# Presence, social presence and heterotopia: the self and the others in a multi-space

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The way people percept themselves and the others during collaborative activities is changeable, being shaped also by the technologies used for communication. Some scholars used the concepts of sense of presence and social presence for understanding this issue in activities mediated by technology [18]. Other scholars refer to presence as a «basic state of consciousness: the attribution of sensation to some distal stimulus, or more broadly to some environment» [15, p. 159], both real and virtual. A problematic issue in this debate consists in understanding how presence is felt within situations in which real and virtual worlds are present at the same time and participants deal with a multi-space - an heterotopia [6] - that enables many forms of interaction and communication. A possible way to analyze it is to use the concept of activity [9] and the activity system as unit of analysis [5]. The aim of the present work is to reflect on this problem using some empirical data from a collaborative activity in which teachers from different schools work together face to face, in the school laboratory, using the educational software CoFFEE. Six sessions during which 10 teachers prepared a pedagogical scenario to be implemented in school have been filmed and qualitatively analysed. Some representative excerpts are analyzed in order to clarify some aspects related to sense of presence and social presence.

***Keywords:*** sense of presence; heterotopias; activity theory; collaboration; qualitative analysis.

## Introduction

A group of teachers is participating in a course designed for making them familiarizing themselves with CoFFEE* (an educational software developed for mediating face to face interactions) and developing a shared pedagogical scenario to be used later with their students. During six sessions, teachers from different schools work collaboratively face-to-face using CoFFEE. Every teacher sits in front of a computer into the computer laboratory of the school, uses the software and discuss with her colleagues. During the fourth session, one of them — Mariangela — is in charge as coordinator of the group work and is using the controller (Fig. 1), that is an application of CoFFEE. Using controller teachers can manage groups of students collaborating with the tools offered by the program. In the picture, the teacher has selected three of the tools offered by CoFFEE: a) the cowriter, a tool used for writing collaborative texts. Selecting a name in the bar above, the teacher enables users to write one at a time; b) The Graphical Tool, a shared virtual whiteboard where conceptual maps can be drawn in groups. Each user can add contributions, which appear on the shared whiteboard as a text box that can be dragged around the screen and linked to other contributions; c) the positionometer that permits students to position themselves in a graduate scale in respect of the theme or the question proposed by the teacher.

The other teachers are using the discusser (fig. 2), the application developed for students, that reproduce in all the screens the interactive virtual space arranged by the teacher. Using controller, Mariangela can start a session and students (in this case, her colleagues) can log in the session using a nickname. When the students are logged in they appear in a little window called «groups console» (fig. 1), visible in the upright corner of the controller. While all the teachers are logging in Mariangela states: «students are you all connected? I see Loretta, Ada..», and teachers answer: «I am here»**, «I'm not»***. In other words, Mariangela is checking if all her colleagues are «present» using the group's console.

This little narration makes evident how the sense of presence — generally defined as «the sense of being there» [20] — is shaped by many factors and that the use of technologies that enable different types of participation, impact the way in which people percept themselves and the others. At a general level, Mariangela and her colleagues are dealing with two interweaving ways for feeling their respective presence: the perception of the physical existence in the same room and the perception

* More info about Collaborative Face to Face Educational Environment (CoFFEE) are available at the website http://www.coffee-soft.org/product.aspx.

