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Managing Work at Several Places: Understanding Nomadic Practices in Student Groups

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Abstract

Within Swedish universities students are often required to work in groups to collaborate on projects or to write essays. A salient feature characterizing this type of work is the lack of a stable and fixed location wherein project-related activities can be carried out and accomplished. Thus, by regarding students as instances of nomadic workers, this thesis investigates the nomadic practices in the context of their group work, with particular attention to issues related to collaborative and coordinative aspects. Although the lack of a stable office has, somehow, always characterized students' activities, the spread of mobile technologies raises relevant analytical issues concerning the relationships between individuals' practices, the use of particular technologies and the physical environments in which interactions may occur.

In this regard, this thesis provides an example of how a philosophical conceptualization of place as the product of human experience can assist in exploring: (a) the relationships between students' activities, the locales they work at, and the situated use of specific technological artifacts; (b) how students occupy and experience places, by investing them with activities, meanings and values; (c) how different physical environments constrain and shape the way activities are performed.

The data were collected by means of ethnographically-informed methods during two different field studies for which two design courses, held at a technical university, had been chosen as settings. Within both of them, the participants were to develop a prototype of novel IT technologies, and to account for the evolution of their projects by means of

a report. The two studies aimed at understanding: (a) how students organize their activities at a number of locations, and how it reflects on the activities they engage with; (b) the strategies they adopt and the technologies they use to overcome problems deriving from the lack of a stable workplace, (c) the different ways a workplace is practically created, how it emerges from students' interactions with the environment they inhabit, and how it is mediated by the technology they use (place-making). Observations, field-notes, video-recordings, semi-structured interviews were used during the phase of data collection. Some participants were also asked to fill in a diary and to take pictures of the different sites used for their project activities. In addition, a workshop, organized as a focus group, was arranged in order to unpack issues concerning students' usage of various technologies, with respect to number of people involved, ongoing activities and the related chosen locations.

The data analysis suggests that taking into account the way a place is disassembled and the way nomadic workers manage to move out of it is central to an understanding of their work practices. Moreover, it shows that the participants experienced planning the division of work as essential in order to manage coordination and collaboration within the groups, to organize collaborative and individual activities, and to allocate them to differing physical places.

Furthermore, this thesis outlines in what way a focus on place may assist designers in reflecting on the design of educational environments, and of technological artifacts enabling students to share and integrate heterogeneous sources of information.

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Table of contents

A Chiara Rizzo

1 Introduction

This thesis explores the nomadic practices of university students engaged in project work. The lack of a stable and fixed location wherein project-related activities can be carried out and accomplished, and the consequent need to move between sites, constitutes an initial reason to consider students as instances of nomadic workers. Nevertheless, as argued throughout this work, the variability of spaces and individuals' physical mobility are not to be considered as the only relevant aspects in an analysis of nomadic work. This particular understanding of being nomadic is central, for example, in anthropological investigations of nomadism (see, for instance, Iron et al., 1972; Johnson, 1969), which generally draw attention to the number of factors (e.g. water sources, rainfall, vegetation and pastures, herd composition, socio-economical organization) that may determine the degree of nomadism of a particular tribe or community.

This thesis is a contribution to the field of Computer Supported Cooperative Work (CSCW), traditionally devoted to understanding how people use tools and technologies to collaborate and communicate with each other (Bannon et al., 1989). Thus, the setting explored herein radically differs, for example, from a community of pastoral nomads. However, considering nomadism as a continuum between sedentary societies and "pure" nomadic ones (Johnson, 1969), and as the outcome of heterogeneous factors has been a source of inspiration for this work.

With respect to this point, I have therefore analyzed existing accounts of nomadic work to illustrate that its investigation encompasses aspects such as: (i) the mobility of artifacts (Eldridge et al., 2000; Lamming et al., 2000; Luff et al. 1998); (ii) understanding the social interactions enabled by being mobile, and the different types of information people may need for different tasks at differing locations (Büscher 2006; Perry et al., 2001); (iii) understanding the spatial, temporal and contextual dimensions of individuals' mobile practices (Kakihara et al., 2001; 2002), but also aspects of experience related to the physical environment and to the use of tools and resources (Bartolucci, 2006); (iv) understanding the interactions between technologies and places, and how place and work can mutually shape each other (Perry et al., 2001a; Brown at al., 2003; Laurier et al., 1998).

To express it in other words, the research presented in this thesis draws on two tenets. Firstly, considering "*mobility*" *as an aspect of "nomadicity"*; secondly, characterizing nomadicity as *work bound to different places* (Bartolucci 2006; Brodie et al., 2001a; Brown et al., 2003; Ciolfi et al., 2005; Wiberg, 2001), rather than on the move, independently of any physical location and spatial constraint (Kleinrock 1995; 1996). The latter approach constitutes an essential underpinning for this thesis, which, in this regard, explores how a philosophical conceptualization of place can assist in investigating the relationships between locales and activities. More specifically, I suggest that Casey's (1993; 1996) notion of place as an event, and as the product of human experience alongside four specific dimensions – physical, psychological, social and historical – can provide a methodological and analytical framework to investigate the complexity of students' nomadic practices. Throughout this thesis, I argue that such a notion can help to understand how physical environments may constrain, determine and shape the way project activities are performed, but also the way students occupy and experience sites, by investing them with activities, meanings, feelings and values.

At the outset of the analysis, a number of categories such as "coordination", "collaboration", "role of supervisor", "use of groupware" "use of email" was identified (for more details see Normark et al., 2005). Although these categories were obviously relevant with regard to the groups' projects, the main challenge encountered was to make sense of them in relation to the students' nomadic practices and not, for instance, in relation to the temporal evolution of a single group's work-processes. In this regard "place" has been useful to draw a coherent picture of relevant

CSCW issues in relation to the lack of a stable site for work, and to understand how students organize their activities at a number of locations.

1.1 Understanding nomadic practices in groups of students

The research presented in this thesis was conducted within the *Nomad Project*, a four-year research project funded by the Swedish Research Council (VetenskapsRådet). The project drew on an initial characterization of students' nomadic practices that can be summarized in terms of variabilities: (a) variability with respect to *location* – project activities can be carried out at school, at home or at any other place; (b) variability with respect to *duration* – the time at disposal for work can vary from some minutes (a corridor encounter, for instance) to some hours (a planned meeting); and (c) variability with respect to *participation* – some tasks can be accomplished individually, while others can be carried out with some of the group members or with the whole group.

Against this original backdrop, the project objectives were: (i) to study students' group activities – namely collaborative writing and collaborative programming – by drawing particular attention to the nomadic practices embedded in them, and how they can shape the work performed, with particular regard to its coordinative and collaborative aspects; (ii) to envision new technological artifacts supporting university students' group work.

My participation in the Nomad Project coincides with its beginning, and my contribution to it has mainly been methodological and analytical. In this thesis, I will first present the methodological and analytical framework that has assisted me in investigating nomadic practices as bound to several sites. I will then continue by illustrating how such a framework may be adopted and used to highlight the salient features of what being nomadic entails in the context of student group projects.

1.2 Research questions

The research questions this work seeks to examine are the following:

- How is it possible to study nomadic practices, both on a methodological and on an analytical level?

- What does being nomadic mean in the context of the students' collaborative activities studied, in particular writing and prototyping, and how does it reflect on the group activities students engage in?
- How do students turn the locations they travel to into places suitable for their work?
- How do students manage and organize their work at several locations and how do they use technologies and artifacts to do so?

Choosing students as instances of nomadic workers was motivated by various reasons. First of all, the lack of a stable and fixed place within the campus boundaries for carrying out project activities, and the consequent concern to manage them at a number of locations (including working at home and in public places, individually and in groups), suggested that their practices might encompass relevant nomadic aspects, without necessarily involving long-distance traveling. In section 1.4, I will come back to this point and explain its relevance for CSCW research. Secondly, since today's students will be tomorrow's workers, investigating their experience and the use they make of mobile technologies may be relevant to envision the role that new technological artifacts could play for tomorrow's professionals.

Readers of this thesis should keep in mind that learning aspects are not central foci of analysis, and that this work is not about mobile learning (see, for instance, Sharples et al., 2002; Taylor et al, 2006). I will, therefore, not aim at examining learning processes through the description of students' activities, nor will I attempt to investigate how information is co-elaborated and transformed into knowledge in a nomadic setting. My objective is to draw attention to the conditions, the setting in which group activities take place, rather than assessing the quality of the different group assignments. Nevertheless, by regarding students as workers and their group activities as work, I do not intend to overshadow the learning aspects inherent in them. On the contrary, the choice to focus broadly on the context in which learning takes place could be related to a body of research approaching learning as accomplished by doing, by actively engaging in social practices (Lave et al., 1991) and in real project activities (Koschmann, 2008).

Finally, it should be noted that, even though a design focus is not a main contribution, an orientation toward the design of technologies and of educational environments for university students underlies the present research. Thus, while the analytical work is meant to inform design, it is informed by the same design orientation (see for instance, Blomberg et al.,

2003). This aspect is particularly relevant with regard to two different issues. On the one hand, it foregrounds a concern to explore the relationships between activities, places and technologies; on the other hand, it influences the representation of the activities observed and of the nomadic practices embedded in them. In Chapter 4, I will discuss and motivate the choice of using vignettes to represent the fabrics of the practices studied both to assist the related analysis, and to support the exploration of design possibilities.

1.3 Understanding nomadic practices in groups of students: the field studies

In order to pursue the research goals introduced above, two field studies were conducted (sections 4.2 and 4.3) and a design-oriented workshop was organized (section 4.4). All the students who participated in the fieldwork were attending design-oriented courses and they were to envision the novel design of information technology. In order to study their work activities and their nomadic practices in their natural context, ethnographic methods – free observations, video-recordings and semi-structured interviews – were adopted (Hughes et al, 1994; Blomberg, 1995; Blomberg et al., 2003). Moreover, students were asked to keep a diary and to take pictures of the several places they worked at, while some of their working documents were collected.

As a complement to the field data, the goal of the workshop was to explore students' experience of working in groups, their use of various mobile technologies, and to brainstorm early design ideas. Therefore, the first part of the workshop was arranged as a *focus group* (Preece et al., 2002) in which the participants had the opportunity to discuss and share their own experience of collaboration related to course projects. The second part, influenced by a Participatory Design approach (Ehn, 1993), involved the participants in an active and direct exploration of design ideas and of the particular work situation in which they could benefit from specific functionalities.

1.4 From a single workplace to a number of places for work

The understanding of work and its mediating technologies has been a main concern for CSCW research, and workplaces such as centres of

coordination (Karsten, 2003; Normark, 2005; Suchman, 1993) and small offices (Rounchfield et al., 1995) have been typical sites for CSCW researchers to study and design for. At the same time, however, the increasing interest in *nomadic work* (Bartolucci 2007; Bergqvist et al., 1999; Brodie et al., 2001a and 2001b; Brown et al., 2003; Kakihara et al., 2001; Su et al., 2008; Wiberg, 2001) reveals a shift of focus towards settings that do not assume stable working hours or working places, but still retain essential, collaborative aspects. The panel discussion (Pipek et al., 2007) at the 2007 European Conference on Computer Supported Cooperative Work (ECSCW) – tackling issues such as the usage of mobile devices, work-life balance and the blurry barriers between private and working hours or private and working usage of technologies – reflects the partial, ongoing migration of work outside traditional, well-defined workplaces that have traditionally been analyzed by CSCW research (Hughes et al., 1995).

The setting presented in this thesis differs from traditional CSCW settings. As argued elsewhere (Bogdan et al., 2006), the main differences are to be found in the organization of place, in the use of tools and technologies, in work organization and routines and in the role played by each of the actors involved. First of all, in work environments such as centers of coordination (Suchman, 1993), place is usually designed *ad hoc* for specific activities. In a control room, for instance, the organization of the physical space and of the supporting tools are essential for the performance of tasks (Normark, 2005). In contrast, in the case of students, no physical space is usually assigned to their project work, which could take place virtually anywhere. The choice of a meeting place varies with the tasks to be accomplished, and places are often adapted to the ones at hand. Secondly, in environments such as control rooms, technologies supporting well-defined activities are provided by the organization and available all the time. As we will see, for students the choice of what technology and application to use is quite open, and often negotiated at the outset of each project. Finally, in centers of coordination, the work is strictly organized by rules and regulations and, in many cases, supervised with scrutiny. The work is often managed by teams, or by shifts of people and characterized by specific routines that actors rely heavily on. For students, project activities are organized as well, however, the lack of formally assigned roles makes it problematic to know in advance who will do what and when they will do it.

Furthermore, students' project work is strongly characterized by a blurry separation between working and non-working hours. Thus, working late at night, both within the university campus or at home is a common

practice, especially when deadlines are approaching. The alternation between co-located, collaborative sessions and distributed, individual ones is another significant aspect. Both aspects present some interesting challenges for the observational fieldwork, both on a methodological and analytical level. On the one hand, it might not always be feasible for the researcher to be present, late at night, in one of the university computer labs, or at some students' home. On the other hand, if a group's co-located working sessions can be observed and studied by an observer, following the single participant raises some problems in term of resources. In such cases, the only way to avoid choosing whom of the group members should be shadowed to the next workplace, where s/he will engage in individual work, would be to have as many researchers as the members of the group. On an analytical level, the main challenge is to hold together the several places at which the participants work, to understand the relations between different activities occurring at several locations, but also to make sense of fragments of the same activity undertaken at various locales.

In Chapter 3 and 4, the aforementioned issues will be addressed in details. For now it will suffice to underline that investigating a nomadic setting points to: (i) a shift of focus from work as carried out by a single cooperative unit to work as continuously distributed between differing configurations of subgroups and individuals; (ii) a shift of focus from work carried out within a single workplace to work being accomplished at a variety of locations that, differently from the "traditional" office, are neither assigned to a particular group nor project.

1.5 Contributions of this thesis

This work contributes to the field of CSCW by:

- Exploring in what way a philosophical conceptualization of place can be used as a methodological and analytical framework to understand nomadic work. It should be noted that this framework is not meant to be a rigid schema for categorization, but rather a flexible tool to assist in investigating and making sense of nomadic practices.
- Identifying aspects of nomadic work that may be useful for future analysis and design.
- Discussing two qualitative studies of university students as a particular cohort of nomadic workers.

- Outlining in what way the place-framework could be relevant for design.

1.6 Outline of this thesis

This thesis consists of seven chapters, including this introduction. In Chapter 2 and 3 the stage for the empirical work is set, by arguing that nomadic practices should be regarded as situated at various places. It should be clarified that the word "situated" is not used to convey the tension between abstract plans and actions enacted in the context of particular, concrete circumstances (Suchman, 1987). By using the expression "situating nomadic practices" I seek instead to emphasize a possible approach to them as bound to different places, rather than independent of physical locations and spatial constraints.

In Chapter 2 different accounts of nomadic work are introduced. In so doing, my objective is to illustrate that physical mobility is only one aspect of nomadicity, and to outline a number of relevant issues involved in the understanding of nomadic settings.

Chapter 3 presents how place as a theoretical notion has been studied and characterized by different disciplines, such as anthropology, philosophy and humanistic geography. In this chapter, I suggest that the conceptualization of place as an event (Casey, 1996), and as the unfinished outcome of people's experience alongside specific dimensions can provide a *methodological and analytic framework* to make sense of nomadic work. More specifically, I argue that the emphasis on the emergent nature of place can assist understanding place-making activities, while the different dimensions can help investigating the relationships between students' activities and the places wherein they are undertaken.

In Chapter 4, the setting studied is introduced and the methodological approach adopted during the fieldwork is further discussed. Chapter 5 provides a detailed account of the collaborative writing and prototyping activities observed, together with a first characterization of the nomadic practices embedded in them. In Chapter 6, the findings are analyzed by drawing on the place-framework elaborated in the third chapter. Firstly, I discuss how place *happens*, how it emerges from students' interactions with the environment they inhabit, and how it is mediated by the technology they use *(place-making)*. Thereafter, I seek to highlight how *places are managed*, which are the strategies adopted and the tools used to overcome the problems deriving from carrying out group work at several locations.

Finally, in Chapter 7, some design reflections concerning the design of learning places enhanced by technological artifacts are raised.

2 Perspectives on nomadic work

In this chapter, I will provide an overview of previous and current research on nomadic work, highlight different strands and approaches and relate them to my own work. In so doing, my main objective will be to begin outlining the various aspects involved in the understanding of nomadic work, aspects to be used as a starting point in the analysis unfolded in this thesis.

The adjectives nomadic and mobile have become widespread keywords in the fields of Human Computer Interaction (HCI), Computer Supported Cooperative Work (CSCW) and Ubiquitous Computing. A recent issue of the journal *Interactions,* primarily focused on Mobile Media (2005), and a panel talk at ECSCW'07 (Pipek et al., 2007), addressing how the usage of mobile technologies may expand and redefine accounts of work contexts, are indicators that the interest in nomadic practices is permeating these areas of research.

Before introducing the details of various research efforts, I would like to anticipate an important conceptual issue emerging from the literature review and subsumed in the questions below. *What does it mean to be mobile and what does it mean to be nomadic? Is it possible to identify any differences between the notion of mobility and the notion of nomadicity?*

The body of research I am about to present seems to suggest that the two notions are often used interchangeably, while their conceptual differences and what their respective meanings encompass are often undefined. A specific conceptualization of nomadicity, and of its relations

to the notion of mobility underlies this work. As reported elsewhere (Bogdan et al., 2006), a first analysis of student group work supported an initial conceptualization of nomadicity as characterized by *discontinuities* – that is changes occurring in the work settings, in the group work, in the group organization, in the physical environments, in the tools and in the technology supporting work activities. In this perspective, the *variability of space* and the related *physical mobility,* necessary to move between different locations, are regarded as only two of the features of nomadicity. Moreover, discontinuities are not considered separately, but with respect to how they may intertwine with each other. Spatial discontinuity, for instance, experienced while moving from a work location to another, may be interrelated with technology discontinuity. Thus, by moving to another locale, the technology used to carry out a set of tasks might change and, conversely, the choice of the site to work at might depend on the technology and resources available in there. To put it in other words, in this perspective *mobility is regarded as an aspect of nomadicity*.

Although a broad corpus of research has explored mobility as a multifaceted notion (Bartolucci, 2007; Brodie et al, 2001a; Brown et al., 2003; Luff et al., 1998; Kakihara et al., 2001 and 2002), and not merely as a matter of physically moving around, I will use the term nomadicity to address the analytical complexity of such a notion. In fact, the adjective nomadic, rather than mobile, seems to lend itself to better convey the various layers of meanings inherent in this type of work.

This conception is central in anthropological investigations of nomadism (Irons et al., 1972) drawing attention to the range of aspects that may determine the nomadic nature of a given community. These accounts stress, in fact, that nomads' spatial wanderings over a given area are not enacted randomly. On the contrary, they are influenced by the presence of specific resources – e.g. water sources, rainfall, vegetation and pastures, type of soil – and by other relevant factors, such as herd composition, or the political and socio-economical organization of a given community. Thus, the extent of tribal territories may vary according to the size, the political power, the wealth and prestige of the tribes involved. By considering the interplay between these dimensions it is possible to identify a continuum of nomadism, spanning from quasi-sedentary communities to "proper nomads" who use animals to wander widely. Moreover, it makes plausible to argue that any classification of nomadic tribes is not rigid, and that a tribe could pass from one category to another as a consequence of changes in the natural environment, or any other of the aspects mentioned above (Dyson-Hudson, 1972; Johnson, 1969).

While the data analysis (chapters 5 and 6) will clarify the relevant aspects of nomadicity within students' projects, in the course of this chapter, an initial articulation of such a notion will be provided. Firstly, I will discuss research approaches primarily focused on technologies (Flinn et al., 2004; Kleinrock 1995 and 1996; Satyanarayanan et al., 2005; Sawhney et al., 2000) and question their tendency to address nomadic work as disconnected and detached from the physical places wherein it occurs. Afterwards, I will draw attention to human-centered studies and highlight that the concern for the social and contextual nature of nomadic practices and for their relationships to the sites at which they occur are fundamental to an investigation of nomadicity. In order to gain a preliminary idea of the key issues to take into consideration when analyzing and designing for nomadic work, a substantial part of this chapter will be devoted to approaches concerned with the human dimension of nomadic work.

