-based simulation, environmental education

Origin: Pedaste, M., Hallik, K., Sarapuu, T. Science Didactics Department, University of Tartu, Estonia

Actors involved: Students from the 7th to the 12th grade (aged 13-18)

Description: Hiking across Estonia is an online multimedia simulation environment for school teams, applicable also individually. Service has been developed experimentally

(within the framework of two MSc theses) and is provided by the University of Tartu. Well-designed learning environment, every-day problem-based inquiry learning, very popular among the students of Estonian schools: in 2001, 2002 and 2003, more than 2600 primary and secondary school students in 300 teams took part in this simulation competition. During the simulation students virtually hike in various ecosystems of Estonia, they have to find and analyze scientific information in order to solve every-day environmental problems. Learning environment is also applicable individually, with other problem-solving tasks, and in different languages.

Website: http://bio.edu.ee/tour/

Article: Pedaste, M., Sarapuu, T. (2003). Developing students' problem solving skills by learning simulation "Hiking Across Estonia". Proceedings of Sixth International Conference on Computer Based Learning in Science, July 5-19, 2003, Nicosia, Cyprus.

Key Informant: Margus Pedaste, E-mail: biodida@ut.ee

2.25 Viten 2: Norwegian Web-based Inquiry Science Environment - develops science education materials combined with classroom evaluation studies.

Key-words: Content service, web based material, science, curriculum valid**.**

Origin: University of Oslo and Norwegian University of Science and Technology.

Actors involved: Teachers and students of primary and secondary schools.

Description: Viten 2 is a project originating within the interdisciplinary research programme: Digital Learning Arenas (DLA). The aim of DLA is to develop digital literacy and to contribute to a qualitative improvement in the production of digital content and services. DLA also stimulates the development and production of rich interactive digital learning environments within the framework of the national learning network.

Viten 2 programs are generally aimed at junior and senior secondary science teaching. Typical programs place students in cases where they need to learn fundamental concepts of science before solving a problem. Students work together at computers to maximize the opportunity for talk and collaborative work. The Gene technology program is one example of how Viten programs are created, implemented and researched. This program was developed by a team of experts representing science education, biology, science teachers, students and experts on the public understanding of issues in this area. The program was designed and written within a 9 month period and launched in January 2004. One doctoral student and one master degree student have been involved in implementation studies together with science educators from the University of Oslo. As of February 2004, there are 133 teachers and 2500 students using the program in Norway.

Our research model looks at learning goals of the program and compares these with pre and post test results. The Viten server records student work so that student answers may be analyzed. Video of lessons is taken and studied to learn about collaboration and talk while working with Viten. Finally an off line debate/role play where students are for or against the use of genetically modified plants in Norway is video taped and analyzed for use of science concepts and understanding of a controversial topic (life-long learning skills). Results from these studies inform the development/revision process as necessary.

The first Viten program was launched in January 2000. As of February 2004 there have been 30.000 registered students and 4850 teachers using Viten programs.

Viten programs have been translated into Danish and soon to Swedish. New funding will make it possible for Viten to look critically at compatibility issues related to the sharing and reuse of learning objects. We hope to make parts or entire programs accessible to other countries and languages as a result of this new line of research.

Viten2 is a research and development project, supported with national funding (Norwegian Network for IT Research and Competence in Education) and located at the University of Oslo and The Norwegian University of Science and Technology.

Website: http://www.viten.no/

Key Informant: doris.jorde@ils.uio.no

2.26 Sharing information to build a community: the Digital Class Book, a Hungarian online database project

Key-words: Community building, online results, ICT skills, parents, administrators, database.

Origin: Project of the Városmajor Secondary Grammar School, Budapest.

Actors involved: Students, teachers, parents and administrator of the Városmajor Secondary Grammar School, Budapest.

Description: Making students and their parents as well as teachers aware of (knowledge) community building potentials of the Information Society and providing a shared information and communication platform for them to get used to these potentials is the aim of the Digital Class Book (DCB) Project of the Városmajor Secondary Grammar School, a high quality educational institution in a well-to-do district of Budapest. Parents here are extremely busy professionals who, however highly they value the role of education for the future of their children, have very little time to devote to school affairs. In turn, teachers of this school are devoted to education not just teaching and need a detailed and prompt feedback on the development of their students and comparative data of disciplines and classes they teach. Students, targeting highly competitive Hungarian universities, also want up-to-date information on their results and the history of their accomplishments.

The Internet-based DCB, with its hierarchy of access rights, serves all these needs without violating privacy rights. Teachers are obliged to enter daily assessment and end-of-topic test results within 24 hours in the system and obtain detailed statistics on the performance of a student, a class or a grade (age group) in one or several disciplines. Students and parents can monitor notes and compare them with class or grade averages or yearly individual development. Absences are kept track of on an hourly basis, so parents are soon alarmed when their child does not show up at school. The database is extremely popular also among school leaders and administrators as it yields centrally required, complex statistics in the matter of seconds. All user groups are highly motivated to make daily use of ICT and thus acquire skills needed for citizens of the Age of Information.

Website:

Key informant: “Andrea Karpati" <karpatian@axelero.hu>

2.27 Centres for the Validation and Certification of Basic Competences (CRVCC). Portugal.

Key-words: Basic competences, certification, ICT skills, lifelong portfolio, validation

Origin: Portuguese Ministry of Education and Ministry of Labour

Actors involved: Adult population and adult trainers

Description: The Ministry of Education together with the Ministry of Labour have launched a national system for the acknowledgement, validation and certification of basic skills, creating a network of Centres (about 60), aimed at the personal development, citizenship and employability of the adult population that has not completed compulsory schooling, giving the opportunity to certificate the competences acquired all through their lives or to complete training in order to get the respective certification. Professionals at these Centres help people to identify their lifelong experiences, professional know-how and self-training, constituting a «lifelong portfolio» that is, later on, validated and certified. They also provide training according to the individual needs for certification requirements. ICT skills are considered among the basic skills.

Website: http://www.dgfv.min-edu.pt/frames/ic_centros_1_f.htm

Key informant: email: dgfv@dgfv.min-edu.pt

2.28 Basic ICT education in the form of e-learning from the Online School. (A Danish example)

Key-words: Online learning, ICT competences, vocational training

Origin: Danish Ministry of Education

Actors involved: Young and adult trainers, secondary school students

Description: The Online School is an e-learning environment, which provides complete web-based e-learning material of basic ICT competencies (ECDL level) via the Internet. The e-learning environment is qualified and challenging with problem-based electronic learning objects and contains a large number of visualizations as well as test, tasks, guiding solutions and instructions. Furthermore, the Online School provides possibilities for registration and reporting as regards the progression and test results of the participants.

The Online School is used broadly at the vocational schools so that the students can acquire the necessary ICT competencies independently. Some schools have integrated the material as part of the curriculum, while other schools provide the material as a supplement to the curriculum.

In vocational training the Online School is used as a supplement to teacher-supported training. The students use the Online school at home for further training. The material is especially suited to adult students with weak points, or who feel that they are lagging behind in relation to the rest of the class.

At commercial upper secondary school the Online School is integrated in the training of the Information Technology subjects. The Online School is typically introduced by an

instructor, after which the material is offered to the students for independent study as a supplement to the training, which is especially suited to the weakest students.

At a number of short-cycle higher education courses basic ICT competencies are part of the ”compulsory qualifications”. As the students have extremely varied qualifications there is a need for differentiated options. To those, who do not possess the qualifications the Online School is provided as a possibility for independent study – for example at an Open Learning Centre with the aid of an instructor. The Online School provides those who are not so skilled with regard to ICT with good basic knowledge, and at the same time it is an effective and cheap training solution.

At many training centres the ICT training is carried out as a mixture of traditional teaching combined with independent study by means of teaching material from the Online School among others, where the visualizations provide a different kind of introduction of specific topics especially to students with a need for non-bookish learning methods.

The Online School is developed with support from the pilot study and development funds of the Danish Ministry of Education and is operated by @ventures, The Competence Centre for e-learning at Aarhus School of Commerce.

Key informant: Leo Hojsholt-Poulsen <leo.hojsholt-poulsen@uni-c.dk>

2.29 Emu.dk

Key-words: Teachers training, ICT application in school

Origin: Danish Ministry of Education

Actors involved: All groups of teachers, except universities

Description: A new site is created on the basis of interaction which focus on actual themes concerning IT as pedagogical tool in teaching. By focusing on five or six themes the site intend to be more specific in its approach and avoid accumulation of information. Main subject is to share information on best practice and show concrete examples as well as to qualify the discussion about the use of IT in teaching – for all groups of teachers on all levels excl longer university studies.

Key informant: Leo Hojsholt-Poulsen <leo.hojsholt-poulsen@uni-c.dk>

2.30 Quality assurance and access to information (Denmark)

Key-words: Quality, quality indicators, vocational training

Origin: Danish Ministry of Education

Actors involved: vocational colleges

Description: All colleges are obliged to establish a quality system for quality improvement and the achievement of the education processes. In the quality framework the vocational colleges must establish procedures for self-assessment covering

strategically selected fields have to be answered. In principle, these questions cover all school activities that are critical to quality assurance. In order to give an answer to these questions, the colleges must have a clear plan and systematic methods to respond to changing demands and publish a follow up plan on the college web.

Today, all vocational colleges in Denmark have quality assurance system which focus both on the input, process and output aspects.

It is neither possible nor desirable to prescribe a top-down fixed and final concept of methods, objectives and values for vocational education and training. Only guidelines are provided.

Quality assurance programmes in the VET sector are constantly intensified. Benchmarking is implemented at national level, increased emphasis is put on quality control of output, and external auditing is used as instrument for monitoring. At present, performance parameters are under consideration.

In order to assure openness and access to information the Parliament passed a law which introduce certain standards for informing the public on the collesges web site about the institutions supply of education, teaching activities and students results etc.

Key informant: Leo Hojsholt-Poulsen <leo.hojsholt-poulsen@uni-c.dk>

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3 RD RECOMMENDATION: EMPOWER EDUCATIONAL ACTORS AND TRAIN FOR THE MANAGEMENT OF CHANGE

The following 23 examples are particularly interesting cases of training programmes that are attaining empowering objectives and have been much appreciated by the learners involved.

