Implementing Use of ICT in Teacher Education

How to add quality to teaching and learning with the help of a Learning Resource Centre

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Abstract. Teachers in Sweden are still in need of digital literacies to master the pedagogical use of ICT in schools. Teacher education has a key role in adding the use of ICT to the abilities of their students and teachers. At Stockholm Institute of Education the Learning Resource Centre has an important role in providing appropriate technology, supported learning environments and competence development for teachers and students. Competence development programs focus on digital literacies. Continuous self evaluation by participants points to good results. The problems which arise for teachers are mainly dependant on lack of time for training and maintaining digital work patterns.

1 Introduction

Even if computers have been used in schools for many years, teachers in Sweden are still struggling to make pedagogical use of ICT, often also lacking proper digital competence. Children's own use of new media and ICT for communication, playing, etc. is a trigger for change in schools. Teacher education has to meet these challenges and introduce adequate ways of teaching and learning with ICT.

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2 The Learning Resource Centre and its task

At Stockholm Institute of Education (SIE) a Learning Resource Centre (LRC) was set up in 2002 as a means of introducing and supporting the use of ICT in education and research and thus strengthening the competencies of future teachers. This decision was motivated by a number of factors which further underlined the need for digital competencies. Such factors were life-long learning issues, Swedish legislation for higher education which demanded information and media literacies for the students, and not least the competition for the recruiting of students by using new e-learning and distance education possibilities. The task of the LRC, which is named Lärum, is

- to use new pedagogical models, ICT, new media and new library models to generate creative environments for information handling, teaching and learning.
- to have an initiating, coordinating and developing role concerning ICT and its use in education and research.
- to provide, develop and synchronize flexible learning environments, to create a virtual university setting and develop support for distance education in cooperation with other responsible departments.

Two existing departments merged into the new LRC: The University Library with information services, collections, student work stations, user education and new physical learning environments, and the Media Production Department with services for film and video-production, computer- and video-conferencing. An ICT support and project development unit was added to the organization with the goal to build collaborative projects with teachers, students and distance education, and responsibility for net course administration. The staff consists of professional librarians, media producers, teachers, technicians, web designers and project leaders from various disciplines. With this mix of staff know-how, organizational background and professionalism it is possible to develop a unique base for the delivery of training and supporting of key competencies.

The essential idea of Lärum is to provide competence development with ICT and learning environments on a broad basis to a majority of students and teachers and encourage them to develop their teaching and learning abilities by pointing to best practice (rather than perform our own projects of excellence). During 2002-2003 learning environments and basic support functions and web were created. Resources were inadequate and the goals were difficult to attain. 2004 brought about better funding and a formal demand for competence development with ICT.

3 Strategies, leaning environments and digital literacies

The task of Lärum is performed by 1) developing an academic standard which encompasses and integrates key skills of using information, media and technology in teaching and learning; 2) by creating flexible learning opportunities with usable tools; 3) by supporting e-learning as active and experimental learning, and tutor-led environments; and 4) by supporting learner autonomy, the independent learner.

At Lärum we have recognized the following key skills and competencies as the most important ones to help develop and support: 1) *Information literacy* is the ability to understand processes for, and to be able to, access, acquire, organize, and evaluate information and information sources and form valid opinions based on the results as well as use information for problem solving [1]; 2) *Technology Literacy is* the ability to use new media such as the Internet to access and communicate information effectively [2]; and 3) *Media literacy and creativity* is the ability to access, analyse and evaluate images, sounds and words in various media and to produce, communicate and distribute content to audiences of all sizes.

To achieve our goals and intentions we try to inspire and support students and teachers in their actual work situations, e.g., by offering supported physical and virtual learning environments with hands-on oriented tools for use such as the library, a media laboratory, smart boards or groupware. Support is provided by professional staff for such thing as film production. We also try to provide appropriate technology, wireless working areas, video streaming, supported communication platforms, learning platform (i.e., Fronter) or net meeting options (i.e., Marratech).

The continuous use of learning environments guarantees more solid ICT competence. We found that users who have made long term use of communication platforms are more willing to adapt to new ICT tools. Our intentions are to support good habits and best practice. The use of learning environments is to a great extent performed as learning by doing which helps develop technology literacy as well as media creativity. The ratio between student and teacher use for communication platforms, net meeting and video streaming is teachers 70%, students 30%, and for media laboratory, library and groupware is 20% teachers, 80% students. Evaluation of the learning environments is indicated by use which has increased by 150% since the LRC opened. Assessment is also performed by web enquiries with a few questions which indicate a high level of satisfaction.

