Συνέδρια της Ελληνικής Επιστημονικής Ένωσης Τεχνολογιών Πληροφορίας & Επικοινωνιών στην Εκπαίδευση

Τόμ. 1 (2008)

6ο Συνέδριο ΕΤΠΕ «Οι ΤΠΕ στην Εκπαίδευση»

First Steps in Supporting E-Moderation of Synchronous Discussions

Baruch B. Schwarz, Christa S. C. Asterhan, Rakheli Hever

Βιβλιογραφική αναφορά:

Schwarz, B. B., Asterhan, C. S. C., & Hever, R. (2026). First Steps in Supporting E-Moderation of Synchronous Discussions . *Συνέδρια της Ελληνικής Επιστημονικής Ένωσης Τεχνολογιών Πληροφορίας & Επικοινωνιών στην Εκπαίδευση*, *1*, 033–038. ανακτήθηκε από https://eproceedings.epublishing.ekt.gr/index.php/cetpe/article/view/9535

First Steps in Supporting E-Moderation of Synchronous Discussions

Baruch B. Schwarz, Christa S. C. Asterhan, Rakheli Hever
The Hebrew University

Introduction

Argumentation has good press nowadays. If people talk together, and persist in their discussions, especially in classrooms, it is fashionable to say that something good happens. And if the tone of the discussion is not aggressive, many would tend to say that they collaborate. Also, since situated cognition has been vastly adopted as a theoretical framework the Learning Sciences, some would certainly observe some group learning in any pleasant discussion. Interestingly, many would characterize what vehicles group reasoning as argumentation. However, in the history of education and pedagogy, the term "argumentation" has designated the hardcore in the curriculum of young classical orators, medieval jurists, monks or rabbis. This seems as if a term that had been reserved to the education of elites and that has been recognized as central in informal logics has been democratized and appropriated by researchers in the Learning Sciences to describe almost every verbal and social activity. Some even incorporate gestures as argumentative moves for solving problems in geology (Radinski, 2008) or in mathematics (Prusak, 2007). This appropriation of argumentation as central in learning is natural for those who adopt a socio-cultural perspective in their study of learning since it combines cognitive and social aspects. However, including too much in argumentation and asserting that collective argumentation can be a powerful means for learning and development (e.g., Schwarz & Asterhan, in press) risks to take off interest in the study of argumentation itself. The term "collective argumentation" is unspecified and too general to provide clear directions about its role in education or in development. And indeed, many practices can be identified with collective argumentation: disputes, debates, or dinner conversations are some of them. A necessary but vast enterprise is to observe specific argumentative practices in natural settings and to study their role to development. In particular, educators have chosen to favor some argumentative practices: critical discussions, brainstorming, collective reflection on problem solving activities, etc. These practices do not occur naturally in educational settings but are initiated. The teacher or the designer who designs activities to enable the implementation of such practices has always in mind criteria for quality. What is then important for the educator is not that argumentation occurs but that its quality is high.

Argumentative design (Andriessen & Schwarz, in press), i.e. the design of a learning environment that may lead to productive argumentation, deals with this issue of quality of argumentation. Argumentative design is particularly complex for

several reasons. First, there are many ways to define productivity: capitalizing on the argumentation in further activities, engaging in dialectic argumentation, referring to each others' ideas, agreeing on a normative argument, exploring the space of debate, reaching conceptual understanding or fostering argumentative skills to cite a few. Productivity points then at different possible goals. In the course of argumentation, discussants have very difficult time maintaining such goals. This role is generally conferred to the teacher, but also for the teacher this orle is very difficult to fulfill. For example, helping in reaching conceptual understanding demands from the teacher deep knowledge of the domain, pedagogical domain and diagnostic skills (Yackel, 2002). Argumentative design often fails then in helping productive argumentation. A way to reduce the gap between design and implementation has been to provide students with synchronous, graphic based CSCL-environments that enable co-construction of argumentative discussion maps (see a/o Schwarz & De Groot, 2007; Schwarz & Glassner, 2007). Quite naturally, although small group unguided synchronous graphical discussions may be productive according to several goals (e.g., reference to others) in many cases, teachers are indispensable mediators for productive student argumentation. However, teacher moderation of synchronous e-discussions is highly complex: The dynamic flow of simultaneously posted (and sometimes overlapping) contributions may quickly fill up the computer screen. It means that the teacher has tremendous difficulties reading the contributions, understanding their interweaving, and evaluating how to intervene in relation to such a flow. This may explain why teachers' attitudes towards on-line moderation are often negative and they may leave discussants without substantive interventions (Gil, Schwarz & Asterhan, 2007). These difficulties are expected to increase when teachers are required to monitor and moderate several small group discussions at once. Synchronous collective argumentation is then a practice that has become in informal settings but that is not well adapted to formal education since teachers are not able to trace students' actions during or after discussions. Finding ways to help teachers having an educational role in this practice is a goal of utmost importance. In contrast, leaving synchronous collective argumentation outside the realm of the school may have serious implications especially in the light of the fact that this practice has turned to commonplace among youngsters. We will describe a system that aims to support teachers and tutors in their on-line moderation practices, by, among others, providing them with tailored awareness tools. In addition to describing the nature of these awareness indicators we will also present research on teachers' preferences concerning the presentation of interaction data and discussions features that may facilitate their on-line moderation practices.