3.1. Strategic action plan for the integration of ICT in schools (2002-2010). "Plan d'action de la charte d'avenir" and FORM@HETICE (French Belgian Community)

Key-words: Teacher education, pedagogical practices, collaborative working sites

Origin: French Belgian Community

Actors involved: Students and teachers of the French Community Schools

Description: The ICT integration policy in the French Community schools has been initiated in order to provide teaching teams with a supplementary teaching tool and to promote equal chances and access to all students. From the beginning, the long term educational objectives have been taken into account especially with the need, as one of the conditions to be met by schools wishing to obtain IC technology, to assign, in their educational project, the uses of ICT to the top priority missions as stated by the French Community (Décret mission du 24 juillet 1997). School directors also had to commit themselves to facilitate for teachers ongoing ICT training for pedagogical uses.

The « *Plan d'action de la charte d'avenir* », adopted February the 7th 2002 by the government, includes the integration of ICT in schools up to 18% of available means concerning the priorities in compulsory schooling. In order to attain the 2010 objectives, the government then adopted in July 2002 a strategic plan for ICT integration into schools comprising four main axes and forty-eight measures.

An example of a concrete measure linked to the action plan is measure 22 which aims at developing a permanent training project for student-teachers trainers (FORM@HETICE) and consists in providing student-teachers, from twenty-three "Hautes Ecoles" (high schools) pedagogical departments, with the means to exploit educational ICT in their classes.

The training mechanism set up rests on several options as regards training teachers for the educational use of ICTs:

- Articulate practice and training in the context of projects, experiments, analysis and evaluation, in close collaboration with peers and experts in and out of the institution;
- Apprehend ICTs as tools for mediating the construction of knowledge, i.e. as supports to build learning processes, take into account the learner, his/her project and his/her peers. An information and dissemination platform has been developed with this vision in mind;

- Take ‘learning about ICT’ as functional activity, which should be connected with educational activity and contextualized projects, while stressing the need for collaborative approaches;
- Rely on the teachers' network as the place for providing “keys” or kind of “opening doors tools”, building on common reference, shared representations of new practices and integration of these to existing practices and institutional contexts;
- Envisage the role of the teachers' trainers like coaches.

The project includes the development of "collaborative working sites" which provide teachers with the opportunity of discussing ‘mass media-related’ issues or subjects which are part of the teachers' initial education. This involves team work, common reference frameworks, sharing of experience (www.det.fundp.ac.be/tice/groupes/index.html).

Website for more details on this project: http://www.det.fundp.ac.be/tice2003/

Website for more details on the strategic plan:

http://enseignement.be/prof/dossiers/tice/cf/index.asp

Key informant: etienne.gilliard@cfwb.be

3.2. Ope.fi: Finnish national program to improve the ICT skills of all teachers, organized in three levels of competencies: basic ICT skills, educational use of ICT skills and advanced use of ICT in education and organisational settings skills.

Key-words: ICT skills, educational ICT, organisational skills, in-service, teacher training, pedagogical use.

Origin: Program launched in 2000, by the Finish Ministry of Education.

Actors involved: Teachers in pre-schools, comprehensive and upper secondary schools, vocational education and adult education institutes.

Description: In year 2000, the Finnish Ministry of Education launched a program called Ope.fi in order to improve the ICT-skills of the whole teaching personnel. The skills taught in the program have been divided in three different phases (levels).

The first phase covers the basic mastering of ICT-tools and it is extremely important for the equal standards in teaching the youngest pupils. Their basic knowledge of ICT must not be different depending on the region where they live or the abilities of the teachers in ICT.

The second phase covers the pedagogical and technical level needed by the schools and networks of schools. The education at this phase addresses the differentiation of educational needs along with the deepening and diversification of pedagogical use.

In the advanced level (phase III) the in-service training will facilitate the revision of development strategies and curricula in the educational establishment.

The Finnish National Board of Education (NBE) has started a sub-program to improve the teacher skills of ICT (Phase I). It covers the teachers in pre-schools, comprehensive and upper secondary schools, vocational education and adult education institutes. In the program a teacher will be tutored by his colleague in the same school and by the same

ICT-tools he uses in his normal working life (peer tutoring). The tutors participate in an extensive training programme that gives them good pedagogical and technical abilities. NBE finances the training of the tutors. Training of tutors is further co-ordinated by OPEKO Training Centre and it is provided by different training organisations around the Finland. NBE also gives extensive financial support to the local authorities participating in this project. In addition NBE has released different teaching materials to support the project. It is distributed free via Internet for all participating individuals. The tutors have their own special edition where they can get more information for their work. Training material includes texts, pictures, ICT simulations, exercises, and a self evaluation section.

Website:

Key Informant: Jouni Kangasniemi jouni.kangasniemi@minedu.fi

3.3. Pedagogical ICT Licence and its superstructures (A Danish national teacher in-service training programme)

Key-words: ICT skills, pedagogical ICT, facilitator, media literacy, special needs, resource persons, teacher training.

Origin: Danish Ministry of Education.

Actors involved: Teachers in primary and lower secondary schools.

Description: Building on a confirmed training programme, the Pedagogical ICT Licence, the Danish Ministry of Education is now proposing "superstructures" in the form of ICT "Themes" and "Facilitator" training. The superstructures to the Pedagogical ICT Licence target experienced teachers, taking their point of departure in the everyday practice of the teacher.

The Pedagogical ICT Licence is a basic course in the pedagogical ICT implementation in teaching and learning. It covers four compulsory areas: texts and the writing process, Internet, communication and collaboration, and school innovation plus four optional modules. By February 2004, 55.000 teachers had already attended this course, e.g. more than half of all Danish primary and lower secondary teachers have completed it. Of course this highly impacts the general level of teachers' pedagogical ICT skills. Once a teacher has completed this course, she may wish to sign up for broadening or complementing her pedagogical ICT qualifications on one or more themes of special interest. This demand has resulted in creating two superstructures to the Pedagogical ICT Licence: Pedagogical ICT Themes, and Pedagogical ICT Facilitators.

Pedagogical ICT Themes: A theme consists of 2-4 modules within a defined area, e.g. Students with special needs, Pre-school, Media literacy, The international perspective, Evaluation and assessment, Producing multimedia, Communication and collaboration, or it focuses on a specific subject, e.g. Mathematics and Mother tongue. The teacher joins a team, and this team work together on the assignments of the theme modules, tutored by electronic communication with their facilitator/trainer. The target group for Pedagogical ICT Themes are teachers who are interested in applying ICT in education want to expand their knowledge and proficiency. They might wish to embrace new skills areas such as ICT and special needs or computer games and informal learning.

The Pedagogical ICT Facilitator course is flexible both in level and in subject matter, depending on the optional part of the Pedagogical ICT Licence the teacher has focussed

on: ICT and learning, curriculum aspects, learning resources or on ICT for children with special needs. The target group for the Pedagogical ICT Facilitator course are teachers who will become pedagogical ICT resource persons in their school. Their future task will be to support and promote the application of ICT in teaching and learning among their colleagues. They will mentor and facilitate in online collaboration areas in the school, they will hold work shops for colleagues introducing new learning technologies and digital resources and they will man the media centre assisting both colleagues and students in the use of the Internet for research purposes.

Website: http://www.school-ict.org/

Article: http://www.eun.org/insight-pdf/Denmark_Pedagogical_ICT.doc

Key Informant: "Leo Højsholt-Poulsen" <leo.hojsholt-poulsen@uni-c.dk>

3.4. Going beyond basic computer courses and supporting the quality use of ICT in schools. Estonian in-service training programme for teachers.

Key-words: In-service, teacher training, ICT application in school.

Origin: Tiger Leap Foundation, Estonia.

Actors involved: Kindergarden, primary, secondary and vocational school teachers.

Description: Tiger Leap Foundation is running in-service training programme for teachers. The training is carried out in more than 50 regional centres and is free for teachers and schools. From 2001 on, the Tiger Leap Foundation stopped organizing basic computer courses and started supporting the training of teachers and school managers of general education schools in information and communication technology (ICT) in compliance with the objectives of the national ICT strategy for schools.

The training is based on a 40-hour course, which allows to take the quality of ICT use in school to a higher level. The course includes the following topics: study material and creation of web pages, use of the internet resources as well as educational and standard software, the possibilities involved in e-mail and ICT use in administration of class work. The course is suitable for Estonian teachers as well as for school managers, enabling them to elaborate their knowledge in ICT application in school.. Programme will be closed in the end of 2004, more than 10 000 (out of 17 000) Estonian teachers are expected to pass the programme by this time.

Website: htttp://www.tiigrihype.ee/eng

Key Informant: Eve Külmallik, E-mail: eve@tiigrihype.ee

3.5. Teacher' Computer Literacy (Educational Part) Lituania

Key-words: Computer literacy, teaching software, didactics, ethics, educational use, distance education

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Origin: Training approved by the Minister of Education and Science of Lithuania on December 2001.

Actors involved: Teachers of secondary schools.

Description: Teachers' Computer Literacy Standard (hereinafter referred to as Standard) is the educational part of a standard training. It completes a more technology-focused part which is based on the computer driving licence. It focuses on the concept of ICT implementation in education: didactic regulations of teachers' professional development; requirements to know how to implement ICT in the educational process; understanding of the social and ethical peculiarities of ICT as well as abilities to use teaching software.

It is focused on four main qualifications:

- To be able to use ICT in the educational process.
- To be able to systematically educate their own and students' information culture.
- To know the methods of professional competence improvement by using ICT.
- To know the main forms of educational information development and dissemination on the Internet as well as the importance of these activities.

Each one of those qualifications refers to several specific skills, such as taking into account the social and ethical peculiarities of ICT in pedagogical activities, or implementing ICT when educating children with special needs. The Teachers' Computer Literacy Standard (educational part) is realized by the distance learning course prepared by the group of experts of ITC. The course is produced for teachers all over Lithuania with the help of Vilnius Distance Education Study Centre at Vilnius University. The content of the course is available via the Internet learning environment (WebCT).

About 50% of teachers of 9-12 grades had achieved, in 2003, the requirements of the Standard, and all of them were trained through online courses.

