Collaborative learning, whether supported by computer technology or not, has been a buzzword among educational policy makers, practitioners and researchers for about a decade now. The conversation/debate has long been dominated by popular views on collaboration, combined with an ambitious belief in the possibilities of technology.

When we introduce students (and teachers) to CSCL we should be aware that they already have a (long) history of educational experiences. Most are based on non-collaborative experiences since education mainly focuses on individual knowledge and skills. Providing students with communication technology does not automatically result in collaboration, let alone collaborative learning as researchers have shown (Guzdial & Turns, 2000; Lehtinen, Nurme, & Salo, 2001). The question is thus: ‘How can we assure involvement of all participants in CSCL and help them to ‘throw of the shackles’ of their own experience in a traditional, F2F, didactic, competitive teaching and learning system?’ and ‘How can we dissolve the remnants of this educational system, such as social loafing and cheating, and foster the implementation of effective, efficient and attractive learning and assessment techniques?’.

Researchers in the field of CSCL have started to take a more reserved position towards popular views on collaboration and technology can be summarised by Salomon’s (2000) claim that what is technologically possible, is not always educationally desirable. Like any other educational approach, CSCL has to provide a sound pedagogical context to support students’ learning. After a decade of technological dominance it is, in our opinion, time to re-align the primary components of CSCL and to consider their interrelationships.

1. WHAT WE KNOW ABOUT CSCL

In our opinion creating CSCL requires several aspects to be considered simultaneously in their interrelations, such as the learning goals, the kind of collaboration best suited to attain these learning goals, the type of support required (instructional, computer software and human) and the technical environment (institutionally determined or specific).

However, it is not possible to specify exactly how much support needs to be provided to guarantee that the desired learning outcomes are attained - learning outcomes simply cannot be specified in such detail. Second, it is difficult to determine whether the different kinds of instructional support have the same effect and whether they can be combined in a CSCL environment.

The design of a CSCL environment requires the careful orchestration of various components, and thus the choice and the combination determines whether the setting facilitates the attainment of learning goals. It is precisely these interrelationships between all of the topics covered in this book that will be highlighted.

1.1 It is all about learning

Although computer-supported collaborative learning is foremost about learning, considerably little attention is paid to the educational design of CSCL settings. Though Cohen argued in 1994 that not every cooperative or collaborative approach is suited for any type of task and Nelson (1999) provided design guidelines for teachers and students to guide their activities during ‘collaborative problem solving’ (CPS), there is little evidence that the specified guidelines also apply or are applied to CSCL settings or how these guidelines affect the interaction/collaboration.

Kirschner, Martens and Strijbos introduced a framework for systematic CSCL design in Chapter 1, building on the idea of ‘multiple collaborative environments’, in which CSCL design is driven by decisions regarding the educational, technological and social affordances of a task, various kinds of support and the technical environment. They illustrated that design of CSCL settings is probabilistic instead of causal. Such a view implies that more attention is paid to learning and interaction processes, and more specifically that the interaction processes seen as most supportive to learning will occur. Taking a probabilistic perspective - instead of a causal one - does not exclude systematic design of CSCL. Strijbos, Martens and Jochems (in press-a) describe a probabilistic methodology, which focuses on designing the desired interaction. Each student in a group may acquire a given skill by means of a chosen method, but may equally likely acquire only a part of the skill, or the skill together with unforeseen elements. Moreover, what students are required to learn is also affected by the learning framework that a teacher, designer or researcher adopts. Lipponen, Hakkarainen and Paavola illustrated in Chapter 2 that the framework affects what kind of interaction is thought to facilitate the learning outcomes, their assessment, the support that is thought to facilitate the collaboration and the technology that is chosen as a support provision. They stress that design of CSCL settings is not just a matter of a technical tool, some instruction to support collaboration, an approach to studying its effects and putting them together. These components are interrelated, not only by the learning framework, but also by the goal of collaboration: internalisation (individual knowledge gain), interaction (sharing and distributed expertise) or transformation (continuous advancement of shared knowledge).

The impact of such a framework is clearly visible in research and practice of the so-called cooperative learning tradition, so as that done by Kagan (1994) who was