

Two PhD-student positions in ICT, media and learning – (a) mobile learning and (b) creative learning cultures

The scientific background of the research positions

Teaching and learning in schools are becoming enhanced by the use of Internet-based technologies. In particular, the younger people often assigned as “net generation” ask for online social networks where they can learn 'anytime, anywhere'. So, some solutions are online learning networks. Such modern day learning systems are often flexible and adaptable to different existing levels of learning strategies. But usually the systems are controlled by the teachers. They often do not implement concepts that embed the whole learning process (formal/informal learning) into the given curriculum neither do they empower the students to manage their own learning nor do they foster creative thinking and creative actions.

An approach to design technical, social and educational elements is delivered by the framework of socio-technical systems and networks as well as computer-supported collaborative learning (CSCL) and Technology-enhanced collaborative learning (TEL). Reshaping blended and co-located learning requires the analysis and design of social processes, technical systems, and educational as well as didactical methods (sociotechnical-didactical design). One essential result is that new learning approaches should be embedded within social interactions. However, they do not focus on such educational concepts that foster a)mobile learning or b)creativity in CSCL arrangements.

a) Mobile learning at schools

In the last few years, we have seen a great boost in access to technology in Sweden mainly because of the one to one laptop programs. With that a lot of changes but also possibilities for new methods of learning, and tools to use, emerges. Even though schools have made this investment, current research in this field is limited, and with this, direct and/or indirect impacts given by these tools on education are not investigated. Possibilities are not discovered. In detail, we don't understand how to use the tools in teaching arrangements in order to foster learning.

New mobile devices like smart phones and tablet PCs could possibly be looked upon as successors of the 1to1-laptop projects at schools. The characteristics of these devices are often compared with those of a stationary computer or laptop. Whether research in these fields is transferable and could be used to understand these next generation devices and their role in education is an open question and needs further investigations.

Today we know that teenagers and young people use Internet connected devices more than other groups in our society. “Digital natives” is a term commonly used to describe a group of people where computers, mobile phones and other technical equipment are present since early age. Young children are growing up with the Internet and tablet PCs in a daily routine way like the older people grew up with the TV. The Internet is already an “objective facticity”. To digital natives this kind of technology is in many cases translucent, widely used but not reflected.

New mobile devices such as tablet PC's and smartphones give teachers two options. They can either choose to reject these new tools or to implement them in their learning environment. If they choose the second alternative it's likely that new methods are found and being developed. Since this is a new area of research and the schools implementing these tools could be seen as pilot programs. It's important that positive and negative aspects using these new tools are collected, organized and discussed. Teachers and students are key groups in this matter. Open research questions are:

- How to *enable learning* at schools with mobile devices (e.g. tablet PCs)?
- Does using a tablet PC affect the ability to learn among students and with regard to the teachers? To what extent?
- What positive and negative aspects can be found and do former research done in

- the one to one computing transcend into the area of tablet PC's?
- Is there a key aspect that leads to a successful mobile device implementation?
- How can we design successfully such new technology-enhanced collaborative learning opportunities? What is a 'successful' sociotechnical-didactical design? (What is 'successful' for whom; what conditions/factors affect learning?)

This research project aims to find and share an educational methodology using mobile tools (perhaps, creating new apps) and also find positive and negative experiences when working with these. CSCL and TEL concepts are possible frameworks. The universities play a key role sharing, gathering and analyzing this kind of knowledge. This PhD project also requires involving active teachers and students at schools to support a design-based research study.

b) Creative Learning Cultures

Learning is an active process of constructing rather than acquiring knowledge and instruction is a process of supporting that construction rather than communicating knowledge. Networks and communities are one method for supporting such active situated learning processes. Introducing new media into learning processes gives the chance to reflect and to improve the education model. Such concepts can support the shift from a teacher's teaching to a student's learning.

Schools and universities play a particular role in the context of creativity since they are intended to educate people who develop creative ideas (generating new ideas) and innovation (enforcement and acceptance of new ideas). In addition to *transmitting* specialized knowledge to students, institutions of education are challenged to develop or even enhance the students' creative potential. Therefore, it is not enough to restrict learning to how expertise, skills, and competencies can be acquired, reproduced, and applied. Students must also be encouraged to learn to think in multiple ways and reach beyond the spectrum of available options to form new relationships between established elements as well as to discover entirely new concepts or previously unconsidered connections (e.g., Jahnke, 2011 "How to foster creativity?").

When the answer to a question is not known, collaborative learning – in forms of social co-construction of new knowledge and competence development – is required to foster creative thinking, creative actions, and innovations. Traditional knowledge management solutions based on notions of capture and cataloguing of information and work processes are insufficient since "knowledge is not a commodity to be consumed but is collaboratively designed and constructed in the *doing of work*".

IML (an interdisciplinary research and teaching group) has already started to design a new mobile lab. Supporting this team, we are looking for a PhD student interested in:

- How to build and foster creative groups, computer-supported collaborative learning, at the workplace (CSCL@Work)?
- How can we design Media-Enhanced learning opportunities, processes and environments for an innovative education that foster creativity?
- To what extent are computational tools useful to foster creativity in learning processes? How to design such innovative tools that encourage nonlinear, non-standard thinking and problem-solving, as well as the exploration and generation of new knowledge?

The analysis should taken into account people's learning as well as the formation and evolution of creative teams by developing technological solutions that facilitate questioning and challenging, foster imaginative thinking, widen the perspectives and make purposeful connections with people and their ideas. CSCL and TEL concepts are possible frameworks. This PhD project aims to study creative learning scenarios and may include also the design of technical applications (e.g., creating new apps for educational purposes and study them).