Spatial Practices in CSCL Discussions

Benzi Slakmon and Baruch B. Schwarz, The Hebrew University of Jerusalem,
School of Education, Mount Scopus, Jerusalem, 91905, Israel
Email: benzion.slakmon@mail.huji.ac.il, baruch.schwarz@mail.huji.ac.il

Abstract: In CSCL environments, space itself − and not only utterances − are objectified. New questions emerge from the relation between objectified space and student activity: How do students react to the spatial resource opened at their disposal? What are their spatial modes of acting within it? What bearing does the spatial organization have on talk? This paper revitalizes the neglected semiotic connection between language and the city. The literature of the perspective of everyday life and other contemporary spatial literature are reviewed in order to better understand the use of space in CSCL discussions, the ways in which it is socially produced, reclaimed, planned, maintained and used. 37 small group Argunaut discussions were analyzed and examined for their spatial development. Four spatial practices are described. The practice of distribution is unfolded. This study argues that issues of proprietorship play a major role in the way discussions evolve.

Introduction

Temporality, sequentiality, segments, events, turns, episodes: When we think of the conceptual category that holds our thinking about discursive phenomena, we primarily think of *time* (Mehan, 1985). Talk is not usually perceived as a spatially organized phenomenon. As talk is moves into CSCL environments, however, words and utterances are objectified, thus becoming an object for reflection. But it is not only the linguistic plane that is objectified; Space itself-the linguistic platform- is also objectified. As a result, the notion of conversational space gets a new actual meaning. The objectification of the conversational space in CSCL raises new kinds of questions: how do students react to the spatial resource opened at their disposal? What will be their spatial modes of acting within it and what bearing will the spatial organization have on talk itself? By deliberating on the emergence of a spatial order in CSCL discussions, we might be able to better understand the processes involved in the emergence and power of the ideas of the private and the public.

In order to understand the use of space in CSCL discussions − the ways in which it is socially produced, reclaimed, planned, maintained and used− the spatial development of 37 Argunaut discussions were analyzed and examined. These discussions comprise the entire corpus of CSCL work done in an eighth grade classroom during a year-long course in humanities. Because of the nature of the corpus, we were able to trace not only the general scheme of spatial arrangement, but also the exact trajectories of change and transitions in which discursive/spatial practices were introduced and later endorsed. Using conversation analysis alongside the spatial analysis, we could identify the key moments of emergence of new spatial practices, and of norming and changes in the meaning of the practice along the corpus. In the following section we will try to construct the foundations for a discussion on the notion of conversation as seen from the perspective of the spatial, as well as from the perspective of property. We will argue that neglecting these perspectives when analyzing student's CSCL talk conceals certain of its attributes. Moreover, we claim that by enriching the analysis, we are also reconnecting and bringing back the intellectual achievements of the recent literature on space, which was based on the metaphor of language and the fruitful comparison between language and the city.

The Space Density Problem

At times when the discussion is productive and many contributions are being made, it does not take long before the problem of density arises. The contributions rapidly accumulate. The argunaut is programed in a way that gives the students the freedom to enlarge its boundaries. Students can drag their contributions to the edge of the conversational space, width and length, and by doing so to enlarge it. As they do so, they cannot see all of the contributions at the same time the density of the discussion affects the quality of the talk because one cannot distinguish the newer contributions from the older ones, and cannot deal with the content and relational overload. The responsiveness of dialogue is at stake when it is not clear who refers to what, and when. In order to deal with the problem of density, the students developed two spatial practices. The first is *the enlargement of the conversational space*, as can be seen at the discussion showed at the upper right corner of figure 2. The second practice is *'the shout'* (figure 1). Shout takes place when a discussant is placing a contribution randomly on the conversational space, and then *moving it to the center of the space and enlarging it disproportionally*, thus squashing all that is present beneath it. The over-sized comment is held there to be seen for an average of 8-15 seconds and subsequently scaled down and dragged to unoccupied territory. In a dense space governed by no conventions of order, some students find this to be the best way to be heard and recognized, even when it means squashing others. When shouting is practiced in discussions, the students who do not actively make use of it are given less recognition.