2.1 Technology-centered approaches to nomadicity

A body of work on the design of mobile technologies focuses on technical aspects, such as the transition between networks (Satyanarayanan et al., 2005), location awareness (Wallbaum, 2007), tools portability and battery lifetime (Flinn et al., 2004) and the reliability of wireless networks. This research area primarily concentrates on the technologies and protocols deployed for the implementation of physical devices and related data service. The expressions "transient use" and "pervasive computing" (Satyanarayanan M. et al., 2005), widely used in this type of research, suggest a notion of nomadic work as something that takes place for a short time, at a variety of locations and that is enabled by a widespread computing. Generally speaking, this strand of research does not take into proper account the work to be supported, whose understanding seems to be inferred either from the researchers' intuition or personal experience.

Another example of research, primarily focused on technological details, is the *Nomadic Radio* (Sawhney et al., 2000), a wearable platform designed to manage voice and text-based messages, personal calendars and other types of communication. The device is based on the main idea of enabling users to engage with audio-based interactions, rather than tactile input, thus allowing them to manage their communication while attending to other work-related tasks, or while moving about.

Despite the rich technical account of the platform, little is said about the nomadic practices this device is intended to support and the context it is meant to be used at. While the type of communication to be supported

seems to be implicit in the media enabling it – email, voicemail, news broadcasts and calendar events –, the setting, addressed by the design of the wearable device, is not accounted for, and the fact that users might be moving around is regarded as the main aspect of their being nomadic.

2.1.1 Anytime, anywhere in a disconnected world[1]

Providing "connectivity anytime and anywhere" (Kleinrock, 1996) is an essential concern of technology-centred approaches to designing for nomadic work. In his work, Kleinrock introduces the notion of *nomadicity*, which he defines in terms of emerging technology:

> "nomadicity is clearly a newly emerging technology that users are already surrounded with" (Ibidem: 356).

According to Kleinrock (1995), this acceptation of nomadicity poses some important challenges with regard to bandwidth, reliability, processing power and interoperability, all relevant aspects related to the design of nomadic systems support. Within his research, users are regarded as nomads, since they own computers and communication devices they bring along during their travels and movements.

> "Indeed, a move from my desk to a conference table constitutes a fundamentally nomadic move, since the computing platforms and communication capability may be considerably different at the two locations" (Ibidem: 37).

Thus, it seems that the very essence of nomadic moves is mostly based on the fact that computing platforms and communication devices might differ according to the different locations one finds himself working at. For this reason, bandwidth, reliability and the other issues mentioned above are important technological concerns, while independence of location and platform is considered to be a fundamental requirement in supporting nomadicity.

Furthermore, by examining the wide range of new portable devices – laptops, notebooks, personal digital assistants, wristwatch computers and mobile phones – Kleinrock envisions the opportunities offered by these technologies to work on the move:

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[1] The wording for this heading is borrowed from one of Kleinrock's papers (Kleinrock, 1996) quoted in this chapter.

> "We now recognize that access to computing and communications is necessary not only from one's ``home base'', but also while one is in transit and/or when one reaches one's destination" (Kleinrock, 1996: 37).

Indeed, according to Kleinrock, supporting nomadic computing is a question of enabling access to remote files and systems anytime and anywhere, and of automatically adjusting to any available connection.

This technological perspective characterizes other research identifying connectivity, both to networks and desktop applications, as the main requirements for nomadic technology (see, for example, La Porta et al., 1996). Similarly to Kleinrock's notion of nomadicity, these efforts focus on how technology can be adapted to different environments by connecting to local networking services (Kindberg et al., 2001); they address different modes of connectivity (Reif et al., 2001) and how to adapt to them without an active, human intervention.

2.1.2 Questioning the access anytime, anywhere approach

Although relevant, a focus on technology that leaves in the background, or merely makes assumptions on, the nature of the work to be supported would be reductive for the work discussed in this thesis. In fact, regarding users as actors, actively engaged in specific activities, by means of particular technologies, in well-defined workplaces (Bannon, 1991) is a main concern of this work, whose ultimate objective is to assist the design of technologies by understanding the work practices they are meant to support.

In this light, one first critique that might be raised to the "access anytime anywhere" approach is that, by focusing only on the possibility offered by mobile technologies, it does not take into account the type of work being addressed and the individuals undertaking it. While nomadicity seems to be primarily characterized by movements and long distance travelling, the changes in the computing infrastructure are a main concern for this strand of research.

A second critique is that "access", "anytime", "anywhere" are used as monolithic terms, but they are, in fact, multifaceted in meaning. In contrast, as pointed out elsewhere (Brodie et al., 2001a; Perry et al., 2001; Wiberg, 2001), different tasks might require various types of access to information and they might not be performed at just anytime – it could be inappropriate, for instance, to call a colleague on his/her mobile phone out of working hours. Besides, some activities might be appropriate in some places, but not in others; for example, because of social norms, it could be

improper to talk on the mobile phone in a hospital or in a meeting room. Consequently, an analysis of various types of access to information in different contexts is an essential prerequisite when designing mobile technologies.

Finally, a third critique to the "access anytime, anywhere" approach concerns the notion of nomadic work as independent of location. In fact, even when accomplished on the move – on a train, on a plane or in an airport – this work is never detached or disconnected from the physical places wherein it occurs. On the contrary, the spatial organization of a given environment, the presence of other people and resources pose important challenges in terms of the possibilities, the constraints and of the type of activities that is possible to carry out within a given location.

2.2 Human-centered approaches to nomadicity

Although the focus on technology is still quite predominant, human-centred approaches to nomadicity have recently emerged within several research projects. Bellotti and Bly's (1996) study of local mobility[2] within a design firm, a work setting traditionally considered non-mobile, constitutes a first example. As the study revealed, the employees relied on their wanderings around the office to meet their colleagues face-to-face, to discuss work related issues and to maintain an awareness of the tasks the others were attending to. Fax was the main tool used by the designers and the other professionals within the firm to share design ideas, sketches and other important documents. Thus, because of the limitations entailed by the use of these artifacts, the employees preferred to walk around and meet their colleagues in person. Nevertheless, while being locally mobile facilitated communication and helped the staff to achieve a better awareness about ongoing activities, it also made it problematic to get in touch with those who were not at their desks or in their offices. By drawing on these findings, the research team developed a prototype aiming, among other things, to enhance awareness of people's movements within the workplace.

Another similar field study was conducted within a Swedish IT company (Bergqvist et al., 1999) in order to understand *mobile meetings* – that

[2] As already explained, I prefer to use the term nomadicity to emphasize that mobility and physical movements are only one aspect of the work practices investigated. Nevertheless, in the following sections I will use the term mobility, whenever it is the one adopted by the research being reviewed.

is meetings taking place away from the desktop for at least one of the participants involved. Based on the description of how these meetings were established by walking around the offices and looking for colleagues, by negotiating the appropriateness of a meeting, of the persons to be involved and the topics to be discussed, the study suggested the design of a technological artifact that would enable to physically locate where people were temporarily located in the workplace.

Although different from the student setting addressed by this thesis, these studies raise interesting issues concerning the awareness of other people's physical locations and their participation in specific tasks.

2.2.1 Local and micro-mobility

Local mobility – that is short distance walking between rooms, buildings or close sites – is also discussed in the seminal paper *Mobility in Collaboration* (Luff et al., 1998) which illustrates how individuals rely on their own mobility, and on the mobility of the artifacts they use, to achieve collaboration and awareness of what the other co-workers are doing. In order to explain the importance of mobility in collaborative practices, three different settings are discussed by the authors: (i) medical consultations; (ii) a construction site; (iii) three main stations of the London underground.

The first study focuses on *micro-mobility*, that is the way artifacts can be moved around and manipulated within circumscribed environments. More specifically, the authors illustrate how the mobility of a patient's medical record – a set of simple paper documents – is an important resource for communication between members of the medical staff, but also between patients and doctors[3]. The fact that the medical record is a collection of paper documents makes it portable and easily manageable, regardless of the location it is used at. Its portability is a critical element of its success as it allows to pass it between the hands of different professionals and to easily locate it in different parts of the office and of the clinic. While the record is an important medium for asynchronous communication – it allows passing on data from hand to hand – it is also an important resource for synchronous communication. In fact, the possibility to point at it, to assemble and to order the documents in different sequences is a critical

[3] For other research on mobility in medical settings see, for example, Bardram and Bossen (2003; 2005).

feature in supporting interactions between medical staff, but also between the staff and the patients.

In the second study of *Mobility in Collaboration,* Luff and Heath present the results of fieldwork conducted at a building site. In their analysis, they point out how the replacement of an old paper allocation sheet – used to record the time spent by each worker on a given task – with an electronic notebook hindered some important collaborative aspects of the work at the construction site. While working, the builders used to wander around and to be mobile, as they needed to be at different physical locations to gain access to information and colleagues. A paper allocation sheet was used at the site in order to record the activities undertaken, the time spent, the problems arisen and solved during a regular working day. The sheet was usually filled in daily by each ganger. Afterwards a foreman, responsible for several gangs would collect the sheets, check them out and hand them over to another person working in a hut, located at the construction site. In this case, the *allocation sheets were mobile and* they supported asynchronous and remote communication between different workers (and groups of workers) at the building site. At a certain point, the paper artifact was replaced by a digital mobile device that served the same functions and resembled, in the design of the layout, the paper allocation sheet. Unfortunately, despite the assumptions on the affectivity of the digital device, the new technology changed some important work practices. For instance, the new system was no more filled out *in situ,* as it had been envisaged, but rather in the hut; in other words, it was not used as a mobile device. The fact that the foreman used to move around the building site was an important occasion to discuss work issues with the gangers and the other workers. However, when the mobile device was introduced, what used to be a quick handover of paper documents became a time consuming activity. In addition, the technology itself became the main topic of discussion, thus hindering the communication between colleagues and the opportunity to deal with present problems. Consequentially, the foreman started to fill out the digital form in the hut, after collecting either notebooks or the old allocation sheets from the gangers. Eventually, a new person was hired to fill out the digital form in the hut.

The third study explores work practices and the need for awareness and communication among the workers of three large hubs of the London Underground. Underground stations are complex places – including platforms and multiple lines, passageways to other lines, escalators and lifts, tickets halls, multiple entrances and exits, and the daily transit of thousand of passengers. That results in a huge quantity of information the staff have

to keep track of. The underground personnel deals with organizational aspects of the hub from the *operational rooms*, equipped with radios to contact other station stuff, a system to make announcements to the passengers, a direct line with the police, switches to open and close gates at the station, output screen of the video surveillance video cameras and so on. Because of situated needs, the staff members are often mobile, away from the operational room, thus losing access to the huge bulk of information available within it. Moreover, they might lack visual and audio information of what is happening at the several platforms, or they might be unable to hear conversations between other colleagues.

This last study is relevant as it shows that the need for different type of real-time information, awareness and communication may arise during a particular collaborative situation. For instance, while station assistants might need to open and close the gates remotely, they might not necessarily need to make announcements at the same time, or have access to the data captured by the video cameras at the station.

Although the three settings reported in this section profoundly differ from the settings I studied, they highlight a number of issues that are relevant when analyzing and designing for nomadic work.

Firstly, *the mobility of artifacts (micro-mobility)* is an essential dimension of nomadic work practices. The portability, the flexibility of use, and the support for communication, enabled by the paper record, are essential in students' project as well. As I will point out while discussing the findings, notes and sketches taken on paper are often used as shared representations to support discussions. They are resources for communication that can be used almost everywhere a meeting takes place.

Secondly, the article underlines a concern to understand the nature of mobility when designing for it. What happened at the construction site was determined by an erroneous assumption on the nature of mobility, and the subsequent selection of the technology introduced. In fact, the foreman's wanderings were a very important collaborative moment at the building site, and the introduction of the mobile device overshadowed the interactions among individuals.

Finally, the third study illustrates that: (i) access to information is situated and may depend on the circumstances and the locations wherein work takes place; (ii) it enables and, at the same time, requires collaboration.

2.2.2 The mobility of artifacts and the importance of paper documents

The mobility of artifacts and the access to paper documents in mobile settings has been extensively documented at Xerox Research Centre Europe as well (Eldridge et al., 2000; Lamming et al., 2000). A mix of qualitative and quantitative studies, performed to inform the design of the system "Satchel", raised a number of issues related to the mobile use of paper, such as: (i) people often failed to take with them all the paper documents needed at meetings, despite the thorough planning; (ii) digital documents were seldom used in meetings for face-to-face interactions, while paper documents were used in the majority of the cases recorded; (iii) participants often found it troublesome to access digital documents stored remotely. Against the backdrop of these findings, the Satchel system was developed in order to support printing at a variety of locations. The system, which in the different versions included different mobile devices (an Apple Newton and, later on, a Nokia 9000 Communicator), enabled its users to store document icons in the mobile device. When an icon was activated – for example, by dragging it to the icon of nearby printer – the actual document was transferred, over the Internet, to the mobile device and, eventually, printed out.

This research is relevant in the context of my work, as it addresses the relevance of paper documents, and the difficulty to reproduce, in a collaborative setting, the affordances they provide. Moreover, this work points to planning the access to and the use of resources in the context of nomadic practices. Both aspects will be tackled while discussing the fieldwork and the concluding design reflections.

2.2.3 Blue-collar mobile workers

The last two studies mentioned in section 2.2.1 concentrate on the nomadic practices of blue-collar workers – that is, workers who strongly rely on the physical performance of their job. Other examples of this type of research can be found in the work by Brodie and Perry (2001b) in which different type of blue-collar workers – such as an electrician, a hairdresser, a builder, a cleaner, etc. – were interviewed in order to understand the use they made of mobile phones. Another representative example of this research is the cohort of photocopy machine technicians studied by Orr (1986), who pointed out how the use of narratives was indispensable to them, to understand the problem at hand.

The main students' activities, I will focus on in the following chapters, are collaborative writing and prototyping, usually regarded as typical instances of knowledge work. The nature of the activities mentioned in this section is therefore different from the ones I observed. Throughout this chapter, other research conducted with blue-collar workers and IT technicians will be mentioned (Brodie et al., 2001b; Kristoffersen et al., 1999 and 2000; Sawhney et al., 2000; Wiberg et al., 2001; Bartolucci 2007). What makes these studies valuable to my work is the support they provide in highlighting a set of initial, relevant issues involved in the understanding of nomadic practices.

2.2.4 Spatial, temporal and contextual mobility[4]

While introducing different research approaches towards nomadic work, my objective has been to stress two main points. Firstly, considering access anytime, anywhere as a main concern is reductive, as different activities and tasks might require different type of information and access to it. Secondly, understanding nomadic practices in terms of mere mobility and independence of locations is simplistic. In fact, even work on the move – on a train, for example – is actually carried out at a particular place that shapes and influences it. In the next chapter, I will clarify in what way it is possible to characterize the relationships between places and activities, and in what way this might be suitable to an investigation of nomadic work. At this point, I want to emphasize that analyzing nomadicity entails understanding the interactional aspects embedded in it. The foreman's wanderings around the building site to collect the allocation sheets, but also to talk to the gangers and the workers, are an emblematic example of that. To put it in other words:

> "Being mobile is not just a matter of people travelling but, far more importantly, related to the interactions they perform – the way they interact with each other in their social lives" (Kakihara et al., 2001: 33).

Kakihara and Sørensen (2001) address the social relevance of people's interactions, and identify three main levels at which they may occur: *spatial* mobility, *contextual* mobility and *temporal* mobility.

Spatial mobility

By using the expression spatial mobility, the two authors refer to the movement of people, but also movements of objects, information and

[4] See footnote 2.

space itself. The expression "movement of space" is used to convey the idea that, because of new technologies, the geographical distance between individuals is not a main concern in interpersonal interactions. Digital media have blurred the distinction between here and there, while work is not merely accomplished at one place, but at various sites. Although this is due to a changing socio-economical context, new technologies and data services such as email, mobile phones, instant messaging applications challenge the traditional notion of workplace as a single and circumscribed environment.

Long distance travelling can be regarded as an example of spatial mobility; however, this is not the only one. Kristoffersen and Ljungberg (2000), for instance, adopt the term *modality* to describe three different types of mobility: (i) the *wandering modality* characterizing local mobility and walking around buildings or offices; (ii) the *travelling modality,* that is the type of mobility embodied by travelling in a vehicle; (iii) the *visiting modality* encompassing work activities that occurr for a limited amount of time, at places wherein a given individual usually does not work.

Temporal mobility

Temporal mobility refers to the fact that the usage of various synchronous and asynchronous communication tools allows for multi-tasking and the opportunity to explain a set of interactions without framing them in a linear and sequential temporality. The relevance of time in understanding mobility is widely acknowledged. For example, while studying mobile practices of service technicians working in a Swedish IT company, Wiberg and Ljungberg (2001) illustrate how their work practices are dependent, to different degrees, both on place and time. Thus, some of the tasks the technicians have to accomplish can be carried out whenever they feel like and at the locations they prefer. Other tasks can be accomplished at any time, but at a specific location; repairing a network, for instance, can be done only at the place wherein the problem has occurred. A third group of tasks can be executed at a specific time frame, but nearly anywhere. This type of tasks must be accomplished in a specific temporal order, such as looking for errors within a network and, then, reporting them to the central station. Finally, other tasks are tightly bound to a specific place and to a particular time. For instance, under emergency circumstances, when cables have been destroyed by a storm, error check and repair must be done in a very precise order and at the place in question. Real activities are never characterized by just one type of tasks. On the contrary, they are enacted by a sequence of errands that can differ according to how much they depend on a particular place or time frame (Wiberg, 2001; Wiberg et al., 2001).

Contextual mobility

Contextual mobility refers to the situated nature of human activities, and to the way different contexts shape the interactions people engage in. In addressing contextuality, Kakihara and Sørensen draw on Suchman's (1987) notion of situatedness and the need to understand the contingency of interactions, both between individuals and between individuals and technology. With this regard, the orientation towards actors, the ways and the particular circumstances in which actions are performed become foregrounded elements of analysis. According to the authors, the interactions between people and context are becoming *mobilized*, as they are enacted across different contexts.

2.2.5 Fluid interactions: "variation without boundaries and transformation without discontinuity"

Kakihara and Sørensen, as we have seen, contribute to the discussion on mobility by addressing three different levels at which interactions may be analyzed. Another relevant issue they discuss is the idea of *fluidity of mobile interactions* (Kakihara et al., 2002).

> "In the environment where people can interact with others by using such emerging technologies as mobile phone, SMS, pagers, email, laptops, PDAs, ICQ, relational disposition of human interaction is becoming ambiguous and transitory. Such a social topology can be a fluid. According to Mol and Law, a fluid world is "a world of mixtures" (p. 660) and "variation without boundaries and transformation without discontinuity" (p. 658) […]. This is clearly the world of the contemporary mobile work mode. Mobile workers engage themselves in getting their job done not only at their formal offices but at various sites such as home, clients' offices, hotels, moving vehicles and so on. Looking at their nature of work, there is no rigid boundary that determines whether inside or outside the office: their office can be anywhere. They permeate across "regions" and "networks." In this sense, we can argue that mobile work is the fluid mode of working". (Kakihara et al., 2002: 5)

Some relevant issues stand out from the passage above. Firstly, the adjective *fluid* is used as a metaphor to explain that boundaries between various (work)places have become fuzzy, partially because of the emerging technologies enumerated in the text quoted above. Fluid is, thus, used as opposite to well-defined, to convey the idea that it has become problematic to identify the boundaries between a place and another, between inside and

outside the office. In this regard, a fluid world is a world of "variations without boundaries".

Secondly, by drawing on Mol and Law's social topology (1994, cited by Kakihara et al., 2002), the authors argue that a fluid world is a world of *"transformation without discontinuities"*. These expressions are used to emphasize that discontinuities between places can be reduced by the usage of mobile technologies, enabling more fluid geographical movements. The term discontinuity is, therefore, used to emphasize that technologies allow individuals to move work out of traditional workplaces.

Discussing this point raises some interesting issues, especially in relation to the notion of nomadicity as characterized by discontinuities, that was introduced in the beginning of this chapter. While analyzing the data, I will further explore this aspect (section 6.4.2). At this point, I would like to anticipate that, as the data suggest, nomadic workers, more specifically the students who participated in the fieldwork presented in this thesis, develop practices and adopt strategies to cope with discontinuities and manage their work at several locations.

2.2.6 Understanding the nature of nomadic interactions

By reviewing research of nomadic work, I have meant to highlight the importance to understand the nature of nomadic interactions, together with the interpersonal and collaborative aspects involved in them.

