



Comp@ct (Comenius Multimedia Projects and Communication Technologies) is an educational European network, funded during the period 1.10.2001 – 30.9.2004 with support from the European Community within the framework of the Socrates programme.

Connecting Comenius Schools is a theme that has been integrated with the main aim of the Comp@ct network, to support Comenius schools by providing knowledge, tools and training. The articles in the book describe Comp@ct's framework and illustrate it with some examples of activities and results.

More information is available: <http://compact.eduprojects.net>



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Institute for Educational Research  
University of Jyväskylä  
P.O. Box 35 (Keskussairaalantie 2)  
40014 University of Jyväskylä, Finland  
Phone +358 14 260 3220  
Fax +358 14 260 3241  
[kti-asiakaspalvelu@kti.jyu.fi](mailto:kti-asiakaspalvelu@kti.jyu.fi)  
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Edited by  
Sonja Kurki  
Pentti Pirhonen



## Comp@ct – Connecting Comenius Schools



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Working Papers 22



**Comp@ct**  
**– Connecting Comenius Schools**

Edited by  
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Supported by EU Commission



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Comp@ct  
– Connecting Comenius Schools

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Connecting Comenius Schools

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**C**omp@ct

Service Portal • On-line Help  
Tools & Training • Guidance & Support  
Events, Seminars, Conferences



# Comp@ct - Connecting Comenius Schools

*Project co-ordinator Sonja Kurki, Oy UniServices Ltd  
Chairman of Comp@ct; Principal, Vitikkala School, Pentti Pirhonen*

Comp@ct (Comenius Multimedia Projects and Communication Technologies) is an educational network supported by the European Commission under the 2001–2004 Socrates programme. Its purpose is to help Comenius schools in their ICT-related project activities. Comp@ct has strong roots in this area as a result of experience gained from the CoMuNet and PICT thematic networks in a previous phase of activity. The implementation of its aims is made possible by collaboration with parties who are involved in the development of educational uses of ICT and possess in-service training expertise.

## **Aims**

Comp@ct's main aim is to provide teachers active at all levels of the educational system and in all educational institutions taking part in Comenius projects with access to advice, support and training. Secondly, it works to create a virtual forum where teachers can share experiences and ideas, raise their awareness of ICT and promote innovation. A third aim is to study experiences with new collaborative learning technologies and examine their impact on school practice. Disseminating the innovative results achieved and spreading information about projects completed is a natural further network objective.

Comp@ct provides a Comenius teacher with:

- background information about online communication and collaboration
- guidelines for the educational use of ICT
- examples of good practice
- some web-based tools together with relevant training and support
- contacts with experts in the field and with potential partners.

## **Different media, various communication technologies**

New schools are being built and new pedagogical methods are being devised, and most European schools have access to the Internet. Broadband connections are reaching schools, and use of ICT is becoming a more integrated element of the curriculum, as it already is in Comenius projects. Comp@ct has expertise in different media, in the provision of appropriate training, in the use of ICT in school projects, and in investigations of such ICT-assisted project activities.

Educational institutions planning and implementing a Comenius project must draw on different media and communications technologies. We offer them a range of collaborative workspaces and communication tools. Thus, it is important to have criteria for deciding what functions the chosen tools should enable. In general, those active in Comenius projects need tools for discussing things, sharing information and other resources, and processing and producing articles, artworks or presentations. Pupils and teachers are also encouraged to establish personal contacts with partner schools. ICT makes this quite easy and cost-effective: users can, for instance, discuss challenges and problems in a chat room and feel encouraged to present their project results and receive feedback on them in a videoconference. Many pupils find it very rewarding to have their own products published on the Internet.

## **Thematic ICT areas**

The work of the Comp@ct partnership is carried out in three thematic ICT areas: Synchronous and Asynchronous Communications, Emerging Technologies, and Collaborative Working Space. There is some overlap, but each thematic area is also concerned with some special aspects of the educational use of ICT. The Comp@ct network offers keynote presentations and workshop contents covering these areas for discussion in thematic conferences and Comenius contact seminars and other training events. The events target primarily teachers and teacher educators, but policy-makers are also welcome. Comp@ct supports teachers and Comenius schools in their efforts to launch or develop their own projects by providing them with background information about and guidelines on the pedagogical use of ICT. These rich and varied knowledge resources are



available on the Comp@ct website, during training events and through online consultancy. The publication includes one example of training event written by French partner.

Emerging Technologies is the currently most interesting Comp@ct thematic area. According to partners with expertise in this thematic field, the “emerging technologies” include such upcoming newer technologies as broadband Internet connections, streaming and mobile learning devices. These technologies enable schools to download high-quality videos, carry out assignments and see the results without a wait. In Austria such techniques have already been employed successfully to access educational media through TV channel-based media-on-demand services. The next step is to develop a more interactive form of participation. The ICT trends and their pedagogical relevance are discussed in the article by Austrian partner Education Highway.

In international projects, broadband connections and mobile devices such as handhelds and wireless tablets mean that pupils can share applications over the Internet and work in real-time collaboration with other project participants no matter where they are located and download audio, video and data materials at the highest-quality resolution and lightning-fast speeds. Maybe some future Comenius projects will broadcast and listen to the voices of Europe.

### **Comp@ct ICT Survey 2004**

The Comp@ct 2004 ICT Survey summarized in this publication follows the similar surveys carried out in 1999 and 2001 by CoMuNet network. By gathering information and experience from Comenius schools of the ICT usage it was interesting to study if something has changed and to find out the current trends in ICT usage. The Comp@ct ICT Survey 2004 found a rapid expansion, in Comenius projects, in the use of such interactive ICT tools as web collaboration tools, web forums and chat rooms. However, among the ICT activities supported by the Comenius project, emailing, disseminating information over the Web and designing web pages take the lead.

## **Impact and outcomes of Comp@ct**

The Comp@ct partnership has provided hundreds of Comenius schools and schools interested in starting a Comenius project with expertise in ICT and knowledge needed when integrating ICT into educational project work. This has been done by organising thematic conferences, contact seminars and other training events. Comp@ct has supported the schools trained by it by supplying them with a collaboration tool for the duration of the project. Teachers have contributed to the design of some of these tools. Moreover, the practical cooperation with ICT suppliers and programmers has given both sides broad insight into the design and development of applications of this kind. eJournalism - the project method for publishing online contents, communicating among participants and enabling collaboration - has been adopted by hundreds of schools as a part of their Comenius projects. You can find the more detailed presentation of the Comp@ct method of educational collaboration in the next article.

Teachers' feedback on training and ICT use has been positive, revealing enhanced motivation to employ web-based tools and an improvement in pupils' and teachers' ICT skills. The findings of the Comp@ct ICT Survey 2004 are similar. The Comenius 2.2 in-service training courses were developed on the basis of successful Comp@ct experiences, and they will be used to disseminate project findings and outcomes also on future courses.

Many of the partner institutions are acknowledged national and/or international experts in the educational use of ICT and are thus able to influence national educational policies and national in-service training provision. Moreover, collaboration with other educational institutions and thematic networks has helped to spread the more interesting results and project practices beyond the Comp@ct network. The network's sustainability strategy, formulated in the end of funding period, offers good prospects for supporting international school projects. The enlargement of the European Union has made the European dimension a reality as the new models of educational collaboration have been distributed to and contacts have been established with educational partner institutions in the new member countries.

**The main outcomes of Comp@ct include:**

- ✓ the project website at <http://compact.eduprojects.net> offering a wide range of information and guidelines
- ✓ a network of schools, other educational institutions and ICT experts
- ✓ Service Portal and ICT tools; further development of eJournal, Ezine and Web Garden
- ✓ three ICT Special Interest Groups (SIGs) to address the needs of specific communities of users
- ✓ two thematic conferences, SIG seminars and workshops and other training events
- ✓ three Comenius 2.2 in-service training courses
- ✓ eJournalism - the project method for publishing online contents, communicating among project participants and enabling collaboration
- ✓ two publications: Educational Cooperation and Collaboration - ICT and International Projectwork (2004) and Comp@ct - Supporting Comenius Schools (2004)
- ✓ Comp@ct ICT Survey 2004, a report on the state of the art in ICT use in Comenius projects.
- ✓ Learn Internet by Doing (LIP): online courses on the use of ICT in international projects
- ✓ models for and examples of good practices in the use of ICT in Comenius projects
- ✓ cooperation with other thematic projects and the like, promoting, investigating and supporting the use of ICT in Comenius projects.

# **eJournalism – The Comp@ct Method of Educational Collaboration**

*Senior lecturer M.A., Vihti Upper Secondary School Ilpo Halonen  
Chairman of Comp@ct Principal of Vitikkala School Pentti Pirhonen*

## **eJournal – a new and innovative tool**

The Internet tool we have taken into use in our Comp@ct activities was eJournal, an easy-to-use and innovative Learning Management System (LMS) that belongs to the category of light and inexpensive commercial LMSs. Comp@ct is involved in the development of eJournal by giving continuing feedback, development ideas and language translations. The basis of the software code lies on the so-called LAMP conception (Linux – Apache – MySQL – PHP). When creating the eJournal the developers took all former experience and current knowledge about other tools into consideration as much as possible. Therefore the eJournal has become a popular tool among the users.

## **eJournalism – creating and publishing content**

eJournalism - what could be a better name for what we try to do together with our pupils and students in the Internet? It is a very exhaustive name and, simultaneously, it hits the crux of the matter. We produce and publish content in eJournals, and what our visitors can discover in the Internet are articles. The articles are composed both of text and images but also of sounds and videos.

As part of school work eJournalism represents eLearning. It seems to be a piece of cake for pupils and students to learn to use the eJournal. They find it as a kind of virtual notebook where they can take notes, make drafts and sketches, create and publish products and share content, such as text, drawings, songs or video clips.

The pupils and students can work individually or in teams. Everything that they produce can be private or public. The parents of some schools are more protective when it comes to

what teachers can show about their children's products in public. Still, it is not a problem in the eJournal. The teacher as the head editor can open the eJournal for parents of the children so that only the parents, and not the whole audience in the Internet, can see what the children have produced.

### **Who can be an eJournalist?**

Practically anyone can be an eJournalist, even children who cannot read or write. As early as at the kindergarten age children love to draw and paint. Possible approaches to present their products in the eJournals are scanning or helping the child to work with the devices and the software. Of course, children also love to sing songs, take photos or video clips etc. One can transfer everything that is in digital form into the media library of eJournals, and it functions in the Internet, providing that the content formats follow some rules of general Internet formats.

### **Cooperation of Comp@ct and OPEKO, the National Centre for Professional Development in Education: LIP teacher training**

Project making in the Internet is like cooking in the kitchen. It does not help you much if you buy a fancy oven, read many cookery books and watch a great number of TV shows about cooking. You will not become a better cook, anyway. Accordingly, one cannot learn project making from books or from lectures. It is something that you must really start doing with your pupils or your students if you want to master it some day. This was the basic notion behind the training model "Learn Internet Projects by Doing – LIP". In Finland the main target group of Comp@ct was the language teachers involved in international projects. Four different LIP teacher-in-service training courses of Finnish language teachers took place at OPEKO.

## **Introducing project ideas and the eJournal**

Twenty-one Finnish language teachers participated in the training course LIP number 1 in Tampere from November 2002 to March 2003. There were three face-to-face (f2f) seminars for the participants at OPEKO, and, in addition, asynchronous distant learning before, between and after the seminars. The course was coached by Ilpo Halonen, M.A., language teacher, project coordinator and ICT trainer. Mr. Pentti Pirhonen and Ms Sonja Kurki, the coordinators of Comp@ct, instructed the teachers of the course to use the eJournal as their main project platform and lectured about Comenius program and the activities of Comp@ct network.

The LIP training model was developed in close cooperation of trainers. From the first course on, LIP became a teacher-in-service training course model for language teachers, and OPEKO, the National Centre for Continuing Education in Tampere started running LIP courses consequently. Currently, November 2004 the course LIP 4 Enterprise has started at OPEKO, and international partner projects are running in the Internet.

## **How does it work?**

Most of the LIP participants are newcomers. They know email, text-editing and browsing on the web. After getting the instructions in the use of eJournal and project model they start making a partner project with a group of their own pupils in collaboration with foreign colleagues and their pupil groups.

The Finnish teachers work in teams instructing not only their pupils but also their foreign colleagues in the use of the eJournal. They have eJournals available where they organize their collaborative projects independently. There is a central eJournal of the course in <http://lip.eduprojects.net> where teachers report about their work and where some feedback of pupils and students can also be read. Also teacher evaluations are published in this eJournal after the course and the project period.

