A Teachers' Team Integration of a Technological Discussion Tool into Classroom Practices

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Abstract

This study focuses on the process of introducing and integrating a technological discussion tool, developed to enhance dialogism and argumentation, into the classroom practices of one Grade 9 class. The tool, Digalo, was used in this class five times during one month, by three different teachers, who all participated in the same teacher-training course prior to enactment, though they taught different subjects. The study examines whether the use of this tool became integrated into the teaching and learning practices in that classroom, across disciplines. Data includes 22 Digalo discussion maps, produced during five lessons, each led by a different teacher. The analysis includes detailed descriptions of the enactment context, changes in the use of the technological tool, in the students' behavior and in their levels of dialogism. The findings track the process in which, over time, the students appropriated and integrated Digalo into their classroom practices, raising more arguments and challenges were raised, referring more to teach other's ideas and gradually assuming responsibility for the discussion. The findings demonstrate that technological tools can be integrated quickly and efficiently, as related practices are relayed across different lessons of teachers who have received the same training.

Keywords: technologic tool implementation, practice, the role of teacher training,

Introduction

The integration of technological tools into classroom scenarios is considered an important goal (e.g., Fishman et al, 2004). However, it's far from being fully achieved (e.g., Cuban, 2002). Possible reasons for this include teacher attitudes regarding technology in the classroom, for examples teachers may worry about being perceived as technologically incompetent by their students, or wasting valuable lesson time on teaching them how to use the tools.

Pedagogical solutions often focus on applying familiar technological tools (chat, forum, etc.) for teaching and learning purposes (e.g., Herring, 2004), or on developing innovative pedagogical-technological tools within a design research framework (e.g., Fishman et al, 2006). This study, belonging to the second category, reports on a teacher-effective strategy to integrate such new tools into classroom practices.

Usually, the integration of innovative technological tools into teaching scenarios is done via teacher-training programs. Such programs typically include the combination of specific subject-matter content with an articulated pedagogy that incorporates the use of a tool especially tailored for a goal expressed by the developers. However, the use of such tools in classrooms often differs from the developers' initial intentions (e.g., Squire, et al., 2003).

An innovative approach has evolved in the EC-funded KP-Lab project's (KP-Lab FP6-IST-2004, 27490) teacher-training program (Eisnmann et al, 2009, Engeström et al, 2003), entrusting teachers with the responsibility for classroom tool integration. The program introduces the teachers to several technological tools (instead of one specific tool), and provides them with technological and pedagogical support from expert teachers, to address possible implementation difficulties. Furthermore, the teachers are required to apply what they have learned during their professional training in their own classrooms, by designing and implementing learning units that incorporate one of the tools presented to them with their students.

This study tracks the process of introducing and assimilating pedagogical dialogic practices and a related technological tool, Digalo, within one classroom, taught by 5 different teachers who underwent KP-Lab teacher training.