** In italian they state «ci sono», that imply the reference to a specific location.

*** In italian she states «io no».

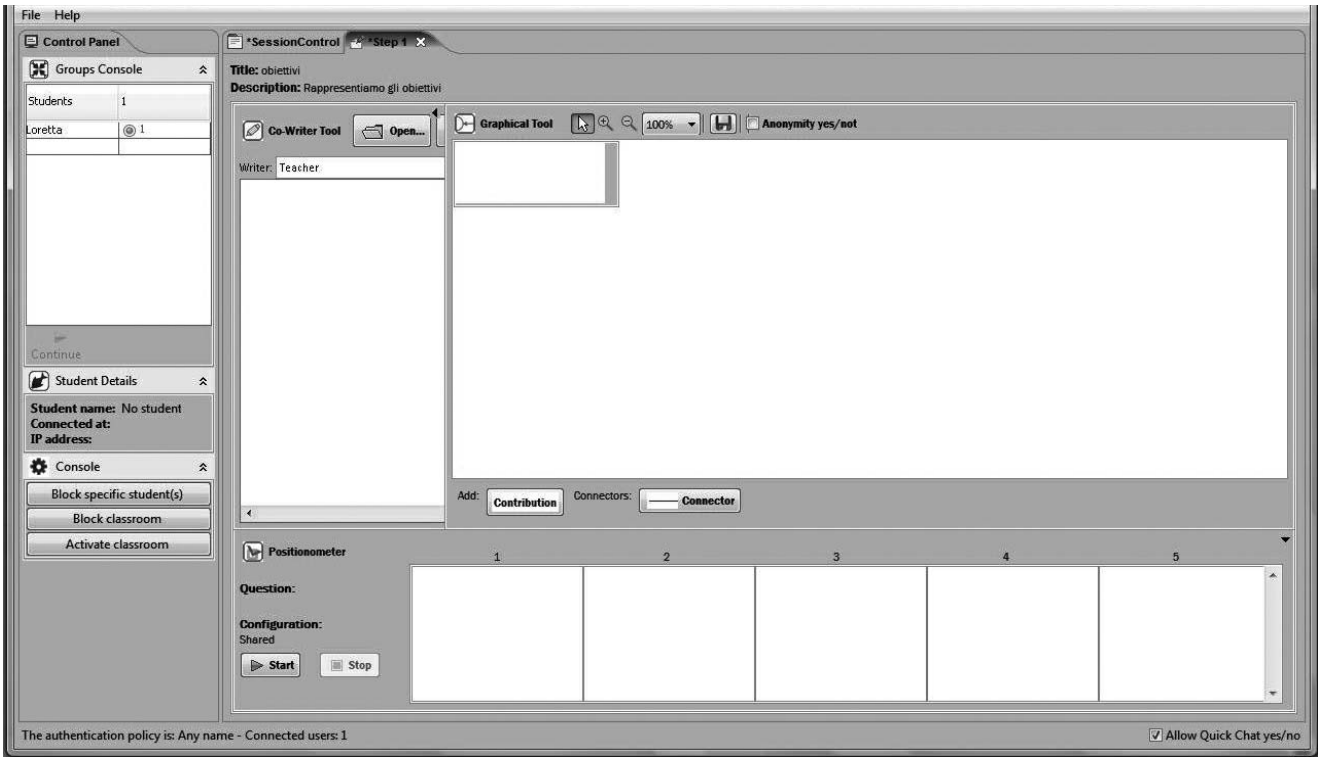


*Fig. 1.* Screenshot of Controller

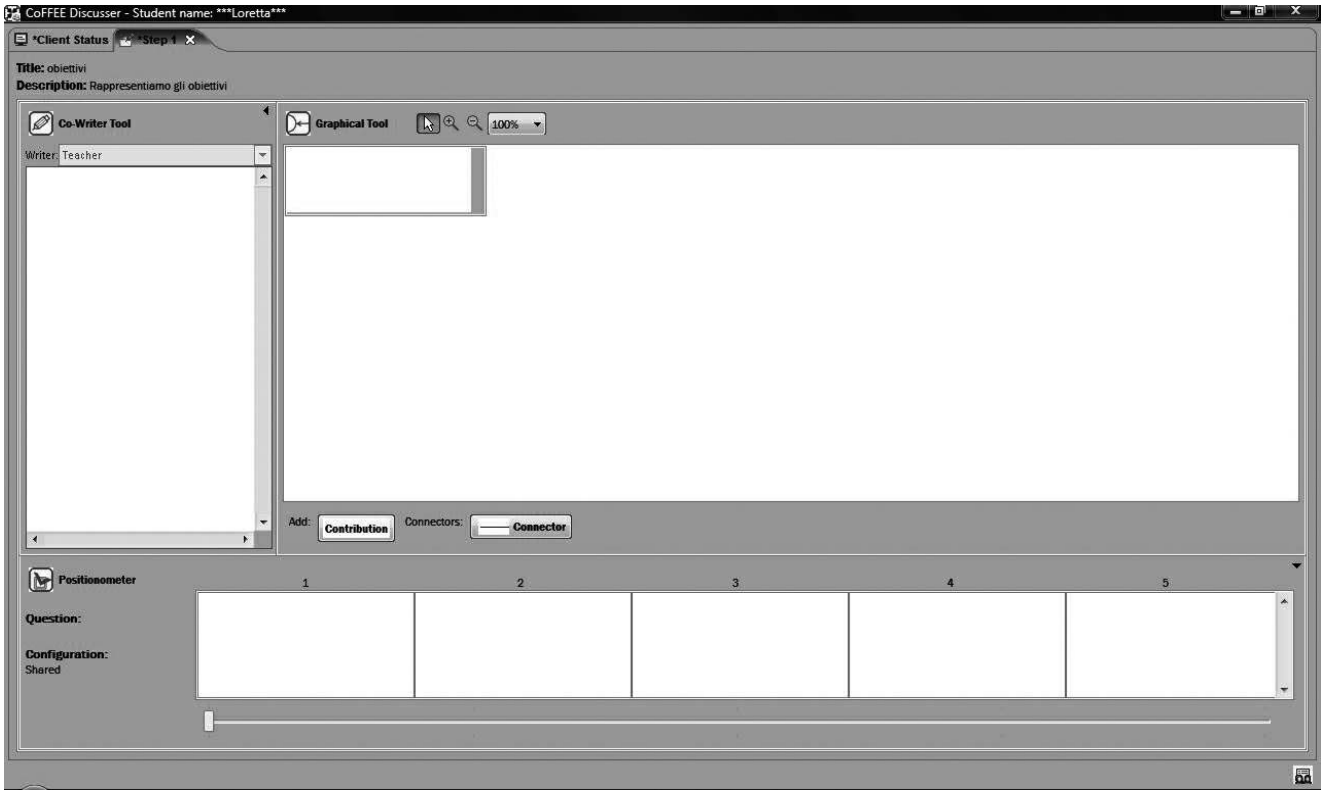


*Fig. 2.* Screenshot of discusser

of the nicknames into the group's console of CoFFEE. The second type of presence is so important for the activity that Mariangela, as the leader of the group, keeps on assuring that her colleagues are connected before beginning the session. In fact, being logged in gives the right to access the tools and the semiotic resources necessary for the activity. If not, the participation of the teachers cannot be considered complete, even if they are physically present and they can participate in the face-to-face interactions.

As stated by Biocca [2], the concept of presence can be considered a key issue for understanding the participation

in mediated activities, but at the same time it seems to be a multifaceted concept. So, before continuing the reflection by the analysis of the empirical data, it is important to answer three theoretical questions: What are presence and social presence? How are they related to participation? How is it possible to analyze them?

## Presence and social presence

The use of the word presence is not unproblematic, given that for understanding it we must keep in mind that it is often used as a shortened version of the term telepresence [15] and that telepresence itself «is a popular idea that is not well defined» [17, p. 64]. So, some clarifications are needed for using the concept. The purpose of this paragraph is not to give an exhaustive review of the use of the concept, but to clarify some aspects related to presence that are crucial for its definition.

Firstly, Steuer [20] distinguish between presence and telepresence «which refer to the sense of being in an environment, generated by natural or mediated means, respectively» [20, p. 3]. Nonetheless, many authors use presence for telepresence and usually refer to experiences elicited by technology and to theories about virtual environments [2]. In this sense the International society for presence research (quoted in [15]) defines presence as the psychological state in which individuals do not recognize the role of technology in their experience. However, as Loomis [12] stated, presence can be referred to a similar and more general concept discussed by many philosophers and perceptual psychologists: the «distal attribution» through which individuals attribute sensation to the external world. In this view, presence is a «basic state of consciousness» [15, p. 159] that is not closely related to technology and permits to use presence for understanding different kinds of experience: presence could be defined, then, as «the feeling of being located in a perceived external world around the self. This applied both to unmediated and mediated presence» [22, p. 3].

