

The shape of the elephant: Scope and membership of the CSCL community

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Abstract. This paper discusses the character of the CSCL research community. While members of the community often feel they have authoritative perceptions of the nature of the community, these perceptions often differ. This paper is an attempt to look empirically at the CSCL community as constituted by leadership in the CSCL conferences. Data are included about who, historically, has published in the CSCL conferences and how those people are distributed across academic disciplines and regions of the world. In addition, the relationship between CSCL and the learning sciences is explored.

Keywords: Citation analysis, bibliometrics, sociology of science, computer-supported collaborative learning, learning sciences, communities of practice.

An old parable tells of three blind men trying to describe an elephant; one describes the rosy tail, another describes the leg like a trunk of a tree, and a third describes the snake-like trunk. Disagreement ensued. All three were locally correct, but all three were wrong in their incomplete view of the whole.

Research fields can be like the elephant. Although participants in the communities might believe they have a comprehensive view of the shape of the whole community, perceptions are shaped heavily by personal perspective. This can yield conflicts, when agendas or definitions for a research community are set. In this paper, we attempt to describe some of the patterns of participation in the CSCL research community based on empirical data derived from the CSCL conference proceedings from 1995 to 2002.

INTRODUCTION: THE SHAPE OF RESEARCH COMMUNITIES

What is a scientific community? How can we explore or define one? The most literal definition would be a community, that is a group of people engaged in shared activities towards overlapping goals, doing science, or systematically modeling and understanding the world. In the stereotypical ideal, the scientific community (only one) is full of people who uncover truths and generally build on what is known about the world to answer questions that are unknown.

Unfortunately, this vision of a research community suggests a much tidier world than the one we live in. First of all, there are many scientific communities, not just one monolithic one. Our “truths” are subject to negotiation and reinterpretation, based not only on data, personal knowledge, and methodological inclinations, but also biases, politics, and personal interests. (Kuhn, 1962; Latour, 1987) We are limited by our humanity, and since our ability to understand and apply science is filtered through our own human capabilities, perhaps this is a good thing. Scientific communities are messy.

A further problem in asking about the nature of scientific communities is that the participants do not see them clearly from a distant point of view; they live them. Debates can get quite heated when evidence suggests ones’ own interpretation of the world may be wrong, whether it is an interpretation of some scientific domain or more personally an interpretation of one’s own community and practices. People may simply reject ideas that require radical interpretation of how things are (Chinn & Brewer, 1993).

Still, it is a sign of a healthy community that is open to questioning itself, its motives, goals, and definitions, even among scientists. As scientific communities progress, they make obsolete their prior interpretations of the world, and this sometimes requires reframing the endeavor at hand. Just because the mission statement or definition of a field might change is not a reason to abandon the endeavor entirely. Such definitions can become a flag that can help rally communities towards common goals.

Science is as science does. In prior work on defining scientific communities (Hoadley, 2004), I argued that there are five core features that define research communities: scope and goals, theoretical commitments, epistemology, methods, and history. Each of these features leaves, to some extent, a trace in the literature of the field. In this paper, I examine the CSCL literature represented by the CSCL conferences, and then attempt to use this information to propose some characteristics of the CSCL community to date, while still recognizing that the CSCL community is a living organism that changes every minute. While there are a number of other venues for CSCL related work that exist, such as the CRIWG, the problems of source selection would be considerable

if opened up to include additional sources. Rather than expand the scope of this study to first, determine, and second, analyze, all CSCL-relevant conferences, this analysis focuses primarily on the CSCL conference itself.

With the “moving target” in mind, I hope to shed some light on a few questions about the CSCL community as represented by the CSCL conference. First of all, who participates? What disciplines or geographic regions do they come from? Do they stay in the community over time? Secondly, what is the relationship between the CSCL community and the community termed “the learning sciences”?

BIBLIOMETRIC ANALYSIS

In this section, I undertake a bibliometric analysis of the field of CSCL as represented by the CSCL conference series. Bibliometrics may be used to answer basic questions about scholarly communication, such as who publishes in a field and how much; what are the connections in the field as indicated by variables such as coauthorship or citation; and who uses a particular research literature for what purposes (Borgman & Furner, 2002). The present analysis builds on a bibliometric analysis of the fields of learning sciences and instructional systems design through six publication outlets during the time from 1991 to 2001 (Kirby, Hoadley, & Carr-Chellman, in press). While these prior analyses looked at cross-field citations and geographic distribution of coauthorship, the present analysis focuses instead upon who participates in the CSCL community, where they come from, and the relationship between other outlets in the learning sciences and the CSCL conference.

