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ijCSCL – a Journal for Research in CSCL

Gerry Stahl * Friedrich Hesse

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A Journal of the Community

The launch of the *International Journal of Computer-Supported Collaborative Learning (ijCSCL)* is a propitious step forward for the CSCL community: It heralds a transition of the field to a new level of academic maturity. It provides an appropriate communication medium and a selective knowledge archive for an increasingly global research network.

ijCSCL was proposed by the CSCL community and is sponsored by the International Society of the Learning Sciences (ISLS). The Board of Editors includes many leading CSCL researchers from around the world, and others participate as reviewers. Many of the articles in *ijCSCL* originate in papers at CSCL conferences and regional workshops.

This journal is committed to serving as an important communication vehicle of the growing CSCL community and cognate fields. As such, *ijCSCL* will contribute to our collaborative learning as a knowledge-building community of practice.

The First Ten Years of CSCL

The term *computer-supported collaborative learning* (CSCL) was first publicly coined at an international workshop in Maratea, Italy, in 1989. Since 1995, a biannual series of international CSCL conferences has been held in North America, Western Europe and most recently Asia. The 2005 CSCL conference held in Taiwan celebrated the tenth anniversary of the conference series with the theme, “CSCL: The Next Ten Years.” Most of the articles in this issue of *ijCSCL* are based on conference papers from there.

As the CSCL conference series evolved over the past ten years, an international community of researchers formed around it. Participants had professional roots in diverse fields, such as artificial intelligence, educational and cognitive psychology, software development, instructional design. While the conference proceedings served as boundary objects to tie this interdisciplinary community loosely together, more was felt to be needed. In recent years, a CSCL book series was launched through Springer and already offers five edited volumes. *ijCSCL* was proposed as an additional medium to support this fast-growing discipline.

Meanwhile, ISLS was founded to provide an institutional support for CSCL and other learning science conferences and journals. Along with the *Journal of the Learning Sciences*, *ijCSCL* is an official journal of ISLS. Another important factor in the development of the CSCL community has been the establishment of regional networks of CSCL researchers and local centers; the oldest of these is the Ontario Institute for Studies in Education in Canada and the largest is the CSCL SIG of Kaleidoscope

in Europe. Such collaborative networks have been essential to progress in this field, and stand in the background of much of the work presented in this issue.

The Next Ten Years of CSCL

Establishing this journal, like holding the latest conference in Taiwan, reflects a strategy that aims to make the CSCL community fully international. We live in a global world and we learn together. The issues that confront the field of CSCL today are far too complex to be solved by individuals or small labs working independently. We must pool our resources, our insights and our findings. The journal's mission is to share seminal innovations and proposals from around the world, so they can be taken up and collaboratively developed. This issue features contributions from Brazil, Canada, China, Denmark, Germany, Sweden, the United Kingdom and the United States.

Over the next decade, *ijCSCL* will contribute to the development of the CSCL field by providing a peer-reviewed venue for the exchange of high-quality analyses and ideas. Although it is now well established as an academic specialty and as a leading-edge research domain, like all vigorous research fields CSCL faces many challenges in specifying its subject matter and approaches. The journal will help to define and project the field's identity.

As a heritage of its interdisciplinary origins, CSCL research includes a mixture of theories, technologies and methodologies. Most of these were developed in different academic contexts and are tuned to conflicting sets of criteria. While it may have been feasible to make progress on CSCL problems during the first decade of the field's existence from exclusively within an educational psychology perspective or using an artificial intelligence approach, it is less likely now. We have learned meanwhile that the issues are complex and intertwined. One must address system-building, instructional-design, experimental-analysis and other aspects simultaneously. The guiding theories, technologies, methodologies, curricula and classroom practices must co-evolve in orchestrated efforts.

This not only means that CSCL research must be practiced by collaborative research teams with diverse training, but also that we need to develop theory, technology, research methods and educational practices that are specific to CSCL, and not simply inherited. We need theories of collaborative interaction that are not necessarily based on individual learning models. We need technologies with specific supports for collaborative learning, not just generic communication media. We need methodologies that capture both micro-level interactions in small groups and community-level developments as mediated by social practices and by technical infrastructures. The articles in this issue start to move in such directions.

A Journal of the Future

The technology of knowledge dissemination is changing rapidly. An international journal of CSCL should be at the forefront of such change. Today, more academic research is conducted by Internet searches than by browsing a library's back-room stacks. Research not readily available online is doomed to obscurity. Without losing sight of the importance of archival preservation, Open Access must be a priority. Through a unique arrangement with the prestigious academic press Springer, *ijCSCL* is able to make the full text of its articles freely available on the Web, indefinitely, while still publishing them electronically and in traditional hardcopy journal form.