The teachers of the LIP training have the freedom to start with any kind of project with their foreign colleagues.

The teachers are instructed in the seminars how to use the eJournal, to collaborate with their colleagues and to make projects together with their pupils. Even if the practical realization of the projects is the main concern of the course, there are presentations and discussions about theoretical framework of the project method in the seminars.

In addition to making their projects, the Finnish participants report about their projects to the course coach. The course coach is the main trainer of the LIP 1 and the tutor of the asynchronous distant learning elaboration of the course in the Internet.

### **The use of the eJournal is fun!**

Starting to use the eJournal was a radical change in the virtual activities of project makers. When writing emails pupils were working offline, and the teachers supported the sending and the receiving of emails. Email projects represented the methods of computer-aided virtual teaching. Taking the eJournal into use pupils changed to work online, and the teachers did not dominate the process as much as they did earlier. This meant that the pupils relied more on themselves in the technical realization of the learning process. They changed to use new methods of computer-mediated teaching on the Internet. It seemed to be very easy for pupils to learn this new way of work.





***USING ICT AND  
EVALUATING THE IMPACT OF ICT***





# ICT in Education

*Anton Knierzinger, Caroline Weigner  
Education Highway  
Innovationcenter For School and New Technology*

As we move from book culture to digital culture, we are on the bring of being able to  
rethink the entire process of teaching and learning

As we move from a print culture to a digitized culture, we move from stable information to  
moving information.

**Dale Spender,**  
IFIP Congress Canberra 1996

For all those who observe the integration of information since decades – and communication technologies in our schools, this development presents itself often as continuum. The first PCs appeared about 1980 in our schools. The improvement of technology is moving forwards step by step and there occur stages of change where it is necessary to pause and reflect what has been reached and in which direction to move.

The digital age in form of the internet entered in almost all schools. The initiation of CD-ROMs and DVDs belongs to everyday life in education. On the other side there appear new trends of technical development which are worth to verify their capability to advancement of teaching and learning, preparation of education and the improvement of school administration. Some of them are details, small tools or pieces of multimedia content which can be quickly and easily integrated into traditional learning and teaching situations and provide a service there.

Others can probably not be integrated meaningfully without bigger changes of tuition methodology. Finally trends appear which ask for a “rethink” of education.

The collection of many good examples in the field of Comp@ct , which can be considered as best practice models of exemplary usage of new information – and communication

technologies in schools, are the right place for an article which should encourage to reflect the actual situation of ICT in European systems of education and think about developments which will be provided by technology for pedagogy in the near future. These examples show that the high level of engagement of teachers, with reference to the integration of new information- and communication technologies in education, ensures that this development is not exclusively pressed by technical improvement, but the didactical and methodical realization of possibilities that are provided by technology, will be in forefront.

## **A. ICT in education – an analysis**

### **1. Internet, the new information- and communication medium**

Most of the European schools are connected to the internet. The distribution shows some differences between the different countries, but you can assume that in nearly all cases, where active interest on working with the internet is shown, it is possible to realize.

The question is, how internet is used and how far this medium is present in everyday life of education.

Internet is a medium which has radically changed the access to information for teachers and pupils in the same way. Information is omnipresent and access is always possible. This changes also the nature of information in education. Information is available or can be retrieved quickly if needed. Information need not be planned. Not information for itself is part of preparation of education, but its acquisition to it.

It is very exciting to observe how new forms of communication change school. Exchange of information, experiences and meanings are seen as important. Cooperation, which was very neglected so far, is gaining new importance.

### **2. PCs in primary education**

Partly unrecognized, IT entered also primary education. Although the curriculums do not demand it at the moment, nor the available teaching material support it, many teachers esteem this medium as welcome support in their job.

Primary education was and still is the ground for new didactic and methodic developments. Here modern ways of teaching such as teaching based on divisions of labor, self-directed and project oriented learning, are used in an amount which can hardly be found in other fields of European educational systems. The integration of disabled children, a partly high percentage of pupils with foreign mother tongue, present a big challenge for the teachers.

No wonder that usage of new media, especially here, is seen as support and is well accepted. But the training of teachers is still missing. This cannot be reduced to technical skills, in fact the applications in education and the possibilities of usage in preparation of education should be in the front.

### **3. Opening of schools outwards**

IT supports the opening of schools outwards in two different ways. On the one side all groups that are involved in school process have access to information which have been not or hardly achieved. In traditional education with the schoolbook a medium is used that imparts special and adapted knowledge for education. Web-sites transport information which might be relevant for education, but is seldom prepared for education. This makes the work in school more exciting, but probably not easier. In consideration of IT school is no longer a protected room.

This sometimes causes problems when you think of the discussion of filtering out unwanted content from the school networks. But it also provides the possibility for different institutions and groups of association to provide schools directly with information and media. This possibility is completely untended from economy but also from cultural institutions.

On the other side schools can present themselves with all their services, wishes and offers in association and many of them do so already. It is interesting to observe the development of school homepages from self-presentation to an offer of information. Not “read what we write” but “we write what you want to read” is in the front.

## **B. ICT trends and their pedagogical relevance**

### **1. Total networking**

While the first equipment of schools were single stations, nowadays networks are implemented everywhere. IKT in education is concentrated on cooperation and communication and the LAN (local area network, inhouse net of the school) is the technical basis for it. But the total networking of the schools by cables cannot be financed.

In this case wireless LANs are a popular alternative, especially for primary schools. In contrast to secondary and upper secondary schools the PCs are not concentrated in PC-laboratories but they are distributed in the whole school building. The very limited bandwidth (11Mb/s) will be replaced through a new standard which will provide higher bandwidths.

### **2. Broadband networks**

To the networking of schools also belongs a broadband internet connection. Broadband internet connections enable totally new and innovative possibilities of usage, for example interactive TV, Media on Demand services and interactive e-learning through virtual classroom software tools. Broadband networks live from the availability of new pedagogical applications which can relieve and enrich everyday life of schools.

### **3. Pervasive computing**

Technology is getting smaller and smaller as someone who knows the newest hardware with Windows CE, which capability can be easily compared with normal PCs, can confirm. Mobile computing will also play a role for learning and teaching.

At the moment the used notebooks in schools are relatively big. Their use affords to carry a second school bag. They need electric power after a short while and can only be connected by cables. The general trend is that technology is present in a higher extent but more and more hidden. The components become smaller and integrated in other things and work more in secrecy.

#### **4. Streaming – and Broadcasting Technology**

But not just the access to information has changed radically. What is done with media in schools? Digital media offer three important advantages. They can be transferred lossless, they can be edited and changed and they are automatically searchable. All three characteristics offer new chances for education. Digital media are used worse if pupils only absorb them passively analogue to school films. Streaming Media Projects will offer an access from schools to digital media libraries. New software allows pupils to produce something new out of internet information and digital media, but enriched by their own thoughts and products.

#### **5. The new role of teachers**

All things mentioned have big affects on the role of the teachers. As internet access offers more information as the biggest teacher library can offer, each teacher has to accept that the access to information is for both groups similar. The role of the teacher changes from someone, who transmits information to someone who makes information available. But it won't loose its importance. Information is not knowledge, but knowledge is the key factor in school. Information has to be integrated into existing knowledge and into the value system. The teachers, as cited as "facilitator" in pedagogical literature with emphasis on IT, must be completed through the "classical teacher", who is "clarifying things and encourages pupils" (Hartmut von Hentig).

## Face-to-Face Across the World

*Principal Officer Rosetta McLeod  
Aberdeen City Council  
Scotland*

Comenius projects provide a useful context for making use of ICT, and, indeed, it would be hard to see how a transnational school project could take place in the 21<sup>st</sup> century without some use of ICT! As technology becomes more widely accessible and more powerful, schools should now consider moving beyond the basic use of email and websites, and consider some rather more innovative applications of newer and emerging technologies.

In Scotland, greater use is now being made of video-conferencing. This is largely due to the fact that each of the 32 education authorities has been equipped with a professional set of video-conferencing equipment which schools can access too. Of course, some schools have their own equipment on site (especially those in remote locations) and often make use of web-cams for face-to-face meetings. On occasion, though, schools will make an arrangement to visit their local education authority when access to more powerful equipment is necessary.

Last Christmas, pupils from a primary school in Aberdeen came to the education offices to participate in a video-conference with Santa Claus! The children assumed, of course, that this was the real person talking to them from the North Pole and, after their initial amazement and apprehension had disappeared, they asked Santa a host of questions about his life. They were keen to find out whether Rudolf the red-nosed reindeer had ever been to the vet, and if Santa had ever overslept on Christmas day. There was even an opportunity to place some last minute requests for Christmas presents! The aim of the activity ( apart from having fun!) was to get the children used to the idea of talking to someone far-away, yet face-to-face. We were very grateful to our ICT partner, Research Machines, for coming up with the idea and turning it into a reality (at least, a "virtual" reality!).



Another school in Aberdeen, Hanover Street Primary School, has been making quite extensive use of the education authority's video-conferencing equipment in its International Reading Champions project. This is a local project which aims to encourage children to read. The project began when local people were invited into the school to talk about a story or a book which they had especially enjoyed, and to read an extract to a class. This was so successful that it was decided to extend the project by inviting colleagues from abroad to talk to the children by video-conference. Through the education department's contacts across the world, a number of video-conferences were set up and classes of children bussed in turn to the education offices. We were very grateful to colleagues in Finland (thanks to the Comp@ct network!), Sweden, Spain, Ireland, Denmark and further afield who took time to find a story from their country which was appropriate to the age of the pupils they were to read to. The pupils, of course, had undertaken some advance preparation about the country they were to link with in the video-conference, and had prepared questions for the reader which were often highly entertaining! Follow-up activities also took place when the children returned to school. Now, the International Reading Champions website is about to go live and it is hoped that it will prove to be a resource which might be copied by others.

Pupils and teachers who have taken part in activities like these have greatly enjoyed the experience and have felt privileged to have had the face-to-face links. It is easy to imagine how similar events might take place in the context of a Comenius project - though, of course, they do need to be well-structured. Teachers from participating schools could hold virtual meetings (in addition to the highly necessary "real" meetings), and pupils could even prepare presentations for their partner schools in other countries.

The facility in Scotland allows up to 12 sites to link simultaneously by means of a video-conferencing "bridge", and it is proving to be a popular resource for holding meetings and even some training events. University and training institutions, as well as private companies also have similar facilities which they may be willing to open to schools. It's certainly worth a try!

## **European Multimedia Seminar in Germany – An Example of Comp@ct Support for Comenius Schools**

*Teacher, president Eric Lucas  
Fréquence-Sill*

Comp@ct French partner Fréquence-Sillé is a non-commercial, associative radio broadcaster in the county of Sarthe in Western France. Since 1991 the station has dedicated itself to communal radio broadcasting primarily to the rural region in the vicinity of Sillé le Guillaume. Due to its geographical location Fréquence Sillé has taken initiatives and assisted in the development of the surrounding rural region. Furthermore, the station has various activities including RadioNet and other educational development projects that are executed with the help of new technologies. The radio station broadcasts educative programs through the Internet and additionally has taken part in the European Cooperation on School Education, Comenius. The station relies on the team of 11 competent staff members and local supporters in fulfilling their mission of local and international educative communication.

In 12 – 15 March 2003 Fréquence-Sillé organised a multimedia seminar. 29 teachers and 20 pupils of Comenius schools from nine countries participated the training session of European multimedia class in Teterow, Germany. The aim of the training was to give the teachers and the pupils knowledge and skills to collaborate on Internet and to produce audio creations and web reportages. The pupils and teachers were not familiar with the tools and reportages but this training event showed that when receiving enough information and guidance a lot can be achieved within 3 days!

### **What were the methods?**

During the three days classes French, Romanian, Spanish, Irish, German, Polish, Luxembourgian, Danish and Latvian participants were introduced and trained to use audio on demand and web reportages. The training included at first observation of experts with

explanations what was done and how. It was also essential for learners to get sufficient amount of information and this was done by various presentations of tools and their usage. But without practical exercises and feel of real production process pupils and teachers learned how to make interviews and reportages and how to put them available on the Internet. It was also important to evaluate the results and get feedback.

### **What was done and produced?**

The seminar participants made observations of audio websites and web reportages sites and various presentations. Furthermore they were introduced to differences between programmes with audio on demand and streaming for the server and the user. Basic difference for the use is that she can start to listen to the streamed audio file right away as it is transmitted rapidly in small pieces over the Internet but if she wants to have audio on demand she needs to wait for the whole file to be downloaded. Without broadband connections the latter takes much more time and patience of user.

