A COMPUTER SUPPORTED CO-OPERATIVE LEARNING COURSE TO PROMOTE THE USE OF ICT IN PRACTICAL AND CREATIVE EDUCATION

By

G. THORSTEINSSON *   **TOM PAGE ****

* Assistant Professor, Iceland University of Education, Department of Design and Craft Education.
** Lecturer, Electronic Product Design, Department of Design and Technology, Loughborough University, UK.

ABSTRACT

Learning scientists have discovered that deep learning is more likely to occur in complex social and technological environments, one example of this is computer-supported collaborative learning (CSCL) situations. This was the main guideline when partners of Socrates Comenius 2.1-project FISTE (A Future Way for In-Service Teacher Training Across Europe) started to plan and implement an online-course for European teachers. The result of FISTE partners' collaboration, an online-course called aimed at introducing the course participants, the European teachers, to new opportunities and ideas how to use ICT pedagogically in teaching. This in turn could offer them possibilities for sharing their experiences and good pedagogical practices and also to encourage them to consider the meaning of collaboration in teaching and learning.

The course lasted for six months and it included six different units which involved both technical and pedagogical issues considering the pedagogical use of ICT. The experiences the participants and the FISTE-tutors had during the course were mostly positive and encouraging, yet all the people who were involved with the course felt it was quite a challenging experience because it included so many new things to all participants. This paper will present the main principles concerning the course, an overall introduction of the course content and also experiences the participants and the FISTE partners gained during the course as tutors.

Keywords: Collaborative Learning, CSCL, Online-course, Pedagogical use of ICT (Information and Communication Technology)

INTRODUCTION

1. Background

The overall aim of this paper is to introduce the basic idea of ECSUT-course (ECSUT Educational Challenges and Solutions in Using ICT), which was organized in the frame of FISTE-project. This paper will present the structure of the course and the work the teachers did during the course. The experiences of the course participants, the European teachers, are presented on the basis of evaluations the teachers made during the course. The partner perspective is presented on the basis of partner notes.

The FISTE project attempts to make connection between different European countries and increase their communication abilities via ICT and ODL in in-service

teachers education. It furthermore, emphasized how the European projects influence the development of the communication abilities and, conversely, how the communication abilities influence the development of the European projects.

It is thus that many European projects saw the light and are successfully working across Europe. Among them, those destined to facilitate and improve school and university students' educational level, by offering them the latest knowledge in the field, transmitted through the most modern and attractive teaching-learning technologies. Such projects are beneficial not only for the students, but also for the educators, who have thus the opportunity of meeting their partners from other countries, of

exchanging ideas with them, of continuously learning from the others' experiences.

FISTE is a three year Comenius-project based on the need for innovative and effective ideas for in-service teacher education. The participants from five European countries are Finland, Romania, Iceland, Latvia and Spain. The main task of FISTE-project is to create a common in-service teachers' training course as a new way to provide in-service teacher education based on ICT. Partners developed in co-ordination an online-course for in-service teachers, which each partner then implemented nationally. Based on these national course experiences partners designed an on-line course called ECSUT - Educational Challenges and Solutions in Using ICT. The course is developed for teachers and teacher trainers who want to use ICT in teaching in a professional and pedagogical manner. The course offers insights into pedagogical aspects in using ICT in teaching and learning and methods for integrating face to face and web-based learning tools. ECSUT-course (January-May 2007) took place in BSCW-learning environment. The course was provided in English (EN). It has been offered to 50 in-service teacher educators from different parts of Europe. FISTE-project has ended in March 2008.

The ECSUT-course makes an attempt to rise to the challenge of the demands for continuous development of skills and knowledge which have caused a need to search and develop new ways to organize learning. The knowledge gained in education becomes quickly outdated and it can lose its value more rapidly than ever before. The skills and knowledge needed in the working life cannot all be taught in traditional, formal schooling and training. Working life and developing societies require new kinds of competencies including independent knowledge acquisition and application, problem solving and, especially skills to work jointly and to collaborate virtually or face-to face in even global groups and teams as learning communities (Lehtinen, 2003); (Lindfors, 2007).

The project developed in in-service teacher education for today and especially for future on an European level. In essence, the project is aimed at finding new ways of how to teach in-service teachers in in-service teacher training and how the teachers themselves can learn and upgrade their knowledge and teaching methods by using ICT. The proposed project concerns the development of an in-service teacher course on national and on European level.

The overall aim of the project was to increase the quality and possibilities for in-service teacher education by achieving the following specific objectives:

- To develop methods for integrating face to face and web-based learning (ODL) in meaningful ways according to the everyday work of in-service teacher.

