

# 'Active' and 'Silent' Students' Experiences of Synchronous Computer-Mediated Discussions in Co-Located Classroom Settings

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## Abstract

Even though the advantages of online discussions over face-to-face discussion formats has been extensively reported and investigated, the blending of online discussion tools in co-located classroom settings has been considered with far less intensity. In this paper, we report on secondary school students' experiences and preferences concerning two different discussion formats in co-located classroom settings, namely face-to-face (F2F) and synchronous, computer-mediated communication (CMC). In addition, we also differentiate between students that are known to be active participants in F2F classroom discussions and those who usually remain silent. The findings highlight several advantages of CMC over F2F discussions in co-located settings and show that different students ('active' and 'silent') experience F2F and computer-mediated classroom communication differently.

**Keywords:** computer-mediated peer dialogue, co-located settings, individual differences, synchronous text-based communication.

## Introduction

The Many theories of learning have recognized the importance of peer dialogue in learning and teaching (e.g., Rogoff, 1998; Wegerif, 2007). Moreover, several studies have shown that in contrast with passive observation of peer dialogue, it is the active participation in processes such as constructing explanations, providing help and engaging in dialectical argumentation that seem to be responsible for the more substantive learning gains (e.g., Asterhan & Schwarz, 2008; Chi, Roy, & Hausmann, 2008; Webb, Troper, & Fall, 1995). However, when implemented in authentic classrooms, discussions usually take on a format of teacher-led classroom discussions or small group peer discussions, which substantively reduces opportunities for students to be active dialogue participants.

Computer-mediated discussion boards have been suggested to be able to overcome several of these shortcomings: First of all, and as has been discussed extensively (e.g., Kiesler, Siegel & McGuire, 1984), a great deal of the non-verbal cues that are present in face-to-face (F2F) communication are lacking in distributed CMC. Since these non-verbal cues are, among others, used to assess social status, computer-mediated communication has the potential of being more democratic (Herring, 2004). Moreover, the increased anonymity of on-line communication is thought to cause people to become less inhibited and to self-disclose more frequently (Suler, 2004). In turn, this may promote free expression of individual standpoints and increased and equalitarian participation by all discussants. In addition, the textual medium of communication, the ability to re-read and re-vise contributions, and the fact that in a-synchronous CMC there is

more time to think and consider one's response before posting it, are all thought to encourage reflection (e.g., Guiller, Durndell, & Ross, 2008).

However, most of the studies that compare F2F with on-line discussion formats have focused on text-based discussion environments that occur in a-synchronous, distributed, distant communication modes. In this study we will focus on the blending of synchronous, text-based discussion tools within co-located classroom settings, a topic that has, thus far, rarely been the focus of research (Cuban, 2002). The use of on-line communication in co-located settings may combine some of the advantages of online communication, without some of the potentially problematic aspects of distant, anonymous communication formats in educational settings: On the one hand, its textual nature, lack of non-verbal cues, persistence of contributions and simultaneous nature may encourage reflection, explicitness, interactivity and participation. On the other, student discussants share a physical space, they personally know their discussion partners and the teacher is physically present. This could avoid some of the negative sides of distant, anonymous CMC in secondary education settings, such as teacher difficulty to verify whether a certain task is actually completed by the student or not, instances of flaming and other social disturbances, and lack of accountability for communication content.

In the present study, we then seek to investigate students' preferences of and experiences with two different discussion formats (F2F and CMC) in co-located classroom settings. We focus on several discussion aspects, such as participation, interactivity, learning and classroom management. The student population should not be considered as homogeneous in their behavior and in their preferences for different communication modes (see also Caspi, Chajut, Saporta, & Beyth-Marom, 2006, Eisenmann & Even, in press). We therefore differentiate between students that are known to be active participants in F2F classroom discussions ('active' students) and those who do not participate frequently ('silent' students). We expect that they differ in the extent to which they welcome the introduction of these new technologies in the classroom: Compared to active students, silent students are expected to show a stronger preference for the online format. We also expect this difference to be strongest for discussion characteristics that involve rate of participation, rate of peer interaction and motivation.