Another relevant issue, standing out from the literature review, addresses the mobility of objects, information and resources. As elucidated in a study of landscape architects (Büscher et al., 2003), information may often be created, collected and interpreted at a variety of places and "it is not a static entity, but it is continuously in formation, ongoingly and collaboratively formulated" (Ibidem: 137). Moreover, in the case of landscape architects, information is neither merely in their heads nor in a written document, but interwoven with other materials – such as maps and pictures of a given place –, with the architects' vision of the place itself and their embodied engagement with it.

This research illustrates that mobility is an essential modality of the way landscape architects look at and make sense of a given environment. It is in this sense that their professional vision can be regarded as *"Vision in motion"* (Büscher, 2006), a vision that relies on movements to make sense and assess a particular landscape environment. In order to develop and convey their own sense of place, the architects are supposed to provide their professional vision by referring to some standard criteria (e.g. landscape elements and resources) in order to assess how a particular landscape could

look like in the future. Since this is achieved by "knowing the landscape from everywhere", that is from different points of view, material practices and motions are fundamental to their job. The professional vision is situated and achieved by gestures and references to the real world, and also by using maps, sketches and photographs. Moreover, while the emerging information is situated and embodied in the environment, it becomes necessary to capture and move it to the office and make it available for other people as well.

A prototype was developed to enable sharing the hybrid sources of information needed by landscape architects to accomplish their work (Büscher et al., 1999). Whereas in the analysis phase it was central to understand how mobility helps assessing and envisioning how a landscape will look like, the design work was particularly significant because of the challenges it raised. In fact, the problem was not simply to preserve the various architects' points of views, but also to enable them to capture information that could be taken to the office and shared with other colleagues, taking into account that this information was conveyed both by physical and digital media, and was located partially in the environment, partially in the individuals' heads, partially in the pictures and maps they used.

2.3 Situating nomadic work: the role of place

The work presented so far has emphasized the importance of understanding the nature of nomadic interactions and of taking into consideration the mobility of objects, information and resources. In the following sections, I will review a body of research which explicitly focuses on the relevance of place to the understanding of nomadic practices.

2.3.1 Work practices bound to several places

Studying nomadic work as bound to different places (Perry et al. 2001; Brown et al., 2003; Ciolfi et al., 2005) questions the assumption that it occurs independently of any physical and spatial constraints. In the article "Place as a Practical Concern of Mobile Workers", Brown and O'Hara (2003) investigate the interactions between technologies and places, and how professional mobile workers use technological artifacts to manage their activities at several places. Their analysis is articulated into four levels: (i) place changing work; (ii) work changing place; (iii) the temporal nature

of mobile work; (iv) decorporalisation of work. Each of these levels will be further addressed in the sections below.

Place changing work

A first important point emerging from this study is that mobile workers are concerned with the places they work at, with regard to their organization, their structure, the resources available and the time spent dwelling in them. For instance, when planning a trip, they can regard it as important to plan which activities should be undertaken during the different moments of their travelling. Thus, because of unreliable connectivity, all the required emailing is usually done at the office, while reading or writing is saved up for train or plain journeys. While the spatial constraints of an environment can deeply affect and shape the activities that can be carried out within them, this influence is not limited to the place's physical structure and infrastructure, but it also involves the time mobile workers can spend within it.

Moreover, while investigating hotdeskers' mobile practices, Brown and O'Hara (2003) illustrate how people's presence at a certain location may shape work. In fact, a hotdesker's choice of a desk is often influenced by the possibility to sit close to colleagues who are involved in the same project. The selection of a given desk is, therefore, determined by – and at the same time determines – the social organization of the workplace. Furthermore, it is generally important for hotdeskers to be visible to other colleagues and to be available for interactions with them. For this reason, they often hang out at cafes or pubs attended by other colleagues, thus indicating their presence in the office, increasing the chances to encounter other people and engage in work interactions with them.

The importance of making oneself visible to others is also discussed by Erickson (2001), who coined the expression *interaction trajectories* to refer to people's wanderings between buildings, enacted to have the chance to meet other colleagues and talk to them.

Work changing place

While place shapes and influences the type of activities that can be accomplished within them, according to Brown and O'Hara, it is also important to investigate how work changes place, particularly through the practices enacted to create the proper work conditions *(place-making)*. A typical place-making strategy is *planful opportunism* (see also Perry et al., 2001), a pre-trip planning often undertaken to make sure that resources and working material (e.g. paper documents, emails, contacts) will be available while on the move or away.

Although mobile workers often arrange the access to resources before each trip, they also rely on connections to other people. Thus, another relevant aspect of making place is the use of technologies (email, laptops, self phones and PDAs) to get in contact with the office whenever, for instance, help is needed.

The existence and the reliability of a connection to the office is one of the main differences between this particular setting and the one described in this thesis. In fact, as the data will illustrate, differently from professional nomadic workers, students cannot always rely on the fact that another peer will do something for them, or will be available, when mostly needed. In other words, they cannot always rely on a central home base; it is this relevant difference that inspired us to define the students' setting as *"On a mission without a home base"* (Bogdan et al., 2006).

Making place, creating the conditions for work to be carried out, is often a fundamental moment for mobile workers, even when they move within a circumscribed city area. In this regard, the studies of cars as *mobile offices* (Laurier et al., 1998) provide detailed descriptions of how the workers/drivers observed create, on a daily base, their mobile office by assembling artifacts and enacting routinized practices (e.g. inserting the radio to gain information about traffic in the city), or by using their mobile phones to connect to other colleagues, to exchange information and to create a sense of sociability with them.

The foci on how a car is transformed into a workplace and on how the sociability of the work is maintained are significant for this thesis as well. In fact, understanding the various aspects involved in place-making is particularly relevant for my setting, the students lacking a steady physical location wherein to work and store working artifacts and material.

Time and decorporalisation of work

Another important concern raised by O'Hara and Brown is time. The professionals they studied were mobile in order to have face-to-face meetings with clients or other colleagues. However, as they were in turn mobile, to organize a meeting was not always a straightforward matter; a main problem was, for example, to be able to coordinate with each other for a given event. With regard to time, the use of asynchronous technologies – such as electronic or voice mail – was useful, as it allowed them to delay replying and to integrate it into another activity out of the office. In this sense, these technologies enabled to stretch out the conversation over time and space.

Finally, Brown and O'Hara discuss decorporalisation of work, referring to the fact that work seems to be losing its body and physicality, since it is

increasingly being mediated by communication and information technologies. Although face-to-face meetings are experienced as fundamental for work interactions, being away contributes to a feeling of detachment, both from the physical office and from other colleagues. Some of the workers interviewed, for instance, used to call the office also to establish a personal contact and not merely to look into some work matters. In other words, the connection to the office was often maintained to establish a sense of presence with the other colleagues (Perry et al., 2001), rather than to solve urgent matters.

Although significant differences subsist between professional nomadic workers and students (see Bogdan et al., 2006), this study is relevant as it emphasizes the strategies adopted in making the most of the locations nomadic workers travel to. Moreover, the focus of place as a practical concern enables to highlight a set of issues – the physical organization of place, the presence of other people and resources, place-making strategies, etc. – which are relevant to explore the relationships between nomadic practices and place.

In the following chapter, I will further explore this topic and argue that place as a theoretical notion can assist the investigation of nomadic work both on an analytical and methodological level.

2.3.2 Other place-centered studies of nomadic workers

Another example of research, addressing mobility[5] as work bound to several places, can be found in the investigation of sales representatives of a firm manufacturing door and window (Ciolfi et al., 2005; Bartolucci, 2007). The workers in question were mobile as they worked on the move, they travelled to building sites and to meet customers, but also because they accomplished their activities at different locations. While the ultimate goal of the project was to inform the design of novel interactive technologies, extensive field studies were carried out to explore the nature of mobility in such a work setting (Bartolucci, 2007). More specifically, the fieldwork aimed at understanding: (i) how the mobile workers observed organize their activities at a variety of locations; (ii) how they use resources in their mobile offices; (iii) in which way the micro-mobility of tools can effect their work practices; (iv) the changes that a mobile devices may introduce into their work practices.

[5] Mobility is the term used within this specific project.

One of the project's contributions explores how the articulation of mobility suggested by Kakihara and Sørensen (2001) can be further expanded by taking into account aspects regarding the physical setting, the use of resources and the social interactions involved in the work activities.

The reps' work took place at three main locations: the building site, the home office and the car. Because of the nature of their job, their activities were strongly dependent on their workplaces. All the door and window measurements, for instance, had to be taken at the building site and they were temporarily annotated on an elevation sheet. The work at the building site was often affected by bad weather conditions and by other environmental factors (presence of mud, scaffoldings, etc.), which made measuring troublesome and the elevation sheet easily ruined. Cars were also important workplaces for this cohort of people. In fact, the car was the place where all these tools were stored, but it was also an important hub for communication with stakeholders and clients (Murphy et al., 2006). Finally, all the sale representatives used to work in their home office, at least one day per week. When at home, the measurements taken during the week were copied to the contract book and orders were sent to the company by fax.

The use of resources is another fundamental aspect that helps to understand the sale representatives' mobile practices. The mobile phone, for instance, enabled them to contact and be contacted at any time of the day and at any location. Besides, it allowed them to organize their daily activities and to schedule meetings, without the need of a strict pre-planning. Another important tool was the fax, often used from home, to transmit orders to the company main office. While the fieldwork was still ongoing, the reps were provided by the company with a PDA, so that they could transmit their orders from anywhere, and without the need to transcribe them from the elevation sheet to a paper order. Hence, the PDA was supposed to give the reps the same opportunities afforded by the home office, while on the move. Nonetheless, despite the high expectations for the new device, it was never used as planned. In fact, the interface was too small to insert measurements while they were being taken, and the artifact was perceived as too fragile to be brought into the building site. That is why the reps started to use it from home or from the car.

Finally, social interactions are important in the sale representatives' work practices. Although they worked mostly individually and their activities did not present essential collaborative aspects, they often felt alone and disconnected from the rest of the company. Moreover, they

perceived negatively the fact that it was problematic to meet up with other colleagues to share work experience or just to socialize.

This study of blue-collar mobile workers is relevant as it illustrates how taking into account the physical environment of work, the resources used and the social interactions enabled to further articulate the contextual, temporal and spatial levels of mobility envisaged by Kakihara and Sørensen. Furthermore, it strengthens a view of mobile work as bound to a variety of places, and it suggests that the design of mobile devices should draw on people's experience of places and not merely on the ideal of providing access anytime, anywhere.

2.4 Mobility as an aspect of nomadicity

In the beginning of this chapter, a notion of nomadicity as characterized by discontinuities was introduced (Bogdan et al., 2006) to point out that the variability of spaces and the physical mobility are only two, although relevant, aspects of this type of work. While discussing how the different discontinuities may intertwine with each other, it was also emphasized that, in this perspective, mobility is only one facet of nomadicity. Furthermore, it was suggested that nomadicity as a notion might be more suitable to convey the complexity of the work practices it address.

Other research contributions have attempted to clarify the difference between mobile and nomadic. For instance, as suggested elsewhere (Bødker et al., 2003), the term mobile may be used to emphasise the difference between mobile and stationary work, particularly focusing on one individual's work practices and the design of new information technologies. While the term nomadic may refer, instead, to the work condition as a whole, thus including transitions between places, work situations and projects, between working ensembles (e.g. groups) and a set of technologies. With this respect, the adjective nomadic refers to a situation characterized by collaboration between individuals, by work occurring at a variety of places (e.g. traditional offices, homes, etc.) and by a range of technological support. This acceptation of the adjective nomadic seems to be suitable for the setting presented in this thesis. Students' group work is, in fact, collaborative, characterized by a transition between several places (home, group rooms, lecture halls, seminar rooms, etc.) and by a fluid change in the collaborative ensemble, the students often attending more than one project or course.

Throughout this chapter, I have attempted to move beyond a notion of nomadicity merely focused on: (i) individuals' spatial movements and their

undifferentiated modalities of working on the move; (ii) the related requirement to guarantee access to information anytime and anywhere (Kleinrock, 1995; 1996). With this regard, most of the research mentioned has helped to start unpacking the essential dimensions of nomadicity that might be overlooked by a too narrow focus on technology. Thus, throughout this chapter, I have underlined that understanding nomadic practices encompasses:

- The mobility of artifacts (Eldridge et al., 2000; Lamming et al., 2000), which Luff and Heath (1998) refer to as micro-mobility;
- The need to understand the social interactions enabled by being mobile and the need to access different type of information, depending on the nature of the ongoing tasks and the locations they occur at (Büscher et al., 2003; Büscher 2006);
- Different ways of contacting people (Bellotti et al., 1996; Erickson, 2001), the importance to be aware of where they are physically located and of the tasks they are currently involved in (Bergvist et al., 1999; Luff et al., 1998);
- The spatial, temporal and contextual dimensions of individuals' mobile practices (Kakihara et al., 2001; 2002), but also aspects of experience regarding the physical environment, the use of tools and resources, and related social interactions (Bartolucci, 2007);
- An account of the discontinuities, that is the range of changes occurring in the technologies used, in the group organization and in the physical location (Bogdan et al., 2006);
- The interactions between technologies and specific places and an understanding of how place and work mutually shape each other (Perry et al., 2001; Brown at al., 2003; Laurier et al., 1998).

In the following chapter, I will further explore the role of place and argue that such a notion can assist the investigation of nomadic work both on an analytical and on a methodological level.

3 Place as a framework to understand nomadic practices

In the previous chapter, I argued for a concept of nomadicity as a multi-layered notion and not as merely centered upon the spatial movements of individuals working on the move, independently of any geographical constraints. In this chapter, I will introduce the theoretical framework that will be adopted as a lens to look at the data collected. More specifically, I will argue that place as a notion can be used, both on an analytical and on a methodological level, to investigate the nomadic practices observed during the field studies.

The argument that an analytical distinction between "space" and "place" can be used to understand work in collaborative settings, or to assist the design of technological enhanced environments is well established in the fields of Computer-Supported Cooperative Work (Fitzpatrick, 1998; Harrison et al. 1996; Harrison et al., 2008; Healey et al., 2008; Ponti et al., 2004) and Interaction Design (Ciolfi, 2004a; McCarthy et al., 2008; Paay et al., 2008). By drawing on this position, this chapter explores how place can be used as a methodological and analytical framework to understand students' nomadic practices.

Place is a notion that describes a given environment by encompassing people's experiences and activities (Malpas, 1999), but also the values and meanings they invest it with (Cresswell, 2004). In this sense, place includes a *lived dimension* – inextricably tied to the presence of one or more

individuals – as well as the geometrical and spatial dimensions of a given environment.

As noted in the previous chapter, nomadicity can be regarded as a matter of work bound to several places (Brodie et al., 2001a; Brown et al., 2003; Bartolucci, 2007; Wiberg et al., 2001), shaping the individuals' activities and interactions enacted within each one of them. By drawing on this perspective, this work attempts to explore: (i) the relations between nomadic practices and the places wherein they occur; (ii) the way nomadicity, with special regard to the variability of place, shapes the collaborative activities students engage with. Hence, my interest in place is practical, determined by a concern to understand how students manage their activities at a number of locations, and how the lack of a fixed and steady place affects and shapes their collaborative activities. If we accept that nomadic work can be regarded as tethered to different places, it becomes relevant for the analysis to explore the relationships between these places and the practices carried out within them. It is in this respect that identifying a structure of place, and the main traits constituting it can help making sense of these relationships.

As it will be illustrated through the data, students plan and organize their activities depending on the sites they move to and work at. Choosing a location because of the nature of the tasks to be carried out, the people involved and the resources available within them are all fundamental facets of their group activities. While each environment presents specific characteristics that constrain, determine and shape the way work is performed, students modify and change locations in order to make them more suitable to the work at hand. Place is, therefore, an important dimension to take into account when investigating nomadic practices; moreover, clarifying its meaning can provide a framework to understand the relations between students, activities, technological artefacts and the particular locale in which they are located. It is in this regard that, in the previous chapter, I criticized the tendency to approach nomadic practices as detached and disconnected from the places wherein they occur. In fact, as nomadic workers do not just happen to be in place, but they live in it, experience it, attribute meanings, feelings, activities and values to it (Tuan, 1974; 1975), the notion of place can be appropriate to analyze their work activities.

In the course of this chapter I will argue that, by overcoming the mere geometric properties and boundaries, and by holding together various facets of human experiences and conditions (Portugali, 2006), place can contribute to a more complete understanding of nomadicity, of how

students manage their activities at a variety of sites and how they turn locations into (work)places, by appropriating resources and investing them with overarching activities.

In the first part of this chapter, an account of how place as a notion has already been utilized in fields such as CSCW, Ubiquitous Computing and Interaction Design will be provided. Afterwards, I will turn to other disciplines such as Humanistic Geography and Phenomenology, not primarily focused on the use or design of technology. In so doing, my first objective is to discuss a number of issues which are relevant to understand the use, or to assist the design of technology. My second goal is to introduce different approaches to place, and to articulate the particular notion that will be adopted as a methodological and analytical framework to understand nomadic practices.

3.1 Introducing place

Place is a many-sided concept which has been object of investigation and analysis within various disciplines such as philosophy (Casey 1993, 1996 and 1997, Malpas, 1999), geography (Buttimer et al., 1980; Sack, 1986; Tuan 1974 and 1975), architecture (Alexander, 1979), anthropology (Feld et al., 1996), environmental psychology (Proshansky, 1969). As a notion, it has been conceptualized and used in different ways, according to the analytical tools, methods and objectives typical of each field. Thus, while accounts of place are fragmented and determined by the objectives of each discipline, the maze surrounding this concept is also due to the many, and often contradictory, descriptions of how place and space relate to each other. As it has been noted elsewhere (Casey, 1997), place as a notion has been taken for granted and obscured by other concepts, such as space and time. Only recently has place gained more attention in the attempt, for instance, to transform geography from a positivist into a more humanistic science (Portugali, 2006). For instance, in his 1997 book *The Fate of Place,* Casey seeks to rediscover the importance of place in social life, by presenting an historical account of how this concept has been approached and considered from the origin of western philosophy.

Before introducing a number of theoretical accounts of place, an overview of how it has already been utilized in design-oriented fields will be provided. In doing so, my aim is to describe the ongoing debate on how place could assist such disciplines, as well as highlighiting the main analytical issues inherent in adopting such a notion.

3.1.1 Space, place and design

A vivid discussion on the relationships between space and place has gained relevance in design-oriented fields (see, for instance, Harrison et al., 1996; Fitzpatrick, 1998; Brown et al, 2002; Ciolfi, 2004a; Hedman, 2004). This interest was initially motivated by the insight that the distinction between space and place could be used to better understand collaborative settings and the relations between people, activities and context (Dourish, 2006). In this regard, the debate has been concerned with the identification of the essential features and the methodological implications that place as a notion could provide, both on an analytical and on a design level. Erickson (1993), for instance, emphasized the great potential that spatial environments could offer for the design of interfaces supporting cooperative work and social interaction. In his perspective, designers of human-computer interactions could, in fact, benefit from understanding how some spatial elements of the real world – e.g. objects within a given place, spatial constraints, etc. – may generate, constrain and catalyze human activities.

A few years later Harrison and Dourish (1996) brought attention to the limitations inherent in designing virtual environments by merely reproducing relational characteristics of space – for instance, proximity, orientation and so on. As they argued, designers could benefit from the analytical distinction between space and place, the latter providing a framework to understand people's behaviour. It is in this light that the catch-phrase "space is an opportunity and place the understood reality" should be interpreted.

In the attempt to characterize the relationships between the two notions, the two authors clarify that whereas space relates to the structural and geometrical properties of a given environment, place includes the cultural understanding of the behaviours and actions allowed within it: "Space is the physical world, place is space invested with values and meanings". Moreover, whereas the physical structure of space is always what it is, place emerges from the way it is used, understood and valued. In other words, place is a cultural phenomenon, and it is indeed people's sense of place that makes some actions appropriate and others "out of place".

According to Harrison and Dourish (1996), this characterization of space and place can be applied to the design of virtual environments. Thus, some features, usually associated with the physical world – for instance, proximity and actions, relational orientation, presence and awareness of others – can be used to represent a virtual model for collaboration, and to frame the actions within it. In this sense, there might be "places which are space-less". Usenet, for instance, presents some features normally

associated with the notion of place (norms of proper behavior, presence of others, etc.), but it does not present any space connotations (e.g. up-down, left-right, etc) or physical space at all.