Data sources and coding

Our team collected and coded ten years of six publications judged (perhaps imperfectly) to be representative of the learning sciences and of the instructional systems design community. Three of these publications were used in the present analysis. From the learning sciences, the group collected and coded the two conference series and the journal now sponsored by the International Society for the Learning Sciences, namely the *Journal of the Learning Sciences* (begun in 1991), the proceedings of the *International Conference for the Learning Sciences* (or *ICLS*, also started in 1991), and the proceedings of the *Computer Supported Collaborative Learning* conference (begun in 1995). Additionally, the *CSCL* series is analysed through the January 2002 conference, in part due to the fact that the conference was originally scheduled for late 2001. Note that this analysis does not include the proceedings of *EuroCSCL 2001*, a conference that was explicitly regional in its focus. This omission is primarily due to logistical issues.

While bibliographic statistics are often taken for granted in the era of bibliographic databases, our data collection involved enormous effort. Partly due to the recent beginning of the various learning sciences publication venues, partly due to the variety of publishers of the works, it took nearly a year to assemble a complete set of materials. Original hard copies of the works were obtained, and the title pages and back matter for each article were photocopied. The title page information was entered into a database, including article citations and author affiliation information. We then coded author affiliations where provided geographically, by country, state or province (for Canada, the United Kingdom, and the United States), and city. Authors’ names were manually standardized. In some cases, missing affiliation information was omitted from the database (i.e., we did not attempt to uncover more affiliation than what was published, so for instance if an author address did not contain departmental affiliation, no attempt was made to find out what department the author was from).

Where provided, departmental affiliations were coded into one of twelve categories (see Table 1). Authors were coded into as many categories as applied, either because they changed departmental affiliations, or because they had multiple affiliations.

Table 1: Disciplinary coding for departmental affiliations

Psych:	Psychology or educational psychology (including human development)
Education:	Education, not including educational psychology, cognitive science, or learning sciences (includes Pedagogy, Curriculum and Instruction, Instructional Design, Educational Technology, Science/Math Education, etc.)
CompSci:	Computer science, computer engineering, human-computer interaction
Info:	Information sciences, information design, informatics, or library science
MediaComm:	Media, communications, mass communication
Linguistics:	Linguistics
Soc:	Sociology or political science
Anthro:	Anthropology
CogSci:	Cognitive science (only when this phrase explicitly used)
LearningSci:	Learning sciences (only when this phrase explicitly used)
Business:	Business and management (including organizational science)
Other:	Departmental affiliation that does not match any of the above

In addition to the authorship data, conference websites were used to identify program and steering committee members for the CSCL conferences from 1995 to 2003, this time including the EuroCSCL conference (under

the presumption that while participation in the conference might be regionally focused, editorial governance was not). Where websites had disappeared, the Internet archive was used. Unlike the authors, these conference organizers were tracked down using the best available current information, including Google searches.

Stability of community leadership

Our first analysis concerns the stability of the CSCL conference community core. Have people participated in the community for years, or is it a “revolving door” which doesn’t really represent a stable group of individuals at all? We begin with an analysis of the program and steering committees. Overall, 226 people served on either program or steering committees, 86 served on at least one steering committee, and 192 served on the program committees. Of the 226 people on these committees, 92 participated in more than one role in the conference over the years. Seventeen people served as either conference chair or program chair. They were counted automatically as members of the steering committee.

Of the steering committee members, 57 (roughly 2/3) served in another conference capacity over the years (either another steering committee or a program committee.) Of the 29 people who served only as a steering committee member once, all but a few (<5) were either at the host institution or local to the hosting institution for the conference. This seems to indicate a relatively high degree of stability at the core of the conference organizing community, although the location does clearly influence conference leadership.

Among program committee members, 84 (roughly 45%) served the conference multiple times (either on another program committee or as a steering committee member). Approximately 12 of the people who only served the conference once were local to the host institution, meaning in the same or nearby cities (although this number is larger if Scandinavians are treated as local to each other). Thus, there were a much larger number of program committee members who served the conference only once as a program committee member.

Among both program and steering committee members, 70 served the conference over multiple years. The average timespan of service for these multi-year individuals was 3.6 years. Looking through the data, few of these people “dropped out” along the way. The maximum possible average based on the starting dates of each individual is 4.9 years, indicating that those who were involved with more than one conference tended to stay involved over a long period of time. 34 people served in 3 or more conference roles (see Table 2).