Method
Digalo
Digalo is a graphic-based e-discussion and e-argumentation tool, developed to enhance dialogism and argumentation. Digalo discussions are held within an object space called a "map" (see Fig. 1). Within this space, users contribute to the discussion by adding shapes representing argumentative ontology (e.g., rectangle for claims) and typing their text into them. Users may also link shapes to other shapes, using arrows of different types (support, opposition. reference). The shape and arrow objects may be modified or deleted. The argumentation map progressively produced is a group product, which can be capitalized on in further learning activities (Schwarz, & de Groot, 2007).
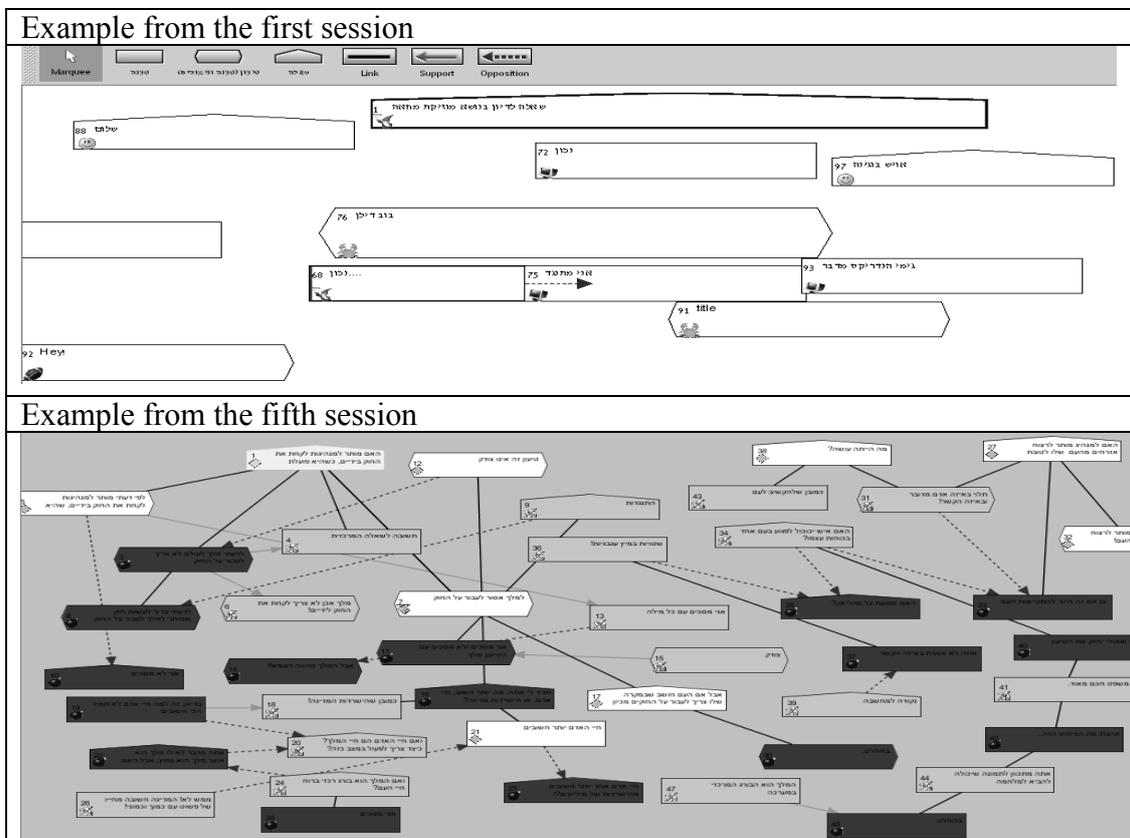

Figure 1. Argumentation maps

Subjects and Activities

In the present study, three teachers who participated in the KP-Lab teacher-training program, used Digalo in the same Grade 9 class. Overall, five related activities took place throughout one month, with the first session focusing on the history of music, the second and fourth on civics, and the third and fifth on bible studies. For each activity, the class was divided into 4-5 small groups, and each student worked with Digalo a total of 2-3 times overall.

Data Collection and Analysis

The data collected comprised of observations of the five lessons in which Digalo was implemented, and of the products of these activities: 22 discussion maps, comprised of 295 shapes and 666 links.

Content analysis and descriptive statistics were applied to the data. In order to identify the practices related to classroom use of Digalo, the students' contributions to the discussion maps and classroom occurrences throughout the related activities underwent content analysis. In addition, quantitative analysis was applied to characteristics of the discussion maps (e.g., frequencies of shape and link types used).

Findings

An examination of the enactment and usage of the tool over time (throughout one month, which included five enactment sessions by three teachers) reveals changes in the classroom norms. In fact, we may conclude that the very nature of argumentative discourse in the classroom changed during the course of the five Digalo sessions, transforming from social discourse to critical educational discourse, as the following analysis of each session demonstrates.

1st Digalo Session

The students' electronic discourse was poor (for example, see Figure 1) and a considerable portion of it (about 30% of the contributions) was of a social, off-topic nature. Moreover, many of the on–topic contributions were superficial (e.g., "[protest music] has a great impact, that's why it is a protest") and for the most part included no reference to the opinions of others. Digalo was used primarily as a *chat tool*.