- To apply the methods for teaching in various learning environments in the work of joined partners.

- To improve teacher education possibilities to use new types of technology for in-service teacher education.

- To improve in-service teachers' use and understanding of ICT to support their own work in meaningful ways.

- To develop European cooperation and awareness.

- To improve the research base of knowledge of how to integrate and best combine face to face learning and web-based learning in European in-service teacher education.

- To disseminate the results of the European in-service teacher education project (FISTE) on local, national and European level.

The FISTE project is concerned with educational use of information and communication technologies (ICTs), specifically with the development and dissemination of a new pedagogical strategy for distance learning through in-service teacher education (FISTE), in schools across Europe (The FISTE website 2006).

The project uses the on-line Virtual Learning Environment platform BSCW as a Computer Supportive Communication Learning tool to facilitate the way the participants work together. It is a continuous meeting place for them, a stable base to work from and at the same time an easily accessible archive of the entire FISTE project teaching material all the undertaken activities are based on.

Innovative solutions are needed in education. Therefore, one of the basic requirements in the future is to teach how to participate in a networked information society in which knowledge will be the most critical resource for social and economical development (Sawyer, 2006); (Teasley and Rochelle, 1993). Modern day learning environments are characterized by their time and place independence and their possibilities for re-use of instructional materials (Kirschner, 2005).

In this development teachers are in a key position. They educate citizens for the future society and therefore it is extremely important to offer opportunities for in-service teachers to update their educational knowledge as well as to teach them to use innovative media in a meaningful way. For in-service teachers it is not just the technology they have to get used to, but also the pedagogical perspectives and learning theoretical aspects they need to consider when they apply ideas in their daily work in real school environment (Lindfors, 2007).

The overall aim of the FISTE -project has been to implement these ideas in practice. By planning and carrying through the ECSUT -course the FISTE-project has not merely aimed at offering European teachers a possibility to learn basic theoretical ideas of pedagogical use of ICT, but also to introduce them with a pedagogical model (i.e. how to learn by discussing and sharing opinions in a web-based learning environment) which emphasizes social interaction, particularly (computer-supported) collaborative learning.

Collaborative learning means a learning situation where a group of learners are jointly working towards a shared goal and they are trying to understand and explain a certain thing or phenomena together. A successful collaborative learning situation can lead to deeper understanding and to better results than a single learner could achieve individually (Ploetzner *et al.*, 1999). When collaborative learning is enabled by computers (for example, in web-based learning environments), it is computer-supported collaborative learning (CSCL). The research of CSCL highlights that, for example, working in online-groups, where group members need to communicate makes learners interact with others and

explain things. This helps them to become aware of their own understanding (about what they know and what they need to learn more about) and therefore this kind of activity can foster learning (Winn, 2002).

Since there are no recipes for teaching that would work in every single teaching situation, the goal of ECSUT -course was not to offer teachers general instructions how to teach but rather to offer European teachers a meeting and discussion place where they could share their ideas and discuss the role of ICT in their work and the possibilities it could offer to support teaching and learning.

2. The Content of The ECSUT - Course

The process of planning the ECSUT - course started when FISTE -project partners planned a national "trial online course" together, and each partner implemented the course on a national level in their universities. Based on experiences gained in this national version FISTE partners developed the ideas further and designed an international, European level online course in English.

The most important principle was to offer European in-service teachers both opportunities to learn about issues they were most interested in on the basis of their teaching experience and duties, and also to offer teachers a possibility to join the on-line discussion groups about the subjects they were most intrigued by. At first the teachers gained knowledge on their own and then shared opinions by introducing, commenting, evaluating and criticizing that knowledge in small groups with other European teachers. This means that during the course the in-service teachers had to work partly individually and partly collaboratively in discussion groups. The collaboration was supported by tutoring in order to promote fruitful and multiple interactions among students (Mäkitalo *et al.*, 2004); (Mäkitalo, 2006).

The course, which lasted for six months, took place in BSCW Shared Workspace System -platform, and the whole course was carried out there. There were 56 participants in the course and 22 participants discussing and evaluating the ECSUT-course from 6 European countries and 2 tutors in each five discussion groups.

The ECSUT course was divided into six different units (see

Figure 1), and each unit contained a certain theme and a task which was linked with the unit's theme. In each unit the participants were offered opportunities to discuss and share experiences and opinions.

The first part of the course, Unit 1 ("Introduction"), which started the ECSUT -course was about getting to know each other. After introductions the course participants were introduced to the FISTE project and partners who worked in ECSUT course, and especially the main ideas of the content of the forthcoming course were highlighted. In the second phase of the course, in Unit 2 ("Instruction (BSCW Platform)"), the participants became more acquainted with the course platform and learned how to do things and participate in discussions in the course's online-environment.