It is by drawing on the notion of space-less places that Harrison and Dourish question the design of virtual environments merely based on spatial models, for it is "a sense of place, rather than the structure of space that frames the behavior". Concerning this issue, the presence of other people and their activities plays an important role as well. In fact, it is also by observing others' behaviour that individuals can infer the proper way of acting in a certain virtual environment. For this reason, a notion of place, rather than space, should inspire designers to frame and design interactive behaviours (see also Dourish, 1999). This design orientation makes essential analytical issues aspects such as: (a) the exploration of how space is turned into place, (b) the focus on how virtual spaces are appropriated and inhabited by people and (c) on how individuals gain an understanding of the way they can act within it.

To summarize, Harrison and Dourish brought to the attention the way place could inform the design of virtual environments, and their conceptualization of space-less places should be understood as a way to explore how such environments could support the emergence of " appropriate behavioural framing" by encompassing something else than the mere spatial features. Nevertheless, a number of critiques have been raised towards the conceptualization of place discussed here.

Firstly, as addressed by Brown and Perry (2002), the fact that the division between the physical, three-dimensional world (space) and "the world invested with meanings (place)" does not take into account activities as the framework within which people attribute meanings to objects. Therefore, meanings appear as permanent attachments to objects rather than the product of ongoing actions.

Secondly, despite the claim that designers should design places, rather than spaces, Harrison and Dourish do not explain what are the traits of place designers should take into account. In addition, neither the notion of place, nor the ways people turn spaces into places are clearly explained (Ciolfi, 2004a).

Thirdly, if we look at digital environments as places, albeit space-less, it becomes important to understand the relationships between such environments and the physical world in which individuals are always, already located. However, Harrison and Dourish do not seem to tackle this aspect. In concluding this chapter, I will come back to the notion of space-

less places and clarify how it relates to the theoretical apparatus I have chosen for my analysis.

Since the 1996 paper, Harrison and Dourish have developed their approach to place independently. By adopting a semiotic perspective, Harrison (Harrison et al., 2008) has explored the emergence of meanings as the result of a semantic tangle of people, loci (the place that exist before the creation) and events (the set of activities performed).

Dourish (2006) has instead drawn attention to the importance of space for the design and analysis of collaborative technologies. This shift of perspective is partly motivated by an attempt to reconsider the relationships between people, actions and spaces on the basis of the increasing usage of mobile technologies.

> "Since it is precisely this relationship between technology and practice that underwrites the conceptual distinction between place and space, and since questions of mobility are inextricably bound up with questions of spatiality, it seems entirely appropriate to revisit the question of space and place once again and consider how we might approach it in light of recent developments" (Dourish, 2006: 300).

The argument here is for an alternative vision of space regarding it as a social product as much as place. Dourish adopts the expression *developing spatialities* to indicate that the use of wireless and ubiquitous technologies might cause people to reencounter the structure of the same space differently, and to connote that they arise from the interactions between individuals and mobile technologies. By adopting the term spatiality, emphasis is put on the different ways people perceive the structures relating the different places they encounter, and on how they articulate their spatial experiences. It is in this sense that space is socially constructed and conceived as the outcome of social practices.

Dourish' objective to rehabilitate space should be understood in relation to ubiquitous technologies and hybrid environments, in which technological and physical layers often intertwine with each other. Nevertheless, some aspects of his revised approach still remain unclear. For instance, he attempts to overcome the dualism between space and place, by stating that also space is the product of social practices. He, therefore, turns to the notion of spatiality – the way in which people generate spatial forms and articulate spatial experience – to evoke how that is possible. However, the relations between space, place and spatialities are not explored. In addition, given that space is socially constructed as much as place, it is not obvious how the two notions differ from each other and, more

importantly, how the distinction can be of practical use for design and analysis.

3.1.2 Designing technology for emerging places

A number of research efforts (see, for instance, Baillie et al., 2008; Fitzpatrick, 1998; Ciolfi, 2004a; Harrison et al., 2008; Hedman, 2004; Sanusi et al., 2008) have drawn on the notion of place in order to provide a framework for analysis and design.

Chalmers (2004) has proposed a semiotic approach to place to explain individuals' usage of technologies. As he points out, the activities people carry out at different locales are often mediated by a number of media. Thus, whereas people's interactions can be influenced by the spatial configuration of a given environment and the affordances it provides, they are also shaped by people's previous experience, knowledge and the range of media they have used. Thus, for instance, a tourist visit to an unfamiliar city is influenced by his experience *in situ*, by his previous life experience as well as by the books, the websites or other type of resources previously consulted, or encountered, about that particular city. For this reason, a narrow emphasis on space as the paramount resource for activity might underrate the interdependence of media, and the fact that a technological artifact is seldom used in isolation.

The debate on how different concepts of place can assist the design of interactive technologies and environments, and on the methodological implications it bears is a fertile topic in the fields of CSCW and Interaction Design. In the following sections, I will shortly introduce the Locales Framework (Fitzpatrick, 1998) and research conducted in a museum setting (Ciolfi 2004a; 2004b). Although these research contexts profoundly differ from the setting I studied, they offer relevant insights for my own work. The former was conceived, for instance, as an attempt to move away from the design of computer interfaces and environments based on place metaphors and on the simple reproduction of spatial features. Its relevance concerns the emphasis put on the *emerging nature* of place and on the way it is configured in the interactions between resources, people and the spaces they inhabit. The latter provides, instead, a concrete example of how a geographical notion of place can be used to understand people's interactions within a museum environment.

3.1.3 The Locales Framework

By drawing on the conceptual distinction between space and place, the theorization of the Locales Framework (Fitzpatrick, et al., 1995; 1996; Fitzpatrick, 1998) explores the opportunities to design collaborative and virtual environments. Within this framework, a locale is defined as the place arising from the interactions between a particular group of people – a social world[6] – their interactional needs, the space they inhabit and the tools, resources and means they use to satisfy those needs. Thus, rather than being a static entity, it is dynamically constructed; it is people's needs and objectives, the use they make of space and resources – hardware, software applications, but also tools not directly related to a computer such as a phone, for instance – that contribute to determining it.

Two relevant aspects characterize this work: (a) although a locale can embody spatial features of the physical world, it is not bonded to them; (b) it can emerge from the intertwinement of virtual and physical spaces.

3.1.4 Using Tuan's notion of place to understand people's interactions in a museum setting

The second contribution, exploring how place can assist the design of interactive museum environments, relates to part of the analytical work carried out within the SHAPE project[7] (Ciolfi 2004a; 2004b). By drawing on Tuan's geographical notion of place (Tuan, 1974; 1975), this analysis focused on the observation of visitors' movements within a museum space, their interactions with the physical environment and the artifacts displayed. Special attention was also devoted to the understanding of personal interactions between visitors, between visitors and the museum staff and to the way they were mediated by the environment spatial organization. The findings inspired the formulation of some sensitivities that informed the design of two interactive exhibits at the Hunt Museum in Limerick (Ciolfi et al., 2002). In this chapter, I will not provide a detailed account of the design sensitivities and the interactive installations that were developed within this project (see also Hedman, 2004; Taxen, 2005). For the purposes of this thesis, I will only briefly refer to the analytical approach adopted and

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[6] The notion of "social world" is borrowed from the sociologist Anselm Strauss and it describes a group of people sharing a commitment to collective actions.

[7] "SHAPE - Situating Hybrid Assemblies in Public Environments" was a EU funded research project within the European initiative "The Disappearing Computer".

attempt to present those aspects of Tuan's geographical notion of place[8] (Tuan, 1974; 1975) that were relevant for the analysis.

Tuan's perspective of place is deeply characterized by the role of *human experience*. According to the geographer, individuals get to know places through their experience and feelings and not only through their eyes and knowledge (Tuan, 1975). The term *Topophilia* (Tuan, 1974) was, in fact, coined to express the effective bonds between people and places and to overcome geometrical approaches to studying them.

For this experiential perspective, the individuals dwelling in a place play a central role: "Place is created by human beings for human purposes" (Tuan, 1975: 165). Thus, a park, a tree or a city are not places just because of their materiality and tangible nature; to remain places they have to be *lived in* by human subjects: "Place is a construct of experience" (Tuan, 1975: 165).

Another essential aspect of Tuan's conceptualization of place is the centrality of its spatial dimension to individuals' experience of place. Tuan's notion of place can be articulated into four main dimensions that are not defined *a priori*, but emerge from people's experience and interaction with and within a given environment:

- Personal: memories, associations and values individuals might relate to a certain place;
- Social: the presence and awareness of others and the influence it might have on someone's experience of a given place;
- Cultural: codes of behavior, national and language differences, norms which might affect and determine people's activities;
- Physical and structural: the perceptible physical qualities of a place, such as material, colors, disposition of artifacts, etc.

As clarified elsewhere (Ciolfi 2004a; 2004b), it is this shift of focus from a notion of place as a background for action, to a notion of place as a locus of interactions between people, but also between people and different

[8] In the second part of this chapter, an overview of how place has been approached in other disciplines, particularly philosophy, will be given. Nevertheless, I have decided to introduce Tuan in this section, as discussing his articulation of place helps to clarify the work introduced herein.

physical locations that makes it a useful analytical framework for disciplines such as Interaction Design and CSCW. In fact, the *experiential orientation* to place raises issues on how people occupy and use space, how they create place by arranging different elements within it and how space features support people's physical presence and their experiences within a given environment. This analytical approach is relevant to my own objectives, as the aforementioned aspects will be essential points in the analysis that will be introduced in the second part of this thesis. Moreover, as I will argue in section 3.3.2, regarding space as the structural and physical layer of place has important analytical consequences for the interpretation of the field studies discussed in this work.

3.1.5 Emerging issues

The first part of this chapter has provided some examples of how "place" has been used in CSCW and Interaction design. In addition, being attentive to such an aspect has allowed me to highlight a set of issues which are relevant for fields oriented towards the design of technology.

Harrison and Dourish' design orientation, for instance, put emphasis on issues such as: (a) exploring how space is turned into place; (b) understanding how virtual spaces are appropriated and inhabited by people; (c) making sense of how individuals gain an understanding of the way they can act within specific environments, both physical and virtual.

The Locales Framework addressed the need to move away from design efforts based on the mere reproduction of spatial metaphors. In this respect, it emphasized the emergent nature of a place, and how it can arise from the ongoing interactions between people, the space they inhabit, the tools and technologies they use. Besides providing a framework for analysis, the Locales Framework also contributed to the exploration of interface design not merely based on the choice of spatial metaphors.

Ciolfi's work provided, instead, an example of how a place-centred approach can assist the analysis of individuals' interactions within augmented museum environments. Moreover, it illustrated how introducing place into Interaction Design can support the elicitation of sensitivities for the design of interactive artifacts in a museum context.

In addition, the study of mobile workers (Brown et al., 2003) presented in the previous chapter (Section 2.3.1) suggested a use of "place" to explore how mobile workers' practices are influenced by the place they act within, and how places are, in turn, adjusted to their needs.

In the sections to come, further conceptualizations of place will be introduced. In so doing, I will discuss in detail the one I have chosen for

the purposes of this work, and I will tackle the methodological and analytical implications inherent in my choice.

3.2 Beyond the physical structure

In the previous sections I have highlighted how place as a notion has been adopted within different research projects within the fields of Computer-Supported Cooperative Work and Interaction Design. In the sections to come, I will discuss how such a notion has been approached in other disciplines, such as Humanistic Geography, philosophy and, in particular, phenomenology.

The choice to discuss the body of literature mentioned above is motivated by the objective to foreground approaches drawing attention to how individuals inhabit and experience places. For this reason, I have decided not to include accounts focusing on: the structural and functional components of place (see for instance, Alexander, 1979; Carr et al., 1992); the way space is planned and produced[9] within societies, by reflecting history and political power within a given context and cultural environment (Lefebvre, 1991); social constructionist aspects of place (see for instance Forest 1995; Halberstam, 2005; Till. 1993). Stating that a place is socially constructed does not simply entail that it has been built by a given community; it also means that the meanings ascribed to it are determined by those forces having a certain power within that society – for instance, politicians, the media industry or other groups active in that particular context. For this reason, according to David Harvey (1996), any interesting investigation of how place is constructed should seek to understand the social processes and forces generating it. A significant example of this approach is Becker's (2002) investigation of the visual elements of a Swedish shopping mall – i.e. the physical layout, the windows, the stairways, etc. – to elucidate how that place was designed and constructed in order to convey well-defined messages and values.

Since, different conceptualizations of place suggest different implications on how we look at a particular situation and make sense of it, in the following sections, I will discuss various philosophical accounts of

[9] As underlined elsewhere (Harrison et al., 2008), the term production denotes the way capitalist culture reproduces space as a means of control – see for instance, the use of maps involving a uniformed coordinate system. Construction relates, instead, to situated meaning-making processes enacted by the inhabitants of a particular place.

place drawing attention to individuals' experiences rather than to the social processes producing it.

3.2.1 Place and meanings

People engage in place-making activities for different reasons. In fields such as CSCW and Ubiquitous Computing, this expression often refers to the practices enacted to turn a site into a place suitable for work. An example of this is the account of the activities carried out by a group of mobile workers to reconfigure their work context, and to align their mobile devices to the evolving task at hand (Kristoffersen et al., 1999).

However, this phenomenon is not limited to such an aspect and, as pointed out elsewhere (Cresswell, 2004), it can include various activities, from decorating rooms to characterizing a neighbourhood to assert the identity or values of a particular community. In general terms, one aspect of place-making is to make space meaningful by attributing meanings to it: a place is, therefore, a *meaningful location*. Toponymy and representations of places, such as maps, are examples of how locations can be invested with meanings (Cresswell, 2004). Although these meanings might already be ascribed (for instance, a building may be designed to symbolize the power and values of a city), they are not fixed labels, but rather the result of people acting and living in it. In other words, they are neither neutral nor natural, but emerge from people's interactions with a given place. As Tuan (1975) puts it, a place is a "center of meaning constructed with experience".

The focus on how people attribute meanings to various sites, and how they consequently act within them is indeed relevant for the field studies discussed in this thesis. In fact, focusing on how nomadic workers experience the places they work at, by understanding the meanings and values they attribute to them – such as availability, privacy, quietness or feeling inspired – is relevant to explore the relationships between activities and the sites wherein they occur.

3.2.2 Place and activities

As already noted, meanings are not labels attached to locales; on the contrary they emerge as the outcome of creatures' activities within them. This means that exploring activities is fundamental to understanding the places hosting them.

The role that human actions play in determining the nature of a place is emphasized by the humanistic geographer David Seamon (1980), who adopts the metaphor of the *body-ballet* to refer to the emergence and the

establishment of routines within specific spatial segments. According to Seamon, a body-ballet is a "set of integrated behaviors which sustains a particular task or aim" (Ibidem: 157), in a particular spatial and temporal dimension. A place-ballet emerges when a number of routines, enacted by several individuals, are combined within a particular location and it contributes to generating a strong sense of place. In fact, it is by observing or participating in these performances – for instance, at an outdoor market – that people get to know a place and become aware of what it is.

The metaphor of the body-ballet emphasizes that a place is a lived space, performed on a daily basis through people living their everyday life and, in this regard, it stresses the importance of routines and established activities. Nevertheless, investigating nomadic settings requires an understanding of emergent activities as well. Within the setting I studied, for instance, emergent activities can be regarded as the consequence of:

- The affordances provided by different locations and the way they configured people's interactions with the environment and with each other. Gaver (1996), for instance, explores the possibility of an ecological approach to social interactions, by outlining how the physical properties of a given environment might affect the collaborative activities of the people inhabiting it. Similarly, by reflecting on the challenges to design mobile technologies, Paay and Kjeldskov (2008) investigate how physical affordances may facilitate social interactions in public places.
- The need to make place. At the various sites wherein students carried out their work – such as library group rooms, cafeterias, classrooms and public spaces within the university buildings – a certain improvisation and extra-work was often required to make place, to create the suitable conditions for work to be performed.

While analyzing the findings, I will illustrate how focusing on emergent activities may contribute to understanding some important phases of nomadic work.

3.2.3 Place, embodiment and agency

By drawing on Heidegger's notion of human existence as necessarily being-in-the-world, Malpas (1999) regards place as the very structure within which experience – including thought, action and judgments – is possible.

In his analysis, place is approached as a *philosophical topography*, a complex but unitary structure encompassing *subjectivity and objectivity, space and time, self and other*. In what follows the elements of this structure will be explicated.

Firstly, Malpas' articulation encapsulates extension and spatiality as necessary conditions to enable thought and experience. In fact, a grasp of space – that is, an individual's ability to locate and orient himself in relation to the features of a given environment – is necessary for individuals to be able to act within a spatial framework. This grasp of space is tightly connected to individuals' bodily and environmental awareness, to their past and present experience and to their sensory, cognitive and motor capacities. Malpas defines this space as "subjective" or "egocentric", and he further specifies that "a creature's subjective space is precisely the space of that creature's own involvement with the world" (Ibidem: 50). Moreover, the perspective on subjective space presupposes an active point of view and the perception of active engagement that "includes a grasp of how one must act in order to achieve certain practical outcomes" (Ibidem: 51).

Secondly, the notion of an active creature, capable of orienting itself towards the worlds and its objects, requires the grasp of an objective space as well. Subjective and objective spaces are both parts of the structure of place. However, the subjective space is tied to a creature's particular surroundings, while the creature and its surroundings can be located within an objective space.

Thirdly, any experience or thoughts always presuppose an active self they belong to; this subject is, in turn, a complex structure whose identity is defined by past thoughts, experiences and judgements. To express it in other words, a fundamental ingredient of the experience of place is a conscious self, capable of purposive behaviour and actions. Thus, according to Malpas, a creature who has experience of the world also possesses the ability to intentionally act upon it *(agency)*. The extract below exemplifies how intentionality might relate both to mental states and actions:

> "Rather than viewing intentionality as some sort of occult relation between mental states and their objects, we can see intentionality as always grounded in the sort of spatial orientation and casual involvement that is characteristically a feature of our engagement with objects in action" (Ibidem: 95).

Intentionality and agency are emplaced and their instantiations are observable through individuals' actions and engagement with objects. When considering agency and intentionality, it should be remarked that a

subject capable of agency and activity is a subject who is able to distinguish between self and the world around. Thus, "to be capable of actions is to be capable of distinguishing, within one's own experience, between active and merely passive effects" (Ibidem: 113).

Finally spatial *embodiment* – that is the capacity to orient oneself in space, to be aware of the bodily capacities also in relation to actions – is necessary to agency, experience and thought.

> "Inasmuch, as the capacity for action is tied to bodily extension and differentiation, so a creature's capacities for action are evident in the differentiation of a creature's body. Moreover, the complexity of the body, and of bodily movements, is itself a mark of the complexity of behavior of which the creature is capable […]. And, of course, grasping the capacities for actions that are present in one's own body is a large part of what is involved in the grasp of subjective space" (Ibidem: 134).

The philosophical articulation of place proposed by Malpas is an attempt to overcome a narrow focus on space. In fact, the spatial dimension provides a frame within which subjective and objective elements can be grasped together with other aspects, such as agency.

Although Malpas' philosophical orientation does not include any suggestions on how to study human experience of place, two tenets of his analysis are relevant to this work: the notions of active involvement and agency. The attention drawn to these aspects is, in fact, in line with CSCW and HCI focus on the active role of human actors, both as experiencing and as acting subjects. Moreover, the fact that intentionality is observable through actions and movements makes place – intended as a complex structure within which experience, thoughts, actions and judgments are possible – an entity which is possible to explore by means of ethnographic methods (see Chapter 4 for more details).

The notions of physical engagement with a subjective space, embodiment and agency may be relevant to understand nomadic practices. In fact, agency is always related to a subject and a subjective space and is, therefore, always emplaced and contextualized. Despite arguing that place results from the interplay of self and other, subjectivity and objectivity, space and time, Malpas' approach lacks, in my opinion, an articulation of how people make sense of their experience of place, and how they distinguish, for instance, between a subjective and an objective space.

In the sections to come, the conceptualization of place I will explicitly draw on will be introduced.

3.3 Understanding Casey's phenomenological approach to place

The different conceptualizations introduced so far share a view of "place" as a product of individuals' experience and activities, as emergent and negotiated by the people inhabiting it.