All articles published in *ijCSCL* are subject to a rigorous peer review process, typically going through several rounds of revision at the direction of at least three Board members in order to bring out their most important contributions. Once a paper is officially accepted it is typeset, assigned a unique Digital Object Identifier (DOI) and posted on ijCSCL.org where it is permanently available for free. Subsequently, the final and official version is published on SpringerLink.com. Quarterly issues of the journal are printed and mailed to subscribers.

Springer is a leader in the field of academic publishing. They bring to this endeavor a wealth of experience and prestige, and they will continue to do so as the publishing industry evolves. Working together, *ijCSCL*, ISLS and Springer have developed a number of ways to make the journal accessible to the widest possible audience. *ijCSCL* is already included in Springer's catalog of education journals, which is distributed to thousands of universities worldwide. Additionally, members of ISLS receive free electronic access and can choose to subscribe to *ijCSCL* as part of their membership fee at ISLS.org. Springer has an alert service at www.springerlink.com/alerting and various free access offers to selected electronic articles. These broad access efforts ensure that *ijCSCL* will be indexed and ranked highly by ISI and other relevant abstracting and indexing services.

Introducing the Inaugural Issue

In keeping with the Taiwan conference theme, "CSCL: The Next Ten Years," volume 1, issue 1 of *ijCSCL* includes articles that propose new directions for the CSCL field. Topics range from reflections on the evolution of the CSCL community itself to innovative theoretical perspectives, pedagogical practices, research methodologies and technological developments.

These articles illustrate the variety of methods, theories and approaches active in contemporary CSCL work. They draw on research traditions, theoretical frameworks, quantitative measures, qualitative analyses, case studies and iterative trials to support their claims and proposals. In future issues, the scope will be broadened further by including more empirical studies based on classic experimental methodology. Rigorous scientific analyses from any approach that contribute to progress in CSCL are welcome. This issue features the following:

1. The CSCL Community in its First Decade

The journal opens with an analysis of the history and development of the CSCL research community. First, a variety of quantitative measures are applied to test prevailing notions about the nature and composition of the community. A key question has to do with continuity of membership: to what extent do attendees at one conference increase their level of participation in subsequent conferences and what is the effect of the high turnover of newcomers? Is the conference series really international; what factors influence its geographic mix? While certain trends emerge from the data, it is necessary to also incorporate qualitative analyses to gain a better understanding of the significance of these trends. The study provides an initial scientific look at CSCL as a research community and establishes a baseline for further investigation, but it also raises enduring methodological questions about how to assess such a fluid and multi-faceted community. It is suggestive of how to continue to deepen the international character of the community.

2. A Relational, Indirect, Meso-level Approach

Much CSCL research focuses on the individual learner or on local interactions in dyads and small groups. The role of technology is conceptualized as mediation by affordances of artifacts, which exist within socio-cultural contexts, influenced by relatively stable large-scale factors. This paper confronts these current views with theoretical challenges emerging from two European Union projects. It suggests that technologies like the Internet cannot be treated as simple artifacts, but form infrastructures at a meso level that mediate between people and social structures. Infrastructures are not objects with attributes, but are enacted in use in ways that help to evolve social edifices. Their relational character implies that design of CSCL technologies and interventions can only be indirect, establishing preconditions for educational opportunities, but not causally determining learning outcomes. This result has not only methodological implications, but ethical ones as well.

3. Student Assessment of Collaborative Inquiry

Perhaps the most vexing issue today in transforming instruction into collaborative knowledge building is how to assess student benefits. If learning takes place through the group, classroom or community, then how can outcomes be measured or credit assigned? In a clever twist, this research has students in Hong Kong schools analyze and assess the knowledge building that takes place in their own classrooms, with a certain emphasis on their own individual involvement. Assessment thereby merges with meta-cognition and promotes deeper learning for both group and individual. This research earned the best paper award at the Taiwan conference; it is part of a long-term research agenda related to the work of Scardamalia and Bereiter, who were there given the lifetime achievement award for their seminal contributions to CSCL. The paper uses quantitative quasi-experimental statistical results to support its claims, as well as qualitative analysis and case study examples to convey a more detailed understanding of these results.

