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Yes we can!

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CSCL in a more global context

As we begin to publish volume 4 of *ijCSCL*, the world has changed and the opportunities for CSCL have been transformed along with it. I am writing this introduction to our new journal volume in early November, immediately after the election of Barack Obama in the US and during a period of unprecedented economic volatility around the globe.

The recent events dramatically accentuate the rapid globalization of all aspects of life. In the US, we change from a parochial culture oriented toward America's rural past to a government led by someone with personal roots in Africa and Asia and with a respect for ideas and collaboration. The economic crisis forces nations around the world to work together in order to pursue their own self-interest in a complexly intertwined and interdependent globe.

The U.S. election—viewed by many as an election of international import—illustrates the importance of an educated population for democracy. Obama's support came from the most educated regions of the country. His campaign emphasized argumentation and reason over emotion and faith. To follow the election process, one had to comprehend polling, statistics, sampling, and economics. It also helped to be conversant with e-mail, blogging, and new computer interface displays. Just as John Dewey emphasized almost a century ago and as people in developing nations have seen repeatedly, education and democracy need to go forward together.

Despite the crushing pressure to address the economy, Obama still maintains his commitment to improving education in America. He wants to support schools, teachers, and instructional technology in order to raise student test scores. This is where CSCL can provide new vision, tools, and approaches. Research in the learning sciences confirms the importance of schools, teachers, technology, and test scores, but demonstrates the need to

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go beyond these basic infrastructural elements. Students need to be engaged in constructing knowledge—for themselves and with their peers. They need to become involved in the cultures of knowledge building in various subject domains and to become conversant in the related media for expressing their own understandings.

CSCL offers innovative and powerful ways to take advantage of computer technology to provide new forms of learning. Too often, technology is viewed as a way of automating education and reducing costs, without changing the traditional view of education as the transfer of facts from an authoritative source to a relatively passive student's memory. CSCL proposes new media to support new experiences for students, in which they can interact with other students in structured environments with well-conceived tasks to learn through exploration and discussion.

Although most CSCL systems are still experimental prototypes, once fully developed with all the supports needed for deployment, they could provide effective learning environments to broad audiences of students. In doing so, they would even make it possible for students to collaborate across national borders, preparing them for an ever more global world.

Mature CSCL environments could be disseminated throughout the world, providing access for students inside and outside of schools to rich digital resources in productive interactional settings. The catch is that students, teachers, parents, schools, and politicians all have to transform how they think about education so that they can appreciate and support the profound kinds of learning that can take place in CSCL experiences.

Some countries have begun to commit to constructivist and collaborative learning as appropriate to our global knowledge-building economy. It is up to CSCL researchers to continue to provide persuasive evidence for transforming our educational institutions in this direction. The attempt to promote progressive education has been frustratingly slow since Dewey first called for it. We still need curriculum, technologies, theories, models, documented successes, and reproducible interventions.

The US has fallen behind recently, with its policy of "no child left untested." At this juncture of history, it seems both hopeful and urgent to move in more collaborative directions. Can CSCL researchers make a difference and help education catch up to its historical mission internationally? Yes we can!

A framework for distinguishing learning approaches

As we prepare for CSCL 2009 in Rhodes, we publish a keynote from CSCL 2007 in New Brunswick. In her paper based on her keynote address, *Diana Laurillard* provides a theoretical framework for distinguishing instructionist, social, constructionist and collaborative learning—whether computer-supported or not. Such a framework can guide the design of technologies driven by the pedagogical requirements of collaborative learning. As the paper points out, educational technologies are often commercially available systems that were designed for the business and leisure markets, not in response to the specific needs of learning. They are generic communication media, perhaps bundled with record-keeping facilities to aid school administration. In contrast, the presented framework stresses the communicative needs of collaborative learners to access explanations, pose questions, offer conceptual understandings, set learning goals, repeat practice, reflect, discuss, debate, articulate, and document their ideas. By spelling out pedagogical needs, such a framework provides a welcome basis for evaluating and comparing CSCL systems in terms of the important issues. It may be a useful tool for arguing that popular systems like smart-boards

or Blackboard, as usually applied in classrooms, do not support specific desirable aspects of robust collaborative learning. It may suggest new techniques—not only technological functionality but also classroom practices.