Website:
http://www.ipc.lt/english/apie/skelbiami_dok/teachers%20computer%20literacy%20standard.doc

Key Informant: vainas@ipc.lt

3.6. Distributed learning – computers in teaching. Mixed training offered to teachers. Iceland

Key-words: Distributed learning, distance education, interactive training, online resources, projects.

Origin: Course offered since the year 2000 by the Ministry of Education, in cooperation with Continuing Education Center of the University of Iceland,

Actors involved: Teachers in upper-secondary schools.

Description: From the year 2000 the Ministry of Education in Iceland, in cooperation with Continuing Education Center of the University of Iceland, has offered teachers in upper-secondary schools a course called *Distributed learning - computers in teaching*. The course is 60 lessons and aimed at teachers that want to be acquainted with new opportunities in teaching and learning, like distributed education with wider use of

information and communication technology (ICT). The main goal of the course is to introduce pedagogy of the Web and new ideas of computer use, WWW and ICT in education. The main themes are: distributed education, distance education, Internet in teaching, interactive training, Web based study material, infrastructure and management of ICT in teaching and learning.

The course is offered at one school at a time and the plan is different for each school, but mainly 3- 6 meeting (for 1- 4 lesson hours) of lectures and discussions about the main themes, chosen by each school. These courses are organised through a distributed learning model so that participants meet for a period of time, but the course is provided through distance learning on the Internet. In between meetings participants use the internet to work on projects related to computer based teaching. Emphasis is on projects that help teachers relate ICT to their own teaching and also give them the opportunity to try in person how it is to study in distributed education.

Website:

Key Informant: arnor.gudmundsson@mrn.stjr.is

3.7. "ICT Support for Learning and Teaching": An online master program for teachers. Stockholm Institute of Education, Sweden.

Key-words: Collaborative learning, ICT platform, teacher training, online courses, flexibility, pedagogical use.

Origin: Set up by the Stockholm Institute of Education, in cooperation with the Scedish phone company Telia.

Actors involved: Teachers of primary and secondary schools.

Description: Initiated by a follow-up course in answer to teachers' requests, "ICT Support for Learning and Teaching" has now become a full fledged training program with a specific ICT platform (Free Access) for collaborative learning. Asked to integrate ICT into their teaching activities, teachers became very much interested in learning more about ICT and getting a deeper understanding of aims and content. Mostly, they wanted to work with and develop ICT-pedagogic matters and issues from the perspective of their own experiences, environment and school.

The first course proposed got an immediately enthusiastic response with 60 (!) teachers as students. Today more than 1200 teachers have participated in the program and in Sweden this is a remarkably high figure. The first group hadn't finished before many others where asking for new courses.

A second course targeted group managers and teachers in the same school. They asked to form teams who wanted to run developmental projects with support of ICT. The feed back from the brave managers who "dared" to attend the course was very positive.

Soon a fully academic 40- points program "ICT Support for Learning and Teaching" was designed to answer participant demands. The program is a distance-administered course with only two physical meetings in classrooms in each course. Most of the activities, teaching/learning/asking/answering/discussing/arguing etc is taking place on the web on a special web platform.

For these studies there are very systematic instructions about participation, content and examination. The web-platform is developed in cooperation with the Swedish phone company Telia. The name of the platform is "Free Access" and it really supports *collaborative learning*. On this platform there is a possibility to perform seminars, teamwork and individual studies. Every single student has the access to all other students' folders which creates the opportunity to great flexibility in time, space and content.

Website:

Key informants: Lars-Erik Bjessmo PhD, E-mail: lars-erik.bjessmo@lhs.se

Ulla Karlsson, E-mail: ulla.karlsson@lhs.se

3.8. PROF2000 – A Portuguese On-line Network of in-service teacher training services.

Key-words: Teacher training, distance education, Internet, online courses, network, virtual training website

Origin: Ministry of Education, Portugal, working through the Regional Education Dept. /DREC.

Actors involved: Teachers of elementary, secondary and upper secondary school

Description: Prof2000 is a national network for teacher training and distance education through ICT and the Internet. It started by the end of 1998 as an outcome of the participation of Portuguese organizations in one European Project - TRENDS (1996-98). The Ministry of Education, through the Regional Education Dept./DREC, manages Prof2000 network, which gathers 38 Local Teacher' s Training Centres and 98 schools (elementary, secondary and upper secondary schools). A central node (Training Centre) gives guidance to the Local Teacher Training Centres and delivers online courses (54 in 2002) to teachers. This central node also supports, technically and pedagogically, activities based on ICT held in Prof2000 schools. Each school has a teacher shifted to work in the programme to raise awareness for its objectives and to work with their peers engaging and preparing activities addressed to students from every Portuguese school.

Prof2000 provides the potential to:

- Work and cooperate at distance;
- Give opportunities to take part in wider range on training opportunities;
- Identify good practices of effective learning through its usage;
- Contribute to develop technical and pedagogical ICT skills on teaching;
- Contribute to integrate ICT in school workflow
- Use Internet as a resource to teaching and learning

Teacher training activities are specially designed to be held online. Each training course/workshop has a set of assignments and activities to be conducted by the trainees attached to it. The Local Teacher Training Centres also provide external teams to assess the quality of the training.

At a central level, all the data related with the demanding of training, the number of hits to the "virtual training website", etc. is collected. Surveys aimed to Schools, to the Local Teacher Training Centres, to Trainers, to Trainees and to School Leaders are also held.

The main pedagogical results of this network are:

- The growth of the Programme with the enrolment of new schools every year;
- All the documents produced during training are published online and they address learning subjects;
- The number of school projects based on ICT in the schools taken part in the Programme has increased;
- A few number of virtual communities started as an outcome of teacher training experiences;
- The development of school websites with services for the local school community;
- The development of Instructional materials for students to support classroom activities;
- The increasing number of schools enrolled in Prof2000 in activities based on ICT.
- 11 000 users registered on Prof2000 website and 3200 trainees (1997-2002)

Web page: http://www.prof2000.pt

Key Informant : Carlos Gouveia, E-mail : prof2000@mail.prof2000.pt

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3.9. Teacher Training in ICT. Italy.

Key-words: ICT skills, Teacher Training, in-service training,

Origin: Italian Ministry of Instruction, Universities and Research

Actors involved : Primary and secondary school teachers

Description: Initial teacher training in ICT was introduced in Italy in 1999. Up until now it has not been compulsory to train future teachers on the use of ICT, but debate and thinking now address this matter. Teachers are hired following a public and official competition; ICT skills are not mandatory, but are welcomed and win additional points. In the absence of initial training, particular importance is given to in-service training in Italy.

In the school years 1999/2000 and 2000/2001 INDIRE (National Institute for Documentation of Innovation and Educational Research) in the framework of the former PSTD program, managed the national initiative for training of 'funzioni obiettivo teachers', organizing a complex mix of face-to-face and distance training courses, web activities and resources (50,000 teachers for the 1999/2000 school year and 40,000 teachers for the 2000/2001 school year). This initiative has been repeated in 2001/2002 to manage the training of 64,000 newly employed Italian teachers.

The global project for the teachers from 2001 onwards is called 'CRUSCOTTO TEACHER' and entails access to teaching schedule via Internet, communication functions with students and families (via e-mail or SMS), access to e-learning features and didactic programs, software, lecture notes written by other teachers (via authentication),and purchase agreements for schools and teachers. (http://www.istruzione.it/innovazione/progetti/posta.shtml).

In 2002 the Ministry of Education started a wide-ranging 'E-Learning blended' course addressed to 160,000 teachers called FORTIC, and which trained three types of teachers: a) average teachers, only 'ICT users'; b) coordinators for the didactical use of ICT in the school; c) teachers in charge of ICT infrastructure at school. (http://www.istruzione.it/innovazione/progetti)

FORTIC includes courses (traditional and distance courses) and training on the didactical use of ICT. They are carried out by different partners: schools and school networks, Regional Directions, Research Institutes and Universities, national (INDIRE - National Institute for Documentation of Innovation and Educational Research, INVALSI - National Institute for the Evaluation of the Education System- and regional agencies (IRRE- Regional Institute for Educational Research) and other partners.

Web page: http://puntoedu.indire.it/, http://www.indire.it/multimedia/, http://monfortic.invalsi.it/)

Key Informant : : Giuseppe Marucci, e-mail: giumaru@tin.it

3.10. WebLOTSEN (WebGUIDES): Empowering teachers touse ICT in the classroom. Germany

Key-words: Teacher training, internet, pedagogical use, mobile network, ICT competencies.

Origin: Training done by the mobile training team of Schulen ans Netz.

Actors involved: Primary and secondary teachers, and teacher trainers and disseminators**.**

Description: The WebLOTSEN (WebGUIDES) is Schulen ans Netz's mobile training team. The team travels all over Germany giving teacher training seminars in the use of new media. Its main focus is the school-related use of the Internet– whether it's for lesson preparation, exchange with colleagues or work in the classroom.

At the beginning of 2004 the work of the WebLOTSEN team entered in a new phase. Whereas in 2002 und 2003 training was provided directly to individual teachers, nowadays the focus is on "training the trainer". At this aim the team cooperates with different institutions such as the media centres of the German federal states or institutions for teacher training and further training. The trainings address trainers and other disseminators, but also teachers who transmit their new competencies to their colleagues "at home", i.e. in their school. The workshops are recognized by the German federal states (*Länder*) as teachers' further training course and complement the training programme offered by the *Länder*. All workshops are focused on the job-related use of the Internet. A mobile network for the training course is provided by Schulen ans Netz.

The following training modules, designed for 8 to 16 hours each are currently available:

- Teaching materials in the Internet: How to find and to use them
- Internet based forms of teaching and learning: Homepage Generator and Virtual Classrooms
- Internet workshop for female teachers: work, communication and information on virtual platforms
- Planning, organizing and designing school twinning with new media
- WebQuests: a method for teaching with new media
- New media in primary education

New modules are being developed:

- Qualification and further training for school managers
- Qualification of teacher trainees
- Gender-specific approaches in teaching with new media

Some experiences from the teacher trainings of the first project phase: 40 per cent of participating teachers had used the Internet for more than three years, but only very few teachers had used it in the classroom. 79 per cent of the participants quoted several months after the workshop that they use the Internet significantly more, than before the workshop But the evaluation also points towards future tasks. The quality of online offers and their concrete advantages are decisive for the actual use of new media by teachers. The existing offers need to be better known among teachers.