After the participants learned how to operate in BSCW, they started to work in Unit 3 ("Pedagogical use of ICT"). In Unit 3 they read about learning theories which are closely connected with the pedagogical use of ICT, and then they were offered discussion areas about different discussion themes.

Participants were able to find theoretical articles to read and discuss from a certain web-based "Database" into which FISTE-participants have collected hundreds of articles concerning ICT and the pedagogical use of it. ECSUT-participants were able to choose suitable articles

and also the topic they wanted to discuss and this way small groups around different discussion topics were established (see Figure. 2).

After pedagogical discussions and completing Unit 3, it was the time to learn about more technical issues in Unit 4 ("Using Technology"). In Unit 4 the participants were offered ten different "workshops" about more technical issues and solutions and participants were able to choose two instruments of those ten themes (i.e. video editing, screen recording, web blogs, computer protection, digital image processing, videoconferencing etc.). They wanted to learn more about in other words the participants were offered technical "tools" for their work and they could learn about the ones they felt the most useful for themselves (see Figure 3). In this unit the participants were advised and given feedback both by video clips and in the discussion space.

The following Unit 5 ("Final Applications") combined the things the participants learned in units 3 and 4: in Unit 5 the participants were asked to think deeper what pedagogical use of ICT really means in practice the task of Unit 5 was to connect the theoretical perspectives with the technical tools: the participants designed learning units and wrote "educational project scripts" in which they planned how to use the technology pedagogically in a way that promotes learning.
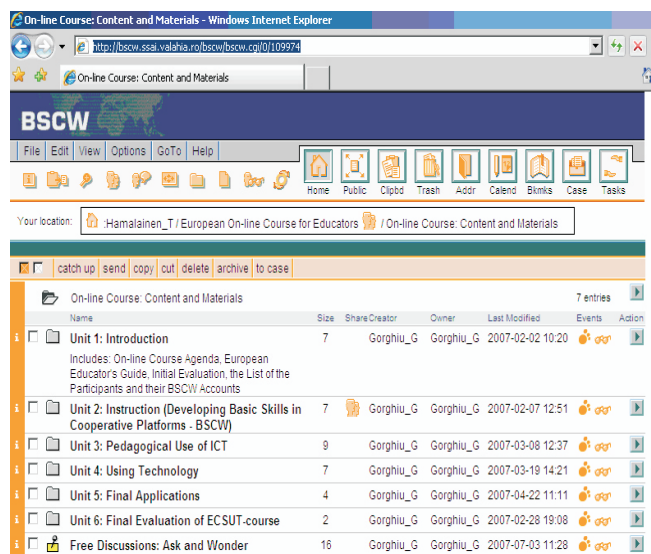

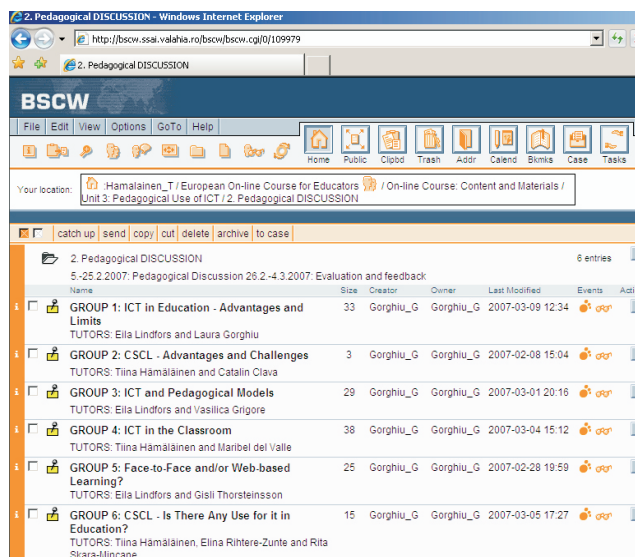Figure 1. BSCW Cooperative Platform. View from the ECSUT course workspace in BSCW-platform.

