

Challenges for research and development work of digital content

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Digital content as a research and development area

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. For example, virtual universities have gained special attention to meet the challenges of the changing society. Further, one of the central areas in this field is the development of digital content, and the research and developmental work related to it. Although the development of content that is delivered digitally such as TV programmes, computer games, Internet sites etc. can be designed for several purposes, one of the application areas is directed towards educational purposes. For example, with the design of games is an area that interests the R&D work of digital content as well as the research on learning environments. With the aid of learning games, emotionally touching learning situations can be created, but there is also a need to be cautious about not just providing temporary diversion without deeper-level learning goals.

The International Centre for Digital Content (ICDC) has a challenging task of being an innovative teaching, research and development facility focusing on the development and retrieval of content in the broadband age. This aim requires multidisciplinary expertise and critical approach. One of lessons that have been learned from the history of computer-assisted learning is not to rely too much on unrealistic expectations about possibilities of learning technologies and digital content delivery. For example, about distance education and communication tools, the most optimistic views have suggested that the Internet and global networks enhance and expand the ways in which humans connect, communicate, create a sense of community and learn. However, in the light of the recent research results also more critical approaches have been presented about the quality of collaboration and communication tools (Dillenbourg, 1999; Järvelä & Häkkinen, 2002; Roschelle & Pea, 1999).

Skills for information society and tools for supporting these skills

ICDC Agenda tackles many of crucial questions related to information society. How is information developed and produced at the Information Age? And how will it be accessed? This could be further continued whether we should go beyond access? When relying too much on access, like in some of the distance learning solutions, the problems of availability (accessibility and cost) and the demand for flexibility (time, place and pace) seem to become the main focus. However, we should not forget to go beyond this, namely from access- and technology-driven approaches and practical reasons to the pedagogical ones. The pedagogical challenges are faced, not only in the content of ICDC, but also in its own teaching. It is, for example, asked what skills are necessary for an individual to succeed in the new economy? How are these skills taught? And what do the new communication toolsets mean for our educational system?

The necessary skills of knowledge workers are at least the ability to construct well-organized knowledge structures in certain domains, the ability to monitor and regulate one's own cognitive

activities (metacognition), and the ability to participate in social construction of knowledge (Häkkinen, 2002). Furthermore, ICT can be one part in promoting these skills. 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 (Häkkinen, 2002; Scardamalia & Bereiter, 1994; Sinko & Lehtinen, 1998). In other words, what sells in the short term is not necessarily something that correlates with the (pedagogical) quality. For example the concept of interactivity has nothing to do with the size of bandwidth or the amount of mouse-clicks, and all the 'nice and beautiful' does not promote learning - reading from nice but static web pages seldom triggers higher-level learning mechanisms. ICT or digital content does not make learning easier, it is always hard and laborious cognitive activity that happens in the minds of learners – through social interaction – supported by tools. Responsibility of learning cannot be transferred not even to the most sophisticated technology. It is a long-term development in the wholeness of learning or working environment – systemic wholeness with interacting factors such as technology, content, culture, social interaction and norms (Salomon, 1993).

Recent research on learning technologies has also indicated that at its best, virtual learning environments can support individual thinking and construction of shared understanding between students (Häkkinen, 2002; Scardamalia & Bereiter, 1994). One of the essential requirements in the rapidly changing society is to prepare learners for participation in socially organized activities and many virtual learning environments are based on collaborating and sharing expertise. Networked technology used in different learning environments provides a learner a relevant platform for storing, 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 and difficulties in reaching shared understanding or coordinating knowledge in distributed teams are still missing (Järvelä & Häkkinen, 2002).

What will become characteristics of successful companies?

The characteristics of successful companies and working life have also the central focus in ICDC Agenda. Despite the fact that current technologies enable to circulate infinite amount of information, knowledge-intensive teams often complain concerns in the extent to which knowledge is actually shared, especially among geographically distributed teams. Further, a large part of the experience remains individual tacit knowledge, it is not shared explicitly, and is lost when experts leave the company (Nonaka & Takeuchi, 1995). The problem of tacit knowledge is that it is shared by participation in joint collective activities rather than by delivering information (Häkkinen, Järvelä & Dillenbourg, 2000).

In addition to the solving what knowledge should be made explicit and how, the successful companies also focus on new kinds of models increasing the competence of its workers. The acute questions in this field are: how to reduce the gap between formal training situations and real work situations? One of the essential prerequisites for successful functioning of organizations is the flexible integration of working and learning activities – knowledge acquisition cannot be separated from its application. Users are more and more often trained in their actual working environment, on the tasks they face everyday, with the tools and the colleagues, which are part of it. Training will not be a specific activity, such as following a course, but a reflective process on their professional practices.

Innovative models – can they be transferred and scaled up?

In order to answer the questions focused in ICDC Agenda, interaction has to be promoted between university, private sector and the community at large. It can be claimed that without strong basic research, applied research and developmental work cannot get very high-level and has only short-term success. High-level academic research and development in the interdisciplinary context and collaboration needs to have its roots in the basic research of each discipline. With the kind of approaches like ICDC, there is always also the risk of industry-driven approaches. We need to

consciously consider the balance between the immediate needs vs. future strategic development. Instead of short-term consulting, the focus should be paid to the kind of continuous dialogue and interaction (partnerships) that also ICDC aims to promote.

The question that always arises with the innovative models is the question of transferring it nationally and also internationally. Although the scientific community can regard certain principles highly promising, they are extremely difficult to be implemented among practitioners. For example, although teachers and students have access to computers, technology is not intensively used, at least not in pedagogically advanced way (Sinko & Lehtinen, 1998). Good practices usually emerge in the pilot projects supported by academic research. New sustainable innovative usually practices require long-term commitment to develop them in close collaboration between researchers and practitioners. They emerge from interaction of these people, and gradually they can trigger changes in the learning or working culture. That is why any reasonable models to enhance this interaction are worth analyzing and further developing.

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