Moreover, Mantovani and Riva [13] suggest that the use of the concept of presence in literature is related to the ontological position of the author that is using it and they identify three ontologies of presence that lead to three different characterization of the concept:

1. the scholars that follow the ontology called by these authors «ingenuous realism» concentrate their efforts on physical presence: a person or an object are *really present* if they exist in a physical environment; they are *virtually present* if they exist in an environment by the mediation of a technological tool as they were physically presence. Virtual presence depends here on the appearance of the virtual world and on its resemblance with physical presence;

2. within the «ecological approach», related to Gibson's theory of perception, organism and environment do not exist independently from each other and presence is considered a relational concept linked to action: a person or an object is *present* in an environment insofar as they can undertake successfully actions in the environment and undergo actions by the environment. In this view the focus is on the implications for action rather than on appearance;

3. the cultural perspective, related to social constructivism, take up and expand the ecological approach, integrating it with the socio-cultural dimension of experience: a person is present in an environment if he or she participate in the culture-mediated and socially distributed process that makes the environment exist.

An interesting cultural perspective on presence has been developed by Riva [15] that strongly link it to agency:

presence has a simple but critical role in our everyday experience: the control of agency and social interaction through the unconscious separation of both «internal» and «external», and «self» and «other» [15, p. 160].

The author, building on neuropsychological findings, argues that people do not separate their knowledge about a place from their ideas about the possible actions that is possible to undertake in that place and from their goals. So, he defines presence as the prereflexive perception of successfully goal directed actions. On the contrary, social presence is prereflexive perception of an «enacting other (I can recognize his/her intensions) in an external world» [15, p. 160].

These definitions, and the cultural perspective more in general, lend itself to analyze situations in which it is difficult to separate physical and virtual worlds, as it is the case of our teachers. In fact, reflecting briefly on the anecdote described above, it is reasonable to argue that the sense of presence of the teachers is not (only) related to physical presence, but it is deliberately socially constructed in order to participate in a collaborative activity in which physical and mediated presence are equally relevant and interweaved. Moreover, it presents some relevant connections — sometimes made explicit by the author himself — with cultural historical activity theory (CHAT), that will be analyzed in the next paragraph and that can make possible to use the concept of activity, as developed in the soviet tradition [23], for the analysis of presence.

## Presence and activity

In Riva's construction «the feeling of presence provides to the subject a feedback about the status of its activity» [14] and the author directly uses Leont'ev (in: [22]) hierarchical organization of activity, sharing the idea that human action cannot be understood if we do not consider its multilevel configuration [15]. If presence is so characterized, teacher's action of declaring their presence can be considered as a functional part of the broader activity undertaken and understood in the light of the motives that lead their professional life. Even if in this article the focus of the analysis will remain at the level of actions and operations, it is important to consider them as part of the whole they constitute as activity.

As stated by Kozulin [9], Vygotsky [21] used the concept of activity the first time as explanatory principle for the comprehension of consciousness: for Vygotsky social laden activities are «generators of consciousness» [21]. In addition, Leont'ev [11] in his elaboration of the concept has maintained the strong relation between activity and consciousness. Riva, in a similar way, consider activity related to presence. An exhaustive discussion of the epistemological issues behind the positions of those authors and a theoretical comparison between the concepts of consciousness and presence is beyond the aims of this article, but it is important to clarify our use of the terms activity and presence: in this paper the concept of activity will be used in order to understand how people perceive themselves and the others while participating in a collaborative activity. It will be showed that such an analysis enlighten some important aspects related to coordination.

Following this thread, we will now describe some features of the concept of activity — some of them considered by Wertsch [22] the main features of the theory of activity — useful for the analysis of presence:

1) in Leont'ev (in: [22]) hierarchy, social laden activities give a cultural structure to human actions and operations. In such a hierarchy, one of the objectives to be reached is to coordinate the various actions carried out by the participants of the activity. In this endeavour for coordination, presence and social presence play a crucial role and activity theory gives a useful framework for analyzing it;

