

# Perspectives on Tools for Computer-Supported Collaborative Learning

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## ABSTRACT

*Computer Supported Collaborative Learning (CSCL) is a research field which emerged during the past 20 years. The research addressed questions in CSCL including – among others - how groups and individuals learn through peer interaction using specific tools, how small groups interact and develop shared meanings over time, how teachers orchestrate collaborative learning activities in the classroom with the support of technology, how institutions change and create new conditions for teaching and learning, and even how the opportunities for learning change as society adopts new models for education. Following the constructivistic and socio-cultural approaches in learning, numerous CSCL tools have been designed, developed and tested over the years. Although they can be classified in various ways, the distinction between systemic and dialogic types of tools and approaches is adopted in this paper. Following this categorization, four interesting research approaches, each focusing on a different kind of computer mediated tool are presented, designating the diversity of research within the CSCL field.*

*Keywords: Collaborative Learning Activities, Computer Supported Collaborative Learning (CSCL), Learning through Peer Interaction, Perspectives, Support, Tools*

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## INTRODUCTION

Although Computer-Supported Collaborative Learning (CSCL) has emerged as a core axis of educational research for about 20 years now, the interest of the international research community remains intact. Hundreds of researchers are actively working on the topic and topic-oriented scientific journals and international conferences

exist nowadays. Thus, CSCL seems to still have a long research path to follow.

But what is CSCL? Etymologically the term indicates that it concerns Collaborative Learning, supported by Computers. According to Dillenbourg (1999), Collaborative Learning is a situation in which two or more people learn or attempt to learn something together. Unlike individual learning, people engaged in collaborative learning capitalize on one another's resources and skills, by asking one another for

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information, evaluating one another's ideas, monitoring one another's work, etc. (Chiu, 2008). In collaboration, individuals may undertake specific roles while interacting with one another, exchanging experiences, information, knowledge, etc. Consequently, Collaborative Learning refers to methodologies and environments in which learners engage in a common task where each individual depends on and is accountable to each other.

Involving computers in the equation, the result is CSCL which is the branch of the learning sciences concerned with studying how people can learn together with the help of computers (Stahl, Koschmann, & Suthers, 2006). The inclusion of collaboration, computer mediation and distance education has problematized the very notion of learning and called into question prevailing assumptions about how to study it. The field of CSCL has a long history of controversy about its theory, methods and definition. The study of CSCL draws on a number of academic disciplines, including instructional technology, educational psychology, sociology, cognitive psychology, and social psychology (Hmelo-Silver, 2006).

It is obvious that CSCL is related to learning within a group. On the other hand, the study of group learning began more than 50 years ago, long before CSCL came into the picture. Research on small groups has an even longer history within social psychology (Stahl, Koschmann, & Suthers, 2006). Thus, it is useful to distinguish CSCL from these earlier research approaches, by examining the differentiation among Cooperative and Collaborative Learning. According to Dillenbourg (1999), "*In cooperation, partners split the work, solve sub-tasks individually and then assemble the partial results into the final output. In collaboration, partners do the work 'together'.*" Roschelle and Teasley (1995) defined collaboration as "...*a process by which individuals negotiate and share meanings relevant to the problem-solving task at hand.... Collaboration is a coordinated, synchronous activity that is the result of a continued attempt to construct and maintain a shared conception of a problem*". With this statement, Roschelle

and Teasley address collaboration as a social activity within a problem solving situation by more than one individuals, describing the *collaborative construction of new problem solving knowledge*.

Correlating the two aforementioned definitions with learning being the significant variable, the differentiation lies in the substantiation process of new knowledge. In cooperation, learning is carried out by individuals, who then contribute to the group product which is actually a combinational collection of individual results. In collaboration, learning occurs socially and knowledge is constructed collaboratively. Similarly, Scardamalia (2002) introduced the notion of Knowledge Building which relates not only to establishing a mutual benefit among collaborators but also is concerned with the advancement of knowledge within a community of collaborating actors. The first goal in knowledge building is not accomplishing projects or tasks but the acquisition of knowledge (Scardamalia & Bereiter, 2003).

Individuals are engaged in the process as group members, but their activities are not actually individual-learning ones, but group interactions like negotiation and sharing which lead to group-learning activities. In the past, studies of learning in groups treated learning as a fundamentally individual process. The fact that individuals worked in groups was treated as a contextual variable that influenced individual learning. In CSCL, by contrast, learning is also analyzed as a group process; analysis of learning at both the individual and the group level is necessary (Stahl, Koschmann, & Suthers, 2006).

## Types of CSCL Tools

Initially, technology (namely computers) was used to implement guided learning approaches, falling under the behavioristic theories of learning. Intelligent Tutoring Systems (ITSs) and Logo-like programming environments appeared while shifting from cognitivism as the constructivist theories, reaching the 90s in which CSCL approaches arose. Their aim was to explore how computers could bring students together

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