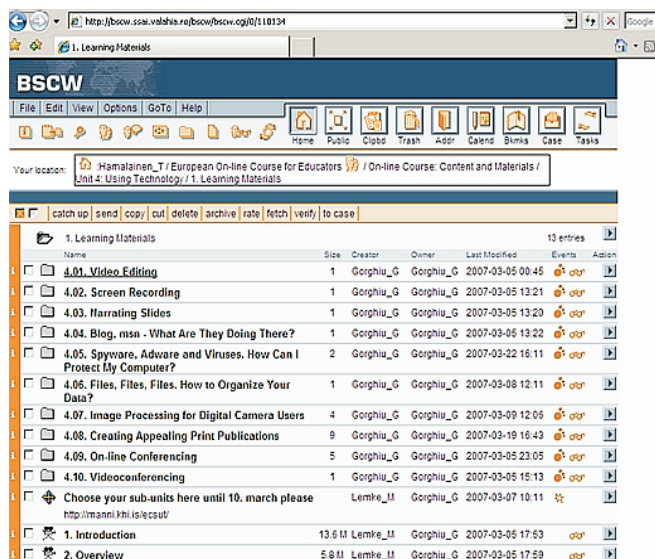Figure 2. BSCW Cooperative Platform. View from discussion groups of Unit 3 in BSCW-platform.

Figure 3. BSCW Cooperative Platform. View from topics
of Unit 4 in BSCW-platform.

The last part of the course, Unit 6 ("Final Evaluation of ECSUT-course") was about discussing and evaluating together the ECSUT-course - what had been learned and gained during it. The participants were also asked to give the feedback about the course, and to evaluate how the course could be developed in the future.

The structure of the course was built in a way that the individual and collaborative work was supported and the participants' free choice of topics and themes was respected instead of offering readymade recipes what to study. The tutors participated in discussions in each unit in BSCW platform and sent emails to participants. There were also narrated power point presentations and video clips on the platform consulting the participants how to go on.

3. How Was The ECSUT Course?

At the end of the course, in Unit 6 the participants, the European teachers, were asked to give feedback and comments about the course and their feeling on how it had succeeded. Most participants mentioned their interest for the content of the course and the work done as well as the intensity and amount of work. The tutors recognized that all the participants were very interested in the course and its content but they felt the workload with all discussions and tasks in different units quite demanding. Both the participants and the tutors pointed

out the lack of time: they would have needed more time in order to properly concentrate on the course.

The participants highlighted all collaborative issues in their answers. The participants gave positive feedback about the pedagogical idea of the shared collaborative work they were able to participate and discuss in the platform many participants mentioned that it was especially the possibility to discuss with European colleagues that taught them the most and gave them new perspectives. They pointed out others' ideas in sharing and constructing new knowledge. Participants shared their pleasure for communicating with colleagues all over Europe. They pointed out their European understanding on the basis of this shared work.

Like one participant expressed it "*These group discussions changed my perspective on ICT and possible future changes. As a result of these discussions, I intend to use ICT more than I do now in my teaching*". Tutors tried to promote the discussion and motivate the participants with their comments; however, tutors gave no content as such for the discussion.

All in all, the idea of working together itself and its realization was experienced to be innovative and somehow exceptional and exiting, but also difficult at the same time because of the language of the course there were no native English speakers in the course among participants. The participants also mentioned their need for more tutoring than they were offered because they felt that more intensive tutoring could have relieved the workload during the course. On the other hand, participants mentioned the lack of time in fulfilling the tasks of the course, so this might be one reason why they felt the course challenging.

The technological issues of the ECSUT -course were mentioned many times by participants and also by tutors. Especially the BSCW -platform had caused many opinions and some trouble as a technological solution, but on the other hand it was also appreciated by participants and tutors because it was simple to use. Some participants and tutors felt it was not a very practical platform to use because they had encountered

problems with the details and features in using the platform. Some tutors also had questions considering the entering and using the platform.

Conclusion

The guideline in planning the course was to consider the future needs of in-service teachers. The pedagogical model according to which the course was carried through was based on the ideas of CSCL, and the overall content of the course was the pedagogical use of ICT. The participating teachers had opportunities to choose and apply material they felt important and interesting due to their daily work. However, the course was very demanding because it contained many units that all included tasks and different content.

The freedom of choice in different units demanded a lot from the participants. They were not used to have that many choices as they had in ECSUT-course. And even though the tutoring was offered it was not utilized by all the participants. The common goal of the ECSUT course was to discuss the use of ICT combined with traditional teaching and learning. The teachers themselves shared quite the same problems and challenges all around Europe. The language problem seemed to be an obstacle for teachers in joining the ECSUT-course. However, the goals of ECSUT course were reached.

The ECSUT course can also be criticized because of its innovational ideas. It seems to be obvious that teachers were not used to make the decisions concerning the content they were supposed to learn on their own. They would have needed more direct orders what to do and how to go on. There could have been one path as an example for teachers how to proceed in the course. At least some of the teachers felt uncertain for so many decisions, the possibilities they had. The language problem could be solved by tutors who can also use the native language of the participants. However, having many tutors from different countries in international courses would require a lot of resources.