Website: www.schulen-ans-netz.de/weblotsen

Key Informant: HYPERLINKBirgit Thomann birgit.thomann@schulen-ans-netz.de

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3.11. PLUTO: a Norwegian Program for Teacher Education, Technology and Change.

Key-words: Teacher education, management of change, digital literacy, digital portfolio.

Origin: Ministry of Education and Research, Norwegian Network for IT Research and Competence In Education.

Actors involved: Students and teachers in higher Education

Description: PLUTO (Program for Teacher Education, Technology and Change) deals with innovative and comprehensive change in teacher education. ICT are more and more present in daily activities and thus becoming familiar tools. Innovative policies are needed to ensure teachers enter the digital culture and understand changes ICT introduces in the teaching and learning processes. Pedagogical, organizational, technological issues are related to specific knowledge domains and integrated in new ways for design and use of learning environments. The objective of the research and development program was to educate students towards developing skills and knowledge to organize more open-ended and student-centered learning environments. So fare as we can se the outcomes this ambitious goal is achieved to a large degree. These imply that teacher students have become able to create a diverse set of teaching and learning activities and use ICT for inquiry-based activities. Teacher education appears as one the most important fields for addressing ICT and digital literacy in education.

The PLUTO program was launched in spring 2000, as part of the Ministry of Education plan for research and development - “ICT in Norwegian Education Plan for 2000-2003”. The PLUTO program consists of 10 projects at eight institutions. A key element of these projects is pedagogical, technological and organizational development and change in teacher education through the use of ICT.

In a number of the projects, the pedagogy and academic content of the training program has been changed systematically by implementing ICT. The PLUTO projects create innovation in an important segment of the education sector through development contracts with partner schools. Many of the partner schools have experimented with flexible practice systems or other forms of new practice systems, which means that the students gain experience as teachers in a realistic everyday school situation.

The PLUTO projects have helped create new models for the organization of teacher education, where various forms of ICT are used and the subjects are vitalized in relation to their vocational aspects. At all institutions the introduction of portfolios has been viewed as a means of supporting and accelerating efforts in pedagogical innovation. At

the same time, the changing of the forms of evaluation in the direction of greater use of portfolio-based schemes is viewed as a natural result of employing more student-active and problem-based forms of learning and work methods.

Several sources are reporting that portfolio assessment leads to increased transfer of "responsibility" to students. Students work harder at their studies, and this creates better continuity in relation to their comprehension of subjects and their studies in general. Students thus gain a more overall perspective of their own education.

Several institutions can show an improvement in their academic level due to the fact that the PLUTO program was expanded. This also shows that organizational and pedagogical changes are required to achieve a successful integration of ICT.

The PLUTO projects have helped create new models for the organization of teacher education, where various forms of ICT are used and the subjects are vitalized in relation to their vocational aspects. These models should be exploited in a continuation of the initiatives with respect to ICT and teacher education.

Many of the PLUTO projects show that the use of ICT contributes to the reinforcement of variation and differentiation abilities. A number of the PLUTO projects have been expanded so that they establish the terms for how the teacher education is organized at the institutions that are involved. This means that over 1800 student teachers are exposed to the principles that the PLUTO projects are based on.

Teacher education appears as one the most important fields for addressing ICT and digital literacy in education. The ability of teachers to critically reflect on their own practice, and review what other teachers have done, should be encouraged.

Website: http://www.luna.itu.no/

Key Informant: morten.soby@itu.uio.no

3.12. SLICT, Strategic Leadership for ICT: A U.K. national programme for headteachers to address the leadership of ICT in schools.

Key-words: Teacher training, headteachers, ICT leadership, collaborative learning, action planning, community of practice.

Origin: National training programme, developed in partnership by NCSL (National College for School Leadership) and Becta (British Educational and Communications Techonology Agency).

Actors involved: Headteachers of primary and secondary schools.

Description: SLICT (Strategic Leadership for ICT) is the first national training programme for headteachers to address the leadership of ICT in schools. This is not a skills based course, but an opportunity for headteachers to build knowledge and understanding of key issues in ICT, to enable them to unlock the undeniable potential that technology has to enhance and extend learning in and out of schools.

The programme seeks to engage school leaders in peer-to-peer learning to share, develop and implement their vision for ICT in their school. Developed in partnership by NCSL and Becta, the programme focuses on the strategic role of headteachers in leading and developing ICT and aims to:

- develop headteachers' understanding of ICT and its potential for learning

- stimulate a clear strategic and transformational vision of ICT in school
- address headteachers' personal development needs and their capacity for strategic leadership of ICT
- empower headteachers in the evaluation of key strategic ICT issues affecting their schools
- enable reflection to enrich and improve student learning
- build headteachers' confidence in their informed professional judgement.

Working with groups of 30 headteachers, SLICT provides opportunities to critically reflect, share, challenge and support learning within a community of practice. The programme is based around the principles of vision, review and action planning, within the context of the headteacher's own school. Participants to take part in a two-and-a-half day residential experience with up to 30 peers, in visits of two well-led schools outside of their own area, in an eight-to-ten-week fully supported facilitated community of practice, and a concluding face-to-face review day with colleagues from other groups to offer a wider perspective.

Website: http://www.becta.org.uk/leaders/leaders.cfm?section=7&id=1420.

Key informant: Pravin.JETHWA2@dfes.gsi.gov.uk

3.13. Italian school heads train online.

Key-words: School heads, professional specialization, blended learning, collaborative learning, flexibility, e-learning.

Origin: Italian ministry of Education.

Actors involved: School heads of primary and secondary schools.

Description: On October 15th 2003, 1500 Italian school heads started the first online training in the national competition reserved to those teachers who have been in charge of "school heads' activities" for three years in their schools. On this occasion the Government's strategy, following the European elearning Action Plan, is to run a competition which includes a final examination as well as a training element based on a blended elearning methodology.

This choice was made to offer real opportunities of re-qualification and for professional specialisation of school-heads. Elearning training methodologies could help to disseminate information and training to a large number of people, wherever they may be, to reduce the overall cost and complexity of training. Furthermore, the Italian ministry of Education (MIUR) set in motion this large scale initiative through the state agency, INDIRE, who has a wide experience in the field of elearning training.

INDIRE, using its in-house developed Virtual Learning Environment called Puntoedu, carried out this training project customising the Virtual Learning Environment (VLE) to the necessities of the competition, maintaining the original characteristics of Puntoedu, though. It facilitates learning by doing and allows steady interaction; Puntoedu training combines on line and on site lessons showing flexibility maintaining the advantage of the method.

In this Puntoedu training edition, a large interest is being demonstrated in the synchronous activities where small group of teachers, living in different part of Italy,

work together on line at the same time discussing about one proposed school issue, with the aim of producing together a common output. This activity is moderated by an online tutor who supports and stimulates the students in their discussion and participation.

Online collaborative learning, simulation of real school situations, discussions and debates in forums and synchronous activities offer different and innovative training ways which keep the student autonomous and leader in his/her training choices. The community instruments provided in the VLE Puntoedu offer a collaborative learning environment where the on line training tutor, the expert and the on site lesson are equally integrated.

Website : http://www.puntoedu.indire.it (VLE only in Italian)

Key Informants: For additional information Giusy Cannella g.cannella@indire.it or Silvia Spinoso silvia.spinoso@eun.org

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3.14. Information Technology in Education for School IT Coordinators. Poland

Key-words: School IT coordinator, teacher training, information technology, postgraduate studies, online support.

Origin: Proposed by leading person in informatics education in Poland, Prof. Maciej M. Syslo – Head of Informatics Institute at Wroclaw University. The proposal won a competition for a grant (financial support) from the Ministry of Education and Sport. The studies had 3 editions in 1999, 2000 and 2001

Actors involved: Postgraduate studies for teachers planning to become school IT coordinators

Description: Teachers preparing to act as their school's IT coordinator attend a one year (2 semesters) studies on Information Technology in Education delivered by scientists from the Informatics Institute of Wroclaw University and teacher trainers from in-service teachers training centre (Warsaw). Studies are approved and sponsored by Ministry of Education and Sport.

The role of school IT coordinator is to:

1. prepare students to use computers;
2. train other teachers in his school in IT and helps them to run the courses;
3. coordinate the implementation of computers and IT in his school and municipality.

A training session lasts 3 days with total of 23 hours. Trainees are asked to submit many ongoing works, projects and at the end the final project. Subjects of those works are given long in advance, so trainees can prepare for the next activity period when they get a chance for consultation with the teacher whereas the teacher checks the progress of trainee's work.

One of the projects would have its subject individually tailored to the trainee's environment (type of school, or subjects he/she teaches, area of interest). The second project would be a report from trainee's own school based on his experiences/activities with implementing IT there. After review, the project is sent to the schools' director with the recommendation of tasks to be accomplished. The final project should concern a

chosen problem regarding methods of teaching IT and the use of information technology in teaching different subjects.

Students receive all publications and hourly notes, e-mail address and have the possibility of creating web pages on the local server. Besides, all educational material can be accessed on the local network. Submitting of two individual projects and the final project is compulsory to obtain the certificate. Trainees receive the help of the Association of Information Technology Teachers (SNTI) which aims to support and help all IT coordinators.

There was a formal evaluation by the Ministry of Education and Sport with positive result. Sustainability is proven by the self organization of group of graduates teachers in The Association of Information Technology Teachers.

Website: http://www.snti.pl with discussion forums, information exchange, teacher support, list of conferences and meetings.

Key Informant: Maciej M. Syslo**,** e-mail: Maciej.Syslo@ii.uni.wroc.pl

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3.15. Development of media competence. Germany, Federal State Thuringia

Key-words: Media competence, "Medienkunde" (media studies), mass media, certification.

Origin: Federal State Thuringia, Ministry of Education

Actors involved: Students and teachers of Thuringian primary and secondary schools.

Description: Development of media competence is an important goal in a time of enormous amount of information and offers by the mass media. The Ministry of Education in Thuringia wants students to master knowledge on a wide variety of media, both traditional and new. Students should start as early as possible and continue until they graduate. This is a precondition to be successful in their professional training or studies. The realisation of this project is highly and is compulsory for all Thuringian primary and secondary schools.