RadioNet Web-Anim, new tools created by Thierry Arsicaud at Frequence-Sillé were discovered and found very interesting. By using teaching step of the web reportages the participants learned to set online the audio and multi-media productions on a shared site – not an everyday job to do! Many interesting moments were spent on practical exercises in the city when the pupils interviewed people with the support of the teachers. Some learned also how to do sound assembly, work on the image, and accompaniment of text.

Afterwards evaluation of the formation was done together with observations of the productions. As the seminar participant were from Comenius projects it was useful to have a reflection on the possibility of using the radio on Internet for sending dialogues online with two or several partners.

The multimedia seminar was in addition a very interesting example of European dimension.

# An Example of ICT Usage in Comenius School Viljandi Paalalinna Gümnaasium

*Paavo Viilup*

*Centre of Educational Technology, Tallinn Pedagogical University*

The following school portrait will provide an overview of the only Comenius school in Viljandi. Special attention will be given to available ICT resources and their use in the school's Comenius project, but a general overview of ICT use will also be given.



## **Overview and history**

Viljandi Paalalinna Gümnaasium is located in Viljandi, a small town of 20 000 in Southern Estonia. The school has approximately 1 017 students (data from 10 September 2003), who are taught by 66 teachers. The school was originally a boarding school (established in 1965 and called Viljandi Boarding School, the current name dates from 1995, but from 1973-1995 the school was called Viljandi Secondary School No. 5)), but now the boarding house is used by the elementary school, whereas the original school building is used by the primary and secondary schools. Special attention is paid to teaching German and music, but in secondary school all students can also choose whether to focus on humanities or science. There are also a number of organisations and clubs (e. g. a number of choirs and sports clubs) which provide extracurricular activities for the school's students.

## ICT resources

At the moment, Viljandi Paalalinna Gümnaasium has the following ICT resources:

- 1 computer lab with 16 computers (Pentium 166) from 1998 (funded by the Phare foundation)
- 1 computer lab with 16 computers (Celeron) from 2003 (leased by the school)
- 2 portable multimedia projectors
- laptops for teachers
- computers for teachers and the administration
- 1 server running the Intranet and the school's webpage

The aforementioned webpage (located at <http://www.vpg.vil.ee> and created by an external web design company) is administered and updated by the ICT coordinator/teacher. In order to update the webpage with information relevant to their courses, teachers have to send this information to the ICT coordinator (via e-mail) and the information will then appear under the appropriate section on the school webpage. While the webpage itself does not have any forums or discussion boards, certain forms (e. g. 11B and 10A) have their own websites, some of which have, among other things, discussion forums for the students and teachers of the form.

At the current time, ICT is taught to forms 4, 7, 10, and 11. The number of lessons per week varies from form to form, but already the teaching of ICT provides the students with sufficient guidance in new technologies and basic ICT concepts. In addition, many teachers use the computer laboratories for teaching various subjects (English is the most prominent one, but biology, mathematics, and arts are also taught using the available ICT resources). Students also have access to the two computer labs after all official lessons are over.

The best example of ICT use in lessons within Viljandi Paalalinna Gümnaasium is an English course, which takes place completely in a computer lab. The author of the course is Mart Reitel, English teacher and also the school's Comenius contact.

### **Comenius 1.3 project: Flexible student grouping: an effective way of solving educational problems**

The project "Flexible Grouping - An Efficient Way To Solve Educational Problems" developed by I.E.S. Jose Conde Garcia (Almansa, Spain), Viljandi Paalalinna Gümnaasium (Viljandi, Estonia), Klaukkalan Yläaste (Klaukkala, Finland), Istituto Magistrale "A. Cairoli" (Pavia, Italy) and Colegiul Tehnic "Traian Vuia" Galati (Galati, Romania) is aimed to research the history of students' groupings in different countries, the present situation in the area and possibilities of implementation of the experience received at the group meetings in everyday school life. The main goal of this project is to study the best ways in which students should be grouped so as to improve their results and their involvement in school and social life.

The aims of the project are outlined as follows:

- to improve the organisation of grouping students in the school
- to avoid conflicts and other bad phenomena (stress, drugs, alcohol) in the school
- to compare grouping methods in different countries in order to implement the best solutions in the school
- to raise students' interest in acquiring knowledge
- to influence trends in changing the educational system
- to improve self-esteem and common teenagers problems through satisfactory groups

The expected effects are outlined as follows:

- improvement of students' results in studying
- raising teachers' knowledge on proper handling groups of students
- improvement of students' mental health in the school
- educating teachers, parents on how to help solve teenagers' problems

The usage of information and communication technologies is outlined in the project plan as follows:

- Internet – email, website, discussion forum
- traditional and cellular phone
- fax

### **Project activities**

Up to now (the project has lasted for one year) all member schools have carried out a research project on school violence (in the form of questionnaire) and the research results from the individual schools were combined into one during a meeting, where the students collaborated on a joint report.

The related questionnaires and other materials are available for interested parties at the project's website (located at <http://www.vpg.vil.ee/~comenius1/>)

### **ICT use in the context of the school's Comenius project**

As is outlined in the project guidelines, communication between the member schools takes place by using both old and new technologies. E-mail is used extensively, which is to be expected, but the project also has a very informative website, which contains much relevant information and is updated with at least some frequency. The website also has a forum, which is used in addition to e-mail to discuss the ideas and issues surrounding the project. The advantage of this is that the discussions are also available for the general public, which in the case of most e-mails is, of course, not the case unless somebody collects all the e-mails and puts them online. The forum does not have a very high posting rate, but the posts are generally to the point and there is no digital debris.

Computer-based synchronous communication methods are not used to manage the project or discuss matters. This is largely due to the lack of technical readiness (this is especially the case with video conferencing) and lack of resources to acquire the necessary equipment. Working on the aforementioned research done by the students would have most likely been more effective if computer-based synchronous communication had been used (in reality, collaboration took place during the meeting in Pavia), but all the member

schools lacked either the technical readiness or were generally hesitant to get involved in trying out synchronous computer-mediated communication. But asynchronous methods are used widely and successfully and the forum is a highly effective inclusion.

### **Other projects**

Viljandi Paalalinna Gümnaasium was also involved in another very successful project “Europe at School Project made by: Travelling with Pippi Through Planet Europe”. The school managed to win the competition, together with partner schools (from Poland and Croatia), twice and was second once. The websites created during this project (or rather many small projects, the last one of which you can at <http://www.vpg.vil.ee/~pippi/>) are truly impressive and use, for example, Flash animations and interactive quizzes to present the subject-matter, which is related to history and finding differences and similarities in the histories of the countries the partnered schools are from.

### **Conclusion**

Viljandi Paalalinna Gümnaasium has been extremely successful in both ICT implementation and project involvement. The school has gained an enormous amount of experience from the lengthy period of involvement in various European projects and this experience is also currently in use. In addition, the school has also proven to be a trustworthy partner for the other project participants. It can only be hoped that the school’s past success will be repeated in future projects.



## Monitoring the Impact of ICT in Schools

*Principal Officer Rosetta McLeod  
Aberdeen City Council  
Scotland*

Across Europe the face of ICT in schools is changing. More hardware is available in the classrooms, computers are linked to the internet, and more pupils and teachers are making use of the new technology. But - and it is a big BUT!- is this huge financial investment really making any difference to teaching and learning and, indeed, to the achievement of pupils?

For some years now, the European Union has been focusing on ways to promote the use of ICT in education. The Commission set out a blueprint for action called "*eLearning: designing tomorrow's education*" which was part of a comprehensive "*eEurope Action Plan*" approved in June 2000. The main aims of the *eLearning* initiative are "to speed up the deployment of a high-quality infrastructure at a reasonable cost; to step up training and overall digital literacy; and to strengthen co-operation and links at all levels - local, regional, national and European - between all sectors involved, from schools and training colleges to equipment, content and service providers."

([http://europa.eu.int/comm/education/policies/ntech/ntechnologies\\_en.html](http://europa.eu.int/comm/education/policies/ntech/ntechnologies_en.html))

The specific objectives of the *eLearning* Action Plan adopted by the Commission in March 2001 include:

- providing all schools with access to the Internet and multimedia resources by the end of 2001, and equipping all classrooms with a fast Internet connection by the end of 2002.
- connecting all schools to research networks by the end of 2002.
- achieving a ratio of 5-15 pupils per multimedia computer by 2004.
- ensuring the availability of support services and educational resources on the Internet, together with online learning platforms for teachers, pupils and parents, by the end of 2002.

- supporting the evolution of school curricula with the aim of integrating new learning methods, based on information and communication technologies, by the end of 2002.
- providing all teachers with appropriate training, adapting teacher training programmes accordingly, and introducing measures to encourage teachers to make real use of digital technology in their lessons, by the end of 2002.

As someone who manages the roll-out of ICT for the schools in my area of the north-east of Scotland, I can confidently say that, measured against the above criteria, we are doing quite well. Our pupil-machine target ratios are reasonably good, all pupils and teachers have access to the internet and email, most of our teachers have participated in local or national ICT training programmes, and I have been building up a team of specialists to support schools with their technical and curricular requirements concerning the use of ICT. We are also experimenting with some of the newer technologies such as interactive whiteboards and tablet PCs, and, in the not-too-distant future we expect to be connected to the Scottish Schools Digital Network, which will provide a fast broadband connection to a national intranet with a wide range of facilities, including access to online content.

Now, however, we really need to ask the question, "Is ICT making a difference to the quality of teaching and learning?" . And if we think it is, then the next question is, "How do we know?".

We can, of course, find much anecdotal evidence from schools across Europe that ICT is being used effectively, but teachers do need a more structured approach to the monitoring and evaluation of the impact of ICT. In Scotland, work has begun to address these issues.

First of all, there are national guidelines

(<http://www.ltscotland.org.uk/5to14/guidelines/ict/index.asp>) which specify the progression of ICT skills and knowledge which pupils should acquire between the ages of 5 and 14 years. These cover the key areas of

- Using the technology
- Creating and presenting
- Collecting and analysing
- Searching and researching

- Communicating and collaborating
- Controlling and modelling
- Developing informed attitudes

The guidelines specify, for example, that a very young pupil should be able to open and reply to a simple email message, while older pupils, at least by the age of 13 or 14 should, should be able to compress and decompress email attachments, send a message to multiple addresses and add addresses to a contact list. All this, of course, is very useful and does help the teacher to know the skills which are expected of pupils as they progress through primary schools and into lower secondary education. But more detailed questions need to be asked in order to assess if there has been any real impact on teaching and learning.

In order to address this, some further materials have been made available through the MIICE project (Measurement of the Impact of ICT on Children's Education) led by the University of Edinburgh ([www.miice.org.uk](http://www.miice.org.uk)). The MIICE project grew out of observation of evidently good practice in the use of ICT to promote learning and teaching across Scotland. MIICE's main purpose was to put into words what most recognise is good quality in learning and teaching incorporating the use of ICT. To this end, a MIICE quality framework was produced specifying 13 Outcomes (the broad areas of impact of ICT use), together with specific Components for each outcome. The Outcomes relate to learning by pupils, the schools' management of effective learning and continuing professional development in the use of ICT for teachers. This sounds very complicated, but to give an example:

Outcome 1: Learner reflection (ie. the learners' ability to think about what they are doing as they use ICT, and their ability to put it into a number of contexts) has 4 Components:

- taking personal responsibility for learning
- realistic but improving culture
- ability to articulate evaluations of actions taken
- development of informed attitudes in relation to ICT in society

Each of these components is further broken down into questions which a teacher might ask in order to obtain evidence of skill. In this way, a teacher might begin to take a structured

approach to monitoring and recording the impact of ICT in the classroom. The MIICE website has a great deal of further information and ideas, and is well worth a visit.

All of this, of course, takes a great deal of teacher time, and, indeed, teacher confidence in becoming familiar with the evaluation process and its links to the process of planning for the use of ICT in the curriculum. It is, however, something that teachers will need to become familiar with if we are to justify the amount of money that has been spent on ICT in recent years. One of the easiest ways to get started is to use a European project as the context for developing ICT skills. In the course of a Comenius project, for example, pupils can exchange emails, attach word-processed files, digital photographs or short clips of digital video. They might even have an opportunity to video-conference with a partner school or to use an online collaborative forum. If pupils keep a portfolio of their work, the teacher then has a good source of evidence on which to base an assessment of ICT skills.