Casey's notion of place (see Casey, 1993 and 1996), which will be introduced in the sections to follow, constitutes another relevant account of its emergent nature. As a phenomenologist philosopher, Casey draws on experience in order to make sense of how people encounter places, perceive them and attribute meanings to them. The experience of a lived body is, in fact, a central element of his conceptualization, essential to the perception and knowledge of a place. In the introduction to this chapter, a possible relationship between nomadic practices and place has been suggested. The importance of this relationship resides on the argument that understanding the analytical components of place could assist exploring the concept of nomadicity in relation to such elements. It is in this light that Casey's theorization of place should be understood in the context of this work. In the sections below, the following issues will be brought to the fore:

- The role of a lived body in perceiving and knowing a place;
- Place regarded as emergent experience articulated alongside four specific dimensions;
- Place regarded as an event;
- The emergence of a sense of place as people wander about and not merely when they reside at a given site.

While introducing the aforementioned aspects, it will be discussed how they can be relevant to the work presented in this thesis.

3.3.1 Perception and the relation between space and place

One of the central tenets of Casey's analysis is the role of perception in the way people make sense of their being in a particular place.

> "Places are not added to sensations any more than they are imposed on spaces. Both sensations and spaces are themselves emplaced at the very first moment, and at very subsequent moment as well". (Casey, 1996: 18).

The quote above brings to the fore the relations between sensations and place. Whereas perceptions and the process of sensing are influenced by place (in the sense that they are partly determined on a cultural level), people's experience of place and the sense they make of it are shaped by individuals' sensations and feelings. In other words, sensations occur in place ("they are emplaced"), while allowing individuals to access and to know it. According to Casey, then, it is possible to know and sense a place only by being there, and to be there is to be in a position to perceive it. In this sense, the knowledge of place is not subsequent to perception, but it is a central element of it, it is "ingredient in perception itself" (Casey, 1996: 18).

The citation also points to another important aspect, that is, the relation between space and place. As noted, place is not simply added on spaces as an extra layer; on the contrary, the spatial dimension is subsumed into the place. Arguing that "space is emplaced from the very first moment" reveals the phenomenological background of Casey's analysis and the underpinning conception that people always experience place and not pure space. More specifically, the primacy of perception and, therefore, of a lived body makes this relationship corporeal in character. To express it in Casey's own words:

> "*In the order of knowing*[10] place comes first. It is "the first of all things" because we know it from the very beginning. But we know it thus only because our bodies have already, i.e., a priori, given us access to it" (Casey, 1993: 110).

3.3.2 Place as emergent

As exemplified above, in Casey's view, the experience of space is already experience of place. Moreover, place is profoundly characterized by the material region in which it is found and by the material, concrete qualities of its spatial dimension. Nevertheless, it would be reductive to understand Casey's conceptualization in this respect only. In fact, similarly to Tuan (1974; 1975), in his analysis (Casey,1993; 1996) place emerges from the interplay of different dimensions, related to its "lived" nature, and from individuals' experience of them. To put it more plainly, according to Casey, it is possible to experience place alongside the following dimensions:

[10] Italic is original.

- A *psychological dimension,* including individuals' memories, values and thoughts;
- *A physical dimension,* that is the geometrical and the physical structure of space;
- *An historical dimension, encompassing* the past of a place together with a person's memory of it;
- *A social dimension*, that is the presence of other people, rules, norms and other cultural aspects that might shape and determine individuals' behaviors.

These dimensions do not have a life of their own; on the contrary they are embodied in individuals' activities and experiences of place, through space and time. It is the intertwinement of these traits of *lived experience* that determines the emergent and negotiated nature of place. Consequently, the sameness between places is not merely based on the similarities of their spatial dimensions (the shape of two rooms, for instance). It rather emerges from the interplay between the dimensions introduced, and involves the extent to which similar experiences and activities are enabled. As noted elsewhere (McCarthy et al, 2005), it is the sense and quality of engagement that makes the place, regardless of the physical environment and its physical immersion. It is the type of experiences and activities enabled that allows individuals to associate similar places and to put them in relation with each other.

This point is particularly relevant for my field studies, as to maintain an engagement with their current activities is a main challenge that students, and arguably other nomadic workers, have to face when moving from a site to another, or when working at a number of locations. As the data will show, nomadic workers often undertake activities, distinguishable from the real work, in order to maintain this engagement, or to make a place more suitable for their needs.

Another important aspect to be noted is the relation between space and place. Approaching space as a dimension of place bears, in fact, important implications in the way I will interpret and analyze the data collected. For instance, one of the groups I followed occasionally used an on-line conference tool in order to meet at distance (see section 5.6.1), as one of the members used to live in another town. Although some interpretation of places (for instance, Harrison et al., 1996) could regard such application as an instance of *space-less place*, I will consider it as a tool used to bridge and connect the different sites students where located at. Thus, throughout this

thesis, physical places (which presuppose a structural and spatial dimension) and digital environments (such as the aforementioned on-line conference application) will be considered as two different entities.

In the last two sections, the centrality of the lived-body and of the relation between space and place has been outlined. In the following section, the dynamic nature of place will be discussed.

3.3.3 Place as dynamic

The *dynamism* of place is another important aspect of Casey's conceptualization (Casey, 1993; 1996). Although stable and perduring in relation to its structural and physical dimensions, the same place might be changing or perceived differently, because of the experience of a lived-body and its movements within it. Thus, whereas a given place may provide a geographically specific set of structures, it may still be difficult to safely predict what will happen within it: "The places we have to negotiate are the result of the practices of those who were here before us, but this place in the future will be different" (Cresswell, 2004: 36).

With this regard, place is not a state achieved once and for all, but rather an entity which is continuously being formed, and its appropriation and use may differ depending on particular circumstances, specific needs and ongoing activities. Some examples, taken from the data, might help to clarify this point. As it will be illustrated, although a corridor, within the university building, serves the main function of connecting an area of the building to another, it may occasionally be perceived by students as a suitable place for work. Thus, a small table, located in the corridor just outside the classroom wherein the upcoming lecture is going to be held, may be chosen to meet up and revise together a project presentation. It is, indeed, the fact that the team revising the presentation is visible to the peers walking by that makes the corridor a suitable workplace, albeit temporary. In fact, the location of the table allowed the other group members – who had not worked on the presentation before – to stop by and give comments about it.

3.3.4 Place and movements

Another aspect characterizing the emergent nature of place and its dynamism is the circulation of individuals within and across places (Casey 1993; 1996). In this perspective, the interactions between a body – that is an individual – place and movements is important in determining a

particular sense of place. Three different modalities relating place, body and motion are considered by Casey:

- *Staying in place*. The body remains within the same place, although not completely stationary, and some of its parts can change their physical position (for instance, turning one's head);
- *Moving within a place*. The body moves freely within a place but still remaining in it (e.g. moving around the same room);
- *Moving between places*. The body moves and travels across a range of places like, for example, in the case of traveling and nomadic circulations of people.

Putting emphasis on movements is central in Casey's (1993) conceptualization. As he argues, being in place is not necessarily a static phenomenon and people can also experience a sense of place as they wander about. In relation to this point, he distinguishes two different ways of dwelling: *dwelling as residing* and *dwelling as wandering*.

Residing involves building places to which is possible to come back, and also supporting social needs such as dwelling, upbringing and education, commemoration and defense. Through building places such as residences, schools, edifices and so forth, individuals modify the local landscape and themselves as active subjects. In fact, they become fabricating agents and social subjects in the cities they inhabit together.

Dwelling can also be accomplished by wandering; while "some dwellings encourage permanent residence, some reflect purely transient uses" (Casey, 1993:115). Thus, places such as parks, cars and street corners can be genuine dwelling places and people can have a strong sense of them as they move about. However, according to Casey, wandering (both within or between places) can be regarded as dwelling only if it involves people's feeling of being settled, a felt familiarity with the place in question and the possibility for repeated return to it.

The anthropologist Marc Augé (1993) regards as non-places the locales typical of contemporary society (for instance, highways, airports, supermarkets, hotel rooms), places marked by transience and ephemerality where individuals are temporarily together, without living together. Augé defines non-places by means of comparison with anthropological places (for instance, a village, a city or a neighbourhood), characterized by their own history, tradition, culture and language. Thus, the comparison is functional to emphasize that non-places are sites of transit, mobility and

travel, temporarily populated by clients, passengers or users, people whose identity is suspended while in transit and re-found at tollbooths and customs.

Both Augé and Casey tackle the relation between mobility and places, and both address the issue of transient use. The former in the context of non-places, the latter in relation to wandering as a dwelling modality. However, while the anthropologist underlines that individuals' relationships to non-places are characterized by moving on to something else, the philosopher emphasizes that it is possible to feel settled while moving about.

The attention drawn to movements and dwelling modalities, to feeling settled, familiarity and the possibility of repeated return are relevant to this thesis. In fact, dwelling presupposes the presence of an active agent, playing a certain role in transforming a site into a dwelling place. As noted, this transformation can be accomplished through fabricating, but also through inhabiting and (re)occupying places. Relating these aspects to the understanding of students' nomadic practices, raises a number of pertinent analytical questions, such as: "How are sites transformed by students into a dwelling place, albeit transient?", "What elements contribute to the feeling of being settled?", "What places do students regard as familiar and how does it relate to the activities they engage with?". Furthermore, the focus on movements is also central to understanding the relations between place and engagement. In fact, when moving from a place to another, keeping an engagement with the ongoing activities is the main challenge that students have to face. How do they practically manage that? How is it a sense of involvement achieved? What are the placial elements that facilitate it?

3.3.5 Place as an event

It should be clear by now that place is not something merely physical. Malpas describes it as a philosophical topography, a complex structure that constitutes the very condition of experience. The humanistic geographer Yi-Fu Tuan characterizes place as the unfinished outcome of individuals' experience alongside four dimensions – personal, social, cultural and physical. Similarly, Casey (1993; 1996) argues that, although inseparable from its materiality, a sense of place emerges from the interplay of people's interactions with its physical, psychological, social and historical layers. It is in the articulation of place as emergent experience alongside the aforementioned dimensions that Casey and Tuan's approaches converge and show some fundamental similarities. The choice to adopt Casey's conceptualization of place, as a methodological and analytical framework

for the field studies presented in this thesis is, nonetheless, justified by the emphasis given to two central tenets of his approach: event and engagement.

In order to characterize the emerging nature of place, Casey (1996) describes it as an *event*, as something happening and negotiated by its own inhabitants.

> "A given place takes on the properties of its occupants, reflecting these qualities in its own construction and description, and expressing them in its occurrence as an *event*: places not only *are*, they *happen*" (Ibidem: 27).

The event metaphor should be considered in relation to the four dimensions constituting and contributing to the experience of a place, for it is in this respect that an entity of place is not given, but constructed and negotiated by the people living and acting within it. Moreover, this metaphor conveys the idea of something unfinished, becoming and in process; something whose meanings are continuously negotiated by active agents, their experiences and social practices. The main square in my hometown used to be, for example, a meeting point for agricultural workers searching for temporary, often daily jobs. Nowadays, this trait of the square is not a salient one anymore, while the physical layout of the square has not changed over the years. In fact, the main changes are to be found in the social and economical layers of the town, due to the massive migration of people from working the land to be employed in the public service sector. It is in this respect that, as Pred (1984) argued, places are never finished; on the contrary, their use and meanings change over time as the consequence of social practices and processes.

Approaching place as an event is tightly connected to another aspect of Casey's analysis, namely the emergence of similarities between places, a point which allows us to introduce the second of the aspects mentioned above: that is *engagement*.

> "A given place may not permit, indeed it often defies, subsumption under given categories. Instead, a place is something for which we continually have to discover or invent new forms of understanding, new concepts in the literal sense of ways of "grasping-together". A place is more an *event* than a *thing* to be assimilated to known categories. As an event, it is unique, idiolocal. […] The "kind" at stake in "kind of" is neither a genus nor a species, that is, a determinate concept that rules over its instances, but *something operating across* margins, laterally, by means of homology or similitude". (Casey, 1996: 26)

By gathering things, thoughts, memories and practices place becomes an event that is difficult to associate with pre-given categories. In this regard, the genus of place is neither something that can be defined by a hierarchy, nor a "determinate concept that rules over its instances", but, as we have seen, the emergent outcome of creatures' activities and experiences articulated through the interaction with a psychological, a physical, an historical and a social dimension. Consequently, the sameness between places does not merely derive from sharing the same physical locations, geometry, or structure, but rather from encompassing phenomena of the same type of abstraction – for instance, dwelling, working or escaping. It is, therefore, the type of experiences and activities enabled that, in Casey's analysis, allow individuals to associate similar places and relate them with each other. It is with respect to this lived dimension and to the type of meaningful engagement enabled that individuals associate similar places and relate them with each other.

This last point is relevant to understanding nomadicity, as to keep an engagement to the ongoing work activities is a main challenge that students and, arguably, other types of nomadic workers, have to face when working at several locations. How is it practically achieved? How do students organize their activities so that they can be carried out at a number of sites? How do they turn a location into a "dwelling" place?

3.4 Place and the understanding of nomadic work: methodological implications

Casey (1996) regards his conceptualization of place as a "philosophically-informed anthropology". Thus, without investigating or describing a particular place, he conceives an abstract framework which can be used to explore the relationships between a specific site and the people inhabiting it. In a similar way, Feld and Basso (1996) underline that "place" is tightly related to ethnographic investigation, because of the central concern for the way people encounter places, and the way it relates to the various aspects of their activities and experience.

Throughout this chapter I have argued that "place" as a theoretical notion may be used to explore nomadic practices and to make sense of students' activities and experiences in relation to the main dimensions outlined in section 3.3.2. Thus, unfolding and discussing Casey's approach has been instrumental to this objective.

At this point, then, another important issue to be tackled concerns the use of "place" in CSCW, the field in which this thesis is framed. As already

clarified, the emphasis on active involvement, agency and intentionality, and the possibility to investigate them through individuals' actions and movements may be related CSCW research. More specifically, it may be associated with the attention drawn to human actors as active agents engaged in real world situations (see for instance, Bannon, 1991; 2005), and to the ethnographic concern to make work visible for analysis and design (see section 4.1 for more details). A focus on place foregrounds the role of individuals as experiencing and acting subjects. Thus, to express it in terms which are particularly meaningful in CSCW or HCI research, *place is a user-centered notion.*

What are the methodological implications of adopting a place-centered approach to understand nomadic practices?

First of all, utilizing "place" to investigate how students organize their activities at a number of locations implies *the adoption of qualitative methods* (see Chapter 4 for more details). In fact, it would be unfeasible to capture the complexity of the relationships between the students' work practice and the sites wherein they occur in an experimental setting. In addition, it would be problematic to quantify and assign specific measurements to such relationships.

Secondly, using "place" implies the *employment of a bottom-up approach* aimed at exploring how place is experienced, appropriated and occupied by its inhabitants. Understanding people in place can therefore be achieved by means of participant observations, interviews and other data collection techniques usually deployed in qualitative field studies. As I will further explain (Chapter 4), different techniques, usually adopted in field studies of ethnographic inspiration, were employed to conduct the fieldwork. More specifically, I chose: (a) to observe the participants and take notes during the observations; (b) to video-record some of the students' work session; (c) conduct semi-structured interviews; (d) to arrange a focus group; (e) to collect their working documents. Moreover, the students were asked: (f) to document their activities by means of a diary; (g) to take pictures of the places they worked at. The combination of these techniques can provide a rich set of data to understand place as an event, that is, to explore how it happens, and how it is practically created by the students inhabiting them. More in detail, they can assist investigating the activities enacted to *make place* and to *bridge different places*. By using the expression *place-making,* I refer to the way a given site is transformed into an adequate place for work to be carried out. With this respect, the appropriation of resources within a given location, the rearrangement of elements within it, the investment of a given location with overarching activities are all relevant aspects to take into

account during the fieldwork; whereas, by using the expression *bridging places*, I refer to the strategies students may adopt and the tools they may use in order to overcome the problems deriving from carrying out their group activities at a variety of locales. Moreover, the combination of these techniques can provide a set of rich data: (i) to understand students' experience of the environments they work at, in relation to the four dimensions highlighted in section 3.3.2; (ii) to explore those elements that may influence the students' feeling of being settled in a place that is occupied only temporarily.

3.5 Place and the understanding of nomadic work: analytical implications

After having outlined the methodological implications deriving from the adoption of place as a notion, in the present section I will address the analytical foci brought to the fore by such an approach.

First of all, focusing on the *metaphor of place as an event* draws attention to how place is practically created by nomadic workers – more specifically to this thesis, by students – and to the practices enacted to make place. In other words, being attentive to the notion of event foregrounds analytical aspects such as:

- Understanding how sites are transformed into dwelling places (see section 3.3.4), albeit transient;
- Understanding the elements that may contribute to the feeling of being settled – e.g. the presence of people or resources that may be useful for the activities to be accomplished;
- Understanding of the places students regard as familiar and of the way they can be related to the activities they engage with;
- Understanding the relationships between movements and engagement. When moving from a place to another, keeping an engagement with the ongoing activities is a main challenge that nomadic workers have to face. With this respect, it becomes relevant to investigate how this is practically managed, how a sense of involvement is achieved and what are the elements of place facilitating it.

Secondly, focusing on the dimensions discussed by Casey (section 3.3.2), also allows us the understanding of nomadicity as tethered to different places. More specifically, it assists to explore the relationships between place and nomadic practices with respect to:

- *A psychological dimension.* How do students relate to different places? What is their experience of them? What are the meanings and values that they attribute to them?
- *A physical dimension.* What are the elements of the physical environment that contribute to the selection of a place, rather than another? How are tasks and activities distributed to different physical environments? What type of social interactions are facilitated by the spatial layer?
- *A social dimension.* What are the social factors (ongoing activities, rules, norms, presence of other people) that can determine the choice of a place, rather than another? How do they relate to the activities undertaken within it?
- *An historical dimension.* What is the students' past experience of working or being at a certain place? Are there any past interactions with a place that may affect the current ones? What is the past of a given place? When was it built and why?

3.6 Summarizing this chapter

In this chapter, I have introduced place as a notion that describes a given environment by encompassing people's experiences and activities within it. In addition, I have argued that the focus on individuals' situated activities makes it a useful analytical concept for CSCW.

With reference to nomadic settings, I have suggested that such a notion might be appropriate to analyze nomadic practices. In fact, by holding together the four facets of human experience of place – the psychological, the physical, the historical and the social dimensions – and the different ways people attribute meanings, feelings, activities and values to it, this notion can provide a framework to understand: (i) how nomadic workers organize their activities at a variety of sites; (ii) how they turn locations into (work)places, by appropriating resources and investing them with overarching activities. With this regard, I have also emphasized the

importance to take into consideration the emergent activities, deriving from the need to make place and to create suitable conditions for work.

In the final part of this chapter, specific attention has been paid to Casey's conceptualization of place, particularly to his view of:

- Place as an *event*, as something that happens and that is negotiated and defined by its inhabitants' activities and experience;
- Place as the outcome of experience along four specific dimensions – physical, psychological, historical and social.

We have already discussed that, with respect to the first point, place can be regarded as emergent, marked by openness and change, rather than permanence. McCarthy and Wright (2005) describe this particular aspect of place by adopting a dialogical metaphor accounting for the emergence of place as the situated outcome of a responsive conversation between geographical places, self and technology. The emergent nature of place is relevant to the empirical work I will introduce in the following chapter. In fact, during the two field studies, I have documented students working in the library cafeteria, in library group rooms, in fast food restaurants, at home, in public open spaces of the university buildings or in seminar rooms. Working sessions were often preceded by a modification of the site, by an adjustment to the ongoing activity and the current tasks. Place was made, *place happened*, not only in relation to students' experience and perception of it, but also in relation to the more practical concern to create the conditions and provide the resources so that work could be carried out and accomplished. Thus, focusing on how place is constantly negotiated and practically achieved is relevant for understanding the setting discussed in this thesis. Moreover, it becomes relevant to understand the challenges that students have to face when moving from a location to another, and how they manage to keep an engagement with their activities.

With respect to the second of the points listed above – particularly the emphasis given to the physical or structural dimension – it should be underlined that the notion of place I have decided to adopt differ from Harrison and Dourish' (1996) notion of space-less place, since the sense of place inherent in their approach is not rooted in the properties of space, but rather in a set of shared and mutual understandings of other people's behaviours and actions. This point is particularly relevant, since my objective is not to understand, for instance, students usage of virtual environments, but rather to explore the way students organize their

activities at a number of locations, and the relationships between their work practices and the physical places in which they occur.