4. A Scholarship of Application

The conventional assumption is that scientific research must result in a generalizable discovery of new knowledge. However, in a new and interdisciplinary scientific community it is also important to integrate existing knowledge from other fields, with appropriate adaptation. This paper proposes yet another form of valuable work in the learning sciences: Exploring how a technology can be applied in a spectrum of situations. The applicability of specific technologies to the support of collaborative learning is not a binary question. Interestingly, this paper demonstrates both the potential and the limitations of wiki technology for CSCL. Within the same university with the same tech support, the use of wikis succeeded easily in certain subject matters and classroom cultures but failed in others. The authors explore in detail the reasons for this and the potential for overcoming the barriers in certain cases.

5. Evolving a Chat Tool to Increase Understanding

Instant messaging, SMS and chat are widely popular among students for socializing one-on-one. In principle, chat technology has the potential to support many-to-many communication for collaborative learning activities, overcoming the requirements of face-to-face interaction for turn-taking and physical presence. However, active chat sessions involving more than three or four participants become confusing and straining. The design-based research reported here undertook many iterations of redesign to respond to the problem of chat confusion. Each attempt led to new insights into the problem and ideas for technical responses. The research agenda spanning several years follows a systematic path of iterative inquiry and CSCL technology design evolution, tested in a Brazilian classroom setting. Thereby, the chat tool is successively modified to overcome the major barriers of this medium and to free chat to become an important technology for collaborative learning.

6. A Dialogical Understanding of Teaching Thinking Skills

It is now popularly accepted that success in the contemporary world requires creative, sophisticated thinking skills, and not just the mastery of accepted facts and proven rules. Theoretical analysis of the nature of higher-order thinking skills ties them fundamentally to dialogic understanding as described in this final article. Thereby, it argues for the centrality of collaborative learning. A series of case studies illustrates the point that many core thinking skills of individuals are actually derived from dialogic skills of small groups of people interacting and collaborating. The skills include dealing effectively with multiple, potentially incompatible perspectives and complex problems that have no clear solution paths or final answers. The notion of teaching thinking skills rather than facts is re-conceptualized in terms of a dialogic model, bringing theoretic coherence to an important but hitherto ad hoc area of study. Perhaps these are the kinds of thinking skills needed in CSCL research itself, developed at the niveau of scientific methodology.

Welcome to the Future: ijCSCL Volume 2

Gerry Stahl * Friedrich Hesse

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An Advance in the Field of CSCL

The start of a second year of *ijCSCL* marks a significant step forward in the history of the CSCL research field. The journal is not just a venue for academic papers, but a medium of discourse about new directions and new understandings within an active community exhibiting diverse perspectives.

The journal has not merely persisted for a full year/volume; it has been adopted by the CSCL community as an important voice. Almost a hundred papers have been submitted to the journal from around the world, covering all aspects of CSCL theory, methodology, technology and practice. A total of two hundred researchers have volunteered to be reviewers, including the illustrious Editorial Board of 42 people. Many of the submitted papers expand on exceptional presentations from CSCL conferences, workshops and research labs. The paper that won the “European CSCL Award for Excellence in the Field of CSCL Research” at January’s CSCL SIG Rendez-Vous in the Swiss Alps (Arnseth & Ludvigsen, 2006) was published in *ijCSCL*.

Like a meeting or a conference, a journal can provide a place to communicate what is going on in a community. However meetings and conferences permit certain kinds of informality and direct interaction with the audience. So it is natural to concentrate on meetings and conferences when a field like CSCL is starting to develop. When a journal become part of the community’s communications, more formal ways of presenting assumptions, theories and outcomes start to take prominence. Journal articles reflect more mature research efforts, more intense peer review and more rigorous editing than conference papers.

During the first year of *ijCSCL*, a highly engaged Editorial Board and additional reviewers from the field did an exceptional job of carefully reading the submitted papers and providing deep and detailed constructive advice to improve the papers. Virtually all published papers went through extensive critique and revision. Although it may not be visible to most readers, all papers had clearer organization and stronger arguments as a result of the review process—even though they may have been based on conference papers or dissertations that had already benefited from a great deal of review and editing. In addition, the many papers that could not be published in *ijCSCL* each received several detailed reviews, helping their authors to learn from the experience and to understand what was needed for future publication. In such ways, the journal also serves as a means for mutual assistance within the community—for community-based collaborative learning.

The journal is thus both an avenue of more formal communication than conferences and a special form of interaction between authors and reviewers. This kind of anonymous interaction and

critique can be more frank and detailed than at a conference. If *ijCSCL* serves these dual purposes of publication and feedback, then it's first anniversary marks a real start to advancing the field..