The Thuringian concept to develop media competence differs from those of other federal states of Germany, especially in:
- the continuity during the entire school attendance;
- the wide variety of media,
- the high degree of obligation for teachers and students.

A characteristic is the obligatory course "Medienkunde" (media studies) at secondary schools in the classes 5 – 7, concerning print and audio-visual media, computers and the Internet. The course topics and the results of the students are certified and added to the school report. The curriculum includes aspects of media effects and media production, the use of media as well aspects of media industry/economy, media professions and policy.

In addition students can attend an optional course in computer studies (classes 8 – 10) or basic and advanced courses in computer science in senior classes 11 – 12.

Website: http://www.medienkunde.de

Key Informant: Dr Frank Giesel, E-Mail: FGiesel@tkm.thueringen.de

3.16. LeaNet: A portal and a community especially developed for women teachers and women student teachers from all types of schools and from all subjects. Germany

Key-words: Portal, community, woman teacher, online courses, gender issues, cooperative learning, platform.

Origin: Service set up by Schulen ans Netz.

Actors involved: Women teachers and women student teachers.

Description: LeaNet is a portal and community specially developed for women teachers and women student teachers from all types of schools and from all subjects. Surveys showed that female teachers feel less motivated and sometimes less secure using new media than their male colleagues. As they represent at the same time the majority (60 per cent) of German teachers, it is of the utmost importance that women teachers are preparedfor the use of new media in the classroom. This is why Schulen ans Netz has decided to support them with a special service.

LeaNet's skilled and experienced editorial team of journalists and educators ensure quality content, support community activities and stand by to answer users' questions. The portal offers a public access area and a members' area.

The public access area offers information on schools and education, new media and gender issues for anyone interested in these subjects. A daily news ticker, a monthly newsletter and a range of subject-specific columns cover a broad spectrum: reports from conferences and trade fairs, presentation of new literature and media services, use of new media in the classroom and aspects of everyday teaching.

The LeaNet community and members' area offers women a chance to communicate with colleagues and friends via a free e-mail account (webmail), send instant messages, create a personal homepage without the need for HTML skills, and much more.

LeaNet also helps users learn about the many ways of working online and about using the Internet in their work. Users can take up a specific subject in open or closed groups, use features like forums, a time planner and chat rooms, or swap and enhance texts, images and graphics.

Online learning at LeaNet gives users the opportunity to acquire important skills in new forms of learning and teaching. Users can then draw on their own experiences to evaluate the usefulness of new media – in education in general and in their own classrooms. The public access area offers self-learning courses, community members can participate in tutor-supported courses, and users can initiate and carry out their own learning-related projects. The online courses are dedicated to topics such as HTML, file management or image processing. Those ones with tutors treat topics such as homepages for classes or schools, or online projects for girls

LeaNet International
LeaNet features interviews with female teachers from around the world, in which they discuss their experiences and the conditions in which they live and work (at

Infothek/Portrait). An international forum gives users direct contact with the women featured in the interviews and allows colleagues working overseas to meet and communicate with one another.

Website: http://www.leanet.de/

Key Informant: HYPERLINKRegina Eichen HYPERLINK

3.17. e-learning-Cluster schools (An Austrian initiative integrating educational targets with administrative change in the implementation of ICT in education)

Key-words: Pioneer school, e-learning cluster, blended learning, bilingualism, pedagogical vision, success factors.

Origin: Austrian Ministry of Education, Science and Culture.

Actors involved: Teachers and schoolmasters in upper secondary schools.

Description: Since 2001, a programme of IT-school development was launched with treaties with pioneer schools to fulfil different targets in the upper secondary schools eLC (e-Learning Cluster) The aim is to accompany the administration process of change and quality management by a clear and concrete pedagogical vision. Major ideas include 1)"E-Education" or "blended learning" with fundamental transformations of learning and organising learning processes, where every school should participate; 2) Bilingual models in education, where all professional subjects can be performed in two different languages. Two languages are used in all situations of school life; 3) Deep insights into work processes of professional fields with intensive contact to companies and simulation of the complex business or trade reality (training firms concepts, business process chains and others); 4) International contacts and studies are main interests of a school with many contacts to other educational institutions and offers of mobility and exchange programmes for students with international partners.

Only with these "big pedagogical" ideas can school management transformation be made. Change processes have to with quality management on all levels of the school and finding strategic targets and priorities for the everyday change process.

In the "e-learning cluster" action, pioneer schools (schools where 60% to 80% of the teachers are trained in e-learning didactics) in each of the Austrian provinces collaborate in clusters to implement practical models of e-Learning. These clusters are based on a national framework defined, supervised and financed by the Austrian Ministry for Education, Science and Culture.

The participation in the e-learning-Cluster project is connected with eight targets that must be reached and should be tied to the leading principles of the school-programme. These eight critical success factors are:

1) Every pupil/student (15 to 19) is offered "e-learning sequences" of about 4 weeks
2) A qualified majority of teachers in these schools implement practical models in e-learning.
3) Teams of teachers cooperate to produce e-learning methods and materials in their subjects.

4) Regional networks offer the possibility for some pioneer-schools to test e-learning environments (e.g. learning platforms, content creation tools) and share the experiences with others.
5) School programmes are made with an integration of e-learning in their lectures and exams.
6) Professional leadership is the critical success factor. Only schools with a positive and clear leadership and a support structure have the chance to adopt a stable innovative structure.
7) A steering group of the school partners (teachers, students, sometimes parents) is established to support content and didactic development, to co-ordinate initiatives in disciplines and subjects and to control the progress of the work.
8) Cluster schools work in networks (technically and as organisation principle) and offer their students (and teachers) additional non-mandatory certified qualifications, IT- and e-learning skills and knowledge, and promotion of didactic approaches for the teachers.

Websites: www.qis.at (Quality initiative);

www.e-lisa.at/notebook-klassen (the community of notebook-class-teachers).

www.schule.at/elc-Community (the e-learning Cluster community).

www.eduhi.at (an example of e-content for the e-learning classes)

Key informant: Rudolf.Apflauer@bmbwk.gv.at

3.18. Private-Public Partnership Program: "Education for the Information-based Lithuania".

Key-words: Business sponsorship, infrastructure, multimedia equipment, pedagogical use.

Origin: Long-term program of business sponsorship for education initiated by the President of Lithuania in 1999.

Actors involved: Business sponsors and primary and secondary school ICT staff.

Description: « Education for the Information-Based Lithuania » is the long-term program of business sponsorship for education initiated by the President of Lithuania in 1999. The implementation of the program is coordinated by the Co-ordination Council.

The program consists of separate projects prepared, developed and administered by joint groups of sponsors and ITC staff. Joint groups of sponsors and ITC staff are developing aims and objectives of concrete projects and prepare projects documentation which is affirmed by the written agreements between the sponsor companies and the Ministry of Education and Science. As the result of the implementation of the program Lithuanian schools has obtained computer hardware, software, computer teaching aids and internet connection; teachers and students has obtained internet connection with 100% or 50% discount.

For example, the idea of ongoing project of Dr. J.P.Kazickas family foundation, V.G.Gruodis and joint telecommunication venture « Omnitel » is to encourage subject teachers to use ICT during preparation of lessons and to implement ICT during the

lessons e.g. for multimedia presentations in subject classrooms (not in computer classes). For this purpose sponsors have presented to 50 winner schools the complete sets of equipment for multimedia presentations (2 notebooks, multimedia projector and the screen), and ITC have transferred the sets of the newest computer teaching aids (initially bought for testing) chosen by the winning schools. The successful school experience will be published on sponsors' web sites.

Website**:**

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3.19. Implementing "Internet and Children's Rights". (Bulgarian rulings for safe work of students in school computer network and Internet)

Key-words: Internet security, safety measures, school policy, children's rights, child protection, international regulations.

Origin: Rules approved in 2003 by the Minister of Education and Science.

Actors involved: Students and teachers in schools of all levels.

Description: An important issue in implementing ICT into education is making sure that students and teachers work in a safe environment. By an order issued on 2nd July 2003 the Minister of Education and Science approved the Rules for students' safety in using school computer networks and Internet. From the beginning of the 2003/2004 school year, they become a compulsory component of the internal regulations of schools and auxiliary units providing training to students on Internet use. In this way Bulgaria ranks security and safety measures for students using Internet, into a state policy. The Rules comply with the international practice and represent the models of school Internet policy in use by EU countries. They define the major principles of school policy, the powers and responsibilities of the school management body, teaching staff, system administrator, students and parents concerning the use of school network and Internet by students.

This document has been designed by a multi-institutional team of experts established to the State Agency for Child Protection within the framework of the project "Internet and Children's Rights" carried out in 2002 with the support of the UNDP. The team included experts from the Ministry of Education and Science, the State Agency for child Protection, teachers in IT and experts f "Parents" Association. The development and adoption of such rules was one of the tasks of the State Agency for Child Protection under the National Program for the Children of Bulgaria, coordinated by the Ministry of Education and Science.

Website: www.sacp.government.bg

Key Informant: Sylvia Kantcheva s.kantcheva@minedu.government.bg

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3.20. WAVE The Virtual Welding Trainer. France

Key-words: Professional Training, virtual reality, welding, simulation.

Origin: AFPA (Association for Permanent Training of Adults) through EFTA.

Actors involved: Trainers, adults learners.

Description: In the context of ICT, AFPA has chosen to develop virtual reality applications to support its "learning by doing pedagogy". Virtual reality for training presents different ranges of advantages. As computer-based simulators, virtual reality is risk-free. Thanks to the reductions of costs, virtual reality systems are now quite affordable by training organisations. Moreover, it enables savings on training costs. However, the most interesting improvements that virtual reality brings are on the educational side. The learning situation can be reconstructed: important components of learning situation can be emphasised, restructured, made visible, when those, which would brings confusion can be removed.

Learning welding in real situations is difficult. It requires numerous attempts for poor results. Progress are slow due both to the difficulty to get visual clues out of the activity, and to the difficulty to correlate feedback evaluation to gesture, errors to their causes. It requires repetitive and time-consuming demonstrations done by trainers.