In the following chapter I will introduce the two field studies conducted, and clarify how a focus on place can be combined with ethnographically-informed methods.

4 Methodology and field studies

The first research question presented in the introduction to this thesis was concerned with the methodological and analytical issues involved in studying nomadic practices; the second addressed the exploration of nomadicity in the context of students' group work and how it shapes the activities they perform.

In Chapter 2, a number of analytical concerns related to understanding nomadic work as a set of situated practices were introduced. As discussed, approaching nomadic work encompasses critical aspects such as: (i) physical mobility, both of people and artifacts (Luff et al., 1998; Eldridge et al., 2000; Lamming et al., 2000); (ii) mobility of heterogeneous sources of information (Büscher et al., 2003); (iii) awareness of other people's location (Bellotti et al., 1996); (iv) understanding of the interactions between technologies and places (Perry et al., 2001; Brown et al. 2003; Bartolucci, 2007). Moreover, a notion of nomadicity regarded as a work condition characterized by *discontinuities* – changes occurring in the work setting, in the group organization, in the physical environments, in the tools and technologies supporting work related activities (Bogdan et al., 2006) – was outlined.

In Chapter 3, the notion of place was introduced and it was suggested that it may be used as methodological and analytical framework: (i) to understand the relationships between activities and the sites wherein they are performed; (ii) to hold together and make sense of the various facets of nomadicity mentioned above.

Throughout this chapter, I will discuss the methodological approach adopted for the collection of the data that will be presented and discussed. The empirical material analyzed comes from *two different field studies* and *a design workshop* (see section 4.4). At the time when the studies were performed and the workshop arranged, all the students were attending courses usually taken during the last years of a typical undergraduate academic curriculum at our university. The only exception were two graduate students, members of the group followed during the second study. In the forthcoming sections, more details will be provided on the goals, on the organization of the fieldwork, and on the data collection techniques employed. Two main activities were studied in detail: collaborative writing and prototyping of novel technologies. More specifically, since writing a report was one of the assignments students had to accomplish in order to account for the group work done (see sections 4.2 and 4.3), I will look at writing not as an isolated process, but as an activity contextualized into a broader design assignment.

In conclusion to this chapter I will reflect on: (i) the use of vignettes (section 4.5) as a medium for communicating the findings and representing the relationships between activities, places and technologies; (ii) the process adopted for the data analysis (section 4.6).

4.1 Methodological approach

In Chapter 3, I argued that "place" might be used to understand the bonds between students' nomadic practices and the sites wherein they occur and, in this regard, I introduced a set of methodological and analytical implications involved in the adoption of a place-centered approach. In addition, I pointed out the shared analytical concerns between "place" as a theoretical notion – with its emphasis on the lived dimension, on various aspects of human activities and experiences, and on the interpretation of how people encounter places – and ethnographic investigation (see also Geertz, 1996).

An ethnography is a written representation of selected aspects of a culture (Van Maanen, 1988) used in the social sciences (e.g. anthropology and sociology) to study small scale, non-western societies or subgroups (e.g. youth, addict, ethnic groups) within industrial communities.

In more recent years, its methods, analytical concerns and goals have been adopted by disciplines such as HCI and CSCW, focused on the understanding of work practices and technologies in use, and oriented towards the design of technological systems (Blomberg, 1995). The turn to

ethnography in CSCW was motivated by the growing realization that understanding individuals' use of technologies in artificial settings was limiting, and that accounting for the social and situated nature of people's interactions was fundamental to understand their use of technological artifacts (see, for instance, Suchman, 1987). A primary objective of this type of ethnography has been "to make work visible" (Suchman, 1995), to provide representations of work based on the fabrics of real, everyday work practices, and to "see activities as social actions embedded within a socially organized domain and accomplished in and through the day-to-day activities of participants" (Hughes et al., 1995: 58). Another key issue, justifying the adoption of ethnography in CSCW, is related to the need to ground the design of collaborative technologies in a in-depth understanding of the social context of work – including issues such as office space, company politics, organizational hierarchies, etc. – (Blomberg et al., 2003; Button, 2000; Hughes et al., 1994 and 1995; Hughes et al., 1992; Nardi, 1997). This applied use of ethnography is not straightforward and it has, in fact, been subject of critiques concerning the marginalization of the theoretical and analytical components (Anderson, 1994; Bader et al., 1998) in favor of a too narrow focus on providing implications for design (Dourish, 2006).

4.1.1. An ethnographically-informed approach

I regard the approach adopted to conduct the field studies presented in this thesis as *ethnographically-informed*. What does motivate this choice?

A first answer relates to my personal background in Communication Science: since I am neither a professional anthropologist nor a sociologist, I would feel uncomfortable to regard my work as ethnography. However, reading ethnographic literature and reflecting on it has been a dialogue and a source of inspiration to conduct the field studies, to represent and to analyze the data collected.

A second answer relates to the role of the field studies in the context of this thesis. Understanding the nomadic conditions characterizing student group work is a primary objective which I seek to achieve by: (i) providing an account of how students' collaborative activities are shaped and influenced by the different environments in which they are carried out; (ii) exploring in what ways students' practices are affected by the facticity of managing work between and across several places; (iii) understanding how students cope with this situation and what tools and technologies they use in order to do that. Although the design reflections outlined at the end of this thesis (Chapter 7) are not a main contribution, this work should be

intended as part of a broader project with explicit design goals, and this very design orientation motivates the particular perspective of my field studies. For this reason, particular attention is drawn to the relations between technologies and places, to the way they mediate students' collaborative activities, and to the practical achievements the students enact to create the conditions to carry out work. Consequently, other aspects, which might be central in ethnographic investigation for social science, are not addressed (for instance, the structural, and social organization of the particular institution studied, students' interactions with the social structure of the university as a whole, students' sense of belonging to a particular community or group, gender and power relations among peers, but also between students and lecturers).

The expression "microethnography" is sometimes used to refer to a specific ethnography that "zeroes in on particular settings […], drawing on the ways that a cultural ethos is reflected in microcosm in selected aspects of everyday life, by giving emphasis to particular behaviors in particular settings rather than attempting to portray a whole cultural system" (Wolcott, 1995: 102). Although this expression might be suitable to my analytical objectives, as already mentioned, I prefer to regard my methodology as *ethnographically-informed*, because of the particular attention drawn to the use of technologies. In fact, while informing the design of technologies, the main foci and analytical concerns are informed by the design orientation itself.

In order to understand how students work in a nomadic setting participant observations and semi-structured interviews, usually employed to study work activities in their natural context were adopted (Blomberg et al., 2003). Moreover, some students were invited to participate in a workshop (section 4.4) to discuss issues related to the use of mobile technologies and to brainstorm and explore some design ideas. The participant-observations were performed in order to gain an understanding of how work practices are performed in situ, how technologies and artifacts are used in a given environment, and how the environment itself enables and affects work. The semi-structured interviews were also conducted to gain insights on the same issues, but from the point of view of the students engaged in the work under analysis. As students did not have their own, stable workplace, it was not always possible to conduct contextual interviews. Thus, a number of interviews were performed in my office.

In the field of CSCW, typical workplace studies have investigated work practices in well-defined physical environments (e.g. Hughes et al., 1995; Normark, 2005; Pettersson et al., 2004; Pycock et al., 1996; Rouncefield et

al., 1994; Räsänen, 2007) within which a differentiation of tasks among the participants involved is explicit and clearly visible. As argued elsewhere (Hughes et al., 1995), "For the lone fieldworker such sites are ideal. They minimize travel and communication problems, and all that the fieldworker needs to see is there in one place and can be gathered with a minimum of disruption" (ibidem: 59). The setting presented herein profoundly differs from the maybe too ideal picture depicted above. In fact, as we will see, students' work is strongly characterized by a blurry separation between working and non-working hours – thus, working late at night, both within the university campus or at home, is a common practice, especially when deadlines are approaching. Furthermore, a relevant aspect of this type of group work is the alternations between co-located collaborative sessions and distributed, individual ones. Both aspects present some interesting challenges for the fieldwork. In fact, on the one hand, it might not always be feasible for the researcher to be present, late at night, in one of the university computer labs, or at some students' home; on the other hand, if a group's co-located working sessions can be observed and studied by an observer, following the single participant raises some problems in term of resources. In such cases, the only way to avoid choosing whom of the group members should be shadowed to the next workplace, where s/he will engage in individual work, would be to have as many researchers as the members of the group. Thus, to complement the data collected by means of observations and interviews, and to overcome the aforementioned problems, the participants in the second field study were asked to keep a diary and to take pictures of the variety of physical environments at which their work related activities took place.

In the following sections, the two field studies and the workshop held with the students will be introduced.

4.2 Study A: Setting and participants

For the first field study a course, held at our university, was chosen as a setting. This course – whose main characteristic is a multidisciplinary approach to the innovative design of information technology – is usually open to students with different background (Computer Science, Psychology, Media Technology, Architecture, etc.). When this first study was carried out, students were supposed to envision technology in order to enhance *shared entertainment*, which represented the main topic for that year course. Moreover, by collaborating in groups of 6 up to 8 members, they were also required to create a web page, to edit a video scenario and to

write a report about the work accomplished within the group.

Although not all the courses involve the same amount of work, they usually include one of the aforementioned group assignments which, thus, constitute typical activities students might engage in. Thus, the course was chosen because it entailed assignments that are typical within students' projects, but also because we expected that its particular organization would give as the opportunity to explore nomadic practices in a collaborative and cooperative setting. In fact, while on the one hand students were to work in groups, on the other hand, they were not provided with dedicated applications and laboratories that they could use for their projects. Certainly, they could use several of the computer laboratories accessible to students; however, differently from a programming course, for instance, they did not have to rely on specific programming tools provided by the course, and available in the dedicated labs used by such courses.

The study was carried out in the context of the Nomad project, between the end of January 2004 and the end of May of the same year. Approaching the course was facilitated by the course coordinator, who introduced our project to the students, distributed a presentation of the study by email and who, eventually, told us how many groups wanted to participate in the study, and how to contact them.

The first half of the course was characterized by regular lectures the students used to attend, while during the second half the groups began to collaborate on their projects. It is during this second phase that most of the fieldwork took place, except from two observations. Together with another researcher of the Nomad project, I was also present at two meetings scheduled in the course plan as regular lectures. These lectures played different roles, such as facilitating the group formation, but also giving each group the opportunity to show the state of their design project, and to receive feedback both from the teachers and from the other peers.

4.2.1 Goals

The first study was quite exploratory and aimed at understanding what being nomadic means for students working in groups, and in what ways it reflects on aspects related to the articulation, the division and distribution of work. More specifically, the foci of this fieldwork can be described as follows:

- Understanding the notion of nomadicity in student group work and the definition of the main features characterizing it. More specifically to this point:
  - How students cope with this situation, and how they managed activities occurring at a variety of locations;
  - How being nomadic shapes the students' collaborative and coordinative practices;
- Identification of the places where students carry out their group activities, how they are experienced and for what reasons they are chosen;
- The tools and artifacts used by students in the context of their group activities, particularly in order to collaborate and communicate with each other.

While these goals constituted a common interest for the Nomad Project, within the groups I followed, particular attention was devoted to the collaborative writing activities. Thus, besides the common, aforementioned points, my personal objectives were also to understand:

- What type of collaborative writing strategies the students adopt and how they relate to different places;
- The various places at which they write;
- How being nomadic shapes the collaborative aspects involved in their writing processes;
- How students use artifacts and technologies both to communicate with others and to co-write documents at different places.

4.2.2 Data collection

As mentioned above, an ethnographically-informed approach was adopted for the collection of the field data. The observations of students' activities were complemented with other qualitative data collection techniques, such as semi-structured interviews and the gathering of work artifacts – in this case the different versions of some of the groups' reports. Semi-structured interviews were chosen as they enable a discussion with the participants, rather than providing a sequence of answers to pre-determined questions. At that point, this technique was suitable, the observational focus being

explorative. Thus, asking questions – such as "How did you plan the group work?", How did you divide it and why?", "Where does the group usually meet?", "In what places do you usually work and why?", "How did you document the project?", "How has the group work evolved until now?", "What tools and technologies are used by the group?", "How did you work while writing the report?" – was useful to prompt discussions and to begin understanding the way being nomadic shapes collaborative and coordinative aspects of students' activities, and how it influences the division and distribution of work among group members.

Four groups, made up of 6 up to 8 students, volunteered to participate in the study. We named each group after the project they were engaged in: (i) the Sound Project, (ii) the Album Project, (iii) the Game Project and (iv) the Connection Project (see Normark et al, 2005, for more details)[11]. At that moment, four people were working within the Nomad project: a postdoctoral researcher, a PhD student in the last phase of her doctoral studies, a research assistant and myself. The fieldwork was distributed so that each of us could follow and study a single group each. The reason for conducting the field study in such a way was not merely determined by the intention to divide and distribute the work among us, but also by the fact that the four groups, participating in the study, often worked at the same time, or at least in the same period, and at different sites. Therefore, in order to follow all of them we had no choice but to divide the work in such a way.

In total, data from about *fifteen observations* – ranging from one to three hours each – and *ten interviews* – each of about one hour – were collected. All the interviews were audio recorded and transcribed. Moreover, one of the groups allowed us to access the email conversations exchanged between its members, so that we could access the Yahoo!Groups ® account the group had created for this specific project. The other groups did not give us any permission to access their electronic conversations.

In analyzing the findings, I will draw on data gathered by the *ten interviews* mentioned above and field-notes taken during *four observations* of four working sessions I was present at. Three out of ten interviews were conducted by me, while the remaining ones were conducted by two other researchers. Two observations took place during two course meetings that

[11] It should be noted, at this point, that the analysis I conducted draws on data regarding only three of these groups.

had been organized as regular lectures, and the other two during two meetings arranged by a group in order to plan and revise their project presentation. In total, about seven hours of observations and ten hours of interviews were performed.

Overview of the data analyzed within study A
• *4 observations* for a total of about *seven* hours Field-notes • *10 semi-structured interviews* for a total of about *ten* hours • *Working documents* created by the participants Different versions of a group's report Data stored in a Yahoo!Groups ® account

Table 4.1

To sum up, the material related to this study mainly stems from the collection of data carried within three groups: (a) the Connection Project group; (b) the Game Project group; (c) the Sound Project group. Unfortunately, it was not possible to access the raw data regarding the Album Project group. The collaborative effort was only related to the phase of data collection; consequently, the analysis and interpretation of the data presented in this thesis are my own responsibility and my personal contribution to the Nomad Project.

The field study was performed both in English and Swedish. More specifically, the interviews with the members of the Connection Project and the Game Project groups were held in English, while the interviews with the Sound Project group were conducted in Swedish. During all the observations, the students were carrying out their assignments while speaking in Swedish. Although it is undeniable that when speaking their own language, the participants could talk about their work practices and their experience of them more thoroughly, I believe the interviews performed in English have provided complete and valuable material to analyze, the participant being quite fluent in English.

4.3 Study B: Setting and participants

For the second field study, another course including a design project was chosen. In this case, the students attending this course were required to work in groups of three up to five members in order to design a prototype of computer support for collaborative work or learning. Furthermore, they were required to write a report to describe the prototype they had developed and the process of designing it. The coordinator of this course briefly introduced the plan of my study to the students attending it. Afterwards, one of the groups volunteered to participate in the study, and the team members contacted me by email to communicate their availability when they had already started to work on their project. At that point, I asked them to let me know when they would meet to work together and, when they finally did, they had already started to work on their prototype.

This particular group was made up of four students: two undergraduate students and two doctoral ones. One of the PhD students shared an office in our university building, whereas the other used to commute from another city, where he had his main office. In this regard, this group differed from the others observed during the first field study.

Similarly to the other course, this one was held during the spring term, from the beginning of February 2006 to the middle of May of the same year. The course was organized in such a way that, during the first half, students learnt about relevant issues and topics in the field of CSCW (Computer-Supported Cooperative Work), by attending regular lectures. During the last two months, in addition to that, they were supposed to practice the design work, by conducting a small user study and developing a prototype of technology support for collaborative work or learning. The data discussed in this thesis were collected during the last week of the course, when the students were most intensively working on their project.

4.3.1 Goals

Complementary to the previous study, which was more exploratory in nature and intents, this second phase of the fieldwork was more explicitly focused on the role of place. By drawing on the initial observation that the lack of a steady office makes place a "practical concern"[12], through this second study I sought to understand how students organize their activities occurring at a variety of locations, and how they practically create the

[12] The expression is borrowed from the article "Place as a Practical Concern for Mobile Workers" (Brown et al., 2003).

proper conditions to undertake such activities (place-making). The analytical foci of this study were:

- Identifying the various locales wherein students carry out their group activities;
- How each place shapes students' work, with particular attention to collaborative writing and prototyping;
- How workplaces are created by the team members, that is how different locations are turned into a suitable places for the work to be undertaken;
- How places are managed and how they are connected with each other, so that students' activities can be carried out at and across different sites. In this regard, special attention was paid to:
    - the circulation of artifacts between different physical environments;
    - the collaborative and coordinative strategies adopted;
    - the situated use of tools and technologies.
- What happens between group meetings and individual work sessions.

During this study, which I will refer to as "Study B", particular attention was given to the understanding of activities enacted to *make place* and to *bridge different places*.

By using the expression *place-making* I refer to how a given site is transformed into an adequate place for work to be carried out. Thus, the appropriation of resources within a given location, the rearrangement of elements within it, the investment of a specific site with overarching activities were all relevant aspects I looked at during the fieldwork. Whereas, by using the expression *bridging places*, I refer to the strategies students adopt and the tools they use in order to overcome the problems deriving from carrying their work at a variety of locales.

As pointed out by Latour (2005), although many elements are often already in place, places do not just exist but, on the contrary, many other elements are transported into one place from another – objects, agents and entities of various nature *circulate* between places and contribute to connect

them. Thus, in this regard, the circulation of artifacts was another relevant aspect to focus on while collecting and analyzing the data.

4.3.2 Data collection

In order to achieve the aforementioned objectives, the data were collected by means of: (i) participant observations and video recordings of two of the group's working sessions – one lasted about four hours, the other about eight hours; (ii) semi-structured interviews; (iii) note taking and follow-up interviews with each of the group members.

The semi-structured interviews were scheduled with the participants and conducted in my office, as it was problematic to organize contextual interviews with participants who did not have a stable office environment. The follow-up interviews – which were also semi-structured – were held soon after the first observation took place and were often inspired by episodes which had raised my curiosity while observing. Eight interviews were conducted in total, of which one was entirely performed by email. More in detail: (i) the student interviewed by email was contacted twice; (ii) a second student was interviewed twice, after each of two observed working sessions; (iii) the remaining two group members were interviewed three times: the first two times after each of two observed writing sessions, while the third follow-up interview was held about one month and a half later.

The interviews were conducted in order to gain insights into the observed activities from the participants' point of view. Moreover, when carrying them out, my main objective was to draw a picture of the relevant work practices the students engaged with when I was not present, particularly the tasks carried out individually at home. In this case, I explicitly asked the informants to recreate the flow of interrelated activities carried out on those occasions. In order to achieve these goals, typical questions were, for instance: "Could you describe what you did when working on the report by yourself?", "Where were you located? Why?", "Was it problematic to move there?" "How did you feel about working in that particular place?", "How do you feel about spending a long time within the university campus?", "Did you have to use any resources or working material for the report?", "How were they accessed and used?".

All the interviews were audio-recorded and transcribed and they resulted in about six hours of recording.

The decision to video record some of the group working sessions was motivated by the need to complement the observation notes taken with the richness of details captured by the videos. Ethnographic observations

documented with a video camera are suitable to capture "real-time production of social life" (Büscher, 1995) and the complexity of overlapping, collaborative activities (Blomberg et al., 2003). The collaborative sessions observed were attended by all of the group members, and watching the video recordings was useful to discover significant details I had missed during the observations. When the data collection phase was over and the analysis had already begun, some parts of the video recordings were watched together with one of the group members, who provided thorough explanations and reflections on what the group was doing. The videos were also useful to investigate the students' interactions with the physical environments.

Because of the difficulty to follow the group and its single members anytime and anywhere, the students were asked to keep a diary and to take pictures of the different environments they worked at (home, a library, hotel rooms, etc.). The use of diaries, to document feelings or to understand patterns and aspects of activities which might be problematic to observe, is widely acknowledged in CSCW and Interaction Design (Carter et al., 2005; Rouncefield et al., 2003; Hulkko et al., 2004; O'Hara et al., 2001; Palen et al., 2002). The diary used in this study contained some open questions in order to stimulate students' thoughts on: (i) unplanned changes of the place they were working at, reasons for those changes and the possible involvement of other group members; (ii) tools used to collaborate and communicate with other peers at those occasions.

