COMPUTER SUPPORT FOR COLLABORATIVE LEARNING: FOUNDATIONS FOR A CSCL COMMUNITY

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Introduction: Foundations for a CSCL Community

A New Era of Learning

Learning takes place in communities, facilitated by artifacts, which in turn sustain the communities that generate them. A series of CSCL conferences – archived in proceedings artifacts like this one – have been foundational events for a growing CSCL community that has an important role to play in a rapidly, painfully self-transforming global culture.

The CSCL community addresses complex and urgent social issues associated with learning in the information era. Despite its healthy growth curve, this research community is still searching for its foundations; to date, there is little consensus on theory, pedagogy, technology or methodology – even less in the broader world of learning stakeholders.

Learning has become a central force of production. Traditional theories and institutions that rose to meet the needs of reproducing knowledge in an industrial world have become fetters on progress: The focus on individual learners obscures the group as the locus of knowledge building and ignores the global interdependence of learning. Fixation on facts distorts the nature of problem-solving inquiry. Modes of thought deriving from the age of rationality and machinery fail to grasp the subtlety of interaction in hyper-networked environments.

CSCL instinctively aims beyond yesterday's concepts. *Collaborative Learning* does not just mean that individual learning is enhanced by participation in small groups; it means that it is the groups themselves that learn. Knowledge is a product of the collaboration process: it arises through interaction of different perspectives, heats up in the cauldron of public discourse, is gradually refined through negotiation, and is codified and preserved in cultural or scientific artifacts. Knowledge is not static and other-worldly: it lives, situated – both locally and historically – in groups, teams, organizations, tribes, social networks and cultural flash points.

Computer Support does not just mean automating the delivery and testing of facts; it means supporting forms of collaboration and knowledge building that could not otherwise take place without networked communication media and software tools for developing group understandings. Computers can manage the complexity of many-to-many discussions, allowing multiple perspectives to interact without hierarchical structuring. They can overcome the limitations of human short-term memories and of paper-based aides to generating or sharing drafts of documents. CSCL should enable more powerful group cognition, which can synthesize complex interactions of ideas at different scales of collaboration, from small classroom project teams to global open source efforts.

A New Paradigm of Learning Research

The keynote talks for CSCL 2002 propose a new paradigm for a distinctive form of educational research. Timothy Koschmann focuses on the micro-level practices that need to be studied, while Yrjö Engeström considers the larger social contexts in which groups interact with other groups to produce learning. Koschmann offers this definition for the CSCL domain:

> CSCL is a field of study centrally concerned with meaning and the practices of meaning-making in the context of joint activity, and the ways in which these practices are mediated through designed artifacts.

It is clear that "meaning and the practices of meaning-making" are here intended as public, observable, socially shared phenomena. This has foundational implications for CSCL research. It does not entail a rejection of quantitative studies of learning outcomes under controlled conditions. However, while these provide important information and ensure empirical grounding, they can in principle never provide the complete story. CSCL is a human science, concerned with its subjects' own interpretations of their ideas and behaviors. Therefore, CSCL also requires qualitative studies of learning practices – such as thick descriptions that incorporate and explore the understanding of the participants in collaborative learning. As public phenomena, the meanings (learning) generated in collaboration processes can be studied directly, particularly with the help of computer logs and digitized video recordings, rather than just being inferred from post-tests.

As already suggested, the description of CSCL as concerning "the practices of meaning-making in the context of joint activity" does not so much entail looking at *individuals'* practices in social settings, as it focuses on the essentially *social* practices of joint meaning-making. Even when conducted by an individual in isolation, meaning-

making is a social act, based on culturally defined linguistic artifacts and oriented toward a potential public audience. An adequate theoretical foundation for CSCL must explain how individual practices are social without forgetting that the social is grounded in individual activities; concepts of *praxis*, *activity*, *social reproduction*, *structuration* and *enactment* begin to address this dialectic.

Koschmann's definition of CSCL includes the study of "the ways in which these [meaning-making] practices are mediated through designed artifacts." He refers here to CSCL technology as mediational artifacts, as software objects designed to support collaborative learning. But this formulation can be taken more generally as raising the question of how meaning-making is mediated by artifacts. This is an extraordinarily broad issue, since all human activity is meaning-making and everything in our physical, intellectual and cultural world can be considered an artifact: physical tools, linguistic symbols, cultural entities, cognitive mechanisms, social rules, . . . It is striking that such a fundamental issue has been so little explored. How do different classes of artifact mediate the creation, sharing, teaching and preserving of meaning? A clearer understanding of the functioning of non-digital artifacts might help us understand how to design software to more effectively foster and convey collaborative meaning-making.

A New CSCL Community

The new era of learning and the new research paradigm call for a community that can integrate results from philosophy, social theory, ethnography, experimentation and pedagogy. More than this, it must be able to carry out research that integrates the foundations of these disciplines into a coherent and productive field of inquiry. As its conceptual framework and software products mature, the CSCL community must broaden to incorporate educational practitioners, teachers, trainers, lifelong learners and students around the world.

The CSCL 2002 conference aims to incrementally build the foundations for such a CSCL community. The call for papers elicited over 300 submissions, of impressive quality and reflective of an energetic international community. Many leaders of this community participated on the Program Committee, joined by even more who served as additional reviewers in an exemplary peer-review process.

The long papers in this Proceedings will be presented in thematic panels at the conference. The papers represented here by abstracts will be presented during interactive poster sessions. All of these papers passed an extremely competitive peer review, which unfortunately had to reject many excellent submissions due to space and time constraints.

In addition to the papers, the conference will include keynote discussions (featuring Timothy Koschmann, Yrjö Engeström and a few outstanding papers on foundational themes), an extensive program of interactive events (organized by Daniel Suthers), workshops (organized by Tamara Sumner and Paul Mulholland), tutorials (organized by Anders Mørch) and a doctoral consortium (organized by Michael Eisenberg and Amy Bruckman). An active Steering Committee (chaired by Gerhard Fischer) handled the many other aspects of preparing the conference. My colleagues at Fraunhofer-FIT, Germany, (formerly GMD-FIT) have been very supportive of my work on the conference. Carla Valle compiled the papers in these Proceedings.

Financial support for CSCL 2002 came from CSCL 1999 (Stanford and SRI), Euro-CSCL 2001 (Maastricht), the National Science Foundation, the Coleman Family Fund, Microsoft, Apple and IBM. The conference is hosted by the Center for LifeLong Learning and Design, the Institute of Cognitive Science, the Department of Computer Science and the Engineering School of the University of Colorado at Boulder.

I believe that this collaborative artifact – the conference *pre*ceedings – reflects the current state of CSCL research, particularly in North America and Western Europe. It documents an extremely heterogeneous, productive phase of inquiry with broad social consequences. I hope that the conference will contribute to the foundations of a vibrant CSCL community and that it will stimulate you as a member of that community.

Gerry Stahl

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