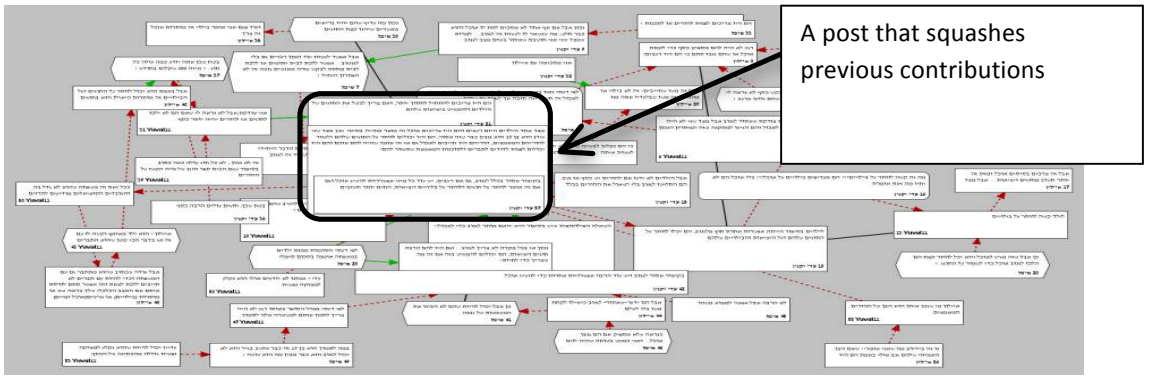

Figure 1. Congestion and squashing in an over-loaded space.

Theoretical Framework

Space's Multiple Meanings and the Learning Sciences

There is a persistent use of the notion of 'space' in the learning science, and particularly in research on CSCL (Erduran et al., 2004; Mercer and Littleton, 2007; Wegerif, 2007; Chin and Osborne, 2010; Schwarz and Asterhan, 2011). Seen from the history of ideas perspective, the term space holds multiple, sometimes contradictory, meanings (Casey, 1997). There are two distinctive ways to use the term: space as entity and space as order. Applied to the textual sphere, the matrix is more complex: using Zoran's (1997) *textual spaciality theory*, the conjunction between these two uses and the two textual levels- the linguistic functions of the *utterance level* and the represented reality of the *world level*- yields a structure with four possibilities for implementing the concept of space in the text: (1) Space as order, applied to the utterance level− that is, on paradigmatic relations and connections between disconnected textual units (2) Space as entity, applied to the utterance level that is the physical, graphic existence of the textual signs (3) Space as order, applied to the world level, which is the entire space of the world: the physical, ideational, psychological (4) Space as entity, applied to the world level. The physical structure of the world as a site of occurrences, plots, and acts. Analyzing the Learning sciences' literature, based on Zoran's Theory it is clear that the term space is used only to describe order in the utterance level. Here we will focus on space as entity.

Talk and the Everyday Life Perspective

The pedagogical challenge of designing talk similarly to that of city planning, is to embrace plurality, in such a way that will lead to generations of forms and practices which will be endorsed and will contribute to the quality and richness of the discursive experience. The idea of the city as a metaphor for language was introduced by Wittgenstein in a famous aphorism (2001, 18): "Our language can be seen as an ancient city: a maze of little streets and squares, of old and new houses, and of houses with additions from various periods; and this surrounded by a multitude of new boroughs with straight regular streets and uniform houses". The similarities between speech and urban architecture, and the use of speech as a metaphor for the city, were a generating force in the development of spatial knowledge. Certeau (1984) capitalized on the similarity when he described *walking as a space of saying*. Everyday life critique (Lefebvre, 1991) might be instrumental in the analysis of the ways in which students discursively and spatially act, in classrooms and in conversations, in order to redefine the meanings of spaces through the practices of recurrence, acquiring, reclaiming, distributing, and appropriating it. Everyday life is the intersection of the site in which individual practices, and social constructs interact (Lefebvre, 1991). The other way also applies: the space of interaction between individual practices and social norms is a site of everyday life. According to Gardiner (2000), it is in these sites that we develop our individual and societal capacities, and only in such spaces, do we become full members of the community (Fenster, 2012).

