Reflection-in-action markers for reflection-on-action in Computer-Supported Collaborative Learning settings

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ABSTRACT

We describe an exploratory study on the use of markers set during a synchronous collaborative interaction (reflection-in-action) for later construction of reflection reports upon the collaboration that occurred (reflection-on-action). During two sessions, pairs of students used the Visu videoconferencing tool for synchronous interaction and marker setting (positive, negative or free) and then individual report building on the interaction (using markers or not). A quantitative descriptive analysis was conducted on the markers put in action, on their use to reflect on action and on the reflection categories of the sentences in these reports. Results show that the students (1) used the markers equally as a note-taking and reflection means during the interaction, (2) used mainly positive markers both to reflect in and on action; (3) paid more attention in identifying what worked in their interaction (conservative direction) rather than in planning on how to improve their group work (progressive direction); (4) used mainly their own markers to reflect on action, with an increase in the use of their partners' markers in the second reflection reports; (5) reflected mainly on their partner in the first reflection reports and more on themselves in the second reports to justify themselves and to express their satisfaction.

1. Introduction

Computer-Supported Collaborative Learning (CSCL) research has shown the need to scaffold collaboration so as to ensure that learners benefit from working together (Dillenbourg, 1999). In the CSCL field, the awareness approach is used to support collaborative learning by monitoring and regulating the interaction between learners. This approach is technology-based, and consists of providing information about group members' knowledge, emotions, actions and interactions during collaborative learning (e.g. Molinari, Chanel, Bétrancourt, Pun, & Bozelle, 2013; Sangin, Molinari, Nüssli, & Dillenbourg, 2011). Such awareness information is supposed to help learners reflect on how they work together and understand how to improve their group performance. Within the awareness approach, there are still few tools designed to encourage learners' reflection during ("reflection-in-action") as well as after their interaction with their partners ("reflection-on-action") (Schön, 1987).

In this paper, an exploratory study is reported in which students in Psychology used the Visu tool – which is a tool for both reflection-in and on-action – in CSCL settings. Visu is a web videoconferencing platform (Bétrancourt, Guichon, & Prié, 2011) that allows participants to take notes and report their feelings about their interaction with their partner at any time during remote synchronous collaboration. More precisely, in this study, students could take notes using two types of markers: emotional markers to express either negative or positive feelings about the way they collaborate; and non-emotional markers to provide any other types of comments on the on-going activity. Visu

also provides students with the possibility to later review the traces of their group's work (audio/video recordings of the interactions, as well as self and partner's markers with their associated notes). Such review can lead to the production of self-reflection reports, as in this study.

This paper focuses on students' reflection processes regarding their remote collaborative work. More particularly, we are interested in the way they used the markers and the associated notes their partner or themselves did create during synchronous interaction sessions, to individually reflect upon the quality of their collaboration after it had taken place. In this study, students were organized in dyads, and each dyad was involved in two consecutive synchronous CSCL sessions. After each of these sessions, students were asked to individually produce a reflection report. They were instructed to organize their reports into two parts, a retrospective part in which they had to describe their perceptions regarding the quality of the interaction they just had with their partner, and a prospective part in which they had to think about how to improve their work as a team.

The general research objective of this study is to describe the use of one's own- and partner's emotional and non-emotional markers — that are set during interaction to take notes and reflect on the collaborative learning process (reflection-in-action) — in later reflection-on-action. More precisely, our questions are: what kinds of markers (emotional or non-emotional) did students use to reflect-in-action while interacting with their partner? What kinds of markers (emotional or non-emotional, own or partner's) did students use to reflect-on-action when building their self-reflection report after collaboration? What kinds of reflection-on-action processes (retrospective processes, e.g. evaluation, causal attribution, affective reactions) and prospective processes (e.g. task analysis, motivational beliefs) — see (Zimmerman, 2002) — were related to the use of emotional and non-emotional markers as well as to the use of own- and partner's markers? To what extent did such reflection processes vary from the first synchronous CSCL session to the second with the use of the different types of markers?