Table 2: Program or steering committee members participating in three or more roles

First	Name Last	Participation years			Number of roles played			
		From	To	Span	Total	Chair	Steer.	Pgm.
Michael	Baker	1999	2003	4	3	0	0	3
Amy	Bruckman	2002	2003	1	4	0	2	2
Tom	Carey	1995	1997	2	3	0	2	1
Allan	Collins	1997	2002	5	3	0	0	3
Pierre	Dillenbourg	1999	2003	4	6	1	1	4
Lone	Dirckinck-Holmfeld	1997	2003	6	3	0	1	2
Yrjö	Engeström	1997	2003	6	4	0	0	4
Anneke	Eurelings	1999	2001	2	3	0	2	1
Gerhard	Fischer	1995	2002	7	4	1	1	2
Shelley	Goldman	1995	1999	4	3	1	1	1
Louis	Gomez	1997	2002	5	3	0	0	3
Kai	Hakkarainen	2001	2003	2	6	1	2	3
Päivi	Häkkinen	2001	2003	2	3	0	1	2
Rogers	Hall	1997	1999	2	3	1	0	2
Christopher	Hoadley	1999	2002	3	3	0	1	2
Ulrich	Hoppe	1999	2003	4	6	1	1	4
Janet	Kolodner	1995	2003	8	3	0	1	2
Timothy	Koschmann	1995	2003	8	11	2	4	5
Erno	Lehtinen	1999	2003	4	3	0	0	3
Naomi	Miyake	1995	2003	8	7	1	0	6
Anders	Mørch	2002	2003	1	4	0	2	2
Hiroaki	Ogata	2001	2003	2	4	0	1	3
Gary	Olson	1995	1999	4	3	0	0	3
Claire	O'Malley	1997	2003	6	5	0	1	4
Roy	Pea	1995	2003	8	5	1	1	3
Rolf	Plötzner	2001	2003	2	3	0	1	2
Mitchel	Resnick	1995	1999	4	3	0	0	3
Jeremy	Roschelle	1995	2003	8	7	1	1	5
Gerry	Stahl	2002	2003	1	4	1	1	2
Manasori	Sugimoto	2002	2003	1	3	0	1	2
Daniel	Suthers	1999	2003	4	6	0	3	3
Felisa	Verdejo	2001	2003	2	4	0	2	2
Barbara	Wasson	2001	2003	2	5	1	2	2
Earl	Woodruff	1995	2002	7	4	1	1	2

Disciplinary representation

The authors of CSCL represent a variety of academic disciplines. Although not all of the 721 unique authors provided enough information to code their departmental affiliation, 549 authors did on at least one CSCL paper. 99 authors were affiliated with more than one field, either due to multiple affiliations on a single paper, or due to affiliations that differed over time. 47 authors had affiliations coded as “Other,” ranging from science, math, or engineering disciplines to health, systems sciences, literature, and so on. Of the Education category, many had affiliations to educational technology in particular.

This analysis of disciplines is unfortunately incomplete. It fails to indicate, for instance, the discipline(s) in which authors were trained, and it is likely to under-represent multidisciplinary or cross-disciplinary that exists within academic departments. For space reasons if nothing else, authors tend not to include a detailed disciplinary pedigree in the affiliation information in their papers. Likewise, it does not necessarily accurately represent the intellectual affiliations of the authors when a nonstandard affiliation was provided (for instance, an acronym specifying a laboratory rather than a traditional academic department). Finally, these disciplinary codes mask differences within disciplines. For instance, a psychotherapist and a cognitive neurologist might both be coded as the same discipline if they both belonged to a psychology department.

Table 3: Distribution of authors across academic disciplines

Discipline	count
Psych	64
Education	334
CompSci	81
Info	39
MediaComm	42
Linguistics	1
Soc	0
Anthro	23
CogSci	2
LearningSci	56
Business	2
Other	47

Geographic representation

Where do CSCL conference presenters and leadership come from? Is CSCL a truly international conference? Beginning with the steering and program committees, the answer is a qualified yes. Of the 226 people identified, 129 (57%) are from North America (US, Canada, Mexico), 81 (36%) are from Europe, 8 (4%) are from Asia, 6 (3%) from Australia-Oceania, and 2 (1%) from South America. The geographic distribution is somewhat different for the 34 active participants in Table 2, where we see 17 (50%) from North America, 14 (41%) from Europe, and 3 (9%) from Asia.