The idea of appropriating space through recurring acts is closely related to Aristotle's definition of 'having'. Aristotle perceived possession as a mediated act (praxis) or movement between the proprietor and the thing (Metaphysics, book V). The Greek word describing possession is hexis. The word can be also described as a qualification that originates in practice and habituation. The physical dimension of the process of hexis is captured in Latin translation as habitus. The term habitus refers not only to the process of acquiring through recurrence, or to the habitual aspect of being accustomed and fluent in the action, but also to the growing capability, readiness and ease to perform the act in the same, but also changed, environments. The experience of ownership- of the conversational space- is the accumulated outcome of recurring bodily practices of spatial doings. The knowledge produced in the process of 'having' is therefore, localized and privatized. It should be highlighted that hexis, due to its habitual and bodily nature, is the cornerstone of Aristotle's ethical virtue, a virtue that neither can be appropriated through direct teaching nor developed naturally in man.

Setting and Context

The data presented is taken from a design-based study, conducted as a year-long humanities course in an eighth grade classroom of 13 girls and 15 boys. The course met six hours per week, and was taught by the first author of the article. The goal of the humanities course was to develop humanistic curricula based on an elaborated form of a *community of philosophical inquiry* (Lipman et al. 1980), in order to engage students in learning to dialogize. The course was divided into three learning cycles, and dealt with ethical and epistemological issues. Neither argumentation nor rigorous school of philosophical thought was addressed directly, as the course stemmed to some extent from the questions of the students and from their interests (Slakmon & Schwarz, in press). Since objectifying talk was one of the major goals for students to become more reflective about both talk and thinking, throughout the third learning cycle, we added a weekly group discussion in the Argunaut system.

The Argunaut system is a CSCL tool designed for promoting synchronous argumentative discussions. Based on the Digalo system (Schwarz and de Groot, 2007), Argunaut appends a monitoring and intervention unit to Digalo. Argunaut has emerged from the need to moderate multiple synchronous discussions in classroom. It provides the moderator with public and private communication channels with the discussants and 'awareness tools' for monitoring ongoing discussions (Schwarz and Asterhan, 2011). The moderator builds the conversational space in advance, adding to it the question/issue to be discussed, and the argumentative/communicative ontology he/she wishes to introduce. The moderator builds numerous conversational spaces in parallel and assigns each predetermined group to its designated conversational space. By doing so, the group finds the question/issue and the ontology in the tool bar. The ontology becomes a speaking/thinking tool since discussants need to select an argumentative category (represented as a distinct geometrical form). Furthermore, students are expected to link their posts to other posts by using one of the communicative connections ('arrows') present in the ontology (green arrow for agreeing, red for criticizing, black for neutral reference). The paper deals with the question of how they act in the conversational space, not from the point of view of what they post, but from the point of view of managing the conversational space. When students engage in an Argunaut conversation, they need to address the question of spatial organization. Like chats, the utterances students produce in the Argunaut system are fixed and do not disappear from conversational space over time. But unlike chat, there is no restraint channeling discussion into threads, so whenever a student posts a contribution on the conversational space, several decisions must be made to differentiate the Argunaut way of communicating from more ordinary forms. A student must decide where to place a contribution and also which of the previous comments to connected with arrows to the utterance. As shown in figure one, as the conversation develops, it becomes overloaded with utterances, and as a result, students find it difficult to find their way in it. Nothing distinguishes earlier entries from later entries so it becomes increasingly difficult to distinguish more important from less important utterances. The CSILE research team faced similar problems and came up with the dialectic function of "rise above" (Scardamalia, 2004). Argunaut does not include any tool for envisioning convergence, leaving the issue for the students to deal with. It became increasingly difficult to distinguish the important from the less important, thus hurting the potential of referentiality, meaning the ability to base an utterance on previous, but not immediately preceding utterances. Since cultural and discursive achievements are based on the accumulation and preservation of traditions, this state of affairs prevents rich and cultured construction.