For further information, please refer to a document on the website of the I-PROBE thematic network on school self-evaluation, "Is ICT being used effectively in your school?":

<http://www.i-probenet.net/>

(Document Library - Magazine section)

### edu365.com: A portal for students

Following the recommendations of the European Union Summit Conference held in Lisbon, the “Generalitat de Catalunya” -Autonomous Government of Catalonia- has launched the Internet educational portal **edu365.com**, addressed to all students and their families.

**edu365.com** is an interactive educational environment that can be used by students both at school and at home, which provides the following services:

1. Personal mail both for the students and their families.
2. Academic information, including professional and vocational orientation and guidance.
3. Curricular support materials, including individualised coaching of students.
4. A personal digital desk with IT tools, including dictionaries, encyclopaedias, multimedia editors, web-based word processors, language translators and a numerical and symbolic calculator.
5. Personal working space for the students.

Personal mail both for the students and for the family is provided to foster cooperation within the learning community: schools, teachers, parents and students, while facilitating communication both at local and international level.

Communication facilities also include access to **chats** and **forums**, which are specially useful to **learning communities** offering the possibility of cooperative project work.



**edu365.com** provides access to all kinds of **academic information**, both for the student and the family. Strong emphasis is made on **professional and vocational orientation and guidance**, which is given on demand by specialised professionals through e-mail.

**Curriculum support materials** for students is facilitated through specific interactive multimedia units such as **tutorials, simulations and drill & practice** materials in all areas of the primary and secondary school curriculum.

Curriculum support also includes **individualised coaching of students** via web by a team of consultant teachers.



system a pioneering service which brings educators, students and parents together in a common environment fostering the quality of education

The **edu365.com** platform integrates **JavaClic**, a multimedia educational environment developed in Catalonia, with more than **70,000 educational activities**, produced by teachers from all over the world.



The project is managed by the “Subdirecció General de Tecnologies de la Informació” –SGTI. Additional information can be obtained from:

**Digital desk** uses an integrated set of Web based IT tools, including dictionaries, encyclopaedias, web-based word processors, language translators and a numerical and symbolic calculator.

Generalitat de Catalunya  
 Departament d'Ensenyament.  
 Via Augusta 202  
 08021 Barcelona – Spain

A variety of additional tools have been added to allow ubiquitous access to intellectual resources for students all over Catalonia. Students will have their own personal working space in order to store and retrieve their personal documents.

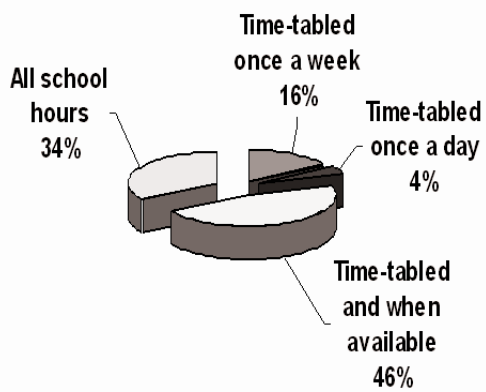
Tel: +34-93-4006914  
 Fax +34-93-2002921  
 e-mail: [info@correu.edu365.com](mailto:info@correu.edu365.com)  
 Web: [www.edu365.com](http://www.edu365.com)

**edu365.com** has the overall objective of offering the Catalan educational

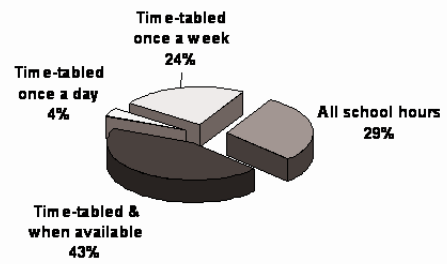


## STUDY FINDINGS

Pupils access to ICT resources in 2004



Pupils access to ICT resources in 2001



Conference 2004  
IN BARCELONA

Dr. Vitalij Denisov, KU, Lithuania  
<http://www.ik.ku.lt>





# History and Development of Collaborative Learning and e-learning in Europe: Lessons Learned

*Professor in Educational Technology Päivi Häkkinen  
Institute for Educational Research  
University of Jyväskylä*

## **From promises to reality**

Information and Communication Technology (ICT) has a dual role in our information society. On the one hand, ICT is assumed to cause partly unpredictable changes in our future information society and in its educational contexts in particular. Increasing challenges of rapidly changing, knowledge-intensive and technology-oriented working life presuppose that facilities for life-long learning and continuous competence development are guaranteed for people in different phases of life. On the other hand, with the aid of ICT, solutions can be built for answering in these challenges. Considerable expectations have been set for the use of new technologies in education at the beginning of this millennium.

The history of e-Learning is short, and it can be characterized by rapid changes in technology development. This has been also the biggest problem of e-Learning. In the history of this field, there are several acronyms such CAI, ITS, ODL, e-Learning, m-Learning etc., which illustrates the dominating nature of technology-driven approaches. What changes rapidly is the technology, not the basic processes of learning. It is a bit worrying that e-Learning is sometimes interpreted in a narrow-minded way by referring to process of delivering digital information and study material to people by the means of communication media. This kind of notion oversimplifies the notions of knowledge and learning.

The most optimistic views suggest that global networks and the use of computers for intellectual communication will further enhance and expand the ways in which humans connect, communicate, and create a sense of community. However, also more critical questions about the possibilities and quality of virtual learning environments have been

presented. Since traditional models of distance learning have not inspired researchers and teachers to develop innovative pedagogical practices, research and development work of the field has started to focus more on creating many-sided pedagogical practices, utilizing ICT, that can support students in their efforts for deeper-level learning and interaction.

### **Integrating collaborative learning and e-Learning**

One of the essential requirements in the rapidly changing society is to prepare learners for participation in socially organized activities. Pure focus on individual cognition has set a stage to shared, interactive and social construction of knowledge (Greeno, 1998), and new learning environments are often based on collaborating and sharing expertise (Koschmann, 1996). Research on collaborative learning and the use of Information and Communication Technologies (ICT) has been integrated in the emerging research area called Computer-Supported Collaborative Learning (CSCL). Research results of computer support for collaborative learning have, however, been contradictory, and several studies have indicated collaborative learning to be far more complex phenomenon and difficult to realise in real-life settings than what has often been thought (Baker, 2002; Häkkinen, 2001; Häkkinen et al., 2004). Collaborative processes are often over-generalized, and any tools for communication and correspondence are called 'collaboration tools' (Roschelle & Pea, 1999). The problem is that if almost any interaction situation is called collaborative, it is difficult to judge whether and when people learn from collaborative situations (Dillenbourg, 1999; Littleton & Häkkinen, 1999).

Two traditions that have strongly contributed to the development of CSCL tradition are research on cooperative and collaborative learning AND Computer-Supported Cooperative Work (CSCW). By CSCL we usually refer to using ICT (usually shared spaces and communication tools) to support collaborative forms of learning. CSCW, on the other hand, reveals issues about the collaborative nature of work supported by groupware (Dourish, 1998). The latter tradition has excluded the issues of learning, but has provided basis for developing groupware tools for learning purposes as well as interesting contexts for knowledge-intensive work and learning at work.

## **Research on CSCL**

Considerable successful results have been received in experiments in Computer Supported Collaborative Learning (CSCL). It is one of the recent ideas to create powerful learning and communication environments in combination of collaborative learning ideas and networked technology. Many advanced technical infrastructures for fostering higher-level processes of inquiry-based interaction have been developed (e.g. Scardamalia & Bereiter, 1994). Recent studies have revealed that in connection with corresponding pedagogical practices, CSCL – environments (such as CSILE, created by Scardamalia & Bereiter) can facilitate higher-level cognitive achievements at school (Scardamalia & Bereiter, 1994; Hakkarainen, Lipponen & Järvelä, 2002). A possible explanation for successful results is an advanced technological infrastructure for engaging students in a process of generating their own research questions, setting up and improving their intuitive theories and searching scientific information as well as sharing their cognitive achievements.

On the other hand, scaling up the models of intensive pilot experiments of CSCL have proved to be extremely difficult to be implemented more broadly. In a more realistic studies and practical experiences the following phenomena have been very typical: short discussion threads, descriptive and surface-level knowledge instead of finding deeper explanations for phenomena, difficulty in generalizing knowledge approached from multiple perspectives, difficulty in making inquiry questions that would evoke elaborated explanations, and difficulty in reaching mutual understanding between collaborators (Järvelä & Häkkinen, 2002).

### **Understanding the concept of collaboration**

In order to be able to design powerful CSCL environments, we need to understand the process of collaborative interaction itself and its contribution to learning. Collaborative learning is nowadays a fashionable phenomenon, but collaboration among students in various learning settings (e.g. in classrooms) is much more complex phenomenon than what has often been thought (Salomon, 1992). Let's just think about the following typical cases of collaborative learning:

- “Free-rider effect”: one team member just leaves it to the others to complete the task
- “Sucker effect”: a more active or capable member of a team discovers that (s)he is taken for a free ride by other team members
- “Status sensitivity”: active or capable members take charge and have an increasing impact on the team’s activity and products
- “Ganging up on the task”: team members collaborate with each other to get the whole task over with as easily and as fast as possible

This makes one ask why collaboration does not happen more often? What makes it so difficult? And why is it, on the other hand, so tempting as a spontaneous phenomenon among small children?

In the history of research on collaborative learning, several researchers have anchored their research on two main traditions: namely Vygotsky’s (1978) sociocultural approach and neo-piagetian ideas of socio-cognitive conflict. Whilst the study of collaborative learning has a relatively brief history, there have nevertheless been substantial changes in the nature of the research being undertaken in this field. Different notions of collaborative learning vary from perspectives focusing on individuals that participate in group activities to perspectives focusing on groups that consists of individuals.

Collaboration necessitates that participants are engaged in a co-ordinated effort to solve a problem or perform a task together. This coordinated, synchronous activity is the result of a continued attempt to construct and maintain a shared conception of a problem (Roschelle & Teasley, 1995). In many of the studies demonstrating positive effects of social interaction for individual learning (Light, Littleton, Messer & Joiner, 1994; Roschelle & Teasley, 1995), collaborative learning has been interpreted as a single learning mechanism. In contrast, recent research on collaborative learning has called for more exact use of terminology related to the specific forms of collaboration (Dillenbourg, 1999). Collaborating participants learn if they generate certain collaborative activities (argumentation, explanation, mutual regulation etc.), which trigger learning mechanisms such as knowledge elicitation and reduced cognitive load. It is relevant to ask what then makes students engaged in these kinds of collaborative activities, what the role

instructional support is and how the circumstances for potential collaboration are made for more optimal. There is an evident need to move beyond simple demonstrations of the advantage of group conditions and focus on studies that seek to understand the processes of collaborative interaction itself and its contribution to learning (Baker, 2002; Crook, 2000).

### **Lessons learned**

On the basis of the history of collaborative learning and e-Learning, there are several lessons that can be learned. First of all, focus of the basic mechanisms and processes of learning in novel learning environments should be the focus. At its best, collaborative e-Learning environments can support cognitive, social, motivational and affective processes of learning. For example, shared workspaces and communication tools can provide a natural setting for explanation, knowledge articulation, argumentation and other demanding cognitive activities. They can also enable sharing and distributing cognitive load and bringing thinking out in open – in other words they can function as a collective memory for a learning community helping the storage of the history of knowledge construction process for revisions and future use.

However, in order to reach these benefits, several pedagogical and contextual prerequisites for successful collaborative learning situation have to be fulfilled:

- space for negotiations and misunderstandings
- need for collaboration (real group tasks)
- reaching mutual understanding, shared values and goals (common ground)
- cognitive conflicts instead of social conflicts
- cognitive diversity
- symmetry of knowledge and status
- group commitment and motivation

From the viewpoint of technology, networked environments used in different learning environments provide a learner a relevant platform for communicating and sharing knowledge. Instead, more advanced technological solutions to support many problematic issues in virtual interaction, such as lack of sense of co-presence or difficulties reaching shared understanding in the distributed teams are still missing (Fischer & Mandl, 2001;

Gutwin & Greenberg, 1999; Häkkinen, Järvelä & Dillenbourg, 2000). This is one of the big challenges for collaboration between developers of learning platforms, researchers and practitioners.

Although the scientific community has regarded the principles of CSCL highly promising, they are extremely difficult to implement among teachers and other practitioners. A typical scenario is that although teachers and students have access to computers, technology is not intensively used. And if it is used, it often supports less advanced pedagogical practices such as transmitting and copying information. If a culture of CSCL is to emerge, it often happens in the special projects supported by researchers rather than revising good practices to be a part of a new culture of schooling (Hakkarainen et al., 2002). So, what is clear is that research, development and training related to e-Learning is distributed. New sustainable pedagogical practices require long-term commitment to develop them in close collaboration between researchers and practitioners. Innovative pedagogical practices emerge from interaction of different partners, and the changes of learning culture are slow and require long-term efforts.