WAVE isolates the body-based learning of gesture from the cognitive understanding of variables used to regulate the welding process. It simulated welding situations through a wide range of exercises. Trainer/Trainees architecture provides a simultaneous control of the training process for several trainees. Predefined and configurable scenarios allows the trainer to optimise the training by providing scheduling, evolution control and gesture quality evaluation. Wave supports training for the MAG and SAEE procedures. The reconstitution of the principal welding positions using a torch and electrode holder naturally cause the learner to transfer them to real situations, saving working materials while eliminating the risks (electric arc) and fears related to the early stages of learning. Wave consists of a central unit with working screen, a MAG torch and SAEE electrode holder, a software server, and trainer control software package, all of which may be installed on line.

WAVE brings a pedagogical improvement through the optimisation of the gesture learning and the concentration requested from the forthcoming welders. Virtual reality was selected for its unique advantages: rendering visible that which is invisible; providing real-time feedback and guidance on welding activity; enabling self-training thanks afterward analysis of errors and performances. Virtual training is more efficient and cost-efficient because no materials are consummated. Learning processes alternates welding under real conditions and welding in virtual environment in order to train to occupational skills. The real-time control devices and the display of phenomena difficult or impossible to perceive under real conditions facilitate understanding of the position and movement and their incidence on the weld.

Website: http://vr.c-s.fr/wave/

Key Informant : Daniel MELLET d'HUART,
AFPA (Association nationale pour la formation professionnelle des adultes
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3.21. Teaching Knowledge Management as a New Communication Skill. Slovenia.

Key-words: Knowledge Management, Knowledge Technology, Grammar Schools, Informatics, Decision Making Process, DEXi.

Origin: Slovenian Ministry of Education, Science and Sport.

Actors involved: Students and teachers in grammar schools.

Description: Teaching knowledge management is done in Slovene grammar schools. The contents and the suggested case-based methods of working with students integrate the use of technology to intensify students' knowledge. The practical part of the lesson is to manage the knowledge in the decision making process. The students learn about good decision making with the help of suitable technology. . The expert system shell DEXi is used for this purpose.

Their knowledge is cemented by building their own multi-attribute model and validating and analysing the variants with which they are met in a concrete decision problem. The terms with which the students become familiar are different kinds of artificial intelligence approaches, knowledge management, data warehouse, data mining, machine learning, expert systems, criteria, measuring scales, functions of usefulness, criteria tree, decision rules, description, validation and analysis of variants. The teaching model develops the students' actual decision making abilities to help them choose their "*Matura*" (Baccalaureat equivalent) subjects**Web page**: http://lopes1.fov.uni-mb.si

Key Informants : Alenka Krape, Gimnazija Vič, Tržaška 72, 1000 Ljubljana, Slovenia
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3.22. "INTERNET: Nonni E Nipoti" (Internet/ grandparents and grandsons) Italy

Key-words: Digital literacy, training of elderly people, secondary school students.

Origin: Several municipalities in Italy.

Actors involved : Upper secondary school students and elderly people (over 55).

Description: The project is a basic digital literacy local animation initiative, aimed also to ease the encounter between generations. Addressed to elderly people (over 55) through the involvement of secondary upper school students (age 17/18) in the role of "digital educators".

Low costs and high level of sustainability, great social impact, high visibility in local communities are the main characteristics of the initiative. It has been experimented with success in many municipalities in Italy in the last years (since 1999: Milano, Trieste, Gorizia, Lucca, Cagliari, Torino, Grugliasco, Mantova, Sondrio) with more than 14.000 "grandparents" involved.

The initiative implies:

- awakening of local partners and public administration bodies (municipalities or others) to support and promote the initiative, guaranteeing logistic condition
- training of "grandsons", students of upper secondary schools, by expert teachers VET teachers to prepare and motivate them to cover the role of "digital educators" for grandparents. Usually "grandsons" have two morning trainings by a VET teacher expert in ICT. The technical issues are discussed together with the methodological approach to be adopted in classroom.
- training activities for "grandparents", in which each "grandson" supports and guides 1 (or more, maximum 4) "grandparent" in learning of digital communication tools and techniques (internet navigation/access and e-mail use) in a computer laboratory. Usually the course is organized on one week with 3-4 hours lessons in computer laboratory with the assistance of the grandson and 2 "free navigation" mornings, done autonomously by grandparents.

It is foreseen a 1:1 to 1:4 grandson/grandparent ratio. The "grandsons" activities are on a volunteer basis (only a draw of an award trip is foreseen) in agreement with the schools they are attending. Usually students of the last year of upper secondary schools are involved.

Management and tutoring of activities are due to the hosting organization (usually a school or a VET centre), financed by local sponsors (usually municipalities).

Web page:

Key Informant : :Ms. Luisa Toeschi, E-mail: toeschi@aim.milano.it
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Tel. 02 4819 3088 - Fax 02 4819 4649 –

3.23. Integration of Media in ICT education. Italy

Key-words: Media, radio, television, e-learning, satellite, audiovisual material.

Origin: Service of the Ministry of Instruction, Universities and Research (MUIR) to sustain Italian school reform**.**

Actors involved: Students and teachers in primary and secondary schools and in post-secondary studies.

Description: To support the reform of the school system, an ICT project of the Ministry of Education has been implemented at national level. In August 2003 the agreement between the Ministry of Education and RAI, the national broadcasting service, was signed which engages the radio and television stations to contribute to formative and educational activities that will be defined and realized on the basis of suitable agreements. RAI will offer content via satellite, which could be integrated into e-learning initiatives on Internet.

The Convention foresees the launch of 4 new schools' channels:

1) "Explora", channel already active, devoted to promoting the sciences.

2) "Divertinglese", already active (March 2003) and devoted to e-learning for children in elementary schools.

3) “DivertiPC”, in action (by Sept. 2003), and devoted to spreading knowledge and ICT expertise for children in elementary schools.

4) “Channel Work”, in preparation, devoted to contributing to the choice of secondary and post-secondary studies.

Around 5,000 schools, equipped with parabolic antenna and satellite systems, have already been involved in “Mosaico” (http://www.mosaico.rai.it), a RAI-Educational project created to supply teachers with audio-visual and multimedia teaching and learning materials integrated with complementing lessons and textbooks. In the last reform of the school system, the introduction of the English language and ICT contents and competence starts from the first year at primary school.

Coordination

The MIUR-RAI convention is effective for 3 years and foresees a strong investment by the Ministry of Education of about 13 M Euro, and from the RAI, besides the costs of realization of the programs, an investment to modernise and widen the park of parabolic antenna which allow the reception of satellite television programs in more than 10 thousand Italian schools of every order and degree at a national level.

Website: http://www.istruzione.it

Key Informant: Giuseppe Marucci, e-mail: giumaru@tin.it

3.24. The personal education plan. Denmark.

Key-words: Education plan, support services, vocational training

Origin: Danish Ministry of Education

Actors involved: Students and teachers in vocational training

Description: The personal education plan is an important tool for transparency and documentation of the individual student’s educational track. It is a prerequisite in a graduated vocational training system where students are allowed to leave/re-enter a training programme within a fixed period of time. All education plans are prepared by the college and the individual in community, and is agreed upon by both parties.

The education plan reflects the wishes, interests and talents of the individual student and the training to be provided to meet these wishes. It also serves to keep the attention of the student on his/hers educational pathway, professional and personal qualifications and goals. The formulation of the personal education plan, in terms of learning experience, contributes to meeting the individual learning needs of the student and to develop his/hers personal competencies. The personal education plan provides information on the student’s choice of subjects during the training programme, not information of private character.

The college is overall responsible for keeping the personal education plan updated, and appoints a teacher as contact person for a group of students. If a training programme has to be revised, the contact person handles this together with the student and the training company. This ensures that the alternating training at college and in company forms a continuum which upgrades the learning perspectives. The education plan is evidently accessible to any relevant party, i.e. college, company and student, at any time.

An IT tool/programme called “Elevplan” (=students plan) has been developed for that purpose. The tool offers a vide range of support functions including the personal education plan. The most important purpose that Elevplan persues is the possibility of permanent documentation of the students competencies in a web-based form accessible all over the country (and the world..) Recently steps have been taken to broaden the scope and open the programme in order to facilitate the dialog between companies, educational institutions and students and in that way raise quality by openness

Key informant: Leo Hojsholt-Poulsen <leo.hojsholt-poulsen@uni-c.dk>

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4. TH RECOMMENDATION: DEVELOP RESEARCH, INDICATORS, ACCESS TO RESULTS AND SPECIFIC FIELDS OF APPLICATION

Following are 12 examples of successful or good practices dealing with evaluation, integration of research results and transfer to other sectors. Social science and educational research need explicit and permanent funding, as both are essential to guide ongoing integration of ICT into education, and help teachers and managers better understand and assess educational issues. Thus empowered, educational actors can produce correct appreciation of good practices, evidence of improved academic achievements and basically enlighten decisions, implementation choices and educational priorities.

4.1. Evaluation processes within "New Media in Higher Education" Austria

Key-words: Evaluation, higher education, project development.

Origin: Austrian Ministry of education science and culture.

Actors involved: University and Fachhochschulen students and teachers.

Description: Within the eFit programme, a three years initiative "New Media in Higher Education" (2000–2003) has been launched. In this programme 25 projects are developed at universities and Fachhochschulen. A special evaluation concept has been worked out for accompanying this developing process. The project teams can contact evaluation teams (e-Learning experts) if they need advice. During the developing process the project teams have to attend two evaluation workshops. The first evaluation workshop takes place in the middle of the development process. At the second evaluation workshop the final product has to be presented and evaluated. This evaluation is prepared with the evaluation team and is going on in front of the whole project community. Thus all attending people take advantages by listening and taking part in the open discussion process.

This evaluation concept is highly accepted by the scientific community.

The initiative "New Media in Higher Education" took part 2003 in the research project "Study on virtual universities-ICT integration in EU universities" undertaken by Consultant IT & Innovation PLS Ramboll Management in Denmark, subsidized the EU-Commission. Unfortunately this Study is still not public.