Eight Argunaut session days were conducted in groups consisting of 3-6 students. Weekly discussions were held with the exception of the first two sessions that took place during the first learning cycle and were held chronologically four months earlier to the third discussion. A total of 37 discussions were produced. All of them were spatially analyzed. Argunaut sessions were held at the school's computer lab and in each session, up to three groups worked simultaneously with the Argunaut, while the other groups were assigned to different tasks, outside of the computer laboratory. Each group formed its own original discussion map. The groups were formed by the teacher, whose attempts to maintain fixed groups each week, were only partially successful, due to student absenteeism. Students were familiar with the computer lab since they had used it all year. The following analysis is based on analyzing the groups' trajectories of participation, and more precisely, collective spatial usage trajectories of the entire 37 discussions.

Order of Occurrence I: First Glimmer of Spatial Order

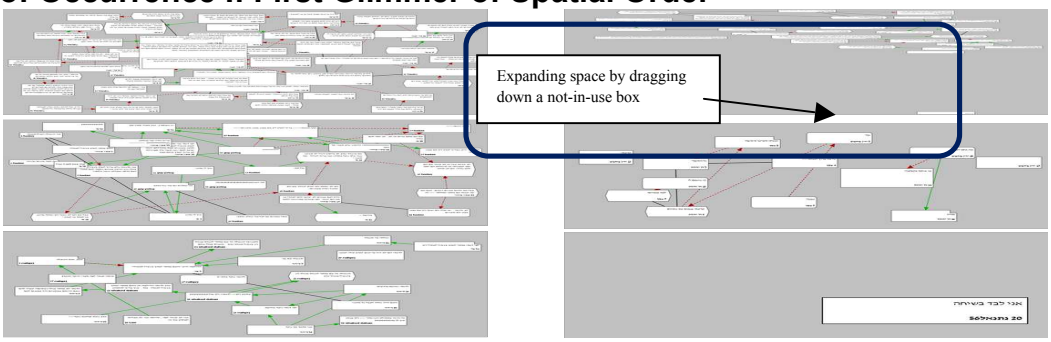

Figure 2. Maps of the six Argunaut discussions held in the fourth discussion day (discussions no.12-17). On the upper right: the practice of enlargement

In all of the 19 first discussions, students were posting their contributions in the conversational space wherever they wanted, and without either consideration for issues of private/public spaces, or any indication of a time-based organization. Figure 2 show how the six discussion maps of the groups looked at the end of discussions no. 12-18. All previous discussion looked the same with regard to the scattering of the contributions. But at discussion day 5, at the following week, only three discussions were held (18-20, figure 3) because some students were absent. As seen, the discussion maps spatial order was as accidental as it was before, except in discussion 20, held by Shira, Dor and Sharon (the upper map in figure 3). Thoughtful spatial organization appears in discussion 20 for the first time. In it, the right column consists of all of Dor's contributions. The cluster located at the bottom of the center of the map consists of Sharon's contributions, and the left column consists of Shira's. A blurred spatial order emerges in this discussion, but some questions need to be asked: How did the order emerge in the first place? What is its function? How do the students comprehend and interpret it? And finally, what will become of it in the following lessons? All questions are temporal by nature, therefore appropriately addressed by trajectory analysis.