Similarly, the reason for using photos was to stimulate and prompt discussions (Carter et al., 2005) about the different environments where work could possibly take place when I, as a researcher, could not be present. A debriefing interview was performed in order to clarify some points and to gather more information about them.

Working material, such as the outline and different versions of the report, sketches of the prototypes and screenshots of the applications used were collected.

The table below (table 4.2) provides an overview of the different data collection techniques deployed within this study. The table also includes techniques adopted by the researcher and by the participants in the study.

Overview of the data collected and analyzed within study B	
• *2 observations* of two of the group working sessions for a total of about *twelve* hours: Field-notes; Video-recording; • *9 semi-structured interviews* • *Working documents* created by the participants*:* Sketches of the prototype; Different versions of the group report	• *4 images* provided by a participant • Screenshots of an application used • *1 diary*

Table 4.2

4.4 The workshop

Besides the two field studies, I was also involved in the organization of a workshop which was carried out in June 2007. *Seven students* participated in the workshop, all of them attending different courses during the last years of master-level academic programs at the Royal Institute of Technology (KTH). As such, the participants were already familiar with working in groups and it was, therefore, assumed that they could share with us their opinions and experience of collaborating on a common university project. None of the participants had previously been involved in the two field studies presented before.

The workshop lasted five hours and was arranged into two parts respectively aiming at:

- Unpacking issues related to the type of technologies students usually use within their group work, with special regard to the number of people involved, the tasks at hand and the locations they are used at;
- Exploring design concepts for possible technological artifacts meant to support student group work.

The first part of the workshop was arranged as a *focus group* (Preece et al., 2002), during which the participants were asked to express their own experience concerning the use of technologies usually deployed in their

work activities. Although new insights were gained regarding these particular aspects of their work activities, the workshop was also a fruitful occasion to corroborate and further analyze some of the findings stemming from the fieldwork (see, for instance, Bogdan et al., 2006; Rossitto et al., 2007).

The second part of the workshop was influenced by Participatory Design (Bødker et al., 1995; Ehn, 1993); the participants were, therefore, actively and directly involved in the exploration of some early design ideas concerning technologies and applications to be utilized within project group activities. During this phase the students were divided into different groups – located in two different rooms – and were left free to choose and tackle the design aspects they thought to be relevant in the context of their learning group activities.

4.5 Organizing the data: the use of vignettes

It is difficult to identify a typical activity, a specific way of going about a certain task that might be used to describe, once and for all, collaborative work as it is actually carried out by students. In fact, because of the differences between group members, their past experience in other projects, the number of peers involved and the complexity of the social interactions between them, different groups may pursue the same goal by performing tasks and activities in various ways. The lack of rules and procedures to be followed, combined with the students' need to juggle with different schedules and assignments in other projects, seems to hinder the emergence and the consolidation of well defined work routines and practices. Moreover, as it will be discussed, differently from other nomadic settings (see, for instance, Bartolucci, 2007; Wiberg 2001), the same activity can be carried out at different sites, and that might have consequences on the choice of the technologies and artifacts to be adopted, and on the way they are practically used.

In order to highlight and discuss these differences, I have decided to present the groups' activities studied more closely in particular types of narrative structures: vignettes. A vignette is "a short piece of writing, music, or acting which clearly expresses the typical characteristics of something or someone[13]". Although the definition above is one of common language, the sense of vignette it conveys is shared by qualitative studies in CSCW,

[13] The Cambridge Online Dictionary.

and often adopted to account for the work practices of people acting in specific settings (Crabtree, 2003; Laurier, 2005; Orr, 1996; Rodden et al., 2004).

As thoroughly discussed (Bruner, 1991), narratives are not merely a mode of representation *(the forms of narrative discourse)*, but also a mode of reasoning *(the narrative mode of thought)* that is typical of human cognition. According to Bruner, people can learn the world narratively and can talk about it narratively: "We organize our experience and our memory of human happenings mainly in the form of narrative" (Bruner, 1991: 4). The narrative mode, therefore, represents connections between events and various narratives – stories, myths, excuses, reasons for doing or not doing something, etc. – and can be used to portray people's goals and intentions, as well as to make individuals, cultures, societies and historical epochs comprehensible as a whole (Richardson, 1995).

By introducing the findings of the two field studies through the use of vignettes, my goal is to provide a vivid representation of the main group activities observed and their relevant aspects – e.g. the flow, the context and the different places in which they occurred, a description of the goals and of the actors involved, the tools used, the adoption of specific strategies to manage at distant and collocated sessions, the emergence of possible breakdowns and resolutions. More specifically, each vignette is attentive to the relationships between the activities and the particular places in which they occurr. Thus, my goal is not to separate and isolate work practices occurring at different sites (e.g. collaborative and co-located from individual and at distance), but rather to highlight the relations between them, and between the various places wherein they were carried out. As the data will show, the fabric of the writing and prototyping activities observed is, in fact, shaped by the number of people involved, but also by the very nature of the place wherein such activities are performed. Thus, for each of the vignette illustrated, particular attention will be devoted to the actors involved and to the type of social interactions between them, to the tools and resources used, but also to the students' experience of the places encountered, to the values they attribute to them, and to the way they turn them into workplaces.

Furthermore, the vignettes are intended to provide a ground for the analysis that will be set out in the sixth chapter. The citation below can help to characterize the relationships between the two chapters.

> "If anthropological interpretation is constructing a reading of what happens, then to divorce it from what happens – from what, in this

> time or that place, specific people say, what they do, what is done to them, from the whole vast business of the world – is to divorce it from its applications and render it vacant. A good interpretation of anything […] takes us into the hurt of that of which it is the interpretation" (Geertz, 1973: 18).

Thus, while Chapter 5 reveals the details of what the participants did and said at a certain time and in a specific place, Chapter 6 provides an interpretation of the practices observed. More specifically, the attention will be drawn to the way locations are transformed into places for work, to the way activities are managed at a number of sites, and to the way they relate to the places wherein they occur with respect to the physical, the psychological, the social and the historical dimensions.

As noted elsewhere (Butler, 1997), every social inquiry is always characterized by three types of participant: the inquirer or narrator (the researcher or writer of the study), the actors (the subjects of the inquiry) and the audience (the various readers who will probably make use of the findings). Being aware of this view is important as it acknowledges that inquirers or narrators are part of the data, and that their objectives and the conceptual tools "shape what will be seen in the field, written in a report, and read by those who purchase their texts" (Van Maanen, 1995: 15).

Thus, while the vignettes provide a ground in which to anchor the analysis, they also respond to my intention to communicate and share the daily, idiosyncratic fabrics of the practices observed as a basis for future design work. In this regard, the process of telling a story allows representing and making sense of a particular setting in a way that "makes it possible the understanding of people who are not present" (Richardson, 1995: 211). The use of such narratives is determined by my underlying interests of exploring how technologies could be designed in order to enhance a given work situation and its context. Although no concrete prototyping work is included in this thesis, to preserve the details of what Suchman (1987) addresses as "moment-to-moment descriptions[14]" is regarded as important to provide a ground for future design work.

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[14] Suchman (1987) uses moment-by-moment descriptions of actors' interactions with particular technologies and within given environments, in order to show that all activities are concrete and embodied, and that, however planned, purposeful actions are inevitably situated in the distinctiveness of particular circumstances.

The names of the participants appearing in the vignettes have all been anonymised. The participants granted me permission to use the pictures included in some of the related commentaries.

4.6 Analyzing the data

> "Every qualitative research needs some structure or conceptual framework through which to view, record, and interpret social action. […]. There must be some basis on which we attend to and subsequently report some things rather than everything" (Wolcott, 1995: 89).

The place-centered framework adopted in this thesis is motivated by the argument that understanding place, as a theoretical notion, can assist exploring the relationships between nomadic practices and the places they are bound to. In this respect then, the dimensions of place discussed by Casey (section 3.3.2) provide an analytical lens to look at those relationships. Moreover, focusing on the event metaphor draws attention to how place is practically created by students, and to the practical achievements enacted in order to make place. In section 3.5 the analytical implications deriving from the adoption of a place-centered framework have been considered.

The interpretation of the material collected is primarily based on observations and interviews, but further enriched by the analysis of data collected by other means: video recordings, a diary and some students' working artifacts (different version of the report and various sketches of the prototype). The data were analyzed recursively. First of all, going through the notes taken during the observations and transcribing the interviews allowed me to gain a first, broad picture of the students' activities and of the processes they were involved in. During a second phase of analysis, I began to examine the other material collected. Watching the videos, for instance, allowed me to discover more details concerning the working sessions observed – particular interactions between group members, between them and the physical environments, negotiation processes, or the students' own motivations for doing something in a certain way. Within both studies I looked at the different versions of the report, and only within the second one at the sketches of the prototype as well. Comparing the different versions of the report was for me a way to verify that the evolution of the text corresponded to how some of the participants had described it during the interviews. For instance, within the

second study, the analysis of the sketches was useful to understand how the form of those representations changed, when they were moved from a locale to another, due to the students' need to move information and resources between sites. Since learning is not the main focus of this work, neither issues related to the students' elaboration of knowledge and how it is mediated by mobile technologies, nor aspects that would help assessing the quality of their assignments have been central foci of the analysis. In this respect then, outlining how some representations evolved throughout the projects is functional to investigate how they were moved between places, rather than understanding the elaboration of the knowledge they conveyed.

As explained in section 4.2.1, the first study sought to explore how working in a nomadic setting shaped the students' group activities, with special regard to collaborative aspects and issues related to the distribution and articulation of work. Thus, at the outset of the analysis, I looked at the data through these lenses, seeking to understand how carrying out work at a variety of location shaped the work itself and how it was distributed among the team members.

One of the main initial challenges of interpreting the data was to hold together the several places at which the participants used to work, to understand the relations between different activities occurring at several locations, but also to make sense of the reasons why fragments of the same activity were undertaken at a number of locales. With this regard, during a second phase of analysis the theoretical notion of place was a valuable analytical framework to interpret and organize the data. Thus, while writing up the analysis of the second field study and of the material collected during the workshop, I went back to "Study A" and interpreted the material by relating it to Casey's conceptualization of place.

As already argued, approaching place as an entity articulated alongside four dimensions – physical, psychological, historical and social – can provide a lens to look at the data. In analyzing the findings, place as a notion will therefore be used as a framework to make sense of the students' work practices and their relations to the various sites wherein they occurred.

5 Presenting nomadic activities in groups of students

In this chapter, an account of the data collected during the field studies previously introduced will be presented. In so doing, I will first provide an overview of the collaborative activities students engaged in, particularly writing and prototyping, that represented a main focus of the field studies. Secondly, I will outline some of the locales more often used by the subjects observed, and address a first set of relationships between such places and the work practices undertaken within them. Furthermore, I will introduce some general reflections concerning the use of technologies and artifacts adopted by the groups investigated. The first three sections of this chapter play a twofold role: on the one hand, they anticipate some general reflections on the activities mentioned above, the environments in which they were performed and the technological artifacts mediating them; on the other hand, they outline the elements constituting the backdrop for the more detailed accounts and analysis that will follow.

As argued in Chapter 3, place as a theoretical notion can provide a framework to explore the relationships between people, activities and technologies. Thus, while the first three sections of this chapter introduce aspects which are relevant to the understanding of the students' nomadic practices, the other sections are meant to give, through the use of vignettes, a detailed account of the project activities observed.

As it will be evident throughout this chapter, it is plausible to identify some work aspects that are common to the various groups followed – for instance, planning the access to working material or the use of particular technologies depending on the peers involved and their respective location.

Nevertheless, it would be problematic to isolate well-defined and typical practices accounting for the students' group activities. With this regard then, the vignettes included in this chapter (see section 4.5) are meant to reveal how, in the setting studied, similar errands may be accomplished differently, and at different places. While this certainly depends on issues such as the number of people involved in the project, time constraints and individuals' motivations, the findings seem to suggest that this is also determined by the particular places students have access to. In fact, while each environment presents specific characteristics that constrain, determine and shape the way work is performed – in a lecture hall, for instance, the arrangement of the lecturer and of the students' desks in front of each other better supports teaching than a dialogue between students – humans can modify and change sites for disparate purposes – one can, for instance, personalize a room by hanging posters or displaying plants. Thus, by using vignettes my objective is to describe this two-sided relationship and illustrate how it might intertwine with other relevant contingencies of the students' work processes.

This chapter is tightly related to the following one. The narratives presented herein illustrate the details of how similar project activities were carried out within the different groups, at different locations and, at the same time, anticipate issues regarding the interplay between places, activities and technological artifacts. In this respect, they provide a ground to anchor the analysis that will be further articulated in the following chapter.

At the same time, this thesis should be considered in the context of a broader project, whose design orientation attributes to the vignettes another important role. In fact, by crystallizing details of the nomadic activities observed, they are also meant to assist the design of technological artifacts for the particular cohort of nomadic users addressed in this thesis. It should be mentioned that the suggestion underlying this approach is that design efforts should take into account not only the artifact, but also the emerging activities a given technology is meant to support and (Rizzo, 2000). The vignettes are, therefore, unique extracts capturing the idiosyncrasies of the practices studied, intended to facilitate the upcoming analysis as well as future design work. In the concluding remarks of this thesis (section 7.3), I will return to the latter issue and discuss how these particular narratives could be used throughout a design phase.

While sets of commentaries are raised after each vignette, a more comprehensive interpretation and analysis will be unfolded in the following chapter. In the sections to come, the vignettes are reproduced in a smaller

font, to distinguish them from their respective commentaries. Some quotes, extracted from the interviews held with the students, are used to clarify and expand relevant issues emerging from the vignettes. A number of pictures are also included to better illustrate relevant aspects regarding the activities investigated anf the places wherein they occurred.

The vignettes are arranged in first and second field study because of two reasons: one related to the analytical foci, the other to the composition of the groups. First of all, the first field study paid particular attention to how working at a number of locations shaped the groups' activities, with special regard to the collaborative and coordinative practices among their members. The second study, instead, focused more explicitly on the role of place, on the way it shaped the activities the students engaged with, on how they organized their activities at a variety of locations, and practically created the proper conditions to undertake the (place-making). Secondly, I think that the presence of two PhD students and, therefore, of two stable offices, in the second study may provide interesting elements to compare the different groups.

5.1 The writing and prototyping activities observed

As previously explained (sections 4.2 and 4.3), the groups studied were made up of students attending two different courses, both including a design project. Writing a report was one of the assignments required in order to pass the course. Such reports were meant to account for the group work accomplished throughout the project, and they were to contain a detailed description of the prototype developed, of the design choices and of the design process itself. The report was to be between 8 and 10 pages long, and students were required to select and use some relevant articles, or book chapters, from the course literature.

This type of writing is rather common within Swedish universities, where students are often required to write essays, or reports, either individually or together with other peers. The importance of this type of assignment within standard undergraduate curricula is emphasized by a course held at the Royal Institute of Technology – the technical university where the field studies where conducted – for first year students who are to get acquainted with scientific writing. As reported elsewhere (Rossitto, 2005), one of the main objectives of such a course is to make students aware of the fact that writing scientific papers goes beyond reporting facts, as it entails to ground them in selected references – it includes genre formalities and style conventions; it entails a critical use of resources and

the awareness that peers' critiques are not necessarily negative. By attending this course, students are stimulated to look at writing as a process, as a means of communication and reflection. They are thought how to develop a coherent text, how to organize contents in different ways or how to support a given argument. Moreover, they are also given suggestions on how to write together and how to handle collaborative aspects of this particular activity, from sharing files to giving constructive comments, from discussing a writing plan to dividing the work.

One thing to bear in mind while reading the findings is that this type of writing is not an independent activity, but rather a means to report on the work done and, thus, embedded in it. Writing the report, both in terms of process and contents, draws on the design work accomplished by the group throughout the project and its evolution is intertwined with it. In this sense, it would be reductive to consider it in isolation, and overlook its interconnections and interdependencies with the rest of the group work. The excerpts reported below illustrate this aspect of the group work.

> "Throughout the spring, we have documented everything we have done for the project and every decision we have taken, just to make it easier to write the report". (Johanna, the Connection Project group)

> "We had divided the work and we had also made a plan on which we had indicated when the different assignments should approximately have been finished, but, at the same time, we should have begun with the report earlier, but we wrote down so much other material throughout the project that we relied on being able to use the material for writing the report". (Erika, the Sound Project group)

These excerpts, both taken from interviews with students who worked in two different groups, show two alternative ways of how students generated and collected information to be used in the final report. In both groups, writing took place during the final phase of the project, when prototyping was almost finished and the project documentation had to be handed in. Nevertheless, the preparation of the contents to include in the report had begun months before: after every group meeting, or workshop with the target users, one person took the responsibility to write down minutes reporting important issues discussed during those events. Later on, when the main writing activity began, the notes were used and elaborated in the production of the document.

Prototyping different types of information technologies was the other main activity the participants were involved in. More specifically, in the first field study, they were supposed to envision technological artifact to enhance shared entertainment in public spaces, while during the second study they were to design the prototype of a computer support for collaborative work or learning. In both cases, students were required to go through a complete design-cycle and to involve their target users, by conducting interviews and observations. In addition to that, in study A, students were supposed to adopt Participatory Design methods Design (Bødker et al., 1995; Ehn, 1993), and to eventually evaluate the prototype developed.

An extensive body of research focuses on learning design practices (see, for instance, Arvola et al., 2008; Lennon et al., 2006; Sundholm et al., 2004) and on what aspects might be crucial to the development of design abilities (Löwgren et al., 1998). Before introducing the details of how collaborative writing and prototyping were carried out by the particular students observed, it should be underlined that my main concern here is not to study these activities in isolation. On the contrary, my objective is to explore the nomadic practices embedded in them, and how activities are undertaken and organized in this specific setting.

5.2 The different places of the group work

As pointed out in the previous section, writing as an activity was intertwined and drew on the project work students were supposed to report on. This permeation concerns both the text contents and the process of writing. In all the cases, the actual writing was carried out during the final phase of the project, although, in one case, an intentional preparation of the report contents had started months before with the collection of the meeting minutes.

In this section, I attempt to provide a first overview of the different sites wherein students carried out their project work, their personal relations to them, the main practices and activities performed within them and the presence of other actors involved. Moreover, I seek to highlight some of the relevant issues that will be further addressed throughout the current and the following chapter.

The students who participated in the field studies worked at several locations, such as group rooms at the university library, lecture halls, cafeterias, open spaces within the university buildings, seminar rooms, homes, etc. One main aspect emerging from this setting is that *it is difficult to*

define a stable correlation between a given place and a typical activity accomplished within it. For instance, the final revision of a presentation may take place in the corridor outside a lecture hall, just before the lecture begins, and reasons of different nature might contribute to making the corridor a suitable, still temporary, workplace. In a specific case observed, it was important, for instance, that the group members, who had not read the presentation yet, could stop by and check it out before the class began.

Furthermore, a lecture hall, generally used for regular teaching activities, can also be used by students for disparate goals, from organizing workshops with the target users chosen by the group to formulating questions for interviews; from writing a report to preparing a project presentation.

> "Once we worked in a lecture hall, because we were working on the script for the video scenario and it was secret. It was also funny because we walked around, citing aloud". (Christina, the Game Project group)

Thus, sites to work at are not chosen randomly, or merely because they happen to be available. Other values, ascribable to a social sphere, for instance, may determine this choice. The "secrecy" mentioned in this last citation refers to the need not to reveal to other people, more precisely to members of other groups, the contents of the video scenario and, therefore, the envisioned technology. Moreover, the fact that the team members were citing aloud and were walking around the room might have been the reason for not preferring one of the library group rooms, instead. Those rooms are in fact rather small and located at the university library, where silence is an essential requirement.

Other places – such as home, computer labs, or offices – were considered to be more suitable for tasks that could be accomplished individually and that did not require discussions and negotiation with the others. On the contrary, some other locations, spanning from areas within the university buildings (open spaces, corridors, group rooms, classrooms) to cafes and fast-food restaurants, were regarded as suitable for working together with peers.