4 Competence development programs for teachers

Another main strategy to reach our aims is to provide various programs for competence development. These programs are performed according to the principle of integrating learning with task performance. Development programs are directed towards all teachers and all students. All teachers at Stockholm Institute of Education have been offered competence development focussing on the use of ICT. Their active participation in various programs totals 20-40 working hrs. Sustained individual learning is guaranteed by the fact that their own learning goes on during their own teaching, which is why we try to develop IT support and tools which can be used continuously. 300 teachers out of 600 attended standard and advanced Office package workshops. Before the program started a web enquiry was sent out to all teachers. The response rate was 80%, and 60% of the teachers were of the opinion that they needed training in the use of standard programs. The immediate evaluation of the workshops was very positive. However, a more in-depth enquiry of the competence development program was carried out in February, 2006.

So far 120 teachers have participated in a net-based course, which means they have to act as students on the net. The course certifies them as net teachers. It involves their using and learning the communication and learning platforms; making homepages; using web evaluation; using smart boards; making power point presentations; producing web based learning materials; searching, using and evaluating information sources on the internet; adapting and using programs for physically impaired, and training in acting as a distance education tutor. Evaluation is performed after the course is finished. The course gets an overall positive assessment, particularly those parts which focus on information literacy and technology literacy. This distance certification course gives the participants a good opportunity to develop all necessary literacies. Fifty teachers can be considered to be very experienced distance educators, and for those teachers we provide just in time support.

A qualitative evaluation of the competence development program for teachers will be carried out by in-depth interviews with sampled teachers and students and video recording of information searching and producing. Selected courses have been evaluated by teachers through the use of e-portfolios and discussion forums on student work and learning patterns. Every 3rd year a large enquiry on student work and life, i.e. ICT literacies, is performed; the latest was presented in February, 2006.

5 Competence development for students

For students there is comprehensive competence development concerning information literacy, including *Basic Information Search*, *In-depth Information Search* as well as *Individual tutoring*. *Basic Information Search* is a good example of how these courses are carried out. The purpose is that students achieve knowledge and skills in order to be able to search and review scientific information in databases and use web tools for searching as well as being able to critically assess internet sources. The course is designed as a 2 x 45-minute workshop.

I*n-depth information search* classes prepare students for degree projects and theses. The class is designed as a 3 x 45-minute workshop, covering relevant referential and full-text databases, information sources, and individual search practice search methods, search engines, source handling, referential matters, and the question of "what makes an article scientific?". After the workshop, participants should be able to choose relevant databases and information sources, to search for information, and to critically analyze information. During the fall term 2005 509 students participated in the classes and 234 responded to the evaluation. For the basic class 84 responses indicated that 60% were content with the pedagogy and 70% were affirmative that they would benefit from their new knowledge in their future studies and work. The assessment of in-depth information search showed that 150 responded, and 74% were positive that their new knowledge would help them in future studies and work.

6 Conclusion and coming projects

Starting spring 2006 students' formal learning of digital literacies (information literacy, media creativity and technology literacy) will be integrated in the teacher education programme. All new students will have to take a diagnostic interactive web test which tells them their level of proficiency using standard programs and web tools. Throughout the program the learning of digital literacies is attached to the developing of 1) communicative abilities, 2) information understanding, analytic abilities and scientific work patterns, and 3) abilities to perform, analyze and present an investigation. In this way these abilities as well as the literacies are trained in progression. It also means a close cooperation between teachers and staff from the LRC, which already during the planning stage has meant creative development.

Ongoing projects at Lärum are e-publishing, the provision of a school of the future test site and the development and organization of learning objects.

The reason that Lärum so far seems to have had a beneficial influence on teacher education is to a great extent due to the mix of professional skills of the staff at Lärum, which makes creative development and support of a broad spectre of digital competencies possible. Still there is need for competence development of the staff as well. During fall 2005 a net course for all staff started, *Learning in Networks.* The course is operated as a project between Lärum and Åbo and Vaasa universities [4].

To decide future development of Lärum, an external evaluation of the organization was performed in March 2006.

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