The experiences of the ECSUT-Course tell us that there is a need to create new ways of learning and teaching and that there are new lessons to be learnt in in-service teacher training. Otherwise we can not expect that the future needs like participating in networked society and the innovational contents and pedagogical models with students and also with in-service teachers can be reached. This tells us that these really are needs in in-service teacher training to develop innovational models how to offer updated content with the future technology.

We can not talk about the shared European knowledge which combines the use of new technology and new ideas in teaching and learning yet, but hopefully some day we could. On the basis of the experiences gained from the ECSUT-course there are not that many teachers in Europe yet who could use the possibilities which the course like ECSUT can offer and exploit the ideas in practice. The ECSUT-course is an example of the future concept of an innovational course idea and gives many possibilities to develop the ideas further for many interest groups.

Acknowledgements

References

[1]. **Kirschner (2005)** , Learning in innovative learning environments. *Computers in Human Behaviour* 21 (4), 547554.

[2]. **Lehtinen, E. (2003)** Computer-supported collaborative learning: An approach to powerful learning environments. In E. de Corte, L. Vershaffel, N. Entwistle, & J. Van Merrieboer (Eds.), *Powerful learning environments: Unravelling basic components and dimensions* (pp. 35-54). Amsterdam: Pergamon.

[3]. **Lindfors, E. (2007)** A learning community in the web Challenges on European level. In international volume: P. Cunningham & M. Cunningham (Eds), *Expanding the Knowledge Economy: Issues, Applications, Case Studies.* Amsterdam: IOS Press.

[4]. **Mäkitalo, K. (2006)** Interaction in Online Learning Environments: How to support Collaborative Activities in Higher Education Setting. University of Jyväskylä. Institute

of Educational Research. *Research Reports* 18.

[5]. Mäkitalo, K., Weinberger, A., Häkkinen, P., Järvelä, S. & Fisher, F. (2004) Epistemic cooperation scripts in online learning environment: fostering learning by reducing uncertaintity in discourse. *Computers in Human Behavior 21*, 603.

[6]. Ploetzner, R., Dillenbourg, P., Preier M. & Traum, D. (1999) Learning by explaining to oneself and to others. In P. Dillenbourg (Ed.), *Collaborative learning: cognitive and computational approaches.* Oxford: Elsevier Science Publishers.

[7]. Sawyer, R. K. (2006) The New Science of Learning. In R.K. Sawyer (Ed.), *Cambridge Handbook of Learning Sciences*. Cambridge University Press.

[8]. Teasley S. & Rochelle, J. (1993) Constructing a joint problem space: The computer as a tool for sharing knowledge. In P. Lajoie, & S.J. Derry (Eds.), *Computers as cognitive tools* (pp. 229-257). Hillsdale, NJ: Erlbaum. (1993).

[9]. Winn. W (2002) Current Trends in Educational Technology Research: The Study of Learning Environments. *Educational Psychology Review* 14 (3), (2002), 331-351.

ABOUT THE AUTHORS

Gisli Thorsteinsson, is an Assistant Professor at Iceland University of Education, in the Department of Design and Craft Education. At present, he is also a PhD student at Loughborough University in England, where he is exploring the pedagogical values of using Virtual Reality Learning Environments for improving ideation in the context of Innovation Education in Iceland. In 1999 he was involved in development of the National Curriculum Area for Information Technology and Technology Education in Iceland and wrote the curriculum for "Design and Craft Education". Gisli has written numerous articles on Innovation Education, Design and Craft Education and the use of ICT and ODL in education. He was one of the originators of the pedagogy for the new Icelandic subject area of Innovation. Gisli has published several textbooks for the elementary school on Innovation Education.

Dr T. Page B.Sc (Hons), M.Phil, Ph.D, C.Eng, MIET, MIEEE, FHEA, is a Lecturer in Electronic Product Design in the Department of Design and Technology at Loughborough University, UK. Dr. Page is a visiting scholar at Iceland University of Education and the University of Lapland in Finland and is an external examiner on undergraduate fields in Product Design and Manufacturing Engineering at the University of East London. He holds a Doctorate in Electronics Design, a Masters degree through research in Engineering Design Methods and an Honours degree in Technology with Industrial Studies. He has taught Computer-Aided Engineering, Manufacturing Systems Engineering and Engineering Design, and now teaches Electronic Product Design. His research interests are in the areas of the research and development of computer applications for technology education, logistics and supply chain management and electronic product design.