There is, however, hope to get researchers and practitioners to get closer together. For example, in a large survey among Finnish schools and teachers year 1998, Finnish teachers did not regard collaborative learning as an important application of computers (Sinko & Lehtinen, 1998). Situation has, however, changed during the last four years, and e.g. in the recent international SITES'M2 study, the most advanced and innovative pedagogical practices using ICT in Finnish schools were somehow related to collaborative learning. One reason for this is a long-term collaboration of teachers and researchers in the area of CSCL.

In addition to technical (access and skills) and pedagogical (models and practices) infrastructure, we also need explicit thinking and awareness of the conceptions of learning and knowledge that we want to facilitate with the aid of technology. Furthermore, also the consideration of social infrastructure should be emphasized. This refers to the integration of ICT use to core educational processes of the whole community, curriculum and assessment.

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# Results of the Comp@ct Questionnaire Survey on ICT Usage in Comenius Projects – 2004

*Doctor, Dr. Vitalij Denisov  
IT engineering Vadim Narozhnyj  
Klaipeda University, Lithuania*

The Survey'2004 on ICT (Information and Communications Technology) usage in Comenius projects was a follow-up of the similar surveys carried out in 1998 and in 2001 by the predecessor of Comp@ct – the CoMuNet project. The purpose of the survey was two-fold: firstly, to provide an overview of the current state of ICT usage in school projects, and secondly, to compare the new results to the results from three and /or seven years ago.

## **The structure of the survey**

The survey consisted of 24 questions grouped into 6 topics:

- Information on the school
- Information on the Socrates/Comenius project
- ICT use in the school
- ICT use in the school Comenius project
- Personal feelings about the use of ICT in Comenius project
- Personal expectations from Comenius Thematic Networks.

All answers were collected through either on-line (web) form or printed form. Where appropriate the survey form was also translated into national languages. Data collected in both forms was then checked, put into a newly developed database and treated (<http://www.ik.ku.lt/compact/>).

As this format was similar to the surveys carried out in 1998 / 2001 it made it easier to compare their results and to highlight what had changed in ICT usage in Comenius projects during the last three/seven years.

## **Participation**

The participants of the 2004 survey included 185 schools from 28 countries across the Europe. The participants comprised 47 Comenius projects co-ordinators and 138 projects partners.

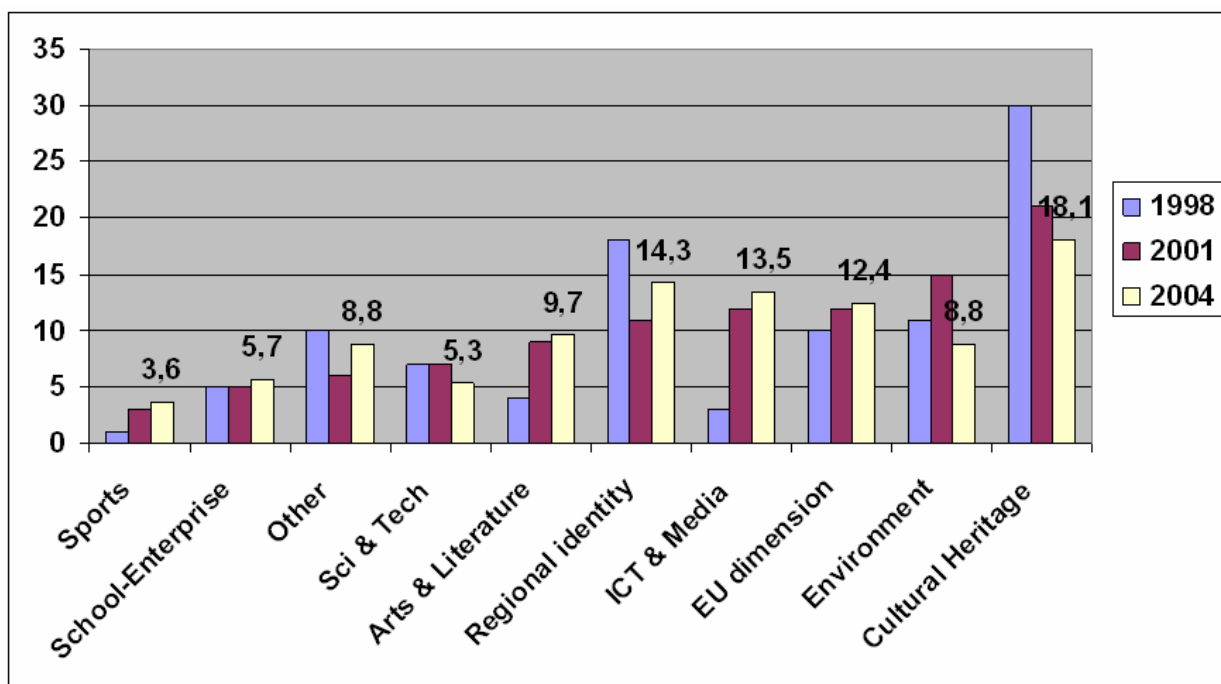
Comparing to the year 2001 the new survey had a much better coverage in terms of countries presented but less responses were received in total. However, it should be mentioned that the majority of the new countries presented in the Survey' 2004 are the countries from the Eastern Europe (mainly newcomers to the EU) and, as a rule, they were not so developed in the ICT field as representatives from the Western Europe. It had, of course, an impact on the survey results received. Meanwhile, it was useful to see the more complete image of ICT usage across the newly expanded Europe.

## **Participant profile**

185 schools from 28 countries answered the Survey'2004. From them 124 (69%) schools were urban schools, 46 (26%) – rural schools, and 9 (5%) – other schools types.

The typical Comenius project co-ordinator was an urban school with approximately 845 pupils, 65 teachers and about 93 computers. The typical partner school had approximately 615 pupils, 53 teachers and about 48 computers; so the coordinating schools were usually bigger and better equipped by computer hardware than the partner schools. The average number of project partners for a typical Comenius school project was 4 - 5.

A comparison with previous surveys results showed a continuing increase of number of projects exploring the ICT, EU Dimension and Arts & Literature thematic areas (see Fig. 1). Although gradually decreasing the Cultural Heritage thematic area remained still the most popular one, followed by the Regional Identity, ICT and EU Dimension areas. The percentage of Comenius projects oriented to the classical science and technology issues, as well as projects supporting relations of schools and enterprises, remained quite low.



**Fig. 1.** Trends in Dynamics of Comenius Thematic Areas: 1998 – 2004.

### ICT resources and strategies

The ratio of computers to students in Comenius schools had improved from 1998, when the average was one computer for every 22 students. In 2001, the average was one computer for every 11 students – a positive change by a factor of two. However, the results of the 2004 survey showed the ratio of one computer to 15 pupils. Again, it should be mentioned that about the half of respondents represent the new European countries which were not so well computerized, compared to Western Europe, especially the Scandinavian countries.

In 2004 already 86 % of schools (65 % in 2001) had developed ICT plans or ICT strategies for implementation within the school. It should be mentioned that six of the coordinating schools (15 in 2001) had not developed any ICT plan. On the individual school level, there was no correlation between the number of computers and the development of strategies, which suggested that ICT planning was more a product of a mindset than of availability of resources.

Additionally, 46 % (37% in 2001) of schools provided computer qualification courses and certifications of computer operating skills (e. g. ECDL).

### **Internet access/availability data**

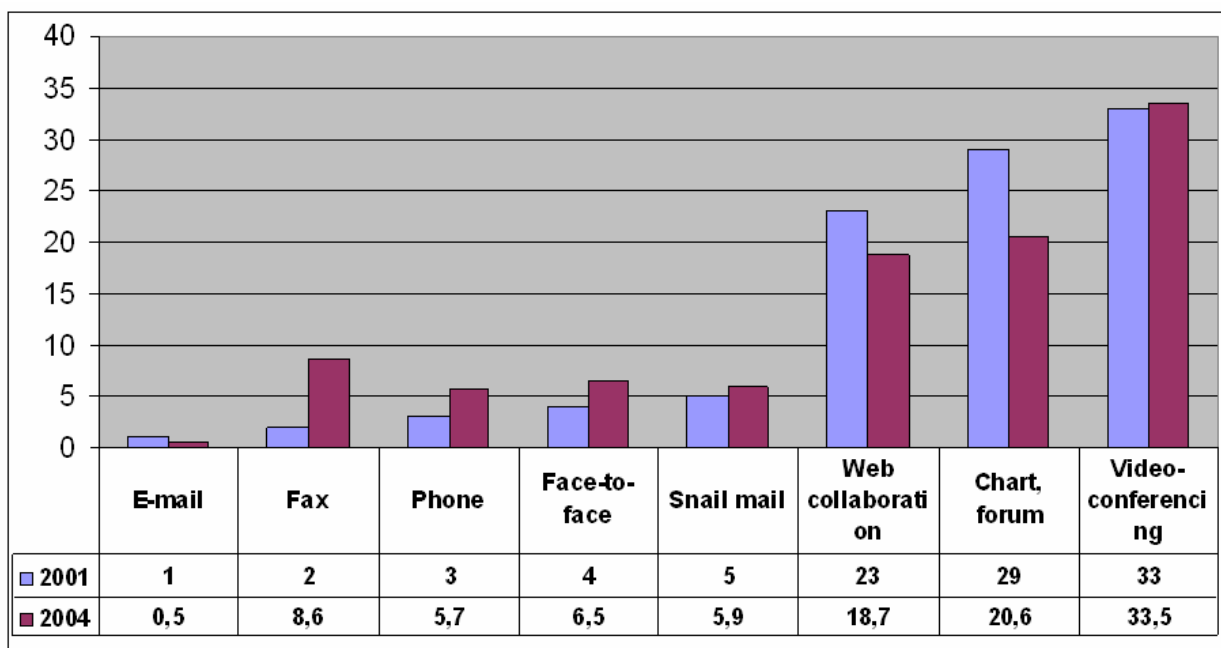
The Internet access had improved dramatically during the last three years. In 2004 only few schools (2%) had no regular Internet access (compared to 35% in 2001). An average school computerization level and local network coverage had also increased essentially. In 2004 about a half of all respondents had more than one computer class connected to the Internet, and about 40 % of schools had computers with Internet access in the school library.

In the majority of Comenius schools, more than 80 % of teachers had access to e-mail. In 2004 the number of schools where students had e-mail access at school was more than double compared to the year 2001. Other computing facilities at school also became more widely available for the students' use. In particular, more than 1/3 of schools provided the access to ICT resources throughout all school hours and about a half of respondents ensured that ICT resources were available for the school students when regular teaching classes were over.

### **Internet usage in Comenius projects**

Of all the intra-project communication media, e-mail became the most intensively used tool– in 2004, 96 % of school projects reported regularly using e-mail for project communication. What had changed most, compared to the year 2001, was the more intensive use of collaborative web tools, forums and chats. To some extent, it could be seen as a result of the Comp@ct Thematic Network (and other networks) whose activities are mainly oriented to the promotion of the use of collaborative means and tools in Comenius projects.