The authorship shows a similarly international pattern. Of the 343 papers analyzed, 258 were coauthored and 24 of these (9%) were collaborations of authors from multiple countries. These international collaborations are listed below in Table 4. If each authorship event is taken separately (i.e., we analyze each author of each paper in the proceedings), we find 900 authorship events. Not all authors identified affiliations and locations (862 of 900), but when they did, authorship was spread across 24 countries, listed below. Here, North America represents 64% of authorship, Europe 26%, Asia 8%, Australia-Oceania 2%, and South America 1%. See Table 5. Obviously, these results would emphasize European participation more if the EuroCSCL 2001 had been included as well.

Table 4: Cross-national collaborations (coauthorship)

Countries (in alphabetical order)	Number of papers
Australia and Brazil	1
Australia and Canada	1
Australia and USA	1
Brazil, Japan, and USA	1
Canada and Japan	1
Canada and New Zealand	1
Canada and Taiwan	1
Canada and USA	2
Denmark and USA	1
Finland and USA	1
France and Norway	1
Germany, UK, and USA	2
Israel and USA	1
Italy and Norway	1
Italy, Japan, and Netherlands	1
Japan and UK	1
Mexico and USA	2
Sweden and USA	1
Switzerland and USA	1
UK and USA	2

Overlap with learning sciences

The issue of whether there is a distinct CSCL community apart from a learning sciences community has been a matter of some contention. In the section that follows, I examine first the relationship between leadership in the two areas, then the relationship between publishing authors in the venues examined previously.

First, there is considerable overlap between the leadership of the two groups. Because data were not collected on the leadership of the learning sciences from the literature (e.g. program and steering committees of the ICLS conference, editorial and review board members of the *Journal of the Learning Sciences*), here I compare the leadership of the International Society of the Learning Sciences and leadership in the CSCL conferences. ISLS has had three boards of directors (an interim board, a founding board, and the board elected in Spring 2004.) Of the 34 people listed in Table 2, 13 have been on the board of directors of ISLS. Looking in the other direction, a majority of the members of each board of directors of ISLS appear in Table 2: 11 of 18 for the interim board, 7 of 12 for the founding board, and 7 of 12 for the Spring 2004

board. Each of the four presidents of ISLS appears in Table 2. The overlap in leadership is even larger if we include all CSCL program and steering committee members: 16 of 18 for the interim board, 10 of 12 for the founding board, and 10 of 12 for the Spring 2004 board.

If the leadership of CSCL overlaps with the learning sciences, do the pools of authors overlap? Of the 721 unique authors, 261 (36%) were also authors of works in either the International Conference of the Learning Sciences or the *Journal of the Learning Sciences*. Of these overlapping authors, 12 did not provide locations, leaving 249 locatable crossover authors. 219 were from the United States and 14 were from Canada. The remaining crossover authors were from Finland (4), Germany (9), Israel (2), Japan (3), the Netherlands (2), Sweden (5), Switzerland (1), and the United Kingdom (8). Put another way, of the 579 North American (US, Canada, Mexico) authors in CSCL, 233 (40%) also published in venues titled “learning sciences,” while non-North American authors were much less likely to publish in these venues (16 of 130, or 12%). These data indicate that while there has been an overlap between the two learning sciences publications and CSCL, it was primarily a North American phenomenon as of January 2002.

DISCUSSION

This analysis provides several important insights about the CSCL community, as represented in the authorship and publishing of the CSCL conference. First of all, CSCL is, as purported, a multidisciplinary field. This suggests that some of the potential conflicts identified in Hoadley (2004) may apply to CSCL as it matures, including theoretical, methodological, and epistemological conflicts. A second finding is that CSCL represents an extremely wide geographic diversity. While some regions (such as South America and Australia-Oceania) are not heavily represented in this dataset, the breadth of participation suggests that further support of international participation would meet an international interest in the field. Connection to regional conferences in these areas might be one approach to solve this problem. Third, the data suggest that, for North Americans CSCL is an outgrowth of the learning sciences, while for non-North Americans, it is not. This points out that how CSCL is interpreted and practiced from a disciplinary sense may be highly contingent on local disciplinary contexts.