2) the notion of goal-directedness of actions claimed by Leont'ev (in: [22]) permits to characterize the concept of presence as a relational concept: if persons act in order to reach objectives, their sense of presence has to be understood in relation to these objectives and their fulfilment. In other words, the way in which a person projects structure on the external world [8] and percept themselves in the world is considered as embedded in practices and sensitive to motives and goals that give reason for them. In particular, it is worthy to distinguish between the role of the motive and the role of the objectives. In fact, while the motive defines the sense of the activity and gives to the activity its direction; the sense of presence, being involved in the monitoring of the state of an ongoing activity, is related to the level of actions and it is sensitive to the fulfilment of the intermediate goals. So the relation between sense of presence and sense of the activity can be considered hierarchical as the relation between motives and goals;

3) Vygotskian concept of mediation makes clear that human beings use material and psychological tools in order to reach their objectives. If we consider the «context» [4] have an action as a physical/symbolical/cultural space filled in with cultural artefacts, presence become a relational concept that contain the bond between the subject and the context in which he or she acts. In other words, answering the question «where am I?», presence could be considered a key concept for understanding how people «segment reality» [1] and use the artefacts present in the environment in order to carry out object directed activities. In this sense, presence is strictly linked with the concept of chronotope as it has been used elsewhere [10];

4) activity theory's emphasis on genetic explanation can be considered a base and a further expansion of this work. In fact, the ontogenetic and phylogenetic origins of the sense of presence are not investigated here. We take for granted that presence is «a neuropsychological phenomenon, evolved from the interplay of our biological and cultural inheritance» [15, p. 6], being that experiments in peripersonal space confirm this claim [14]. This article, instead, focus at the micro-level of actions and operations and on the role that presence play in some significant moments of a collaborative activity carried out in a complex environment — an heterotopia [6] — as the one described in the introduction. However, it is clear that presence is shaped by the configuration of the activity and our aim is to discuss how some aspects of the activity, in the here and now of the interaction, generate a particular form of presence.

## Presence and heterotopia

In the beginning of this article, we started with the description of a situation in which different kind of spaces were overlapping. These spaces are defined by participants while interacting with the environment and transforming parts of the context in a resource for action. In that process of space definition, activity have an important role. In fact, on the one hand, parts of the physical environment irrelevant for the activity are not considered at all by the participants, and on the other hand, participants actively arrange artefacts — like handbooks containing notes or the virtual space generated by the software — that become semiotic resources for the activity. Indeed, the context of the activity is constituted by heterogeneous spaces arranged by the participants in line with their objectives. In Foucault's [6] language, it constitutes a heterotopia, defined as «juxtaposing in a single real place several spaces, several sites that are in themselves incompatible».

This concept, if applied to our context enables us to consider the school as a highly complex heterotopia in which heterogeneous physical, relational, organisational, cultural and virtual spaces overlap. As in a cinema, where the audience and screen spaces overlap, or in a library, where the physical space overlaps with both the timeless space of the written pages and the «historicised» space of the culture laid down within those pages, so in a school we can see a complex overlap of heterogeneous spaces, both in the classroom and in other working spaces — laboratories, textbooks, computer labs or informal meeting places such as the corridors or the playground.

Foucault's conception of space is valuable for better understanding the issue of sense of presence. In fact, using this concept it is possible to readapt the definition of sense of presence given above and focus on its rela-

tional aspects that in Riva's definition remain implicit: sense of presence is, then, the perception of successful goal directed action carried out in a specific selection of the overlapping spaces of an heterotopia.

This definition maintains the original characterization of the concept, but adds to it the explicit reference to a specific context. So, when we talk about sense of presence, we refer to the space — or the spaces — relevant for the interaction at a given moment.

The starting point of this vision is socio-constructivist. In fact, according to this approach, people interactively construct the realities in which they live, developing symbolic, sense-filled «possible worlds», while they act in their physical, social and cultural environment [3]. These possible worlds constitute themselves as heterotopias in which physical, symbolical and cultural spaces coexist and people actively negotiate the spaces relevant for their inter-actions.