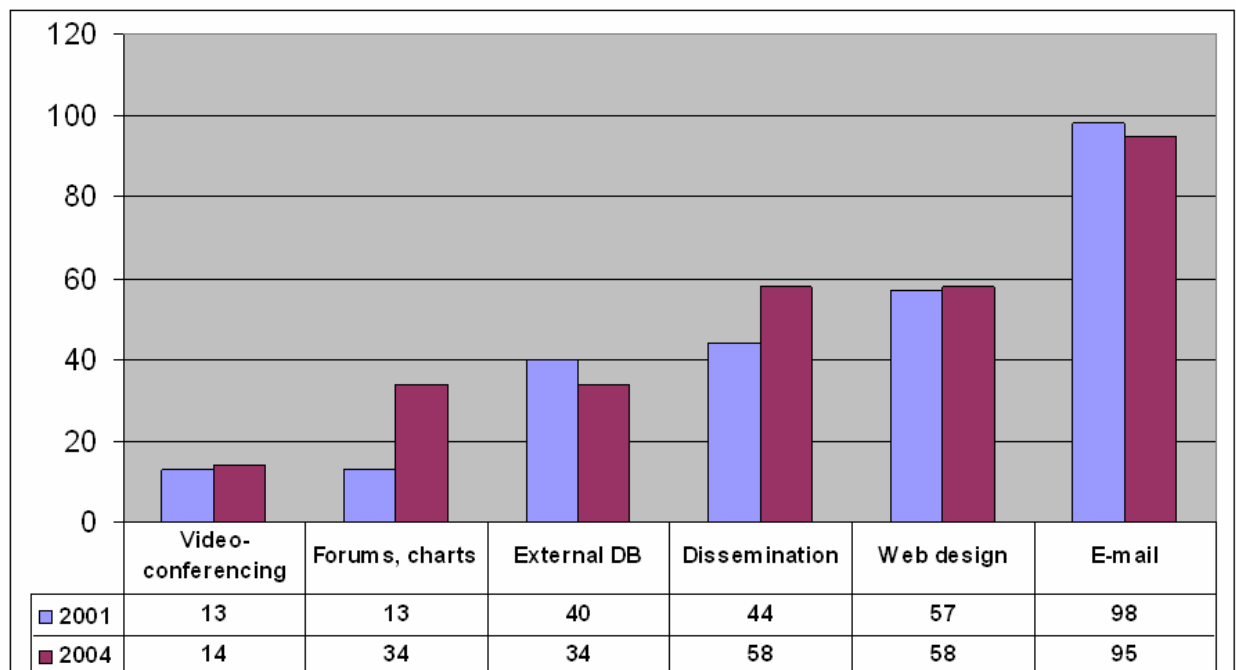
At the same time, the use of traditional communication channels like phone, fax and snail mail had gradually decreased. It can be confirmed by the diagram presented in Fig. 2 where communication channels that were never used in a project were ranked.



**Fig. 2.** Communication channels that were never used in a Comenius project (%).

In 2004 there was a visible trend towards the use of interactive ICT tools in the project activities. Among the project supported ICT activities the use of e-mail, the dissemination of information through the web and the design of web pages took a lead (see Fig. 2). The use of forums and chats increased rapidly.

As a result of that, more and more Comenius schools used Internet services to find school partners (69 % in 2004 vs 29 % in 2001) in an intensive way, and the number of schools that developed their own web sites and network services also increased.



**Fig. 3.** Comenius project supported ICT activities (%).

The survey results showed that the Socrates/Comenius National Agency Web sites remained the main source of Comenius information in all participating countries. Nearly every participant used the Socrates/Comenius National Agency Web site to obtain the Comenius information needed. A significant information support was provided also through various school networks, and more than a half of the schools belonged to a school network. The general trend was that of increased reliance on ICT tools for communication, collaboration and information support within Comenius projects.

### **Experiences and expectations of project participants**

The survey results showed that the majority of Comenius project participants had used ICT in their projects intensively and had evaluated their experience quite positively. In particular:

- 78 % generally or definitely agreed with the statement that *“ICT has encouraged new teaching and learning methods in my school”*;
- 82 % generally or definitely agreed that *“My experience using ICT in the Comenius project has been positive”*;
- More than 90 % emphasized moderate and intensive ICT use in the project.

Moreover, the ICT activities of a Comenius project had had a positive impact on the general ICT competence at school. In particular, 55 % of respondents supposed that the use of ICT within their project had produced a big impact on the teachers' ICT literacy competence. Even more, 58 % of respondents reported that the use of ICT within their project had produced a positive impact on the ICT literacy competence of the pupils.

The survey also showed high expectations from Comenius Thematic Network with respect to providing ICT means and tools for supporting collaborative activities, ICT training, and innovative teaching methods.

# Educator's ICT Competence and Possibilities of Comenius Projects

*Director Vainas Brazdeikis  
Centre of IT for education (Vilnius)  
Kaunas University of Technology*

## **Introduction**

Modern education is related to the newest ICT. It is commonly agreed that ICT provides positive impact on education (Schacter, 1999). Therefore a lot of investments are targeted on implementation of ICT in education. Computer labs and access to the Internet are very important issues when improvement of schools is concerned, but they are not enough to reach a significant positive impact. A great number of researchers agree that this positive impact relies on abilities of the educator to work effectively (Andresen, 2002; Markauskaitė, 2000; Coughlin, 1999). For this reason it is necessary for educators to develop their *competence to use and to apply information and communication technologies* (hereafter: the Educator's ICT Competence)..

In order to develop the Educator's ICT Competence it is necessary to have a clear strategy, as a part of the whole strategy of ICT implementation. This article describes the case of Lithuanian strategy of ICT implementation in the educational system and particularly in the ICT competence of educators.

The aim of the article is to define the competence of an educator and to analyse how it correlates with Comenius projects.

## **The educator's ICT competence**

According to P. Jucevičienė, D. Lepaite (2001) the general level of competence could be divided into four levels:

- Behaviour level. The behaviour competence is necessary for the operational work performance.



- Added level. The added competence based on certain knowledge is necessary for the improvement of work.
- Integrated level. The integrated competence is necessary for the change of the internal and external work conditions.
- Holistic level. The holistic competence is necessary for the new work development and the transfer of qualification to new situations.

On the other hand, the analysis of researches shows that implementation of ICT (P.Jucevičienė, V. Dagiene, Anderson) is a process of four stages:

- Introduction. Implementation of new content (computer literacy), access to the computer facilities.
- Application. Diversity of traditional educational processes.
- Integration. Development of teaching and learning possibilities using the Internet.
- Transformation. Transformation of educational components. Process in transformation of educational paradigm.

The process of ICT implementation has a direct impact on changes in the structure of the Educator's ICT Competence. The four-level hierarchical competence model matches the four stages of ICT implementation, which gives justification for a four-level structure of the Educator's ICT Competence.

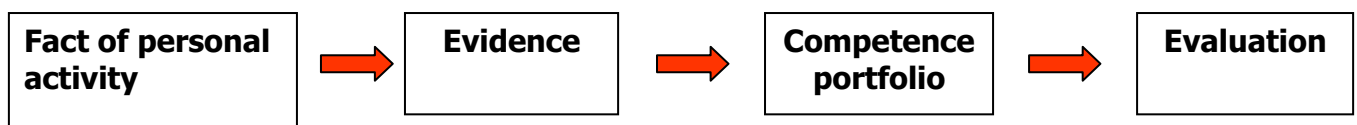
Documents describing factors of teachers' competence divide the Educator's ICT Competence into two parts:

- The first part - ICT literacy (basic ICT competence) which covers characteristics for:
  - Technological literacy. Ability to use and manage IT.
  - Information literacy. Possession of information skills and ability to use them in the right way.
  - Social literacy. Knowledge of social, ethic and legal norms and ability to follow them when using ICT.
- Second part - integral educational ICT competence which covers characteristics for:
  - Educational competence. Knowing how to apply ICT into education and ability to use educational ICT in an effective way.

- Pedagogic competence. Ability to develop the ICT literacy of students.
- Management competencies. Ability to plan, manage and analyze processes of applying ICT.

### Competence evaluation

It is quite difficult to evaluate one's competence. The most realistic method to evaluate it is to take the facts about one's personal activities into consideration. One of the recommended ways to evaluate competence is the competence portfolio (Jucevičienė, 2001)



Competence evaluation method (Figure 1)

Applying this method implies gathering facts about one's personal activities, describing them as evidence and collecting them in a competence portfolio.

*Barton and Coolins (1997) suggest these types of information as evidence:*

- **Product:** multimedia work, document, diary etc.
- **Reproduction:** documentation of actions etc..
- **Confirmation and write -up:** from colleagues, reporter, inspection etc.
- **Presentation or case analysis**

*Jucevičienė P. (2002) suggests to group evidence to:*

- **Direct evidence:** project report, message, video, data, video/webconferencing material etc.
- **Indirect evidence:** confirmation, protocol of meeting etc.

The research was completed with previously mentioned groups using the ICT educators' competence characteristics and the competence portfolio method mentioned above.

## Research groups

There were two groups used for research:

- Active groups. Competence of all members of the group.
- Inactive Comenius group

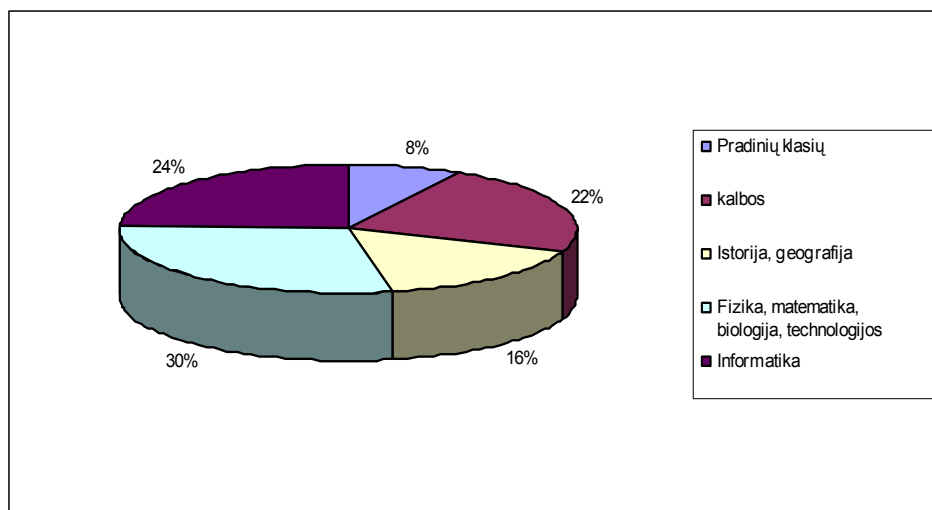
During the research participants prepared their own competence portfolios and presented them, after which the products were evaluated.

Active Comenius project participants were:

- EMISTE study group of the University of Kaunas (KTU). Selection of group criteria: participation in international projects; 15 members - 13 Comenius project members
- schools participating in the IPM Tools, Comenius 2.1 project; 10 members

Inactive Comenius project participants were:

- Study group (planning to take part in a Comenius 2 project); 11 members
- Consultant group. Selection criteria of group: recommendation from schools, or publication. Some of them were working in a Comenius project; 28 members



Groups consist of various subjects teachers (Figure 2)

Developmental research was conducted basing on the competence model and on evaluation methodology. It was based on reflections of self-analyses of the teachers. Teachers' groups (about 80), both groups participating in Comenius projects and those not-participating, proved facts and evidence about their ICT competence and developed their competence portfolios.

### Researches

During the research comparison between Comenius IPM Tools groups and study groups was performed, and it showed the impact of the Comenius projects. Facts of the research (Table 1) look very relevant. They show correlation between Comenius project works and ICT competence from the standpoint of Comenius teachers.

Table 1

Facts of the research

<u>Facts of the Comenius project</u>	<u>Facts of the non-Comenius project</u>
<ul style="list-style-type: none"> <li>• PowerPoint presentation about Com. project</li> <li>• Article with photo for www magazine</li> <li>• E-newspaper</li> <li>• Comenius product data base</li> <li>• Letter for project partner</li> <li>• Plan of Comenius project activities</li> <li>• Report about Comenius project</li> </ul>	<ul style="list-style-type: none"> <li>• Presentation about school, for seminar, lesson</li> <li>• Article</li> <li>• Tasks for students, text about CD and software</li> <li>• Data base for students' evaluation</li> <li>• Tasks for students about email</li> <li>• Individual program, the syllabus of subject</li> <li>• Competence portfolio, documentation in an e-form</li> </ul>

The findings proved the positive impact of Comenius projects on the Educator's ICT competence. Correlation in some instances between subject taught, gender and educational qualification. In their activities the educators indicated lower estimations for their social, pedagogic and management competence and higher for their technological and informative, as well as for their educational competence.

KTU also completed other various researches such as:

- **Tarvydienė L. Education for Citizenship at the Secondary School Through International Project "Forumeduca. The European Citizens in the New Millennium"**. Results of the study enable to enhance education for citizenship and implementation of other European dimensions through realisation of international educational projects.
- **Voskienė R. Development of Pupils' Communicative Competence Through Socrates Language project**. The biggest differences before and after the Socrates projects are in students' social and sociocultural competences, and the smallest difference is in their discourse and sociolinguistic competences. Students from Socrates Comenius language project group have better communicative competence than other students. The biggest difference between the competences of the respondents is in their strategic and sociolinguistic competences;
- **Buinevičiūtė A. Peculiarities of Collaboration Between Various European School Teams in European running EU SOCRATES project "Tourism – Water – Environment"**. Students and teachers, working in an international team, teach each other. Teaching comes through collaboration, social skills formation and deepening.
- **Rupainienė V. Features of Educational Innovations Implemented During the European School Partnership Project (the Case of Comenius Project 'Children's Games and Toys')**. During the implementation of international school partnership projects, educational innovations (new ideas, practices and processes; something that is newly implemented) emerge at the school level. They can also give birth to educational innovations at a level of didactic, pedagogical or educational system.
- **Petkūnas, V. The Impact of International Cooperation Project on ICT Implementation at Vocational Education and Training School**. Relying on the results of the research, Visaginas Polytechnic School has reached only the commencement of the first stage of ICT implementation before this international project was started and achieved the third stage conditions at the end of the project.