2nd Digalo Session

The discourse was on-topic and learning-oriented, and included no off-topic content. The contributions primarily involved stating a position regarding the discussion question and/or expressing agreement with the stated opinions of others (using support connectors or words of agreement to indicate this). About 40% of the contributions contained references to/mentions of other members of the discussion group, mostly indicating support of previous statements by them. Each person responded individually, and discussion threads rarely developed, as is usually the case with responses to *blog articles*.

3rd and 4th Digalo Sessions

The 3rd and 4th Digalo discussions were characterized by an initial phase in which the students stated their positions and by a later phase in which they developed and elaborated these opinions as they negotiated with their peers and responded to challenges and questions.

In both cases, about half of the contributions (mainly in the earlier stages of discussion) were stand-alone 'closed' contributions, showing no indication that this is a discussion with other people (e.g., "No! The king is not allowed to murder his own people for what he thinks is the good of the public!"). In the more advanced stages of discussion, a significant proportion of the

contributions were 'open' or 'social' (primarily expressing support and sometimes including requests for explanation and/or elaboration). In effect, the discussion's structure changed over time within a single discussion thread, starting with a collection of discrete arguments, to each of which were added responses, questions and elaborations. The discussion comprised of several 'mini-discussions' or threads, which evolved in parallel (reminiscent of *specialized forums)*.

Despite the abovementioned similarities, there were several differences between the 3rd and 4th sessions. The 4th session contained a larger proportion of 'open' contributions (35%) compared with 'social' contributions (15%), while in the 3rd session they were of equal proportion (about 25%), and these contributions were generally more elaborated. Additionally, the proportion of opposition connectors in the 4th session was more than twice that of the 3rd (12% and 25%, respectively). Another difference was found regarding the proportion of opposition connectors used: in the 3rd session, only about 12% of the connectors were opposition connectors, while in the 4th session, the proportion was much larger (about 25%). Furthermore, compared with the 3rd session, in which the main source of challenges was the teacher, in the 4th session the students themselves expressed opposing opinions (sometimes going against their own ideas) in order to liven up the discussion, and sometimes asked each other for further explanations and clarifications.

5th Digalo Session

This session was characterized by the students 'waiting' for each other in order to respond to the other's opinion (in contrast with prior sessions in which opinions were expressed independently and in parallel). The discourse includes requests for explanation or elaboration of specific contributions (e.g., "What do you mean by 'I sort of agree'?"), comments regarding inaccuracies or inconsistencies (e.g., "You are contradicting yourself…"), and examples of 'interesting cases' that bear relevance on the validity of an argument (e.g., "If you were a king, would you kill innocent people?"). The students continuously responded to each other in ways that advanced the discussion and led it in various, unplanned directions.

Indeed, over half the contributions in this session were of the 'open' type. Likewise, about a fifth of the contributions included students' questions or challenges to each other (e.g., "Would you convert in order to survive or would you prefer to stay true to your religion and die?"). This aspect is also reflected in the use of connectors – about 25% of which were opposition connectors.

In summary, the Digalo discourse evolved from a friendly 'chat' (1st session) to a unique form of educational discourse (5th session). From expressing unilateral opinions, the students progressed to collaborative discourse, which involved listening to other opinions, examining them critically and responding (whether with a question, a challenge or a change of one's own opinion).

Two additional developments were observed in teaching and learning practices throughout the enactment month, related to the nature of discussion questions and tool use, and the respective roles of students and teachers in the discussion.

The discussion questions presented by the teachers to the students for each session changed, from questions summarizing previous lessons to open questions that invite the students to tackle them without guidance. The status of the technological tool changed accordingly, from a tool that enables sharing and organizing existing knowledge (preserving the teacher's status as

'owner' of this knowledge) to a tool that has affordances for constructing individual knowledge through collaboration and negotiation with peers.