A system for moderating e-discussions

The aim of the ARGUNAUT project (www.argunaut.org) is to develop a computerized system that supports moderators in their endeavor to increase the quality of argumentative e-discussions. The most salient features of ARGUNAUT's

Moderator's Interface are: (a) awareness tools that provide immediate representations of aspects of e-discussions; (b) pre-defined alerting rules; (c) a remote control intervention panel from which the moderator can send textual comments and images to targeted students or the whole group in a variety of ways; and (d) tools for off-line reflection (see Figure 1). These aids are envisioned to help the teacher monitor, evaluate and direct the discussion without disrupting the flow of the ongoing collective argumentation.

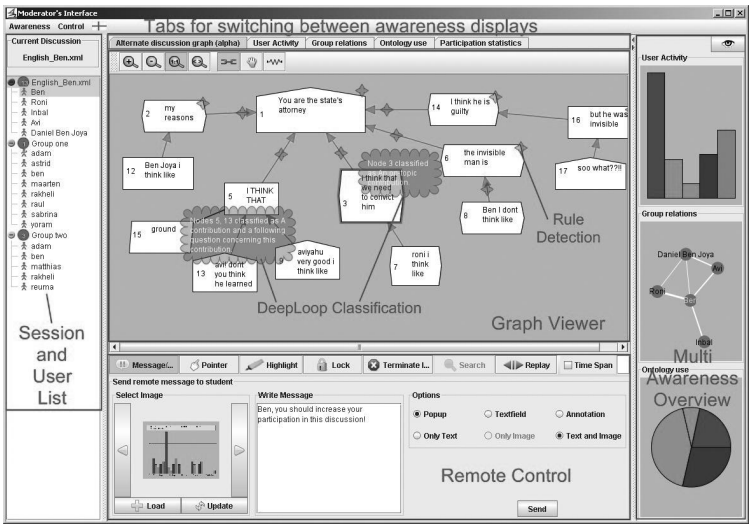

Figure 1. *The ARGUNAUT Moderator's Interface at its current state of development.*

The design of the tools is based on a user-centered design approach, involving teachers, tutors and (high school and university) student discussants. Currently, the system supports moderation of e-discussions within two different platforms, but the system could also be relevant for other synchronous discussion tools as well, particularly graphical tools. One of the currently supported platforms is Digalo (see figure 5), who provides its users with a shared workspace based on a concept-mapping interface. The tool enables synchronous, textual talk through mediation of geometrical shapes that represent different dialogical moves.

Awareness tools

The term awareness is defined as "an understanding of the activities of the others which provides context for your own activity" (Dourish & Belloti, 1992). A great variety of tools for e-discussion are available today, many of which offer awareness features for participants or moderators. Awareness feedback is based on various properties of the discussion, such as social interaction patterns, participation, temporal stages and text analysis. Yet, a systematic integration and combina-

tion of structural, process-oriented, and textual aspects has only recently been discussed in initiatives such as the Interaction Analysis project in the European Kaleidoscope network. The awareness tools that are developed for the ARGUNAUT system are derived from structural, process-oriented and textual elements of Digalo discussion maps. The *structural* elements are the direct or computable attributes of each shape or arrow object (such as type, creator, and number of characters) and any combination using these attributes as building blocks. The *process*-oriented elements are comprised of user actions on the discussion objects, and sequences thereof (stressing the dimension of time and the process of discussion rather than the end product). The *textual* elements are the text contributions typed within each shape.

We address several levels and methods of processing these elements. The lower levels are those of simple statistics (e.g. average text length, distribution of contribution types, and the like) or the use of statistical relationships between elements as relatively simple composite indicators (e.g., using the ratio between the number of connectors and the number of shapes as a measure of connectivity). The higher levels may involve more complex units, combining several types of elements (e.g., a cluster of shapes with certain characteristics, a sequence of actions indicative of a certain phenomenon) and/or the use of artificial intelligence methods and intensive input from pedagogical researchers (e.g., machine-learning classifications, query by example, search for pre-defined patterns). We refer to previous publications on these issues (e.g., Hever, et al., 2007).