The CSCL Research Community Supports *ijCSCL*

As we start to publish our second volume of *ijCSCL*, the Board of Editors would like to thank all the members of the CSCL community who have supported the journal through its first year. The following researchers contributed reviews to *ijCSCL* to date:

Shaaron Ainsworth, Hans Christian Arnseth, Daniel Bodemer, Jürgen Buder, Murat Perit Cakir, John M. Carroll, Carol K.K. Chan, Elizabeth Charles, Cesar Alberto Collazos, Charles Crook, Lucilla Crosta, Lone Dirckinck-Holmfeld, Nathan Dwyer, Noel Enyedy, Brian Foley, Andrea Forte, Hugo Fuks, Frode Guribye, Päivi Häkkinen, Christine Joyce Howe, James Hudson, Patrick Jermann, Richard Joiner, Christopher Jones, Regina Jucks, Yael Kali, Victor Kaptelinin, Manu Kapur, Andrea Kienle, Minna Lakkala, Victor Lally, Nancy Law, Lasse Lipponen, Jacques Lonchamp, Rose Luckin, Johan Lundin, Richard Medina, Anders Mørch, Daisy Mwanza-Simwami, Jun Oshima, Ruediger Pfister, Janet Read, Peter Reimann, Jochen Rick, Tim Roberts, Nikol Rummel, Nadira Saab, Johann Sarmiento, Wesley Shumar, Jan-Willem Strijbos, Berthel Sutter, Gustav Taxén, Ramon Prudencio Toledo, Jan van Aalst, Ravi Vatrapu, Marjaana Veermans, Jim Waters, Rupert Boulewijn Wegerif, Gordon Wells, Martin Wessner, Tobin Frye White, Joyce Yukawa, Nan Zhou.

Along with the members of the Editorial Board, these reviewers not only determined what was selected to publish in the journal and gave valuable insights to all submitting authors, they also contributed significantly to guiding the major revisions that all accepted papers passed through before being published. In this way, the community establishes the content and tone of the journal.

We look forward to thanking you in person for your support and your interest in *ijCSCL* at the international conference of CSCL 2007 at Rutgers University, New Brunswick, NJ, USA, near New York City, July 16-21 (see <http://www.isls.org/csc12007>).

FlashThemes in CSCL

As mentioned in the introduction to issue 2, a number of workshops on topics in CSCL proposed developing special issues for *ijCSCL*. These were not topics solicited by the *ijCSCL* Editorial Board, but arose out of the work and concerns of practitioners. They are themes which "flashed" up in the field through a kind of spontaneous combustion of hot topics, stirred up by experiences in the wild. Responding to these openly and welcoming such suggestions has been a way for *ijCSCL* to give voice to the concerns of the field in a timely and flexible way and to stay at the leading edge of a rapidly evolving discipline.

This year, *ijCSCL* begins to publish papers on these flash themes. Reviews of papers on these themes are being coordinated by Associate Editors of *ijCSCL* (as indicated in parentheses below) in a move to broaden editorial responsibilities as the journal becomes more established. Future issues will include papers on the flash themes of:

- Scripting in CSCL (reviews coordinated by Barbara Wasson)
- Methods for Evaluating CSCL (Claire O'Malley)
- Graphical Support for CSCL (Daniel D. Suthers)

In this issue, two papers on the theme of "Learning in Communities" are published. They arose out of a workshop by that name organized by Jack Carroll and Chris Hoadley at Penn State University (USA), August 14-17, 2006. The workshop was attended by 29 researchers, mostly from North

America, and was sponsored by NSF (grant IIS-0511198). A report on the workshop itself appeared previously in the *Journal of Community Informatics* (Carroll & Bishop, 2005). Six other papers derived from the workshop are under review for the *Journal of CSCW*. The workshop at Penn State built on related workshops at ICLS 2004 and CSCL 2005, which resulted in special issues in the *ACM SigGroup Bulletin* (Klamma, Rohde, & Stahl, 2004) and in *Behavior & Information Technology* (Rohde, Wulf, & Stahl, 2006).

Computer-Supported Community-Based Learning

Lave & Wenger (1991) brought home the importance of “communities of practice” (CoPs) for learning. In this issue we have a pair of articles investigating the role of communities in learning within contemporary institutions. Together, they suggest a specific form of CSCL, where the term “collaborative” is specified as referring to collaboration that is “community-based” in the sense of CoPs providing socio-cultural contexts in which collaborative learning can take place. They illustrate community-based learning related to the university and related to what in the USA are known as non-profit organizations and elsewhere as non-governmental organizations (NGOs). By publishing these articles, we bring considerations from CSCW (computer-supported cooperative work) and HCI (human-computer interaction) into the CSCL discussion.

