Fostering Collaboration in CSCL

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INTRODUCTION

Some collaborative learning strategies widely used in face-to-face settings can also be adapted to online contexts. They allow us to master the complex relations between members of large, heterogeneous online learning communities. The authors build on their experience in the application of some of the most well-known strategies and techniques used in online courses, such as jigsaw, peer review, role-play, case study, and brainstorming. The use of these strategies in computer supported collaborative learning (CSCL) environments and the related models describing the social structure of the learning community is discussed in the attempt to highlight their strengths and weaknesses and investigate the conditions for their applicability. The aim is to inform the design and the management of online learning communities.

BACKGROUND

The theoretical framework of this study is based on:

- Socioconstructivism, which emphasises negotiation as the basic element in the process of knowledge development and considers language, dialogue, and collaboration as the main learning tools (Vygotsky, 1934/1962);
- Situated learning, that stresses the importance of the cultural and social context where learning takes place, since this context is strictly intertwined with the knowledge development process (Brown, Collins, & Duguid, 1989);
- Computer supported collaborative learning (CSCL), according to which computer mediated communication and, in particular, written, asynchronous interactions between the members of a virtual community favour the development of critical thinking and conceptualisation (Dillenbourg, 1999; Palloff & Pratt, 1999).

In this framework, online learning initiatives generally include methods and activities that promote interaction, negotiation of meanings, and collaborative construction of knowledge within authentic and meaningful contexts. The learning community, meaning all the actors involved, plays a prominent part in the process. Several different roles can be identified: the designer, the tutor, the expert of the domain, and, obviously, the student. Although the differentiation of roles helps both the design and the critical analysis of the learning process, a single actor may play more than one role. It is, in fact, desirable that all the community members share their competence and play an active and proactive role in the management of the learning process.

During the course, it is desirable for community members to interact, discuss, and participate in the production of cognitive artefacts. In order to facilitate and encourage these collaborative dynamics, strategies and techniques that support the development of the social dimension of the community are often used. These strategies are selected by the designer prior to the educational process, taking into consideration a number of variables such as course objectives and content, characteristics of target population, and context constraints. For this reason, different courses use different strategies and each strategy requires a suitable "social structure." The concept of social structure includes team composition, roles, and relationships between team members as well as relationships between teams. Indeed, teams may vary over time during a course and even within the same activity while each strategy

requires team members to play distinct roles (Persico & Sarti, 2005).

STRATEGIES AND TECHNIQUES TO FOSTER COLLABORATION

The terms "strategy" and "technique" are sometimes used to indicate explicit and complete procedures. At other times, they identify mere expedients. In any case, they serve the purpose to organize and guide students' collaborative activities in order to help them meet the desired objectives. As far as our study is concerned, the two terms are practically synonyms: the former emphasises the importance of the organisation and management of the learning activity, and the latter stresses the procedural nature of the method. Each technique is generally described in terms of the steps of a procedure and the behaviours that students are supposed to put into practice. Some examples are Jigsaw, peer review, brainstorming, case study, and role play. Although they have been borrowed from in-presence collaborative contexts, these techniques have also proved effective in online learning. Indeed, virtual environments have features that often enhance the pedagogical potential offered by such techniques: for example, the possibility of interaction independent of time and space and the chance to reflect on contributions to the discussion thanks to the permanent nature of computer mediated dialogues. The above mentioned strategies have been given different names by different authors: "cooperative and competitive learning structures" (Kagan, 1990), "instructional methods" (Kanuka & Anderson, 1999), "techniques" (Aronson, Blaney, Stephin, Sikes, & Snapp, 1978), and "collaborative learning flow pattern" (Hernandez-Leo, Asensio-Pérez, Dimitriadis, Bote-Lorenzo, Jorrín-Abellán, & Villasclaras-Fernández, 2005). Dillenbourg (2002) introduces the expression "CSCL scripts" and states: "*A script is a story or scenario that the students and tutors have to play as actors play a movie script.*" Unlike cinema, however, the designer is like a director who has only a rough idea of event sequencing and leaves to the creativity of the actors (learners and tutors) not only the details but also some important decisions regarding the script, the actors' roles, and often even the aims of the performance. Each phase of the script specifies how students should interact to solve a given problem through a collaborative activity. Hence, the script includes five elements: the student's task, the group composition, how the task is distributed within the group and sometimes between groups, the type of interaction both in and outside the groups, and the schedule of phases, if any.

Even if every technique is different, they do have some features in common. For example, most of them are based on a "learning by doing" approach, where the exchange of opinions among peers is favoured by proposing tasks in which the final aim is either the creation of an authentic product (artefact) or the solution of a real problem. The underlying idea is that the need to attain a common and tangible objective activates concentration and is a catalyst for the participants' efforts. Of course, students will need to fully understand the techniques adopted, and, to achieve such mastery, procedures and instructions should be stated very clearly (Brush, 1998).

Most strategies to support online collaborative learning feature two or more stages in order to allow participants to collaborate at different levels and differentiate among roles, thus favouring the adoption of multiple perspectives. Groups are generally small (5–7 people) although some strategies feature multilevel grouping: for example, small groups in the first stage and the whole cohort in the second stage. A useful rule of thumb is that small groups are preferable for more structured activities, while brainstorming and free discussion are more effective in larger groups. Small groups have the following advantages: individual participants have more opportunities to contribute to the discussion, decision making is faster, people get to know each other better and reach agreement more easily. Larger groups, on the other hand, bring in more people to accomplish a task, more ideas, and a broader range of skills. They also provide more opportunities for participants to refer to what has been said by others. In any case, the possibility to alternate different kinds of grouping allows instructional designers to take advantage of the strengths of both small and large teams. Table 1 compares the above-mentioned strategies, reporting some critical aspects that usually inform decision making in instructional design.

Studies concerning the adoption of group techniques in CSCL show that there are conditions to their effectiveness (Blocher, 2005; Hinze, Bischoff, & Blakowski, 2002; Lebaron & Miller, 2005; Renner, 1997). One important prerequisite for all collaborative techniques is that they should promote reciprocal interdependency of participants. This means that teamwork should rely