Table 1. *Interaction data indicators for on-line moderation, as indicated by experienced teachers (N=14)*

Source category	*Details and possible indicators*
Presence	Who is online, who has been active for the last [time interval], who is lurking.
Participation	Number of contributions per discussant, by the different discussion ontology categories.
Responsiveness	The extent of interpersonal interaction and responsiveness to each other. For example: social network diagrams, numerical indicators of connectivity on discussion map-level, frequency of questions shapes within a map, or indicators of dialogicity based on machine learning classifications
Quality of reasoning: shape-level	Whether discussants use reasoned arguments as opposed to simple claims (based on machine learning classifications)
Quality of reasoning: discussion map-level	Whether the group considered multiple perspectives. For example: ratio of supporting and opposing links, map-level classifications based on content analyses
Impact of contributions	Identification of contributions that were neglected (i.e., without links) and contributions that catalyzed or opened up the discussion (i.e., with many links).
Textual length	Identification of particularly long contributions

What type of interaction data do teachers need?

As a first step, we gathered data on teachers' needs with regards to the different sources of information that could aid them in the moderation process. A total of fourteen teachers who had experience with conducting and/or moderating Digalo discussions, participated in one or more of the following three data collection activities: *(1) Questionnaires* in which they were asked to rate and rank predefined sources of information according to the extent according to which they considered each one of them as helpful in supporting on-line moderation of Digalo discussions; *(2) Evaluation of screen shots of possible awareness indicators* for online moderation; and *(3) Identification of interaction and discussion features* that would require on-line teacher intervention, based on two actual discussion maps.

The combined results of these three different data collection activities led us to identify seven different categories of information sources that were recurrently mentioned by the teachers to be potentially helpful in supporting on-line moderation. They are presented in Table 1, together with a short description of how these features can be operationalized into awareness indicators. Most of these features are currently implemented in the Moderator's Interface of the ARGUNAUT system as automatically detected and up-dated awareness visualizations for moderators. Currently the system has been implemented in different locations in Israel, Colombia, Great Britain and Germany. We will present preliminary findings from research with the first integrated versions of the system in both actual and simulated learning settings.

First results

We will present first results about the use of the ARGUNAUT system by teachers to moderate discussions. Moderation was done on 1, 2 and 4 groups of discussants organized in parallel triads. We will give insights on the strategies adopted by the moderators, the responsiveness of the students and the quality of the moderated discussions. We will also focus on how teachers evaluate the discussant's work and appropriate the different ARGUNAUT features *during* e-moderation practices. We expect to present a first critical analysis of the potentialities of a nascent practice, moderation of synchronous graphical e-discussions. Our intuition so far is that this practice may propose challenges and solutions in the quest of non-intrusive ways to help learners construct knowledge through argumentation.

Acknowledgments

The material in this paper is based on work supported by the EC -funded ARGUNAUT project (IST-2005-027728).

REFERENCES

Andriessen, J. E. B., & Schwarz, B. B. (in press). Argumentative Design. In A-N. Perret Clermont and N. Muller-Mirza (Eds.). *Argumentation and Education – Contributions in Argumentation*, *Communicative Interactions and Education*. Advanced Series in Learning and Instruction, Routledge.

Asterhan, C. S. C., Schwarz, B. B., & Gil, J. (under review). E-moderation of synchronous argumentative dialogue: First findings from multiple sources.

Gil, J., Schwarz, B. B., & Asterhan C. S. C. (2007). Intuitive moderation styles and beliefs of teachers in CSCL-based argumentation. In: C. A. Chinn, G. Erkens, & S. Puntambekar (Eds.), *The Computer Supported Collaborative Learning (CSCL) Conference 2007* Vol. 8.

Hever, R., De Groot, R., de Laat, M., Harrer, A., Hoppe, U., McLaren, B. M., & Scheuer, O. (2007). Combining structural, process-oriented and textual elements to generate awareness indicators for graphical e-discussions. In: C. A. Chinn, G. Erkens, & S. Puntambekar (Eds.), *The Computer Supported Collaborative Learning (CSCL) Conference 2007,* Vol. 8.

Schwarz, B. B., & Asterhan, C. S. C. (in press). Argumentation and Reasoning. To appear in: K. Littleton, C. Wood, & J. Kleine Staarman (Eds.). *Elsevier Handbook of Educational Psychology*: *New Perspectives on Learning and Teaching*. Elsevier.

Schwarz, B. B., & De Groot, R. (2007). Argumentation in a changing world. *International Journal of Computer-Supported Collaborative Learning, 2*(2-3), 297-313.

Yackel, E. (2002). What we can learn from analyzing the teacher's role in collective argumentation. *Journal of Mathematical Behavior*, *21*, 423-440.