Website: http://www.efit-austria.at/english/

Key Informants: Andrea.Ecker@bmbwk.gv.at,
Felicitas.Pflichter@bmbwk.gv.at

4.2. MeDiDa-Prix: (A yearly competition of e-Learning products and processes among institutions of higher education from German speaking countries)

Key-words: Competition, quality indicators, higher education, elearning products, elearning processes, quality, award.

Origin: Ministries of Education of Austria, Germany and Switzerland.

Actors involved: Students and teachers in higher education.

Description: Another example of good practice of quality indicators for comparable results is the MeDiDa-Prix. This is a yearly competition of eLearning products and. This competition of excellent practices of eLearning/eTeaching projects and processes in higher education institutions was worked out in 1999 as a cooperation between the three German speaking countries, Austria, Germany and Switzerland and takes place every year in another partner-country. The awarding sum and the costs of organisation are taken over alternately be one of the three countries. Since its creation, the award has become a famous label for developing and implementing eLearning products and processes within the community. The award provides 100.000 € also in a lump sum or divided amongst the winners.

In this competition the focus is set on the process of implementation of eLearning in the institution or organisation body. The indicators and evaluation criteria are raising quality in teaching and learning and within the accompanying administration process.

Website: http://www.medidaprix.org/

Key Informant: For Austria: Felicitas.Pflichter@bmbwk.gv.at

For Germany: Antje.Scharsich@bmbf.bund.de

For Switzerland: Rene.Bloch@bbw.admin.ch

4.3. Stimulating the integration of ICT in schools: A Luxemburg Report based on three case studies conducted in high schools (lycées) for CERI (OECD)

Key-words: Case study, international study, interviews, recommendations, pedagogical use, lack of use.

Origin: Study conducted by Service de Coordination de la Recherche et de l'Innovation Pédagogiques et Technologiques (SCRIPT) du Ministère de l'Education Nationale, de la Formation Professionnelle et des Sports (Luxemburg) as part of an international study piloted by CERI (OECD).

Actors involved: School management, teachers, parents and students from Luxemburg high schools.

Description: The publication « Les technologies de l'information et de la communication dans les lycées » summarizes the main results of case studies conducted as part of an international study on the successful implementation of new technologies in schools. (CERI, Center for Educational Research and Innovation, of OECD, Organisation for Economic Co-operation and Development, based in Paris)

The case studies are qualitative studies drawing from interviews with the school management, with teachers, parents and students, from observation of classes and

students' work, from archive and current documents, from schools' websites, from surveys and school equipment inspection. The main sources, however, are the 60 interviews. The studies were conducted by the Service de Coordination de la Recherche et de l'Innovation Pédagogiques et Technologiques (SCRIPT) du Ministère de l'Education Nationale, de la Formation Professionnelle et des Sports.

The data gathered show the situation of 2000-2001 in three Luxemburg high schools, relatively well equipped in computer technology and having a good experience of some ICT applications. However ICT was still not commonly used as a teaching and learning tool. The three studies were conducted in order to help grasp why ICT was not used and to find information on what would be most conducive to the use of ICT in schools.

The study shows that ICT was used in the general secondary sections and in the technical secondary sections, but at a very low level of integration in the courses. Yet almost all the persons interviewed –managers, teachers, parents and students – were convinced that ICT has a role to play in education, and that schools had a responsibility to train students to use ICT as a tool that could facilitate their learning and needed to be mastered for their adult life. The study consequently concludes with a series of recommendations for the integration of ICT in teaching and learning.

Website: http://www.script.lu/activinno/ict_etude_ocde/ict_rapport_synthese.pdf (study)

Key informant: José Bertemes, bertemes@men.lu

4.4. 'Forum New Media', a network of teachers and researchers at universities and fachhochschulen (higher education institutions geared to professional training) Austria

Key-words: Higher education, professional training, forum, media, projects, research.

Origin: Set up by a group of Austrian teachers and researchers.

Actors involved: Teachers and researchers at universities and Fachhochschulen.

Description: During the last three years a network called "Forum New Media" was built up. The members of this network are teachers and researchers at universities and Fachhochschulen.

Twice a year the members of this network meet at so called "Business-Meeting" presenting their projects and discussing their results in research and development.

Website: http://serverprojekt.fh-joanneum.at

Key informant: Prof. Dr. Roland Mittermeir, University of Klagzenfurt
mittermeir@ifi.uni-klu.ac.at

4.5. Researchers and teachers collaborate for an improved implementation of educational ICT: ITMF programme, Danemark.

Key-words: Research projects, community building, collaboration, network, learning materials.

Origin: The project is financed by the Danish parliament, prepared and organized by the Ministry of Education, and managed and carried out by UNI•C.

Actors involved: Researchers, teachers and pupils of primary and lower secondary schools.

Description: The ITMF programme (ICT and Media in the Danish Folkeskole, 2001–2004) includes about 80 examples of collaborative research projects involving researchers, teachers and pupils where the results of the research lead to a better and improved implementation of educational ICT. (Folkeskolen is the Danish municipal primary and lower secondary school).

The project is financed by the Danish parliament, prepared and organized by the Ministry of Education, and managed and carried out by UNI•C. The purpose is to distribute money for the development of educational content and learning materials, and to encourage and facilitate the dialogue between the parties of *Folkeskole*n. One of the main focuses of the project is called 'Educational Opportunities - Learn with IT in *Folkeskolen*'.

Schools in network and municipalities are central actors in the projects, and it is a requirement that schools collaborate with other competent professionals towards the implementation of the project. The schools have to network with researchers**,** publishers, ICT specialists and other partners. About 15,000,000 € are used on this part of the programme.

The main issues are:

* IT, precise subject goals and the Central Skills and Competencies. Development of educational content means here cross-curricular projects, team cooperation between teachers, and development of professional competencies both in relation to individual subjects and across the curricula.

* IT and greater amplitude in *Folkeskolen.* And with regard to the development of educational and learning materials the programme intends to broaden the scope and create more opportunities for all kinds of children and to be able to differentiate teaching and learning according to the individual needs.

* IT and increased dialogue between the parties of *Folkeskolen*. The dialogue between all parties of *Folkeskolen* must develop into the necessary cooperation between teachers, parents and the administration, for example - between anyone with an interest in teaching. This can be done by creating learning-community-building ICT-based tools and methods.

Website: http://www.itmf.dk See for example, Mars 2003 (production of educational material in natural science) and The Virtual Study Room (virtual study rooms/areas for pupils at secondary level).

Key Informant: "Leo Højsholt-Poulsen" <leo.hojsholt-poulsen@uni-c.dk>

4.6. PILOT: Norwegian Project for Innovation in Learning, Organisation and Technology.

Key-words: Stimulating good practices, develop research, interaction with research, case studies, network teachers and researchers.

Origin: Ministry of Education and Research.

Actors involved: Researchers and teachers of primary and secondary schools.

Description: PILOT is the largest and most extensive project in Norway related to the pedagogical use of ICT in schools. The project was initiated by the Ministry of Education and Research, and it has been in progress since the autumn of 1999.

PILOT consists of 120 primary and secondary schools that have worked with extensive use of ICT in education. The aim of the project is: "To get the participating schools to develop the pedagogical and organisational opportunities that are opened up by the use of ICT, and to develop and distribute new knowledge on this." The project schools are spread across the entire country, and nine counties are involved. ITU (Norwegian Network for IT Research and Competence in Education) has the coordinating responsibility for the research agenda in PILOT.

From the initial phase, where infrastructure and technological challenges were in focus, the project has during the last years concentrated much more on varied pedagogical approaches to education and integration of ICT in the pedagogical practice.

PILOT became a natural part of the school culture as a project. Key findings: The results of the research and project network led to a better and improved implementation of educational ICT:

Using an action research network teachers reflect on their own practice using ICT and thereby develop a sustainable platform for school development. Extended collaboration between schools has been set up with virtual platforms. Ongoing formative evaluation allows the processing of research results back to the teachers and school leaders. The research results show 'good practices', which act as inspiration for other teachers and students. PILOT contributed to establishing schools as learning organisations in continuous development.

Website : http://www.itu.no/Prosjekter/

Key informant: ola.erstad@itu.uio.no

4.7. VALNET : European Schoolnet Validation Network. Production of a validation methodology for ICT pilot schools. Portugal

Key-words: Collaborative research, validation methodology, project, virtual learning environments.

Origin: Participation of DAPP/Programme Nónio (Portuguese Ministry of Education) in VALNET (2001-2004), one of the "School of Tomorrow" projects funded by the European Commission's Information Society Technology IST program.

Actors involved: Researchers, students and teachers of secondary schools.

Description: A good example of collaborative research involving researchers, teachers and students can is the project VALNET. The project consists of a validation methodology for ICT pilot schools and proposes a framework for a number of validation and dissemination activities. Funded by the European Commission's Information Society Technology IST program, it is one of the "School of Tomorrow" projects. Given the large and ever-increasing numbers of computer-based learning projects, initiatives and products around, there is clearly a need for coordination and validation.

DAPP/Programme Nónio is one of the partners of this big project and holds the responsibility to validate one of the collaborative platforms – Fle3. To validate this platform, two Nónio Competence Centres and 10 schools are engaged. Portugal is responsible for the coordination of the same process in two other countries (Hungary and Denmark) and to produce a final report on the results of the experiment.

With the purpose of expanding the use of virtual learning environments, a seminar took place to disseminate the Valnet experience, with the participation of the researchers and the teachers using the platform in the schools. The target public of the seminar was constituted by the network of Competence Centres (at a national level) and by the ENIS schools. The participants were involved in training sessions on the use of the platform, in order to train other colleagues or to use it in their own schools. The FLe3 platform is freeware and open source and offers total flexibility to adapt according to the needs of each school.

This project is contextualized in one of the measures that the Nónio Programme wishes to launch, a call for proposals addressed to schools to develop virtual learning environments. Some content projects have been supported by the Nónio Programme before, such as financing e-learning platforms aimed at teacher training.

Website : http://community.eun.org/entry_page.cfm?area=186

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4.8. ICT schoolportraits: International evidence of good practice. Holland

Key-words: Innovative practices, school portraits, good practice, international study.

Origin: Dutch Inspectorate of the Ministry of Education.

Actors involved: Researchers, students and teachers of secondary schools.