Fischer, Rohde & Wulf elaborate the concept of CoP with distinctions that have developed in reaction to Lave & Wenger, distinguishing networks of practice and communities of interest from CoPs as variants. The community-based focus is a move within CSCL to the level of what Jones, Dirckinck-Holmfeld, & Lindström (2006) called the “macro-scale” in the first issue of *ijCSCL*. Here, a community is not only learning via computer-supported media, but they are also learning about how to design and use computer-supported “community-based” learning technology. In a transitional period for institutions of higher learning when online learning threatens the viability and competitiveness of brick-and-mortar universities, it is timely to ask how residential research universities can develop unique and attractive approaches to computer-supported community-based learning by involving students in real-world research in academic labs and local industry.

Carroll & Faroque propose a middle layer of theoretical constructs they call frameworks, which mediate between general patterns and individual cases. Based on long experience working with non-profit community-based organizations who struggle with computer technology, the authors want to formulate generalizations that will provide practical guidance in dealing with common problems that arise in this context. They draw on the idea of design patterns (Alexander, 1977) and the literature that has developed in computer science and CSCL based on Alexander’s approach. We may dispute the definition of pattern used here as a simplification of Alexander’s pattern languages and may wonder if this sense of theory is strong enough for our field, as a reviewer did, but the authors seem to be pointing in a promising direction. Just as the nature of residential research universities in the age of distance education is in turmoil, voluntary and neighborhood-based organizations are threatened in the age of social fragmentation and globalization. In both cases, there seems to be no general solution; pattern languages of inter-related partial solutions generalized from multiple experiences and adaptable to concrete cases may provide the best solution.

Methods for Analyzing Collaborative Interaction

The theme of methodology is one that permeates discussions of CSCL and generates endless controversy. This is not a flash theme, but an enduring one. It probably plays a role in every issue of *ijCSCL*, not only this one.

To understand the nature of a collaboration or a set of collaborative activities, one has to know about the various dimensions of interaction that take place. What are the key dimensions and how can they be measured or analyzed? Researchers in CSCL have tried to apply diverse theories and

methodologies, many borrowed from established fields of social science research. The results are still heavily contested. This issue of *ijCSCL* features two articles that explicitly explore importing quantitative methodologies into CSCL, in combination with complementary approaches.

Meier, Spada & Rummel differentiate as many as nine dimensions of interaction for quantitative analysis and assessment. They derived these through an interesting combination of bottom-up qualitative content analysis with generalization, refined through top-down theory-informed considerations. Operationalized for reliable application, these dimensions are then used to develop and successfully apply a rating scheme for assessing the quality of computer-supported collaboration processes among dyads of college students engaged in videoconferencing. It is suggested that such a ranking approach has advantages over coding for many research questions, still allowing a quantitative comparison of alternative conditions.

A quite similar interest drives the paper by De Laat, Lally, Lipponen & Simons. They are interested in synthesizing and extending the understanding of patterns of collaboration in the context of networked learning or CSCL. They start with a general overview of the utility of social network analysis (SNA) in social science and in previous CSCL studies. Then they bring in content analysis and critical event recall as complementary tools. Their paper provides an additional example of the usability of SNA.

While the last two articles mentioned strive to produce quantitative support for generalization, the paper by Rourke & Kanuka argues explicitly for a qualitative approach as a way of gaining deeper insight into important CSCL phenomena. Much CSCL research aims to support discourse that stimulates critical thinking and even argumentation; much CSCL literature also bemoans the common failure of online discourse to achieve high levels of critical reflection, often using quantitative measures based upon coding, ranking or SNA, for instance. This paper adopts a “naturalistic paradigm” in which “realities are multiple, constructed and holistic ... so that it is impossible to distinguish causes from effects.” It inquires into the life contexts of several students in an in-depth case study of online learning in order to explore the manifold and subtle barriers that mitigate against the ideal of online critical discourse. Thereby, one catches a glimpse of personal factors that influence the diverse ways that individual students interact to co-construct reality, course materials and understandings of each other—factors that might well slip through the sieves of methods that aggregate data for the sake of generalized findings.

Perhaps the implication of the papers in this issue is that CSCL needs to promote the inter-animation of complementary quantitative and qualitative perspectives rather than hoping to converge on a single ideal method.

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