The US National Academy of Sciences recently released a report highlighting the importance of interdisciplinary research, and the difficulties such research faces (Committee on Facilitating Interdisciplinary Research, 2005). The report identifies four drivers of interdisciplinary research: “the inherent complexity of nature and society, the desire to explore problems and questions that are not confined to a single discipline, the need to solve societal problems, and the power of new technologies.” (Committee on Facilitating Interdisciplinary Research, 2005, p. 2) Certainly, many in the field of CSCL would agree that all four drivers apply to this field. CSCL studies complex interactions between natural (psychological, sociological) phenomena and social goals, works on problems that cross social sciences and computer science, is driven by complex societal problems such as education, and is directly impacted by the rapidly shifting technological tools available to us. The report suggests barriers that come with this interdisciplinarity. Interdisciplinary work requires both interdisciplinary collaboration and exchange. It also requires changing some of the organizational and social structures that are supported by disciplines. Interdisciplinarity requires extra effort on the part of a wide variety of stakeholders, ranging from funding organizations to academic institutions to governmental or policymakers to students. This cross-disciplinary effort includes working towards mutual understanding of disciplinary methods, languages, and cultures.

The CSCL community faces additional challenges because it is, generally, an international phenomenon as well. Researchers in the field therefore must not only cross disciplinary methods, languages, and cultures, but must also cross national or regional methods, languages, and cultures. It is all the more surprising that the CSCL community has become as international as the results suggest in the short span of its existence. Such internationalism is a testament to not only the interest produced by important problems of CSCL, but also to the deliberate efforts of those in the community and the community leadership to permit and promote international activity. Obviously, the community builds on the strength of its North Atlantic ties, but should make deliberate efforts to extend this participation to other regions; the presence of the CSCL conference in Asia is an important step in this direction.

Table 5: Authorship events by country

Country/Region	Count	Percentage
China	3	0.35%
Israel	9	1.04%
Italy	4	0.46%
Japan	46	5.34%
Singapore	2	0.23%
Taiwan	3	0.35%
Asia	67	7.77%
Australia	11	1.28%
New Zealand	3	0.35%
Australia-Oceania	14	1.62%
Denmark	12	1.39%
Finland	29	3.36%
France	6	0.70%
Germany	57	6.61%
Greece	9	1.04%
Ireland	3	0.35%
Netherlands	19	2.20%
Norway	22	2.55%
Spain	6	0.70%
Sweden	12	1.39%
Switzerland	6	0.70%
United Kingdom	43	4.99%
Europe	224	25.99%
Canada	61	7.08%
Mexico	5	0.58%
USA	486	56.38%
North America	552	64.04%
Brazil	5	0.58%
South America	5	0.58%
Total	862	100.00%

What can we do with these results? If CSCL is to succeed in the future, it will need to overcome the challenges associated with interdisciplinary research, and to continue surmounting challenges posed by a global reach. On a personal level, this might include making connections to those in other disciplines and building relationships with other researchers across national boundaries. But, more subtly, these results also suggest that members of the community must approach governance, reviewing, and other evaluative tasks with full knowledge that while each person might imagine that they have a relatively complete picture of the community, this is actually quite unlikely. The debate over whether CSCL is related to the Learning Sciences is an example of where the presumption that one knows one's own community can be fallacious.

What will the future of the CSCL field look like? While future-gazing is by nature speculative, I can predict that, based on prior stability of community leadership by solid scholars from multiple domains, the community will continue to build on a successful tradition of valuable scholarship. Many questions remain, however. Will the field come to represent a discipline unto itself, or will it continue to be a relatively porous grouping that draws on people from multiple disciplines? As the community continues to embrace new audiences from additional geographic regions, it is likely to encounter more culture-clashes from different regional manifestations of disciplinary norms. However, this might provide not only a new burden of building common ground, but tremendous fuel for cross-disciplinary fertilization of ideas. The integration of learning sciences concepts and community into non-North American research communities is another likely source of cross-pollination. CSCL seems poised to bridge these gaps via the hundreds of researchers who have previously attended and presented at both CSCL and ICLS conferences.

As CSCL reaches its tenth birthday, it is important to realize that we are the blind men feeling our own elephant. Important discourse must take place on the characteristics that make CSCL a desirable research community. Given the huge barriers that are already being surmounted—intercontinental travel; cross-disciplinary discussion, authorship, and review; and continuity of the community's leadership—it is clear that CSCL provides a special and valuable venue for researchers whose work could instead be limited to their disciplines or localities. As we explore together our theoretical commitments, epistemologies, methods, and goals, we can come to better understand our history—and our future.

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