The construction of these possible worlds is strictly related to activity and its motives and it reflects the negotiation that take place between individuals and between them and their environment, but also the broader social phenomena that have to do with the historical evolution of the social practices and the culture of a community. Therefore, even if in this paper the focus will be on the micro-level, it is important to take in account the expansion of the unit of analysis described by Engestrom [5] in the second and third generation of activity theory. In fact, as pointed out by Spinuzzi [18, p. 28] often researchers specialized in a field search the crux of the problem only at one level of analysis. The author argues that it is important to «integrate research scope» and to examine workers' labour at different levels because single-scope methods «tend to produce design solutions oriented to that level of scope». An expanded unit of analysis that comprise the subject and their socio-cultural environment composed also by communities, artefacts, rules and division of labour, then, if treated as a multilevel system as theorized by Leont'ev (in [22]), and clarified by Spinuzzi, make possible to understand the complex processes underlying human life.

## Back to the teachers: the context of the research

The data analyzed in the following paragraph consist in video records and software logs from a training course for a group of secondary school teachers, during which they familiarized themselves with a software suite designed to support face-to-face interaction. The aim of this activity was to jointly develop a shared educational scenario on career guidance to be subsequently implemented in the classroom. The course required six sessions, with the voluntary participation of 10 teachers, all women, from different schools, who were attending a Master's degree on career guidance. Once they are awarded the Master, the teachers should be able to offer career advice and guidance to their students and will take on the role of career teacher in their school. The use of a software program and the planning of a classroom activity were proposed as a Masters training assignment with a strong effect on the acquisition of professional skills, both technological and concerning career guidance. During the six training sessions, the teachers became familiar with the software package and worked in groups in order to develop a pedagogical scenario, in which the topic of further education and careers was treated as a problem-solving activity. In the first three sessions, the objectives were discussed and the various tools in the software package illustrated. The last three sessions were devoted to the development of the usage scenario.

This corpus was firstly analyzed in order to understand the space-time management of the teachers using the concept of chronotope [10]. During the analysis, other aspects of the interaction attracted the attention of the researcher and other theoretical concepts revealed themselves to be useful for understanding some interesting issues. This article is the result of this kind of follow up succeeding the main study and its aim is not to present a complete and full designed research, but to discuss the role of presence in some interaction that permits to clarify some issues related to coordination.

## Presence and coordination

In the introduction of this article, we split presence in two aspects: physical presence and virtual presence. After the theoretical discussion, it results that the distinction is not perfectly satisfying. In fact, in this article the sense of presence is related to the ongoing activity and it is characterized as a psychological process and a social creation: from a psychological perspective, the subject feels his presence insofar as he or she percept his or her actions into the context relevant for the activity; as a social construct, during collaborative activities, presence is negotiated between the participants (as the teachers were doing in the situation descript in the introduction). Therefore, it is not satisfying to say that a teacher is present if her name appears into the groups consol of CoFFEE and/or her body exists into the room. The condition for presence is that the process of social negotiation should generate the sense of presence and the social presence necessary for the participation in the activity. This process is realized in this case by the little dialogue described above, but also by the actions undertaken by all the teachers while sitting in front of the computer, taking relevant artefacts as block notes and books from their bags and logging in. In other words, teachers do not declare their presence, but they actively generate it setting up a configuration of participation that they believe useful for reaching the object that motivate the activity.

That process of social negotiation is not always linear and undisturbed. On the contrary, often it brings tensions and disorder, as it is the case of the excerpt presented below. It is extracted from the third session of

the training — the session preceding the one sketched in the introduction. During this session, the teachers were discussing the objectives of the pedagogical scenario to be implemented in their respective classrooms. The creation of the scenario was the object of the entire training and a description of it was the main outcome. In order to discuss the objectives of the scenario, teachers were requested to represent them in the graphical tool of CoFFEE. They were totally free to decide the number of the objectives, their possible link with each other and the general organization in the space.

The configuration of participation during the discussion was problematic for a series of reasons. Firstly, the order of the computers into the school laboratory was shaped as a horseshoe so teachers were giving their back to their colleagues. For this reason, during the major part of the verbal interaction teachers were looking the screen without seeing their interlocutors, while in some moments in which the verbal communication seemed to be crucial some teachers turned themselves toward each other and/or moved from their seats and approached their colleagues' workspace.