The paradox of productive failure

If you look at the sequence of models of instructionist, social, constructionist and collaborative learning it is striking how they become increasingly complicated. Common-sense conceptions of instructionist learning paint a simple picture: Students are given facts, and they store them for display on request; students either know the facts and can recall them in tests, or they have not learned them. Collaborative learning is much messier than that: There are group processes, which are driven by contributions from group members and which may affect future performances by the individuals. In their paper, *Manu Kapur & Charles Kinzer* explore an interesting twist in the interplay of group and individual problem-solving performance. They confirm their earlier finding that Indian high school students who were in groups that failed to solve ill-structured physics problems later outperformed students who had been in groups that succeeded in solving well-structured problems. Failure in collaborative group knowledge building had a paradoxically positive learning effect in the longer run. From a Vygotskian perspective, this is not so surprising. Challenging ill-structured problems carefully selected in the zone of proximal development of the students provided an opportunity for the groups to develop problem-solving skills that the individual group members could subsequently internalize, individualize, or make their own during posttests. The fact that these were purely peer groups—unlike in Vygotsky's examples—accounts for the fact that they did not fully succeed in the purposefully out-of-reach goal, but they nevertheless forged significant steps in working on the problem. The paper's authors engaged in extensive data analysis to confirm the experimental result of productive failure. However, as they point out, they did not conduct the kind of interaction analysis that might support their speculation about the microgenetic processes that mediated between the "failed" group knowledge-building practices and the subsequent superior individual learning.

"Do u wanna go 2 the moon?"

The process of learning is no more confined to individuals and small groups than politics is confined by national boundaries. The study of CSCL has to include research into how knowledge is diffused through communities of practice. The paper by *Deborah Fields & Yasmin Kafai* reports on a connective ethnography of how pre-teenage newcomers to a virtual community learn about a desirable virtual meeting place called "the moon" and then find out how to get there. To document how community members are socialized into community practices like meeting on the moon, the researchers had to "connect" data from diverse ethnographic sources: server log data, video recordings, field notes, and interviews. One implication of the study is that learning is an important part of participation in virtual communities; another is that such learning ranges across many settings, requiring data analysis at multiple units of analysis. Accordingly, the paper contributes to the argument that popular virtual environments for gaming and socializing are relevant sites for CSCL research. To support such research, the paper extends and demonstrates the use of connective ethnography in an online setting.

Scripting, modeling, and elaborating

In this final contribution to the original set of papers on the *ijCSCL* flash theme of scripting, *Nikol Rummel, Hans Spada & Sabine Hauser* compare scripting to other approaches for training students in effective collaboration skills. Working with dyads each consisting of a medical student and a psychology student, they teach the dyads how to share their complementary expertise in various ways and then they test to see which way produced the best collaboration practices. In the scripting condition, dyads are given a series of precise instructions to follow and the dyads step through this. Alternatively, dyads in the modeling condition are presented with a video-recorded model dialog of a medical student and a psychology student effectively coordinating their work, managing their time, and using their complementary knowledge for problem solving. Additional conditions were created where dyads using scripting or modeling were systematically prompted to engage in collaborative self-explanation. Along with a control condition without scripting, modeling, or elaborating, this created five conditions to compare. The results raised doubts about scripting, and the paper discusses why this might be. One important consideration is that this experiment looked at the results after the scripted learning process, when the script supports were withdrawn; at that point it seemed that students had more lasting learning outcomes about how to collaborate by watching the video model—especially with prompted reflecting on it—than by being marched through a scripted process. Once more we see that collaborative learning is a complicated interplay between individual and group learning processes, which may not follow common-sense assumptions and folk theories.

The agency of the CSCL system

In an insightful case study, *Annika Lantz-Andersson* shows how students working in a CSCL environment may attribute their problems to the technology rather than to their own work. The example nicely demonstrates the complexity of assigning agency when interacting with an educational software system. People have an understanding of the way that computers respond, requiring inputs in specific rigid formats. So if a computer rejects a student response, it may be because the answer is not in the precise format required. On the other hand, the computer programming is quite opaque, so that a user cannot tell what requirements have been set up. Furthermore, teachers design problems differently when computers will be mediating the problem solving. Consequently, the students' task of framing the problem context is quite complex. In a face-to-face situation with a teacher, a student simply has to guess what answer the teacher has in mind. If the student gives a partially correct response, the teacher is likely to indicate how the answer needs to be revised. In a computer-supported situation, the student not only has to guess at the teacher's expectation, but also has to take into account that the teacher's expectation is modified by the computer-supported context and that the computer response to a partially correct answer is likely to be inscrutable. In this case study, students collaborated—which allowed the researchers to observe their quandaries—but the software was not collaboration-support software. In a true CSCL context, the software would support the communication and collaboration, but would leave the assessment of the correctness of answers to people, avoiding the rigidity of simplistic testing, drilling, or tutoring software.