Improving the Use of Strategies in Computer-Supported Collaborative Processes

César A. Collazos*, Luis A. Guerrero, José A. Pino, and Sergio F. Ochoa

Department of Computer Science
Universidad de Chile
Blanco Encalada 2120, Santiago, Chile
{ccollazo, luguerre, jpin, socho}@dcc.uchile.cl

Abstract. The members of a work group need to apply a common strategy to collaboratively solve a problem. A good strategy will mainly depend on the collaboration scenario, participants’ background, and available tools. This paper presents two widgets that have been useful to help to define and use good group members’ strategies in collaborative learning scenarios. The concepts behind these widgets can be reused to support strategy definition processes in order to improve the efficiency and effectiveness of computer-supported collaborative processes.

1 Introduction

Computers have become very important to support group work and collaboration. People interact with other people in all aspects of life and, as computers have become prevalent, users seek computer support to extend their interactions. Besides, advances in networking technology and software systems will lead to an emphasis on interpersonal computing. Understanding group dynamics and the collaborative process of work groups are then both interesting research fields and the basis for new tools to support the findings.

In this scenario, the computer supported collaborative learning process has received much care [15]. In this process, the results of learning activities depend not only on the student’s skills to execute a task, but also on the strategy of collaboration with teammates to do it. The use, understanding and adoption of a strategy are crucial for an effective and efficient collaborative learning.

In a series of preliminary experiments in Computer-Supported Collaborative Learning (CSCL) environments, it has been observed that groups with little experience in collaborative work, understand, use and adopt cooperation strategies in a bad manner [8]. In these experiments, although all groups were deficient in the strategy definition, those that tried to define and communicate a strategy got better results in CSCL activities. Based on this preliminary information, our work explores whether

* On leave from FIET, Universidad del Cauca, Colombia.
the impact of a consistent use of a strategy can produce good results during this kind of activities. Our hypothesis claims a good use, definition and adoption of strategies should imply good collaboration, which in turn it is known to lead to good learning. This hypothesis is emphasized in the case of groups just formed or with little collaborative experience.

We have designed a widget to support discussions within the learning group and another one to support monitoring the tasks done by the group. These widgets are intended to improve the strategic aspect of group work and thus, they provide a way to validate the hypothesis. Both widgets were embedded in a tool called TeamQuest, which is a labyrinth type collaborative game. Two versions of this tool were used during the experiments, one with widgets and another one without them. The performance of the learning activities was measured by using the indicators proposed by Collazos et al. [8]. The participants in the experimental activities were primary school students.

Next section presents related work about methods to promote the use of strategies in CSCL activities and the justification of our proposal. Section 3 describes the preliminary study that originates this proposal and the results obtained from such study. Section 4 presents the TeamQuest tool and the widgets developed to improve the use of strategies. Section 5 describes the experiments carried out in order to measure the impact of consistent strategy use over a CSCL activity, and the obtained results. Finally, Section 6 presents the conclusions and future work.

2 Background

Since the advent of computer supported collaborative work, CSCL research has been of major interest. It has been conclusively argued that a focus on the process of collaboration is necessary in order to understand the value of working together with peers for learning [20]. CSCL is a research area that reports a great amount of scientific work in several aspects. Unfortunately, there are no studies focused on how to improve the use of strategies in collaborative activities using computer technology. Collaborative learning technologies must go beyond generic groupware applications, and even the basic technology is not yet well developed [24]. Therefore, it is necessary to define a model describing how to design socio-technical environments that will promote collaboration within groups.

From the collaborative work viewpoint, effective groups have goals being clarified and modified as follows. There should be the best possible match between individual and group goals. They are also cooperatively structured so all members are committed to reach them. Results of experimentation have shown groups were ineffective because communication was poor. This could be explained by lack of strategy understanding shown by some members of the group. Thus, it is not only important to understand the problem, as Dillenbourg mentions [12], but to be aware that the rest of the people can understand the problem situation during a collaborative activity.

Soller et al. [23] claim the way in which a student shares new knowledge with the group and the way in which the group responds are important. They determine to a large extent how well this new knowledge is assimilated into the group, and whether or not the group members learn the new concept. Also, as Clarck & Schaefer [3] men-