Secondly, the combination of tool selected by the researcher was so organized:

1) in the up-left part of the screen teachers could see and use the graphical tool described in the beginning of the article (see fig. 1);

2) in the up-right part of the screen there was the threaded chat, a tool organized like a forum that permits to create different thread of discussion and carry out thematic discussions. This tool was not used at all during the session because the teachers preferred verbal communication for the thematic discussion about the objectives, so this tool is not relevant for the interaction and will not be described in detail;

3) in the bottom part of the screen there was the repository tool, a tool that permits to share files into the network of computers created by CoFFEE. This tool was used in order to share some files in the beginning of the session. Among these files there was the file containing the results of the brainstorming about the possible objectives of the scenario elaborated during the preceding session. They used this list as a resource for the discussion. In the beginning of the session, the teachers used the repository for saving on their computer these files and opened them using Microsoft Word. After that, the repository became irrelevant for the activity.

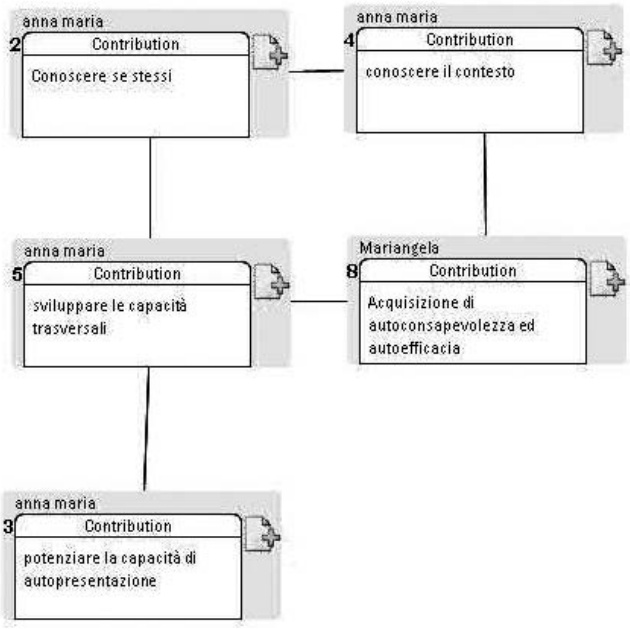


*Fig. 3*. The conceptual map

Unfortunately, the security settings of the computers in that laboratory blocked the creation of the log and it is impossible to visualize how the map was like in the exact moment of the interaction but when the researcher realized that the log was not working, he manually created a copy of the map as it was in the end of the session. The final map is represented in fig. 3 and it maintains the features necessary for the analysis.

The excerpt has been extracted from the final part of the session, when the map was almost in its final form. Teachers were using the shared space of the graphical tool as the main space for the interaction. They were modifying the map adding new contributions or editing existent ones and their individual sense of presence was focused into that virtual space. That shared space, however, do not offer any cue for the perception of the social presence, if not that you suddenly see contributions changing, moving or disappear. At a certain point of the interaction, Mariangela exclaimed:

Excerpt 1

1. Mariangela: no, it looks a mess
2. Giuseppe: what?
3. Mariangela: ((non audible words, followed by a laugh))
4. Loretta: it's because they should be numerated
5. Mariangela: because if we have eight steps and they are progressive and here we overlap
6. each other while we're writing we already deleted the numbers and they are gone ((two non
7. audible words)) this should have been three and became six this should have been seven
8. here I had put seven but it comes as five
9. ((overlapped and not udible words for 5 seconds))
10. Mariangela: because it is useless if we go and put well she put two into there (0.8) no it is
11. necessary to be well coordinated in order to do a good group work because this is a crazy
12. group work

It is clear from the excerpt that Mariangela and Loretta were unhappy with the map they were elaborating (lines 1 and 4) and Mariangela saw the crux of the problem in the issue of «coordination» (line 11). In fact, they were overlapping each other and no one of them could realize the map she had in mind. But why they were overlapping? Why was it impossible to be «well coordinated» in this group work? Probably, accordingly to Spinuzzi [18], there is not a crux of the problem but a series of possible solutions.