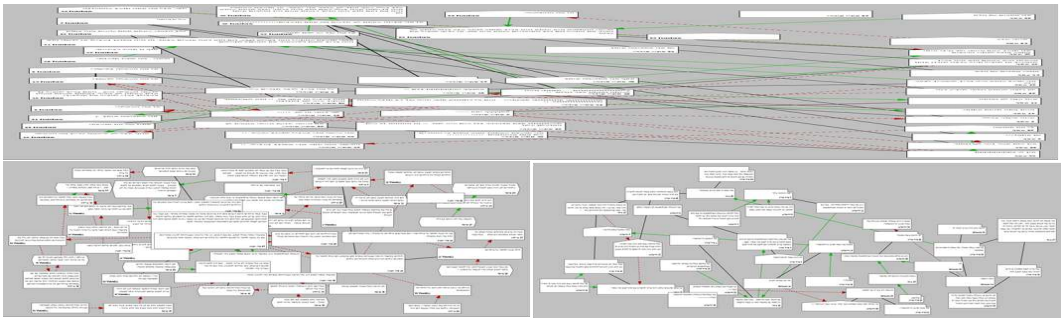

Figure 3. Maps of the three discussions held in the fifth discussion day (no.18-20). Discussion no. 20 highlighted

The students were dealing with a moral dilemma posed by a classmate in a story he composed. After reading the story, the participants were assigned to the Argunaut to discuss the problem. Sharon, Dor, and Shira, the three students involved in the discussion (20), placed their contributions in the center of the space, in no observable order. Eight and a half minutes after they started the conversation, Sharon used *shouting* to post the following: "pputttttttt a little bittttt of orderrrrrrr in the dialogue we're havingggg…!! This is theeeeee perfect dialogue of ours". But her contribution did not receive any obvious response. The discussion continued. Shira formulated a well-informed argument and received Dor's endorsement. They each placed their contribution wherever they found space. Three minutes after Sharon's call, the flow stopped. At this point, Shira's contributions were scattered all over the space. Among them were comments 5 and 10, positioned on the left side of the space, one above the other. Shira created a gap between them and moved one of her previous contributions between them. The next thing she did was to align the newly created three box column by moving the upper box. The entire move took six seconds. It took six seconds for Dor to detect the move. He dragged one of his contributions to the extreme right, opposite of Shira's column. There Dor used contribution as the cornerstone of his column. He continued to rapidly build his column from his previous comments. Sharon started organizing her eight contributions just as Dor and Shira finished organizing theirs. The process of organization took place in a flicker of less than two minutes. In it, no new utterances were produced; each column was made of contributions authored by a single participant. The placement of the contributions inside the columns was driven by a spatial-organizational logic: *The columns have no chronological consistency*; we

can see that with regard to all three discussants, there is no connection between the production time of the contributions and their place in the column. It is important to note that this time the organization of the space emerged only *after* the discussion was almost entirely completed. It did not emerge as an integral component of the development of content and ideas. The session lasted for another 12.5 minutes. As seen in figure 4, an open, un-utilized, space was created between Dor's and Sharon's columns, and another free space was found above Dor's column. In the remaining minutes of the discussion both areas functioned as *public spheres* which became the place for introducing new comments and exchanging ideas. New contributions were posted and placed first in it, sometimes accompanied with a *shout*, and then dragged to the *private sphere* of the contributor, as if it were a conversational capital belonging to the producer.

Order of Occurrence II: Recognizing the Practice of Distribution

Five discussions were held the following week (21-25), at day 6. Both Shira and Dor regrouped to different groups with other classmates. Sharon did not attend that day. As seen from figure 5, Dor (discussion no. 22) duplicated the practice of distribution, whereas Shira's discussion (no. 21, figure 4) was generated without any other spatial organization than shouting. Although Shira was the first to introduce distribution, this time she posted and placed her contributions randomly, like everybody else. Consequently, the practice of distribution was neither introduced to the other participants nor reinvented. In Dor's (22), we see the *migration of the idea of spatial organization through the practice of distribution* for the first time in the entire corpus. Dor's session ended with spatial organization very similar to the one introduced for the first time a week earlier in his discussion (20). Not only did Dor import the practice of distribution, but he also performed it fervently keeping his own 'property' on the right-hand side of the space, just as in the original discussion. As in the previous week, distribution and privatization only occurred after sixteen minutes, and yet again, Dor did this while ignoring the chronological aspect of placing his contributions. He acted swiftly, and all other participants followed his example, and made their own columns. Although Shira does not practice distribution, one practice Shira did reuse was shouting. Reviewing all of previous and parallel discussion in this corpus, we traced only two shouts prior to discussion 20; that is, the practice had no contagious effect. In fact, it was not recognized as a practice: in both two first shouting cases, the gesture did not repeat itself by the shouters, nor was it reenacted by their peers. But in Shira's discussion group (22), not only did it occur, but it was also repeated over and over again, by all three participants. The practice was recognized and endorsed immediately after Shira introduced it for the first time and became a *common and shared* practice, a real hit: twenty three shouts appeared in the discussion. In the social sense then, shouting was generated in this session.