## Conclusions

- The findings proved a positive impact of Comenius projects on the Educator's ICT competence.
- Within their activities the educators indicated lower estimations for their social, pedagogic and management competence and higher for their technological competence.
- Suggested to the Ministry of Education and Science of Lithuania and to schools to encourage their educators to participate in Comenius projects more actively, and to apply the Educator's ICT Competence assessment and evaluation portfolios.

Referring to the theoretical analyses and to the survey the suggestion is that the Ministry of Education and Science of Lithuania and Lithuanian schools encourage their educators to more actively participate in Comenius projects, as well as to apply the Educator's ICT Competence assessment and evaluation portfolios. Moreover, construction of the competence portfolio is recommended to educators to evaluate their activities and to design their professional development programs. It is possible to organize the same construction of ICT competence and of evaluation for Compact activities too. Compact partners could produce e-portfolio tools for these tasks.

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# Portfolio Assessment in Finnish Childhood Education

*Senior researcher Marja Kankaanranta  
Institute for Educational Research  
University of Jyväskylä*

## **Defining portfolio assessment**

Although portfolios are still a relatively new means for assessment in childhood through secondary education, they have been utilized for long, already, in various professional fields. In the working life portfolios have served as a portrait of the person, of his or her skills, abilities, interests, and potentials (Linnakylä 1994; Hartnell-Young & Morris 1999). Portfolios have aroused interest especially in occupations requiring creativity, originality and individuality, and in which expertise is acquired through diverse education and work experiences. In such occupations professional competence is varied, as well, and calls for various kinds of knowledge, being typically hard to demonstrate by means of mere education or certificates. For example, artists, photographers, graphics designers, architects and journalists have assorted their best works into portfolios to display the works and achievements themselves but also their techniques, ideas and plans as well as to show the strengths and range of their competencies and creativity (e.g. Adams 1989; Valencia 1990). In many cases they have built these portfolios for years including items from their study periods as well as from a variety of working life contexts. Quite often portfolios or sample works are required also when applying for education in these fields.

In an educational context, the use of portfolios has proven to be a promising form of authentic assessment. Authentic assessment represents such assessment culture in which the aim is to support child's or student's learning, to connect learning, teaching and assessment to each other and to show learner's strengths in real life and real instructional contexts (e.g. Ackers 1994, 65; Paulson et al. 1992; Kankaanranta 1998a). In authentic assessment it is presumed that children or students are involved in the evaluation of their own achievements and that assessment tasks are real and meaningful for the learners and



their education (Linnakylä 1994; Bridgeman et al. 1995). Educational assessment is an integral part of learning and teaching processes and should not be taken out of that context.

It is also essential that information be collected over time, from multiple sources, and using multiple methods and perspectives. Portfolio assessment can be described as a practical strategy for organizing this kind of assessment data. Information gained through authentic assessment is supposed to be used for decisions about curriculum and instruction. It is argued that authentic assessment augments quantitative assessment tradition with a qualitative component and brings subjective, personal, and professional elements to the objective measures (Shaklee et al. 1997).

### **Purposes and advantages of portfolios**

The definition of a portfolio or portfolio assessment is always dependent on the goals of assessment, the purpose and uses of a portfolio and on the perspective of its evaluation. And again, the goals of the assessment and the purpose of portfolio will direct the content, implementation and the concrete form of a portfolio (de Fina 1992, 31; Linnakylä 1994). So far, portfolios have most often been constructed in the form of folders or briefcases. However, the development of information and communication technologies has brought digital portfolios as a noteworthy alternative for the display of learning experiences.

In an educational context, a portfolio generally refers to a child's, student's or a teacher's own collection of samples of tasks and achievements, which represent the person's growth and learning experiences in a relevant and broadly representative manner (e.g. Kankaanranta 1998; Kankaanranta & Linnakylä 1999). It is essential that the author of the portfolio is involved in selecting and judging the quality of work (Paulson et al. 1991). Often portfolios include descriptions about the environment and processes associated with learning and working, as well as one's own ideas or philosophy on learning, teaching or working in general. Portfolios can also be collaborative showcases of a specific group's or community's achievements, or they can give a more process-oriented picture of continuous development in the whole school community (e.g. Martin-Kniep 1999). A good portfolio represents a set of work that shows the range, quality and depth of learning and teaching and reflects a person's or a group's actual performance as a visual presentation of accomplishments and capabilities (Herman et al. 1994; Tillema 1998). Orientation toward

future is also important, and therefore portfolios usually contain a section on future goals and challenges.

Practical issues in developing portfolios concern the definition and purpose of a portfolio and reflection on what is important for a person to document through a portfolio, like for a teacher would be documentation of critical teaching tasks (Wolf 1996b). Some of the primary purposes for portfolio assessment in educational context are definition of learning goals, promotion of learning, display of learning environments, support of self-assessment, development of teaching and strengthening of collaboration. Further reported goals or advantages are, for instance, that a portfolio-oriented approach raises a sense of ownership, fosters student or teacher empowerment (Pollari 2000), provides a sense of accomplishment, allows for the exhibition of variety and creativity of tasks, emphasizes the social and human-side of learning (Berlach 1997), and provides an opportunity for reflection and integration of content. The advantages of portfolio assessment reflect both the qualities of good pedagogy and good assessment. In other words, portfolios afford a means for the unfolding of teaching and learning over time and also an opportunity to engage in the analysis of the work done.

### **Shift from a paper to a digital portfolio**

The notion of digital portfolios has recently raised wide interest as a means for describing and assessing teaching and learning at the various levels of education systems all over the world, from early childhood education up to the doctoral level (e.g. Barrett 1999; Hartnell-Young & Morriss 1999). The possibilities of digital portfolios have been broadly recognized also when it comes to specialists of different fields and displaying their competencies, strengths and evolving expertise.

A growing interest in the digitally formatted portfolios has been due to the realized shortcomings of more traditional portfolios. Some of the shortcomings have to do with difficulties in distributing the information; the paper-based form allows only restricted access and circulation, and does not give much opportunity for wider communication (e.g. Linnakylä & Kankaanranta 1999). It is also difficult to show the multiple forms of efforts, progress and achievements. Still another concern has been with the dynamic nature of portfolio i.e. how to store and manage the materials accumulating to the portfolios in the

long run, during decades of study and work. The need for ongoing revision and updating of a portfolio also demonstrate this dynamic nature.

Modern information and communication technologies, however, offer solutions for these problems. By means of multimedia one's competencies and achievements can be illustrated more diversely than before, and the hypertext features of digital portfolios make it possible to add in new sections, levels or paths. And of course they are as easy to rearrange or reduce. Words like computer-based, electronic, digital and multimedia are used interchangeably when referring to digitally formatted portfolios, which involve the use of electronic technologies. Barrett (2000) distinguishes electronic and digital portfolios on the basis of the form of artifacts. In an electronic portfolio there is a combination of material both in analog (e.g. videotapes) and computer-readable form, but in a digital portfolio all artifacts are in computer-readable form. Thus, in the case of web portfolios the notion of a digital portfolio is justified. The basic multimedia elements included in digital portfolios are text, images, sound, video and hypertext links for the organization of the material.

A digital portfolio contains partly similar pieces of information as more traditional ones, but the data has been compiled and is stored, maintained and shared electronically by means of information technology. The digital format also allows for presenting new kinds of contents. Multimedia technologies make it possible to display one's competencies by means of any combination of texts, images, sounds, and video clips. A digital portfolio may contain anything that can be stored in digital form, e.g. by means of word processors, scanners, video recorders or microphones. The digital form enables easy and fast data transfers and access, thus facilitating more diverse and broad-based sharing of learning experiences and expertise. By technological means children's or teacher's competencies or pedagogical practices of a kindergarten can be made visible in a form that is easy to access, even repeatedly if necessary.

Digital portfolios link authentic assessment and the use of technology. The portfolios distributed on the Internet provide a technology-enriched medium for displaying and integrating what happens in the daily life of educational institutions. Thus, they increase possibilities for opening up the life and work in the educational institutions to several directions locally, nationally and also globally. From teacher's perspective, digital portfolios enable to make visible a whole range of views and areas of expertise in

education, its development and organization, teacher's education and philosophical thinking, usual learning and work tasks, collaboration and future envisioning.

The accessibility of digital portfolios through computer networks provides also an opportunity for feedback and for mutual communication, debate and problem solving among the experts in the field. Active and sustained communication, in turn, strengthens collaboration and reveals different kinds of educational cultures and environments for continuous development. At its best, this interaction is extended to broader contexts outside educational community, to involve different interest groups such as parents, administrators, novices in the field, as well as teachers and students at other educational levels. In sum, digital portfolios can benefit many different parties and in many respects. A digital portfolio also tells about the author's skills and practices with regard to information technology. Furthermore, it also gives a chance to show aesthetic and creative capabilities, which have traditionally been greatly valued e.g. in early childhood settings, especially for visualizing and presenting knowledge as well as for reflecting and self-evaluating the development of expertise and pedagogical practices in early childhood education.

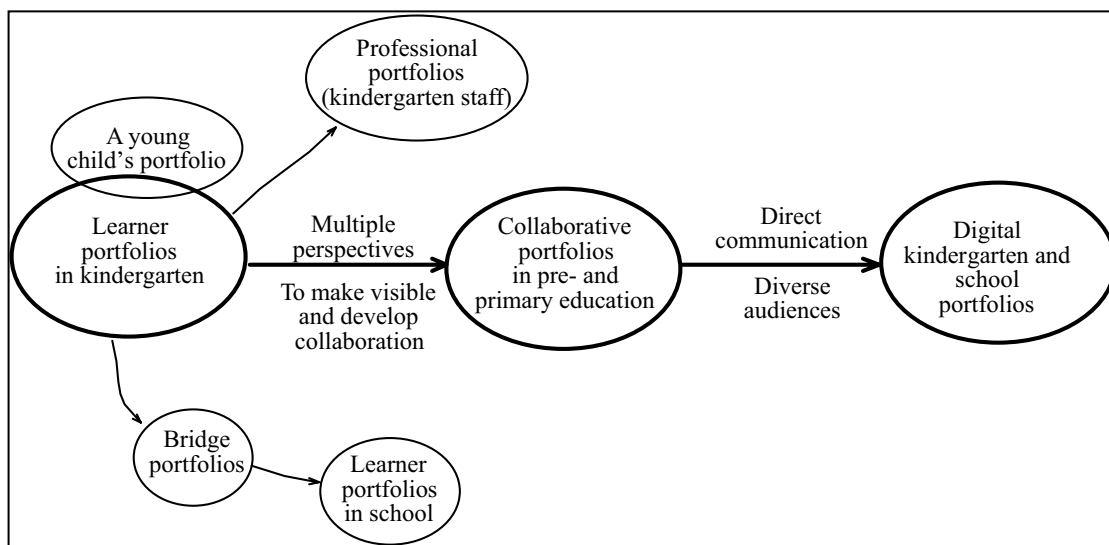
### **Developing portfolio assessment in the Finnish early childhood education**

One of the intriguing features of portfolios is that through them it is possible to reach out and combine many different perspectives on learning environments. The same basic principles of portfolio assessment are compatible in the application of portfolios for learners of different ages. It is also promising possibility to use same kind of approaches both with children and adults in making visible and assessing their growth and learning (Bruner 1996; Kankaanranta 1998a, b; Strandell 1995; Waksler 1986). Of course, there are also differences in the actual application of portfolios as regards the perspective from which learning and the learning environment is examined. Further differences are related to issues such as who has the main responsibility for the portfolio construction and to what extent it is an individual or a collaborative process.

The study focused on developing and applying portfolio assessment in the Finnish early childhood education. through a series of action research projects (Kankaanranta 1998a, b, 1999, 2002). The aim of the development work was to reach and combine different perspectives on learning environments in order to get a wide view of the daily life in

childhood institutions. The whole research project "Flexible learning in early childhood environments" started as a case study in one kindergarten and school, but proceeded then to a digital network of teachers in various childhood educational settings. The research project consisted of several connected action research studies (Figure 1) of which the next three were the most central ones:

1. Portfolio assessment as a child-centered method: Reaching for the child's perspective on childhood learning environments
2. Making visible the collaborative development work in kindergartens and schools by means of school portfolios: Building bridges between educational institutions
3. Digital portfolios as a technology-enriched method for collaborative assessment in childhood education: Enhancing collaboration and communication of teachers in diverse childhood institutions



*Figure 1.* Series of action research studies on the use of portfolios in early childhood education

In the following I will shortly present the main focuses and the progress of these preceding studies.