A possible answer is that there was not enough communication between the teachers, so that they were not

able to reciprocally adapt their actions. In this sense, teachers started behaving, as they were alone in the shared space. They felt strong sense of presence seeing their thoughts appear into the map, but it was undermined when they saw the map changing without having the possibility to control these changes and realize the map they had in mind. Their agency was undermined by the actions of someone else. They do not recognized the social presence of their colleagues into the tool and they do not accepted that a generalized other was modifying *their* own space. An information designer probably would have seen the crux in the fact that the tool does not permit to visualize the actions of the other participants, but only the final results of them when they are completed. Following this view, making the actions of the others visible could have made easier the coordination.

However, a pair of minutes after the dialogue in the excerpt 1, Mariangela stated: «work group is to talk, to coordinate and to say ((two non-audible words)) wait your turn». So, at another level of analysis that do not focus only on what happens into the graphical tool, teachers had the opportunity for coordinating with each other by using verbal communication. Mariangela was proposing that they should proceed into the graphical tool as they usually do during conversations: taking turns. In this way, she was creating a rule for the displaying of agency into the map and so she was socially negotiating how to regulate presence into the activity.

*Fig. 4.* The teachers at work

In this perspective, two different spaces of an heterotopia became relevant at the same time, i. e. the space of verbal conversation and the space of the graphical tool, and to be present in one of them became important in order to get the right to be present in the other.

In conclusion, fig. 4 represents the teachers few seconds after the dialogue discussed above. It is clear that some of the teachers left their computer and approached Mariangela's desk. Here and in other occasions, they felt that in order to participate in the verbal interaction they had to be physically close to their interlocutor. This happened especially in critical moments, when the tension was strong. In particular, Angela (standing in front of the computer) was using all her body — by the practice of pointing [7] — in order to assert herself. Doing so, she selected a particular space framework in which physical presence was strategically used in order to indirectly participate to the map construction. She constructed another framework of presence for the interaction.

## Conclusions

This article shows that the combination of the concepts of heterotopia and presence can be functional in order to analyze coordination during collaborative activities. Starting from a constructivist viewpoint, we argue that to use presence in this way can permit to overcome some problems related to the terminological confusion about the concept. In particular, some features of the concept of activity have been used in order to characterize the concept of sense of presence.

Nevertheless, the reflections presented here do not have the characteristic of orderliness required by a fully developed scientific framework, but they can be considered as an attempt to explore the concept and to show how activity theory can give some insights for its characterization. In particular, the selection of the unit of analysis is a problematic issue and deserves a reflection and discussion that is beyond the aims of this explorative work. We consider this article the starting point for a further development of the perspective described, linking the concepts of presence and chronotope as complementary tools for the analysis of space-time management.

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# Присутствие, социальное присутствие и гетеротопия: Я и Другие в мульти-пространстве

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То, как люди воспринимают себя и других во время совместной деятельности, является изменчивым, а также формируется технологиями, используемыми при коммуникации. Некоторые ученые использовали понятие «ощущение присутствия и социального присутствия» при интерпретации этого вопроса в деятельности опосредованной технологией [18]. Другие ученые ссылаются на присутствие в качестве «основного состояния сознания: присвоение ощущений некоторым периферическим стимулам, или в более широком плане некоторой окружающей среде» [15, с. 159], как реальной, так и виртуальной. Проблемным вопросом в этой дискуссии является понимание, как присутствие ощущается в случаях, когда реальный и виртуальный миры представлены одновременно, и участники взаимодействуют с мультипространством — гетеротопией [6], которое активирует множество форм взаимодействия и коммуникации. Одним из возможных путей для анализа его заключается в использовании концепции деятельности [9] и системы деятельности в качестве единицы анализа [5]. Целью настоящей работы является рассмотреть данную проблему с помощью эмпирических данных о совместной деятельности, в которой учителя из разных школ работают вместе, лицом к лицу, в школьной лаборатории, используя образовательное программное обеспечение CoFFEE. Шесть сессий, в ходе которых 10 учителей подготовили педагогический сценарий для реализации в школе, были сняты на видео и качественно проанализированы. Несколько репрезентативных отрывков были проанализированы в целях уточнения некоторых аспектов, связанных с ощущением присутствия и социального присутствия.

***Ключевые слова:*** ощущение присутствия; гетеротопии; теория деятельности, сотрудничество, качественный анализ.