Similarly, the roles and responsibilities of the teachers and the students changed over time. The teacher, initially cast in the role of knowledge 'owner', responsible to 'transfer' it to the students (monologic approach), became a facilitator of knowledge construction through dialogic discourse, growing increasingly less dominant with time. The responsibility for the discussion shifted from the teacher to the students.

Conclusion

The technological tool Digalo, which facilitates and supports shared thinking and dialogic reasoning, was used five times in the same classroom, throughout one month. Each time, the tool was used by a different group of students (each individual student worked with Digalo a total of 2-3 times), with varying teachers and discussion topics related to different curricular areas. Despite these variations, and despite the relatively small number of sessions, and despite the fact that not all students participated in all sessions, the desired discourse practices and norms developed.

The process throughout which this was achieved may be likened to a relay race, a gradual progression in which norms and practices were transmitted between students across time, little by little transforming their educational discourse. Some of the students who participated in the first session participated also in the second session, during which they served as socialization agents and transmitted the desired discussion norms to their peers who did not take part in the first session. This phenomenon repeated itself for the following sessions, so that in five lessons, each involving only a third or a half of the students, the desired norms and practices were assimilated by the entire class.

With each session, more and more productive, educational discussions developed. Practices developed of raising and challenging different arguments; referring to each other by raising arguments; and utilizing previous arguments in follow-up arguments. Analysis of these class discussions additionally revealed changes in the way the technological tool's role was perceived and in the respective roles of students and teachers in the discussion. With time, students took upon themselves more and more the responsibility to lead and promote the discussion.
This process occurred without the guiding intervention and facilitation of a teacher overseeing all five sessions. No single teacher was required to shoulder the burden of the entire assimilation process.

The process of a teachers' team integration is part of the results of the teacher-training program. The work of different teachers, within the communal framework, proved to have an additive effect that transformed the class' discourse practices. Therefore, effective integration is achieved in a way that does not place the full burden on a single teacher, and is thus perceived as less threatening and more acceptable to teachers.

References

Asterhan, C. S. C., & Eisenmann, T. (2009). Online and face-to-face discussion in the classroom: A study on the experiences of 'active' and 'silent' students. In C. O'Malley, D. Suthers, P. Reimann & A. Dimitracopoulou. (Eds), *Proceedings of the 9th international conference: Society of the learning science – CSCL* (132-136). Greece: University of the Aegean.

Cuban, L. (2002). *Oversold and underused: computers in the classroom*. Harvard University Press. United States of America.

Eisenmann, T. Schwarz, B. B., & de Goot, R. (2009). Relay race of practice: integrating technological tools into teaching and learning scenarios. In C. O'Malley, D. Suthers, P. Reimann & A. Dimitracopoulou. (Eds), *Proceedings of the 9th international conference: Society of the learning science - CSCL* (252-256). Greece: University of the Aegean.

Engeström, Y., Engeström, R., & Kerosuo, H. (2003). The discursive construction of collaborative care. *Applied Linguistics*, *24*(3), 286-315

Herring, S. C. (2004). Computer-mediated discourse analysis: An approach to researching online behavior. In: S. A. Barab, R. Kling, and J. H. Gray (Eds.), *Designing for Virtual Communities in the Service of Learning* (pp. 338-376). New York: Cambridge University Press

Fishman, B., Marx, R. W., Blumenfeld, P., Krajcik, J., & Soloway, E. (2004). Creating a Framework for Research on Systemic Technology Innovations. *The Journal of the Learning Sciences*, *13*(1), 43-76.

Fishman, B. J., Penuel, W. R., & Yamaguchi, R. (2006). Fostering innovation implementation: findings about supporting scale from GLOBE. *Paper presented at the International Conference on Learning Sciences*.

Schwarz, B. B. & de Groot, R. (2007). Argumentation in a changing world. *Computer-Supported Colaborative Learning*, *2*, 297-313.

Squire, K. D., MaKinster, J. G., Barnett, M., Luehmann, A. L., & Barab, S. L. (2003). Designed curriculum and local culture: Acknowledging the primacy of classroom culture. *Science Education*, *87*, 468-489.