In Section 2 we define the theoretical background of this research as well as the existing tools and platforms used to support reflection processes in CSCL settings. Section 3 deals with the Visu platform, which provides collaborative learners with the possibility to self-report what they are experiencing during interaction, including cognitive and affective information about themselves, their partner and the group as a whole. In Section 4 we present the study we conducted in an ecological context, namely during the Educational Psychology Course of the Bachelor of Science in Psychology at the Distance Learning University Switzerland. We finally sum up the main results of this study and present our future works.

2. Related background

2.1. Theoretical framework for analyzing reflection in CSCL

2.1.1. Regulation in CSCL

Although there is a growing body of research that focuses on socially shared metacognition and regulation e.g. (Iiskala, Vauras, Lehtinen, & Salonen, 2011; Järvelä & Järvenoja, 2011), we still know little on how learners regulate and reflect upon their own activity, their partner's activity as well as their group activity in CSCL settings. Regulation is defined as controlled processes through which thoughts, emotions, strategies, and behaviors "are oriented to attaining goals" (Zimmerman, 2002). Regulation processes have proved to be important for successful collaborative learning (Järvelä & Järvenoja, 2011). They occur mainly in episodes when collaborating partners are confronted with conceptual or relational difficulties, and their role is either to facilitate or to inhibit representations and activities (Iiskala et al., 2011). Individuals can engage in three types of regulation processes during collaborative learning tasks. First, they can individually reflect upon how to regulate their learning processes and outcomes (self-regulation). Second, they can reflect upon how to help and support their partners in their learning (other-regulation). As pointed out by Järvenoja (2010), although other-regulation is beneficial to the whole group, it can be viewed as a form of individual regulation as it may be used (at first) for personal goals. Third, regulation and reflection can also be co-constructed processes (shared regulation): learners can discuss and develop together common strategies to control their group activity and the learning challenges they face during interaction.

According to Van der Puil, Andriessen, and Kanselaar (2004), regulation processes in collaborative learning situations can take two directions: conservative or progressive. In the conservative direction, regulation can be seen as a "looking-backward" process through which group members reflect on what was right or wrong with their working relationship (social regulation) as well as with the way they shared and negotiated knowledge (cognitive regulation). In the progressive direction, regulation is viewed as a "looking-forward" process through which collaborators pay attention on how to achieve the learning task goals in the future. Van der Puil et al. (2004) also showed that the way group members regulate their work could be dominated by conservative forces; in such cases, they would be mainly focused on repairing the relation, relegating to a second plane the learning and task goals.

2.1.2. Reflection as a regulation process

Reflection is considered as one phase of regulation in the models proposed by Pintrich (2004) and Zimmerman (2002) to describe self-regulated learning (SRL). More precisely, reflection refers to cognitive and affective processes that take place once the overall task or part of the task has been completed. In this phase, learners assess the quality of work being performed (evaluation), and try to explain successes and failures (causal attribution). They also positively or negatively react to such attributions (affective reactions). They can affectively react to the collaborative situation, by expressing different levels of satisfaction (satisfaction/affect), protecting the feeling of competence or proposing adjustments and changes in behavior necessary to succeed (adaptive/defensive decisions). In CSCL settings these reflection processes (evaluation, causal attribution, satisfaction/affect, adaptive/defensive decisions) can be individual or collaborative, and may focus on oneself, the partner, the group, the task or the context. Reflection is considered as crucial for learning as it helps individuals to internalize and reconstruct what they have (socially) learned, and to transfer their knowledge and skills.

Both SRL models (Pintrich, 2004; Zimmerman, 2002) also identified two other phases of regulation, namely the forethought and performance phases. The forethought phase refers to processes that are carried out in preparation for the task. In this phase, learners analyze the task (task analysis), establish goals (goal setting) and plan strategies to achieve them (strategic planning). They also activate motivational processes (motivational beliefs) such as efficacy and task interest/value beliefs. The performance phase refers to processes that occur during the task. In this phase, learners actively keep track of the progress of the task, and activate strategies to maintain their concentration and