## **Method**

### **Participants**

Twenty-three 9th grade students and ten 11th grade students from a secondary school in the Jerusalem metropolitan area participated in this study. All students filled out a questionnaire on their experience of face-to-face and on-line classroom discussions (see Tools section). In addition, four 9th graders (two 'highly active' and two 'silent' classroom discussion participants) participated in short, individual structured interviews on this experience. They were selected based on the teacher's evaluations of the most active and most silent students in face-to-face classroom discussions.

### **Tools and Procedure**

All students had participated in at least two classroom activities in three different subjects (civic education, biblical studies and history) that blended traditional teaching activities with online discussions. The discussions were conducted within the Digalo environment (e.g., Schwarz & de Groot, 2008) which enables synchronous, textual talk through mediation of geometrical shapes (diagrams) that represent different dialogical moves (such as, argument, explanation, claim, and so forth). For further details on the discussion environment, see <http://www.argonaut.org>.

A questionnaire was developed in which students were asked to indicate their personal experiences with on-line Digalo and face-to-face classroom discussions in a comparative way. It included twelve statements that described different aspects of students' personal experience in discussions. The items assessed aspects of interaction (e.g., "Students reacted to my contributions"), participation (e.g., "I participated in the discussion), the learning experience ("I felt that I learned new things on the subject", "The discussion caused me to think about the subject", ), clarity (e.g., "I managed to follow the discussion development"), motivation (e.g., "I enjoyed the discussion"), and classroom management (e.g., "There were a lot of classroom disturbances"). For each item, students were asked to indicate whether the statement characterized themselves more in Digalo discussions, more in face-to-face classroom discussions, or equally well. Values ranged from 1 (much more in Digalo discussions) to 5 (much more in classroom discussions). In addition, students were asked to self-report on their frequency of participation in face-to-face classroom discussion, ranging from 1 (almost never) to 4 (a lot).

The interview was developed in parallel to the questionnaire and its aim was to expand the understanding of the findings from the questionnaires analysis (Johnson & Onwuegbuzie, 2004). The interview was conducted by person that was unknown to the students. They were asked describe their experience with F2F and electronic classroom discussions, while receiving several prompts for further explanations and examples.

## Results

The comparison between the different discussion styles (F2F and CMC) proved to be quite natural for the students and they were very cooperative. Student responses to the twelve forced-choice items were recoded by a linear transformation and reversed when appropriate. Mean preference scores were calculated for the whole sample and are reported in Table 1. Positive values indicate a mean preference for on-line discussions and negative values a mean preference for F2F classroom discussions (range from -2 to 2). All statistical analyses were conducted with two-tailed t-tests.

**Table 1. Mean number (and SD) of pupils' self-reported preference scores for face-to-face or on-line discussions on selected discussion characteristics (N=33)**

Discussion characteristics	M	SD	
Reactions of others to self	.42	1.30	p = .070
Reactions of self to others	.49	1.35	*
Self-expression	.48	1.30	*
Participation	.24	1.20	
Interest	-.06	1.12	
Enjoyment	.00	1.20	
Caused to think	.19	.10	
Learned new things	-.09	.88	
Understand topic	.80	1.10	
Follow discussion	-.33	1.24	
Classroom disturbances	.97	1.04	****
Off-task behavior	.85	1.15	****

\* p < .05, p < .005, \*\*\*\*

The mean preference scores in Table 1 show a general trend for preference of online Digalo discussion over face-to-face classroom discussions for 8 out of the 12 different discussion characteristics tested. These preferences in favor of online Digalo discussion formats were significantly larger than chance for measures of classroom management (classroom disturbance and off-task behavior), interactivity and self-expression. Indeed, in all interviews differences related to classroom management were mentioned. The students distinguished between the different discussions – while one is quiet (“in Digalo it’s quite” or “the lessons were conducted quietly because the discussion was going in writing”), the other was noisy (“there is much more noise”). In addition, the interviewees also mentioned that in a regular lesson the teacher is occupied with discipline problems while in Digalo-lessons the teacher is more available for other issues. The difference that students experienced with regards to the opportunities to interact with fellow peers was also recurrently mentioned in the interviews, as is shown in the following excerpt:

“... and in Digalo it is quiet and you can see, you sit in front of the computer by yourself, see what people write... and can refer to each thing separately and in your own pace... next to the computer I found it easier to express myself” (interviewee #3).