Figure 4. Shira's group sixth day discussion (no.21, left) and Dor's group sixth day discussion (no. 22, right)

Order of Occurrence III: Endorsement

Figure 5 shows the ways discussions ended a week later. Between the sessions the class conducted a teacher-led reflective lesson, in which Dor's way of spatial organization was introduced by the teacher in the presence of his classmates (the practice of shouting was not discussed by the teacher).However, the teacher *incorrectly* referred to it *not only as spatial but also as chronological* (as if the upper boxes are the first to be created and so on). And he praised the practice suggesting that this might contribute to student's ability to reconnect ongoing discussion with adjacent contributions, and to enrich the conversation and make it more reflexive and cohesive. The following week, the teacher's incorrect assumptions turned out to be productive: four out of the five discussion groups practiced *spatial and chronological distribution*. For the first time in the corpus, and simultaneously in all four groups practicing distribution, distribution was the organizing logic of space and time right from the beginning. The contributions were posted in accordance with it. Surprisingly, the only group to act differently was Shira's, the unaware inventor of the norm (at the upper left part of figure 5). Spatially, her discussion group started with random order, reorganized into columns and scattered again before finally becoming organized. The loosely maintained spatial organization in this group was not accompanied by a chronological one.

Small-group modification of a social norm might be seen as a different, and maybe higher, level of endorsement and mastery. This is the case presented in the discussion held by Nadav, Amos, and Adam (at the lower left part of figure 5). As the session ended, we find the discussion map to be organized with two columns at the poles of the space and a boxes-made robot in the center. They started the conversation adhering to the emerging norms, and at one point near the end of the session they transcended them through play, as they started to refer to the boxes as imaginative building blocks.

Order of Occurrence IV: Consolidating the Practice of Distribution

Once repetition of social action is played out by different agents and identified as such, one might presume mastery in performing the practice (Sfard, 2008). This is the case shown here with regard to the spatial and chronological organization and with regard to the act of shouting. The final Argunaut session held two weeks afterwards. In between, the teacher did not refer to the topic and no further Argunaut session was held. In the final day, all four discussion groups acted in accordance with the norms of spatial and chronological organization. More interesting is the fact that only one group actually started with the order right from the beginning. In all three other cases, sessions began with random order up until a point where one participant called for order. *Without any further talk regarding the 'what and how*', all discussions became involved in a short period of massive reorganization of space, and all three discussions reorganized in accordance with the spatial norm endorsed. From this point on, all of the groups started posting in chronological order as well. The endorsement in these three discussions is a *social-action, based upon individual's reference to the same activity-substructure*.

