

Intra-group and Intergroup: An Exploration of Learning with Complementary Collaboration Tools

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Abstract

In this paper, we explore the learning that occurred in two types of collaborative learning environments in a seventh grade life sciences classroom: an *intra-group* environment and an *intergroup* environment. Students used both types of collaboration tools, each tuned to the needs of the task they were doing within or across groups.

We found that the learning outcomes in the two collaborative settings were different. During the intra-group collaboration, students focused more on the structure and behavior of the designs. The inter-group environment on the other hand, led them to discuss the function/s of their models, ask for and provide justifications for the functions. We discuss the results and suggest integration of the inter and intra group tools.

Keywords— classroom discourse processes, K-12 collaborative learning strategies, tools to support teaching in collaborative settings

Introduction

Outcomes of computer supported collaborative learning are influenced by several factors. Some of these are the composition of the pairs or groups (Whitelock, Taylor, O'Shea, Scanlon, Clark, & O'Malley, 1993), the nature of the task (Puntambekar, 1996) and the nature of the environment itself (Crook, 1994). These factors, either singly or in combination, lead to different interactions among the learners; the types of interactions heavily influence the learning outcomes. In addition, learning outcomes in a CSCL environment are also influenced by the instructional roles that the tools support and when the tools are used in the learning process (Koschmann, 1996).

In this paper, we explore the learning that occurred in two types of collaborative learning environments in a seventh grade life sciences classroom: an *intra-group* environment in which the collaboration was synchronous, scaffolded, without computers and within the groups (the group journals), and an *intergroup* environment in which the collaboration was asynchronous, with much less scaffolding, with a computer tool (Web-SMILE), used between the groups. Students used *both* an intergroup collaboration tool and an intra group collaboration tool, each tuned to the needs of the task they were doing within or across groups. We analyzed the student discourse using the the SBF model (based on a model by Goel, Garza, Grue, Murdock & Recker, 1996) that explains design of physical devices in terms of the Structure (the component parts), Function (the functions of the parts) and Behavior (which refers to the causal relationships between the functions of the various components of the system resulting in an action). We found that the learning outcomes in the two collaborative settings were different. During the intra-group collaboration students focused more on the structure and behavior of the designs. The inter-group environment on the other hand, led them to discuss the functions of their models; ask for and also provide justifications for the functions. We discuss these results and suggest integration of the inter and intra group tools.

Context of the Study

The study was part of the Learning by Design project, aimed at helping middle school students learn science by having them engage in design problems. Learning by Design (LBD) is being developed at Georgia Tech's EduTech Institute as an approach to teaching science, integrated with math and technology, in middle schools. Based on Problem-Based Learning (Barrows, 1985), our conception of LBD (Kolodner,