Description: The Dutch Inspectorate has made 130 ICT schoolportraits, in which innovative practices are described and analysed. These have been identified in the Netherlands and in Sweden, Ireland, France, Canada and Scotland.

Within the Netherlands they have been widely distributed and discussed. Teacher trainers are using them as course material. The portraits show what can be achieved with creative application of technology.

A number of the portraits have been translated in English and/or French.

The format of the ICT-schoolportraits has been adopted in an international project ERNIST) in which education inspectorates produce similar evidence of good practice in their own countries. Participants are apart from the Netherlands: Austria, Scotland, England, Flanders and Northern Ireland.

The results will be published in the spring of 2004.

Website: *http://194.13.31.211/ictschoolportretten/*

Key informant: Ferry de Rijcke <fderijcke@planet.nl>

4.9. ICT national statistics and studies. Portugal

Key-words: Statistics, use of ICT, teacher training, infrastructure, questionnaire.

Origin: Ministry of Education, Portugal.

Actors involved: Researchers, students and teachers of primary and secondary schools.

Description: The Ministry of Education, through Nónio Programme, launched the first ICT national inquiries in 1997, 1998 and 2000. The schools were inquired about infrastructure, software and pedagogical use. All schools were inquired and a comprehensive response was given. However, the need to have an annual and universal picture of the situation led to the inclusion of a set of questions related to the ICT infrastructure in schools in an existing statistic questionnaire (model 400) in 2001 and the creation of a specific and extensive ICT questionnaire (model 700) that was included in the education statistics system in 2002.

Parallel to the statistics other evaluation studies were launched by Ministry of Education/Nónio Programme, on the use of ICT by teachers and pupils in primary and secondary schools, in the school years 2001/2002 and 2002/2003 respectively, addressed to a «zoom-out» and representative sample of teachers (about 20.000 answers) and pupils/students (about 60.000 answers).

Two studies about ICT in pre-service teacher training and in-service teacher training were conducted also by the Ministry of Education/Nónio Programme, during 2003-2004, as an update of former and similar studies developed in 1998 and 2000.

Another study is about to be launched, 2004/2005to inquire about the use of educational multimedia contents in schools.

In 2001, 5 case studies on the impact of ICT on Learning were conducted by the Ministry of Education/ Nónio Programme, in the framework of an OECD initiative.

Website: URL: http://www.nonioxxi.pt

Key informant: Ida Brandão, Email: ida.brandao@dapp.min-edu.pt

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4.10. Laptops for disadvantaged students: Irish initiative

Key-words: Secondary education, mainstream education; learning difficulty; support teacher; innovation; project; inclusion; assistive technology; hardware; software.

Origin: Irish Department of Education and Science.

Actors involved: Teachers in secondary education, students with dyslexia or other reading/writing difficulties.

Description: The goal of the Laptops Initiative is to identify how laptops and other portable ICT equipment can best be used to support students with dyslexia or other reading and writing difficulties in a manner that facilitates learning, and access to learning, in an inclusive environment. The project addresses common issues related to this goal in a number of different schools and at several different levels, i.e. school level, classroom or group level, teacher level and at the level of the individual student.

The objectives for the project are:

- To develop models of classroom management supporting the use of laptops in mainstream classes and identify associated practical issues, with a view to enabling students with learning difficulties to participate more fully in mainstream classes.
- To trial the use of laptop computers as a personal support tool for students with dyslexia or other reading/writing difficulties both in the school and home environments, with a view to identifying the most successful methods of use, their benefits and drawbacks.
- To identify ways in which different software products can be used to support students with learning difficulties.

In December 2000, 31 schools in secondary education were provided with substantial funding by the Irish Department of Education and Science for laptops and other Information and Communication Technology (ICT) resources to assist students with dyslexia or other reading or writing difficulties (see Press Release announcing the initiative). This funding was intended to support existing educational provision for these students.

The National Centre for Technology in Education (NCTE), an agency of the Department of Education and Science, is providing support to the participating schools (the schools requested a high level of support to be provided). The 31 schools represent a mix of sizes and types of school, management systems, provision for special needs, approaches to inclusion and levels of competence in ICT. The approach of the Irish government to ICT integration in schools is to support schools in making their own planning and purchasing decisions for ICT. Therefore, in planning how the initiative was to be implemented, the NCTE needed to develop a flexible framework with clear goals and objectives for this initiative and assistance to the schools in developing detailed project implementation planning suited to their local situation. The goals and objectives (outlined above) clearly focus on the idea of the laptop being used in mainstream classrooms and at home, both as a teaching and learning tool and specifically as an assistive technology tool.

Website: http://www.ncte.ie

Key informant: National Centre for Technology in Education
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4.11. Tiger in Focus: an Estonian longitudinal study about ICT use in education

Key-words: Survey, ICT in education, assessment, indicators.

Origin: Tallinn Pedagogical University and Tiger Leap Foundation, Estonia

Actors involved: Headmasters, ICT support persons, students and teachers of primary and secondary (grades 8 and 11) schools.

Description: Estonia has not participated in international studies of ICT in education (SITES, OECD). The first survey of ICT in Estonian schools was carried out after completion of the national school computerization program Tiger Leap (1997-2000). The study labeled Tiger in Focus and was designed and carried out by a joint research group

of the Department of Government and Centre of Educational Technology in Tallinn Pedagogical University, the largest teacher training institution in Estonia.

Goals of the Tiger in Focus (TIF) survey were:

- To analyze the scope and ways of integrating ICT into learning/teaching processes, by measuring the intensity, purpose and ways of computer usage by the teachers and students within the schools settings
- To evaluate the integration of ICT into non-formal learning processes, by measuring the intensity, purpose and ways of computer usage by the teachers and students outside of the school
- To describe the readiness of teachers and students to use ICT in teaching and learning, by assessing the their ICT competencies and attitudes towards ICT
- To search positive and negative determinants which could shape the attitudes of teachers and students towards ICT usage in teaching and learning.

The survey is going to be repeated on the same sample of schools every third year in order to describe the dynamics of the processes related to ICT in education. Survey sampling included 98 primary and secondary schools, which accounts for more than 17% of all 560 primary and secondary schools in Estonia. It was a randomly stratified sample, with five explicit layers based on the five regions - North, West, Central, South and North-East Estonia. Within each region schools were stratified according to implicit layers based on the school type. In all primary 8th grade levels and, in secondary schools, all 8th and 11th grade level students from one parallel class were included in the sample. This will make it possible to compare the survey results of the same students in 2003/2004 within the longitudinal study. In each school, five teachers who taught the main subjects on the 8th grade level were included in the sample (in secondary schools at 11th grade level). Sampling consisted of 490 teachers in total. Survey questionnaires were sent also to headmasters and ICT support persons in all schools belonging to sample.

Website:
http://www.tiigrihype.ee/eng/publikatsioonid/tiigerluup_eng/tiigerluup_eng.html

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4.12. LearnIT, Learning and IT: The Swedish Knowledge Foundation's Research Programme

Key-words: Virtual research school, doctoral students, learning I society, organizational learning, basic learning issues, It and society.

Origin: Eight-year program, Knowledge Foundation, set up by the Swedish Ministry of Education.

Actors involved: All learners of all ages.

Description: The national virtual research school, Knowledge Foundation, is an unusual construct which aims to bring together doctoral students from different fields (computer science, information science, media and communication, cognitive science, educational research and others) in order to increase the collaboration between research specialisations and between universities. The field of learning and IT is rather limited in Sweden as a whole and the various research environments at the colleges, universities

and institutes of engineering are small, often comprising no more than a couple of people. By linking these environments together and facilitating collaborative work, a valuable national community of some weight will be created.

The Knowledge Foundation was established in 1994 by the Swedish Parliament and aims to boost Sweden's competitiveness by supporting: research and postgraduate programmes, competence development in industry, and school development and IT. The research school organises a programme of courses at research level in the area Learning and IT which are also open to other students at that level from throughout the country. Today there are some twenty doctoral students working within the research school.

The Knowledge Foundation's research programme Learning and IT (LearnIT) aims in the long-term to build up a body of knowledge in the area where learning meets information and communication technology. The programme is limited to an eight-year term, 2000-2007. After this period the themes that the programme has developed should be so well established and have such good representatives that they will have good standing in the universities, with the bodies that fund research and in society at large

The aim is:

- to contribute to deeper understanding of the effects and consequences of the areas where The Knowledge Foundation has been active, and to see that this knowledge is spread in the community.
- to initiate and carry out research on issues associated with learning, competence development, and life at work and in society in those areas where the development of information and communication technology is an important component.

In other words, the intention is for the programme to have a two-fold structure involving, on the one hand, the analysis of existing activities and dissemination of information about them, and, on the other hand, the stimulation and carrying out of new research and development on learning and IT. This mission is not limited to school and formal education; it concerns to an equal degree issues of learning and further education in the workforce as we move towards new technology and new ways of working.

An assumption for the programme is that knowledge and competence are key features of economic and social development in the knowledge society. At the centre of the programme is learning in society in the broad sense (in production, in school and in other environments)

Principles for the future: The programme is to have a clear thematic organisation. The questions to be researched should follow the different levels outlined above: school and school development, possibilities for handicapped and marginalised groups; adult education and trade union work. These are the areas which for the moment we find to be most urgent for the programme, which will initially be organised at the three levels of society, organisations and individuals. Examples of issues at the three levels might be thus:

IT, learning and the development of society. At an overall structural level we can identify issues that are related to changes in democracy, including ethics. The ownership and control of information and knowledge implies power. The ways in which knowledge is distributed, and on whose conditions this happens, are decisive for understanding the main streams of current development of society.

IT and organisational learning. At the second level we can identify issues concerning the ways organisations change with the developments, and the consequent changes in

what is done at work and how it is organised. Analysis of educational support in different operations (production, trade, the administrative functions of businesses and public services, and so on) at the point of change from traditional manual production to solutions that exploit modern information technology is essential.

IT and individual competence development. The third level for the programme aims to identify basic issues concerned with how the structure and content of learning changes with information technology. It thereby also concerns how the structure and content of the learner's knowledge is changed by the exploitation of the resources available through information technology. Issues of memory and the structure of memory are also included. A concrete example of research, which is called for, is the study of how IT-based teaching material and teaching environments affect the processes of learning.

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