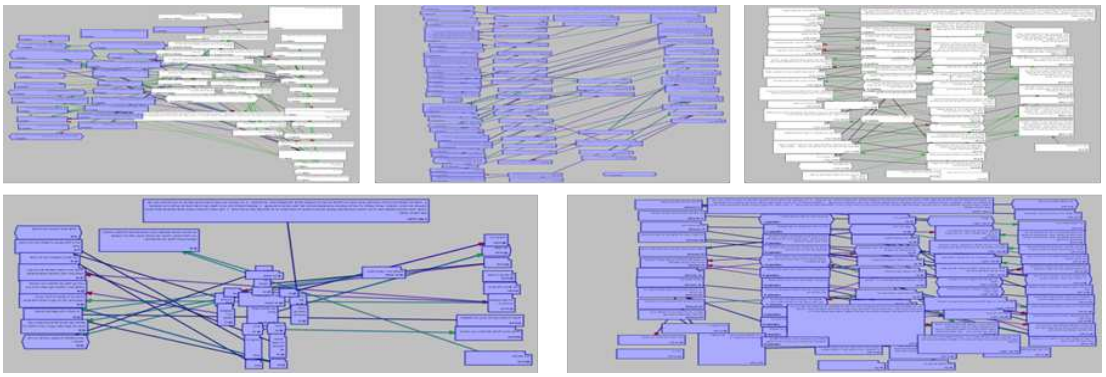

Figure 5. Group's discussion maps at the end of the seventh day (discussions no. 26-30)

Discussion

The question of ownership in conversational spaces (Slakmon and Schwarz, in press), which has been neglected from the analysis of CSCL and peer discussion, turned out to be a major factor in students' discursive behavior. Before the endorsement of the norm of distribution, *all* students treated the conversational space as public space. The question of possession did not arise at all. Everyone could have posted wherever suitable, even with squashing the other's contributions. As a result, the students' voices were not heard, and they were subject to constant squashing. There were no complaints about the squashing, but the discussions evolved with no reference to the past, that is, its latter parts. Therefore, it lost the potential it had to establish traditions, in the sense of building on each other's ideas, accumulating socially acknowledged insights and intellectual achievements.

Both squashing and shouting are egoistic solutions, and only contributed to worsening the problem, since they delete past contributions in order to be heard. Both solutions were destined to fail: the previous parts of the conversation that function as a background and as a context are preconditions that must exist if one's voice is to be heard. In this sense, all students treated the conversational space as owned by none of them, and it suffered from the classic *tragedy of the commons* (Hardin, 1968). Only after the emergence of distribution, and the introduction of the idea of ownership, did the space turned out to be part of the public sphere. Space was socially produced in the collaborative act of planning. The significant collaborative achievement of students here is realized when we see planning as an act of arranging space in accordance with the goals and principles of the power holders (Fenster, 2012). In this sense, when students are involved in the social production of space, it can be inferred that they act within it as power holders. If not, their entire discursive strategies would have been different: opposing, accommodating or subversive. Moreover, the practice of dividing space into private and public led to the decline of the earlier strategies aimed at solving the problem of the density of the space*: squashing and shouting only existed in the discussions where the students did not divide the conversational space.*

The sense of ownership has a significant effect on the way students hold discussions in the conversational space, In the public sphere in which the ritual of posting a comment awaits others to read it and

then, moving it to one's own space. This only happened when students had private space to return to. They guarded their private space and the public *at the same time* and the private and the public spaces nourished and strengthened each other. The space was divided into private and public spheres on the basis of a previous agreement on perceiving it as a collective source. Through the joint production and maintenance the private and the public, discussion thrives.

Interesting questions regarding spatial practices are answered in this paper but need further analysis, among them, the analysis of the in-groups politics of endorsement, and the question of the relations between spatial practices and discussion quality. With regard to the later, initial analyses suggest that discussions spatially organized to private and public spaces were more productive in terms of number of contributions and of contributions that functioned as knots of convergence, or of joint reference by the entire group.

Students gave up the privileged freedom of posting anywhere, and opted instead for the more restricted arrangement, regulated by the social norm of distribution. The ability to co-exist became a procedural norm and no longer was it left to the jurisdiction of each participant. This freed the students from the need to decide according to which criteria, if any, they should squash other contributions. The mere act of being in the conversational space had been ensured, and was no longer a matter of treaties, friendship, time or content. A tolerant way of being together at the conversational space gained prominence, and in so doing the students developed an enhanced way of dealing with heterogeneity without muting each other's voices.

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