Facilitating students' sense-making in modern history through a computer-supported note-sharing tool

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Abstract

This paper reports on an intervention study on facilitation of students' joint sense-making in computer-supported classroom discussion in the setting of a modern history class. The focus of the study is the use of a note-sharing tool designed to bridge classroom activities such as teacher lectures, computer-based individual work, small group activities and class discussion. The tool was designed with two aims in mind: to sustain and display arguments as a basis for joint sense-making, and as a bridge between various learning activities. The data consists of video-recorded classroom interaction, students' written work, and pre- and post-tests collected from a Norwegian senior high school. The students (N=25) worked on the topic of democratic development and the role of ideologies in Europe prior to the First World War era. We used the increase from pre- to post- test to chart the students' trajectories of participation across classroom activities. We found large variations in results among students, especially with regard to what they gained from computer-based individual work, but also with regard to what they gained from participation in collective arenas. Despite these differences, our analysis shows that all students benefitted from the computer-supported collective discussions.

Summary

Aims

Learning activities in classrooms today are often a mix of computer-based activities, peer-group work and teacher-led interaction in the classroom, with different types of texts to read and assignments to be written. However, research has identified that students in such settings often struggle to make sense of multiple texts (Strømsø & Bråten, 2012) and fail to

make connections across related learning activities (Furberg & Rasmussen, 2012). Importantly, studies have also documented positive learning gains from interventions that prompt students to discuss concepts, issues and dilemmas that they encounter in the various texts they read (Sweet & Snow, 2003). This includes using computer tools for such facilitations (Mercer & Littleton, 2007). Motivated by these findings, a specific support tool was designed with the aim of enabling students to share notes across various classroom activities. We use the notion of trajectories of participation to describe the processes and results of having taken part in activities over time (Rasmussen, 2012). We investigate the following research questions:

1) How did individual and collective activities contribute to students' learning?

2) How was the note-sharing tool used in classroom discussion?

Methodology

We have qualitatively analysed oral and written products from 25 high school students and their teacher during eight lessons in modern history. The topic was nationalism and democratic development, and focused on how different ideologies created tension in Europe in the period leading up to the First World War. The learning activities were sequenced in three stages. The project started with an introductory lecture based on a chapter in the students' history textbook. After the teacher's lecture, the students wrote individual essays (computer seatwork). Finally, the students discussed the topic in groups and then in a teacher-led session that involved the entire class.

The note-sharing tool that was developed in this project was made available on PCs and iPads, and uses features familiar from Twitter. The notes were written as short summaries or statements based on the students' individual essays, and appeared as post-it notes on an iPad. The students used their notes when preparing a short group presentation in a closing teacher-led class discussion where the notes were displayed on a whiteboard. In this way, the tool connected various classroom activities, computer-based individual work, small group and class discussion and facilitated joint sense-making.

The analysed data are: (1) individual writings (essays and notes from the intervention tool), (2) transcribed video recordings from the teacher's introductory lecture, two peer group

discussions, and the closing class discussions, (3) Pre- and post-tests. The same test was given to the students before and after the intervention. By comparing the pre- and post-tests, we traced the increase in performance to identify whether this stemmed from individual work or collective discussion, and we analysed the use of the note-sharing tool on collective discussion by means of interaction analysis (Jordan & Henderson, 1995).

Findings

First, the empirical analyses made it possible to identify two patterns of how individual and collective activities contributed to students' learning. We named the first pattern 'self-maintained' students (n=12). These students were active across all learning activities, and had an increase from pre- to post-test ranging from two to three full grades. The analysis of their post-test responses indicates that the increase in their performances stemmed from both individual and collective activities. The second pattern consisted of students who undertook little individual work, implying that they wrote nothing or only very brief individual essays (n=13). In contrast with the self-maintained students, their increase in performance mainly stemmed from the collective arenas (teacher lecture, group work or class discussion). When we looked up the students´ final assessment grades in history from the previous year, we found that the self-maintained students had grades 4, 5 or 6, while the second group had grades on the lower end of the scale.

Second, we found that that the self-maintained students were most adept at bridging activities with the note-sharing tool. Since however the tool also facilitated sharing both in the groups and in class discussion, all students gained access to each other's arguments.

Theoretical and educational significance

The trajectories of participation that we identified bring to the fore variations in how individuals take part in various learning activities, as well as identifying common sources of knowledge. Our findings suggest that sharing- notes were beneficial for all students despite variations in achievements. Our interactional analysis shows that the teacher played a crucial role in making the class discussion a productive common source of knowledge for the students. The note-sharing tool seemed in this setting to provide the teacher with access to the students' own reflections and ideas, and he used their words in his elaborations and clarifications. This finding is in line with accumulating evidence of the value of discussion, the

importance of the teacher and of computers as productive facilitators for joint sense-making (Mercer & Littleton, 2007).

References:

Bråten, I., & Strømsø, H.I. (2012). Knowledge acquisition: Constructing meaning from multiple information sources. In N.M. Seel (Ed.), Encyclopedia of the sciences of learning. Heidelberg: Springer

Furberg, A., & Rasmussen, I (2012). Faktaorientering og forståelsesorientering i elevers bruk av nettbaserte .læringsomgivelser, I: T. E. Hauge & A Lund (red.), Små skritt eller store sprang? Om digitale tilstander i skolen. Cappelen Damm Akademisk. s 23 - 57

Jordan, B., & Henderson, A. (1995). Interaction Analysis: Foundations and Practice. Journal of the Learning Sciences, 4 (1). P. 39-103.

Mercer, Neil and Littleton, Karen (2007). Dialogue and the development of children's thinking: a sociocultural approach. London, UK: Routledge.

Rasmussen, I. (2012). Trajectories of participation: temporality and learning, In N. M. Seel (Ed.), Encyclopedia of the Sciences of Learning.

Sweet, A.P., & Snow, C. (2003). Rethinking reading comprehension. The Guilford Press