Following this exploration, we then turned to a comparison of discussion format preferences of 'silent' and 'active' participants in F2F classroom discussions. Silent participants were operationally defined as those students that indicated that they "almost never" or "every now and then" participated in classroom discussions (N = 15), whereas active participants indicated that they did so "often" or "a lot" (N = 18). Mean preference scores for these two groups are presented in Table 2.

**Table 2. Mean number (and SD) of pupils' responses, by silent participants and active participants in F2F classroom discussions**

Discussion characteristics	Silent participants (n=15)		Active participants (n=18)		F2F
	M	SD	M	SD	
Reactions of others to self	1.20****	.77	-.22	1.31	t (33) = 3.87***
Reactions of self to others	1.40****	.74	-.28	1.27	t (33) = 4.50****
Self-expression	1.53****	.52	-.39	1.09	t (33) = 6.63****
Participation	1.77****	.49	-.67**	.77	t (33) = 9.08****
Interest	.40	1.06	-.44	1.04	t (33) = 2.31*
Enjoyment	.47	1.19	-.39	1.09	t (33) = 2.15*
Understand topic	.07	1.03	-.61	1.09	t (33) = 1.82
Follow discussion	.13	1.19	-.72*	1.18	t (33) = 2.07*
Caused to think	.73**	.79	-.28	.96	t (33) = 3.25***
Learned new things	.40	.74	-.50*	.79	t (33) = 3.37***
Classroom disturbances	1.33****	.72	.67*	1.19	t (33) = 1.90
Off-task behavior	1.27****	.80	.50	1.29	t (33) = 1.99

\* p < .05, \*\* p < 0.01, \*\*\* p < .005, \*\*\*\* p < .001

First of all, the data in Table 2 show that, overall, discussion format preferences were consistent with being high or low frequency participants in face-to-face classroom discussions on most discussion aspects: On all but the classroom management aspects and understand topic. The active participants' scores indicate an overall preference for face-to-face classroom discussions (10 out of 12 different discussion characteristics tested). These preferences reached statistical significance on the following aspects: rate of participation, the ability to follow the discussion, the ability to learn new things and the number of classroom disturbances. In the interviews the active students did not discuss preferences for one format over the other. However, they did

voluntarily acknowledge and appreciate the advantages of CMC discussion for their fellow 'silent' classmates:

“For me it is about the same because I do participate, but [for] students who don't participate it helps them to better understand the material, to understand what other students say” (interviewee #4)

The silent participants, on the other hand, consistently tended to indicate preferences for the online discussion format on all test items. This preference was strongest and statically significant for the following dimensions: They reported that they interacted more with their peers, that they participated more and felt that they could express themselves more, and that the group as a whole suffered from far less classroom disturbances and off-task behavior. As one of them mentioned:

“In Digalo most of the students are busy with writing, [it gives] opportunity to each one to express himself more than he does usually... from Digalo I learned more than in a discussion on the same topic in the class... in the class I don't participate so much” (interviewee #2)

## Discussion

The blending of online discussion tools in co-located classroom settings can alter discussion practices in a classroom. Similar to a-synchronous discussion formats outside the classroom context, turn-taking is not required and many non-verbal cues are not conveyed, it may promote more egalitarian student participation, the free expression of ideas and increase student peer interaction. In addition, students also reported that they experienced less classroom interruptions and disturbances in this format. On the other hand, it avoids some of the more undesired phenomena associated with distant, anonymous CMC, such as social and learning disturbances. Our findings also showed that different students (active and silent) experience F2F and computer-mediated communication differently. In CMC environments, students that are usually quiet in F2F classroom discussions seemed to have begun to develop discussion practices as active participants and readily identified the advantages of online peer discussions. The more “active” students, on the other hand, had well-founded discussion practices and therefore received the new communication format with reservations. However, they did acknowledge the advantages for their “silent” fellow classmates. To further examine these first preliminary findings on different communication media within co-located classrooms, direct observations of student behavior during on-line and F2F discussions will have to complete the picture. A particular interesting venue for future research concerns the question whether the development of these new practices will carry over to F2F classroom discussion activities.

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