Teacher tools in a networked learning classroom: monitor, view and interpret interaction data

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Abstract

Teachers of networked collaborative classrooms may collect students' interaction data that can support them to interpret students' activities, in order to intervene when necessary. In this paper, an innovative tool is presented that can be used to assist teachers to build multiple alternative views and interpretations based on interaction data, during collaborative activities. Overviews, detailed and comparative views are available at the class, group and individual level. Collaboration activity and the content of the process may be visualized, while rules can be defined that when activated, the teacher's attention, is drawn to interesting events.

Keywords

Teacher's monitor, teacher's views in cscl settings, interpretation of interaction data

Teacher Views during Networked learning activities

During synchronous Computer Supported Collaborative Learning (CSCL) activities, of multiple small groups working concurrently, a teacher is faced with a strenuous, information rich situation, as students' activities produce multiple flows of data. These data, however, if used appropriately, may help the supervisor interpret the situation and take effective regulatory action. This requires a quick appraisal of the situation, based on a comparison of the current situation to a model of a desired one, at various levels. This is performed in the classroom by the teacher, taking into account various experiences and knowledge of student's personalities and typical behaviours (Soller et al, 2005).

The design of a software tool that supports supervisors of CSCL classes has been the objective of the research reported here. The tool has been designed and tested in cases of real-time collaboration of small groups (2-3 students) forming up a class (collocated or distant), interacting during activities of limited duration (15 to 60 minutes), with the teacher present physically or electronically. Students collaborate to solve a problem, through Synergo (Avouris et al, 2004), an environment with a shared drawing space through which diagrammatic representations can be built jointly by a group and a chatting tool for direct text based communication. The log files produced, may be used for generating information and views of the process, through graphs, and video like representations, through sequences of snapshots of the drawing space.

For a number of years we have been using Synergo in a course, part of a Computer Engineering degree curriculum, for building and exploring collaboratively basic Algorithmic structures. For the assessment of students' work, teachers have been using Synergo facilities and in particular, the diagram viewer for the assessment of the solution produced, and the playback, a video-like reproduction of the process.

Until recently, the teachers, in the class, observed students' activities, without additional support by any tools, while during the offline assessment they were able to analyse the process of just one group at a time. An outcome of these studies has been the collection of requirements by the teachers for a new tool to support their monitoring and supervising role. The teachers requested overview of the process in three levels (class, group, individual), view of the flow of the process and instances of the problem solving and collaboration process and occasionally, detailed reproduction of parts of the activity or of interesting episodes, for better understanding of students reasoning during problem solving. To support teachers (Dimitracopoulou, 2005) we have designed a new tool, presented here, to assist their tasks in collaborative classrooms. This tool is being currently evaluated by typical teachers. The tool, using the group activity logfiles, builds various views implementing class, group and individuals' interaction overviews and detailed views of the content of the process (Voyiatzaki et al, 2006).

A new tool to assist Teachers during CSCL activities

In this section we present a typical use of the supervisor tool. In Fig 1, a typical screenshot of the supervisor tool is shown. In the upper parts (1,2) refer to the class overview, related to the collaboration activity, while the bottom parts (3,4,5) refer to the group and individuals' process and problem solving views. The teacher can see at the class view (1) the groups and their members. Next group interactions (2) may be monitored using graphical representations, which change during groups' activity. In the example of fig.1, Group1 is more active than the others, while Group3 exchanged fewer chat messages compared to the others. This information can attract teacher's attention. Rules may be defined, which, if activated may cause certain actions. For example, we can see that Group 1 and Group 3 in class overview (1) have been marked with "lamp" "chat" icons respectively, according to rules which have been activated, related to Group1's activity and Group3's chat messages. Teacher can focus in a group and view its dialogue (3), detect difficulties or misunderstandings, or the current status of the solution specific group is working on. Current solution instance can be represented in comparison with other groups' solutions (5) to detect differences that may lead to supervisor's intervention at group or class level. The supervisor may monitor individual's contribution, either by content of messages (3) or by comparing group members' interactions (4). The supervisor may decide to have all views available or one of the two horizontal parts.
The tool can be also used to reproduce the class activity, for off-line class activity evaluation, or to simulate a class activity for training purposes. All these use cases are currently evaluated during specific studies. Further research is planned on the design of suitable alarms to attract teacher's attention, and support appropriate intervention.

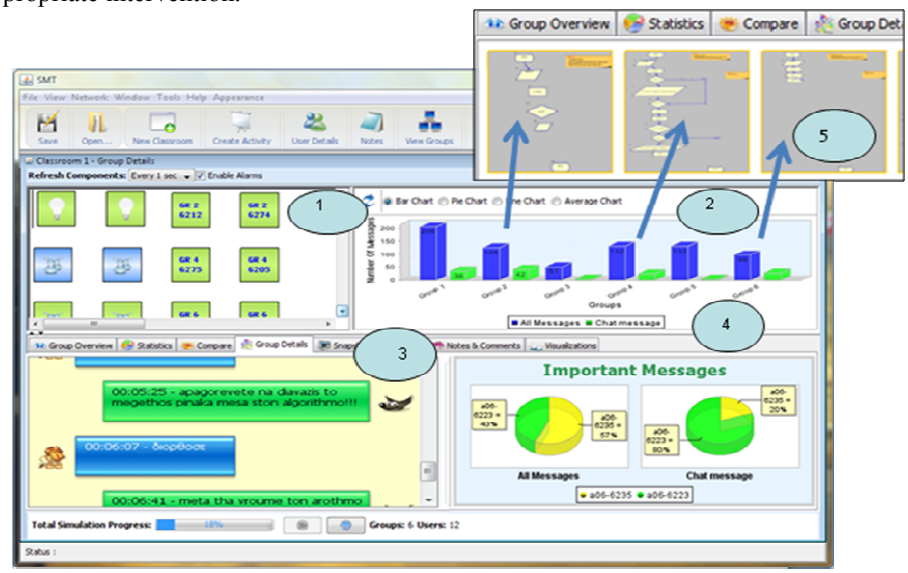

Fig 1. : Views available to the teacher.

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