## **Portfolio assessment as a child-centered method**

In the first action research study, the use of portfolios was developed as an assessment method in close collaboration with one kindergarten and primary school in southern Finland (Kankaanranta 1998a). Portfolio assessment was defined as a child-centered and contextual assessment method, which opens possibilities to combine teaching, learning and assessment (Paulson et al. 1992; Linnakylä 1994; Kankaanranta 1998a). Children's portfolios were called "the albums of growth", because their primary function was to reflect children's growth and learning in different learning environments.

The field phase of the study lasted from the beginning of autumn 1993 to the end of year 1994. In the kindergarten, the portfolios were applied as a method of documentation and assessment for the children of various ages (from 1 year to 6). However, in the study the focus was on the follow-up of one preschool group from kindergarten to the first grade in the primary school. The main goals were to attain children's ideas of their meaningful learning experiences in early childhood learning environments, to enhance children's self-awareness of their own growth and learning and to support the continuity of learning from preschool to primary school. The emphasis was on the participant perspective or how growth and learning was understood, reflected and made visible in children's portfolios. Children's portfolios were analyzed through a cross-case analysis and personal profiles.

It was found out that portfolios had diverse functions from the perspectives of children, the preschool, homes and children's future school, respectively. Most of all, the albums of growth built bridges between different childhood environments in such a way that children's meaningful experiences and their thoughts of learning were carried across from kindergarten to home and school. In addition to building connections between different learning environments, the albums of growth had a very significant function in the interaction of children and teachers in the kindergarten.

Children participated in varied ways in the portfolio assessment. Their active involvement in the process of documentation, in making choices for portfolio contents, in assessment of their own work and learning, and in the discussions of goals and dreams was found particularly valuable (see Kankaanranta 1998a). Through portfolios, children were able to tell and make visible their experiences and things they had learned so far in their early

childhood. It was discovered that children were enthusiastic when their stories, experiences, thoughts and plans were listened to and when they were taken into consideration in the planning and realization of the activities in the kindergarten. The reflection and discussion on children's own work and experiences enhanced their sense of success.

The context of the daily activities and learning was very similar for the children in the study. Children's daily life in the kindergarten included significant shared experiences, which became visible through portfolios. Children were proud of their role as pre-schoolers, which meant for them, most of all, a sense of togetherness within their own kindergarten group. However, children's personal portfolio profiles revealed that from the shared experiences and common activities children also constructed their own and very personal entities. Children's descriptions of their learning histories exposed pictures of freedom of learning and showed their personal learning paths or learning curriculums. During the pre-school year, these personal learning paths were also influenced by the learning objectives (e.g. things to be learned before the school starts) coming from children's different surrounding environments.

The most central outcomes of the study were the opening of children's worlds of experiences and the audibility of children's voices for many audiences in children's growth and learning environments (Kankaanranta 1998a). The communicative and dialogic nature of the portfolio presentations gave extremely promising prospects for the further development of the portfolio assessment and also for the theoretical deepening of the ecological approach. The portfolios of children are, at their best, suitable vehicles for collaborative reflection and analysis, in which the activities and events become shared and co-built. The most central thing is that the child is present and participates in the situations where his/her strengths and developmental challenges as well as experiences and thoughts on learning are under discussion and consideration.

The teachers in the kindergarten were accustomed to observation and interviews as a means for reaching child's perspective. So far, the main aim of the documentation had been to provide the parents with information about their children's daily life in the kindergarten. Along with the portfolio assessment, the meaning of adult-centered communication became less central, and the child's own role as a narrator and mediator of his/her pre-

school experiences from one environment to another was strengthened. Nevertheless, the teachers felt that the portfolio assessment was also an important method regarding their own work. They perceived it as a child-centered means for the assessment of day care activities and for the future planning.

Portfolio assessment also increased parental participation in children's daily life in kindergarten. In the main, parents pointed out that through the portfolio presentations they obtained novel, sometimes even surprising, conceptions of their children's thinking skills. They were stunned about the depth of thinking, which became apparent especially in the children's criteria for choices and in the descriptions and presentations of their work in the portfolios.

When leaving kindergarten, the children took their albums to their homes. During the summer preceding the school beginning, children gathered with their parents a showcase portfolio to be taken to the prospective school. These so-called bridge portfolios were warmly welcomed at school by teachers and new school friends, because they offered a possibility to get to know the newcomers and their prior meaningful experiences and interests. The teachers in the school also appreciated that they could get acquainted with the activities and methods of kindergarten.

The first action research study produced several "sidetracks" during the research process indicating the projectivity of action research. The basic research task concerned the child's perspective on learning environments and it was discovered that the portfolios or "folders of growth" were valuable as an assessment approach with young children. Along the portfolio development process also directions for further development emerged. Teachers got interested in applying portfolios in the documentation and assessment of their own professional growth. They felt that it was necessary to experience the portfolio process themselves in order to be able to guide children in it. It was especially promising to see a multiperspective scheme applied, using the same methods and approaches in the process of making visible and assessing the growth and learning of all the learners, children and adults alike, in the learning environment.



## **Making the collaborative development work visible by means of school portfolios**

In the second action research project (during 1995-1997) a national network of kindergartens and schools was established in order to make visible and evaluate the collaborative work between successive educational levels (Kankaanranta 1999). The participants consisted of groups of teachers from 24 kindergartens and 20 primary schools. One teacher group came from the same kindergarten that participated in the first action research study. In the study, teachers compiled collaborative portfolios as a means for assessing and sharing information and experiences about the progress of development work in the area of preprimary and primary education. Teachers were guided in portfolio development but the responsibility of collaboration and the sense of ownership in developing their work remained with the teachers.

There were two types of portfolios: a documentation portfolio was a means for documenting the progress of development projects. It was gathered and maintained by teachers and it contained material about collaboration between kindergarten and school. In several kindergartens and schools also children participated in documentation. The most meaningful evidence about work in kindergartens and schools was selected to a so-called showcase portfolio to be displayed for presentation and assessment. In a way the showcase portfolio was a summary about the collaborative activities. The aim was that the portfolios would feature personal stories and analyses of the progress of collaboration and realization of common activities in different local development projects.

Each teacher group chose a specific area or theme of collaboration between preprimary and primary education to be displayed in the portfolio. Collaboration was carried out and developed with structural, educational and functional arrangements. In a portfolio, teachers reflected on the ongoing stages of experimenting, problem solving and feelings of success in the community building process of people who traditionally have been working in their own separate settings. On the portfolio pages it was sometimes also possible to get the feel of shared learning situations and sense of togetherness of children of different ages.

During years 1996 - 1997 portfolios circulated in the teacher network around Finland to share information and experiences between teachers. Teachers were also asked to give the portfolio authors feedback in terms of the general impression received, the strengths of the

portfolio contents and also about areas needing further development. In general, teachers gave each other valuable and sometimes also quite sympathetic feedback for the realization of collaboration. According to the teachers, especially meaningful was feedback in which another teacher gave recognition about the work done (Kankaanranta 1999).

In the feedback on portfolios, teachers reflected both on methodological and content features. In teachers' view, a good portfolio gives an impression that the authors have a serious interest in the development of kindergarten or school practices but also in the documentation and honest assessment of the activities. This kind of portfolio contains carefully collected and logically organized information and materials about kindergarten or school practices. A good portfolio convinces the reader with its personality, interesting evidence and thought-provoking reflections and feelings. Teachers appreciated that pedagogical practices are made clearly visible through experiences and thoughts of teachers and children. In their view, the wealth and depth of reflection, constructive criticism, and presence of feelings raise the quality of a portfolio. Portfolios that were found particularly interesting and useful were those giving fresh ideas for teachers' own work and documentation of activities. Teachers also highlighted the importance of bringing up also the problems encountered in collaborative activities. A sense of togetherness was achieved when teachers realized that often the development areas and problems are similar in different parts of Finland.

When assessing the overall impression of portfolios, teachers brought forth also some problems affecting portfolio's readability. Whereas one portfolio was praised for the amount of material, in another the precise manner of documentation was felt to be even too detailed. In the latter case the authors were advised to concentrate on the essential and to choose the most meaningful material for the showcase portfolio as evidence of the practices and development projects. Some portfolios were found to be accurate, well planned and finely realized, and these same features were desired for the portfolios which seemed to be confused, superficial, incoherent and difficult to approach.

The collegial assessment of portfolios produced useful information with relevance to the construction of a portfolio. For the further development of portfolios, teachers stressed the meaning of documentation, selection, reflection and the coverage of different perspectives in order to compose an integrated whole. Documentation should show descriptions of

everyday life, the realization of goals and plans and the participation of children. Good documentation is diversified, clear and shows originality. Teachers expected information about what is really happening in the daily life of kindergartens and schools and how learning becomes evident in everyday practices. Teachers stated that portfolios constructed in kindergarten and school communities should combine different perspectives as widely as possible. Many portfolios had, indeed, made children's views visible as work samples and as written evidence of their experiences, comments and assessments. According to the teachers, reflection and assessment should be geared towards more personal feelings and thoughts, even to include diary-like reflective texts. The overall summaries and lists of contents in the beginning of a portfolio guide the reader into the framework and help analyze the contents.

### **Development of digital portfolios as a technology-enriched method for collaborative assessment in early childhood education**

In the second action research project, collaborative portfolio development compelled teachers to an ongoing reflection and assessment of the work done in local development projects. However, there was still a lack of direct communication and sharing of portfolio contents between different collaborative groups of teachers in the research network. Instead, usually the researcher acted as the facilitator and organizer of the events for indirect collegial portfolio evaluation. Therefore, in order to enhance and facilitate teachers' mutual communication, the emphasis of the third action research study was placed on direct, technology-enriched collaboration between teachers in diverse early childhood environments. The use of information and communication technologies (ICT) was seen as a possibility for continuous and fast sharing and assessment of information concerning school-level development work. The use of ICT was also presumed to facilitate mutual discussion, feedback and authentic assessment within the whole network of kindergartens and schools. Networking, facilitated by information technology, was expected to help create a community of teachers that encourages and supports ongoing development work and reflection on practices. Participants were teachers from eight kindergartens, one preschool group situated in a primary school and four primary schools in three towns of Central Finland.

In the study, the aim of portfolio development was that digital portfolios would be used as a means for collaborative inquiry on pedagogical practices and meaningful experiences in childhood environments. According to the dual nature of action research, the use of portfolios challenged teachers to participate in the twofold development of the practices in kindergartens or schools on the one hand, and the use of digital portfolios as a method of inquiry on the other hand (see Kemmis & Wilkinson 1998). As a research method, digital kindergarten and school portfolios gave an opportunity to reach a versatile and teacher-selected authentic data about the everyday life and activities in the childhood environments. This data served as a basis for joint online discussions in the teacher network. Digital portfolios were shared on the web environment in order to emphasize direct, technology-enriched communication and collaboration among teachers. The web-based nature of portfolios challenged the portfolio constructor, in this case a teacher, to operate and communicate in the global Internet environment more generally as well.

The findings of the study suggested that digital portfolio development requires consideration of several design and implementation issues. This is in accordance with Barrett's (1998) argument that digital portfolio development should be preceded by a careful examination of strategic questions about the functions and uses of assessment in general and portfolio in particular, but also about the human and technological resources available. The following issues proved to be central for sustainable use and development of portfolios:

- Definition of purposes for digital portfolios
- Consideration of the meaning of kindergarten or school culture for digital portfolio development
- Exploration of the role of ICT in the childhood environment
- Provision of diverse support for teachers
- Development of user-friendly technological tools
- Collaboration in the portfolio design and implementation
- Reflection on ethical issues

Ideally, a set of digital and paper-based portfolios can become a forum of reciprocal interaction, sharing and feedback in the field of childhood education. For teacher students, school portfolios can provide a means for familiarizing oneself with the pedagogical

practices of kindergartens and schools. On the other hand, through learner portfolios students can display and integrate their own personal learning curricula in childhood education. For teachers attending in-service training, portfolios can be a means for reflecting, displaying and sharing their work. Similarly, for academic experts in the field, portfolios offer an opportunity to show their competence in teaching and also research work. In all, portfolios can provide a forum where different audiences can meet the builders of childhood learning environments and begin to understand the changing worlds of children.

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