> "We had a long meeting where everyone worked with the interviews, cut and pasted and grouped them in categories. Then we divided ourselves in groups and each one analyzed more deeply one of the categories we had come up with". (Christina, the Game Project group)

In the episode mentioned in the quote above, it was important to gather up because the task at hand required the participation of the whole group. Relevant categories, that would eventually shape and influence the prototype envisioned by the group, were expected to emerge from the analysis of the interviews the students had held with their user groups. It was, therefore, important that as many people as possible would attend this event. Moreover, Christina's words point to the actual "manual" work, by which the given task was accomplished. Cutting out paper pieces of an interview and grouping them together, depending on the topic they convey, are instances of the physicality of work made possible by being co-located in the same room.

The distinction between places for collective and individual activities seems to be common to all the groups studied and, as it will be further discussed, planning the division of work, and the sequence of tasks to be carried out is a conscious strategy, often adopted by students, to manage the alternation of group and individual activities (Rossitto et al., 2007).

In order to give an idea of the type of analysis I will engage with, another important issue to mention regards the emotional values the students attribute to some places. In fact, while the vignettes will illustrate how the lack of a steady workplace often resulted into a concern to divide, organize and distribute the project's activities among its members, it would be reductive to frame the relations between students and their various workplaces only from such a perspective. Although, as we will see, this practical orientation was indeed essential for the setting studied, the data also point to other aspects of the students' experience of place. For instance, one of the participants expressed his preference to meet his fellow peers at the university library in the following terms:

> "It feels like a new way of thinking, especially since when it has been renovated, it is a very inspiring place". (Åke, the Connection Project group)

Similarly, another participant explained that he considered the train as a very relaxing and engaging place to work at. In fact, the lack of distractions, combined with the motivation to efficiently use the time spent commuting, usually resulted in deep involvement with reading or writing tasks.

5.3 Tools and resources

It is problematic to define, once and for all, which are the most representative technologies and tools students adopt and use in the context of their group work. Email, generic groupware (e.g. Yahoo!Groups ®), instant messaging applications, pen and paper, whiteboards, but also course literature and working documents are used to support the various group activities, including writing and prototyping. Some of these technologies, particularly groupware, are often introduced into the group practices by one of the group members who has a previous experience of them. In general terms, it could be said that these tools are used differently, depending on the task at hand, the number of people involved and the different locations at which work related activities take place. Email, for example, can be used for coordinative purposes and to make a date, to exchange comments on parts of a report written by several co-authors, to share working documents and to make them available either to others or to oneself. As it will be illustrated, some groups used the poll functionality available in Yahoo!Groups ® to vote on a meeting date that would fit everybody's schedule.

As it will be evident in the following chapters, it seems to be difficult to identify a direct correlation between the use of specific tools and technologies and the class of places they are used at. Within this chapter, I will provide some concrete examples of how specific technologies and tools were used in different situations. In the following chapter, a more systematic discussion on the use of technologies, their relation to geographical locations and to the specific setting of a group will be developed (see section 6.3).

5.4 Field study A

During the first field study four groups were followed simultaneously. While I was assigned to the Connection Project, the data presented and discussed herein pertain to two other groups as well, namely the Game Project group and the Sound Project group.

In what follows, an overview of the groups' life will be presented in order to give the readers a backdrop in which to contextualize the work practices being discussed. As the initial phases of the groups' processes were similar, extracts from interviews conducted within different groups will be used to clarify aspects related to the formation of the various groups.

Although most of the fieldwork focused on observing the students' work practices while they were actually attending to their projects, during the first study, I was present, together with another researcher, at the lecture organized to facilitate the formation of the various groups. This particular event, which was part of the regular course schedule, was regarded as a moment meant to encourage the students to join the same group because of an idea they wanted to work with, rather than because of "inter-personal preferences[15]", such as a reciprocal acquaintance. This lecture aimed, therefore, at giving the students a common arena and the opportunity to discuss shared ideas and common interests. Nonetheless, as reported elsewhere (Normark et al., 2005), only half of the students were present at this event (about 20 out of 45). At the time when this observation was conducted, this was interpreted as a consequence of the fact that several students already knew each other, and had already decided to join the same team. Several interviews confirmed this hypothesis and the participants clarified that they thought it was more comfortable to work on the same project with persons that they knew would do their job, rather than venturing with someone never met before.

During the lecture, when the students were asked by the course leader to brainstorm on the notion of shared entertainment and public spaces, one of them volunteered to be the *facilitator* and write on the blackboard the outcome of the ongoing brainstorming. Eventually, after the main emerging ideas were highlighted, the facilitator encouraged the students sharing similar interests to move to the same area of the lecture hall and to identify

[15] This is the expression used by one of the participants.

who else was interested in the same topic. At the end of the lecture, five groups were formed.

5.4.1 Division of work and formation of subgroups

Soon after this lecture, the students of each group met up in order to further develop their design idea and the users they wanted to target with their projects. After these two aspects were refined, the different assignments (see section 4.2) were allocated among the group members who, on this base, organized themselves in several subgroups. Within the group I followed, for instance, two peers were responsible for shooting and editing the movie (video scenario), two students took over the report assignment and two others the project's website, while everyone contributed to the development of the prototype.

Although the particular allocation of tasks mentioned above relates to a specific group, it might exemplify what happened within the other students' ensembles as well.

> "The problem was that we were too many. We were always different people showing up at the meetings and it was difficult to communicate […]. Already at the beginning, we divided among ourselves the website, the video and the report and, later on, the presentation as well. Thus, fewer people took care of the respective areas and it became easier to coordinate". (Staffan, the Sound Project group)

The quote above provides an explanation for the formation of smaller working units. The whole group was too large and that made it difficult for the team members to communicate with each other and to coordinate for face-to-face interactions.

The data collected within the different groups suggest that the students' need to juggle with different schedules (e.g attending several courses, participating in other projects, being involved in various activities related to their private lives) was another relevant reason that determined the formation of subgroups and the respective allocation of tasks.

The following citation anticipates a strategy adopted by the students to cope with this problem, that is the rotation of people attending to some important events – for instance, the three workshops held together with the final users involved in their project.

> "When we hold workshops with users, the division of tasks does not apply and everyone attends them. However, the main problem is that group members have different individual schedules. Thus, every time we meet our target users, although people change and we take turns, we try to have at least two members who attended the previous meeting as well. This procedure is to guarantee that we can keep track on what is going on with them [the users] and that they can recognize us". (Åke, the Connection Project group)

As explained, the alternation of peers at the different workshops facilitated the students' participation in other courses, and it helped to keep a connection with the final users targeted by the group. At the same time though, other interviews suggest a complementary explanation related to the students' expectation towards this course and the values they attribute to it.

> "We had the small groups and everyone worked on his respective group. The problem here is that in this course we had very important things related with the core of the course, that is to be in contact and interact with the users, and everyone wanted to do those parts. Of course doing the video and writing the report is also important but it's not the core of the course. No one wanted to give up doing the "user thing" because we were all doing this course to learn how to work with users. So that's why we were always a bigger group attending the workshops. Dividing this essential part of the project was not so easy. But then, we tried to have different people planning different workshops and contributing in different ways. Maybe it would have been easier if we had just said 'you do this in this workshop and you do that in the other workshop', but everyone wanted to be involved". (Caroline, the Game Project group)

The quote gives an idea of what the students felt was most important for the project and what they were prepared to invest more effort on.

In the following sections, six narratives illustrating some typical activities the groups engaged with will be presented and discussed.

5.4.2 Vignette 1: Writing the report in the Game Project group

This first vignette is based on data collected by interviewing the two members of the Game Project group who were responsible for writing the

report. Ten days passed from the time when the first and the second interview were conducted, the two participants being very busy with finishing their exams in the end of the academic year. The activities retold below were mainly carried out at the two participants' respective homes, over a period of about seven days. While the narrative unfolds without including an explicit conceptual analysis, the sections following it include some reflexive commentaries about:

- The nature of the type of writing described and its tight connections to the rest of the group work;
- The particular writing strategy adopted by the two actors involved, and the coordination problems arisen;
- The attempt to involve other group members in the writing process (especially during the final revision) and, at the same time, the realization that it would have been easier if only few persons were involved.

In many cases, it was possible to observe some similar patterns within different groups (for instance, the formation of sub-groups and the division of work between them, or the habit to annotate the outcome of each meeting the students held). At other times, even if the concrete moment-to-moment development of the work processes were not identical between the different groups, similar motivations were provided by the different actors involved. It is for these reasons that extracts selected from interviews, conducted within various groups, are used in the commentaries, when they help to clarify the practices being discussed.

Starting to write the report

Camilla and Anna-Karin were two members of the Game Project group, within which they were responsible for writing the report. About one week before the end of the project, when most of the design work had already been accomplished, Camilla discussed the report with Anna-Karin and volunteered to sketch the skeleton of the document, that is to write down some headings, providing an overview of *what* they could write about and a suggestion of how to divide it in different sections. Before writing the outline, Camilla took a look at the group's website to check out the material (notes) available in there, and to be able to recapitulate the work done throughout the project. After having written the report outline, Camilla sent it to Anna-Karin via e-mail and asked for her comments. However, as she did not receive any reply, she started to work on the first part of

the report, namely the first workshop[16]. It is while attending to this task that she finally got an email from Anna-Karin containing a version of the report she had written.

Editing the report: Anna-Karin

When Anna-Karin received the outline from Camilla, she integrated it with the notes available in the group's website, trying to make them fit under each of the headlines suggested by her peer. She added text to all the sections in the outline, including the one about the first workshop with users (the same one that Camilla was writing about). Afterwards, she sent the report to Camilla as an email attachment.

Editing the report: Camilla

After receiving the email, as soon as Camilla realized they had, partially, been working on the same parts and that Anna-Karin had roughly covered all the main issues to be tackled in the report, she modified her initial plans. Thus, she gave up editing her version of the document, put it aside and continued adding text to the document that Anna-Karin had sent her.

Editing the report: Camilla and Anna-Karin

From this moment on, working on the report was mainly characterized by an alternation of writing sessions between the two co-authors. One of the two peers would write some text to the whole document and then she would send the latest, revised version to the other. Occasionally, in order to know if the other writer needed some help or just to make sure that she could take over the writing task, they rang or sent text messages to each other. After the initial problem, Camilla always preferred to wait for some feedback from Anna-Karin, as she did not want to end up editing the same section again. When a new version was received, the two co-authors usually added parts to the text which already existed and, at the same time, they revised the language. In doing so, they used to highlight those parts which had been changed by using text of different colors. During this continuous exchange, the report evolved from a list of bullets to a discursive text.

Finalizing the report

The writing process was carried out in this way almost until the text was completed. However, before turning it in, Camilla revised it one last time – she added sentences, looked at the language, added the list of references. She also marked some things in the report she was not sure about. The day before the deadline, she sent the document to every group member, so that they could read it as well, but only three of the nine group members gave some comments on it. Anna-Karin and Louise, another group member, read through the report, changed those parts Camilla had marked and deleted some other parts. Eventually, adjusting

[16] The workshop in question is one of the three each group was supposed to hold with their respective users. All the workshops were organized according to the Participatory Design approach taught throughout the course (see, for instance, Bødker et al., 2000).

the layout was the only task left to accomplish and Anna-Karin suggested that Alexander, another group member, could do that, as he was good at it. Thus, as the very last thing, Alexander adjusted the layout of the document, made a .pdf version of it and handed it in.

5.4.2.1 Understanding the writing activity

As seen in the vignette above, two participants were mostly involved in the writing process which was undertaken a week before the course and the project ended.

> "We had a lot of things to do for this course and we also felt that it would have been difficult to write a report when we did not know what the next step with the project would have been. It was easier afterwards when we knew what we had done and, therefore, what to write about". (Camilla, the Game Project group)

By explaining why it was started at the end of the project timeline, the citation above clarifies the relationships between this particular writing and the rest of the course. Although the writing process was mostly performed during the last week of the project, *its beginning does not coincide with this phase and with the actual moment when the outline was initially sketched by one of the co-authors*. In fact, before sketching the outline, Camilla checked out the group's website, where working resources had been stored throughout the project. As the students had foreseen that they would have needed the information produced during the design process, in order to document what was accomplished, they had decided to take note of every decision taken and every task undertaken from the outset of the project.

> "Every time we had a workshop brief to decide what to do, during every meeting we had someone who wrote down what happened and the conclusions we reached. It was usually different people who did that […]. I emailed them *[the notes]* to everyone and then Alexander put them on the website. Maybe half of the group was part of this writing note, but it was mostly me, Simon and Alexander because we had a laptop". (Camilla, the Game Project group)

After suggesting what to write about by means of the outline, this first phase of writing was mainly characterized by pasting into one document the meetings minutes. These notes were, therefore, important because they facilitated the first part of the writing process.

5.4.2.2 Situating the writing activity at a variety of sites

In the vignette recounted in section 5.4.2, as soon as one of the co-authors realized they were working on the same parts of the report, the working plans were modified. Thus, one of them put aside the document she had created and shifted to the one written by the other peer, to which she added small pieces of text under different sections.

Reflecting on this aspect may be relevant, as it illustrates how the lack of communication between two persons located and working at different sites, resulted in a need to reshape the plans concerning the writing activity and the strategies of how to concretely go about it. That is why Camilla's initial proposal, to divide the text in different parts the two writers could edit separately, was abandoned. *The flexibility of the writing plans and the strategies adopted is, therefore, one first aspect that reflects the situatedness of the activity in question.*

A second aspect is related, instead, to *the number of people actually involved in the writing assignment*. In fact, although in this specific case, it involved two main actors, Camilla and Anna-Karin, other group members played a decisive role in its execution. In this regard, it has already been mentioned that, throughout the project, notes and meeting minutes were taken by other team members. Something similar can be said about the final revision of the document. The case depicted in the vignette shows, for instance, that before the report was handed in, all the group members were invited to express their own opinion about what had been written, and that another peer took it over just to adjust its layout. Although the issue just tackled emerge from data collected within the Game Project, similar patterns emerged in other groups as well. Within the Album Project, for example, the final revision of the document – including proofreading, revising sentences and making the text coherent – was done by a student who had not been involved in the writing process before, as one of the designated co-writers had to prepare for another exam at the same time.

Finally, a concluding remark can be raised about the relationships between the different phases of writing.

> "The day before turning it in, I was late trying to finish everything […], I printed it out and I read *[it]* from the beginning to the end […] and I realized that we needed one more heading between two concepts, because something was missing. Thus I added a heading just the day before. Moreover, Johanna[17] […] had some comments

[17] Johanna is the group supervisor, appointed when the groups were formed.

about the description of each workshop, she said maybe we did not need a discussion after each workshop, so we changed that as well". (Camilla, the Game Project group).

Within the Game Project group, the changes to the outline of the report were limited to the addition of a headline, while the overall plan of what to write was not substantially modified after being laid out. The separation between the planning and the writing phases, often recursive and intertwined in solo writing (Hayes et al., 1980), emerge from data collected within other groups as well. When the students were asked if there was a reason for that, they explained that modifying an original outline, for instance, would be time-consuming, as it would require a motivation for the changes, the other co-writer's agreement and a lot of extra communication, either by email or in presence. Thus, changes were made only if really needed or suggested by the group's supervisor.

5.4.2.3 Communication between smaller ensembles

As already reported, immediately after the group formation, the students divided themselves in smaller groups, each responsible for a specific assignment. These subgroups did not operate in complete isolation, but, on the contrary, sought to maintain a connection to the others, even though it was not always easily achieved. The quote below exemplifies some of the problems the students encountered in the attempt to involve all the group members in a specific task:

"Yes we sent it [the report], when we had so much [text] that one could read it without getting crazy about strange sentences and could understand what we meant; then we sent it out to the whole group. But then of course…the response was quite weak as they were busy with their own things. And maybe we should have shouted and said that we needed more responses, but if they are interested, it is their responsibility to look at it". (Erika, the Sound Project group)

The lack of response Erika experienced from her peers was not merely determined by their lack of interest, but also by the fact that *they were more actively immersed in other work activities*, both related to project in question and to other courses. For this reason they chose to prioritize them, rather than commenting on the group report.

Furthermore, being distributed at a variety of locations made it more problematic to communicate with the others. In fact, as it will be further explained, the use of email was fairly effective between two persons, whereas it raised some serious coordinative problems when the exchange of messages involved the whole group.

5.4.2.4 "It was smoother to do it by ourselves…"

> "In the beginning we had thought that maybe more people could be in our group and write the report, but it became obvious that it was *smoother* to do it by ourselves. […] and we wrote quite much, we had become quite synchronized, we divided it up, you write this part and I write this other one. Afterwards, one wrote a draft and we asked each other to read it over, and we discussed and then one sent it around and then one got a new task and so we did in this way. I think we worked quite closely, I believe so!" (Erika, the Sound Project group)

Why does Erika think that it was easier if only two people worked on the report?

Firstly, and probably more obviously, the amount of work was such that it could be easily accomplished by two actors. The document was to be eight pages long and, within all the groups studied, the creation and the collection of its contents had already begun from the very first meeting, as minuting the proceedings was a regular practice. Nevertheless, when one of the participants, primarily involved in the writing assignment, was asked to further unpack this issue, she explained that they usually sent the different versions of the document to the whole group, to enable everyone to express some comments about it. However, this was not always easily achieved, because the other group members were engaged in other projects and courses, and they found it too demanding to attend to everything. Thus, "*smoother" means that it was easier to synchronize two persons' agendas rather than involving more people.*

Secondly, *what the participants perceived as "smoother" was the possibility to adjust their working plans depending on the technologies and the locations available.* The excerpt below, exemplifies this point.

> "I used my computer *[in the library cafeteria where an Internet connection is available]* and Ann sat at the lab and we talked via Instant Messaging. Afterwards, when there was a computer available I moved to the lab". (Erika, the Sound Project group)

Although the two students were supposed to work together, only one of them had a laptop and only one (university) computer was available in the computer laboratory. Only in the late afternoon, it was possible to work in presence, in the same room.

Thirdly, as the vignette seems to suggest, "*smoother" can be related to the possibility to more easily adjust the working plans in terms of the tasks to be attended.* While describing the writing activity she had carried out, Camilla explained that one evening Anna-Karin was expecting the latest version of the document from her. However, as Camilla was very tired that evening, she called the other fellow writer and explained she had not added anything relevant to the document and, therefore, she could not send it, as previously agreed. Thus, after this phone call, Anna-Karin decided to temporarily leave the report aside and study French instead.

5.4.3 Vignette 2: Planning and writing the presentation in the Connection Project group

In the following vignette, another writing activity, namely the preparation of a presentation, observed in the Connection Project will be introduced. This particular activity involved three main actors, it was started on a Friday afternoon and was concluded the following Monday. As it will be clarified in the commentaries, it took place at three distinct locations: the library cafeteria, at the students' respective homes and, finally in a corridor.

This particular reconstruction is based on observational field-notes taken when the three students firstly met up to plan what to include in the presentation and, afterwards, when they met again to revise it. Before the meeting began, I met one of the participants, who had just got back from a lecture, outside the library. One of the participants involved was interviewed and asked to clarify some aspects of what I had previously observed (for instance, the reasons why they had decided to divide the work in such a way), as well as to explain how they had worked during the weekend. The following vignette has been selected because it illustrates:

- The alternation of different writing strategies as a way to cope with the impracticality of writing together at anytime, but also with the need to work during the weekend;
- The lack of common writing tools;
- The extreme case of working in a corridor.

Deciding what to write

Emily, Monika and Niclas were members of the "Connection project" within which they were responsible for preparing the presentation about the work accomplished by their group. In order to work on it, they decided to meet up at the university library. The first one to show up at the meeting was Monika, who immediately looked for a group room where the team could gather up and work. However, as all the rooms were occupied, she chose a table in the library cafeteria, instead. The place was quite noisy, some of the students present there were working on their assignments, while others were just hanging out enjoying a coffee and a chat among friends. In the meantime, the rest of the group arrived. However, before starting to work on their task, Monika had a short meeting with the member of another sub-group who was there, at the library, to give Monika the video scenario to include in the presentation. Soon after, while sitting at one of the tables in the cafeteria, the three students began by reflecting on the constraints of their assignment: ten minutes were allowed for the presentation, six of which were devoted to the video scenario and that left only four minutes to comment on the whole work process. This resulted in an essential constraint and planning the presentation was very much characterized by the selection of the most important things. The three students had not prepared anything for this meeting (e.g. suggestions of what to include in the presentation) and, before setting the plan out, they did not know how they would have gone about the actual writing. Emily suggested the possibility that one of them would write it all. Thus, after considering the time constraints, they agreed on the main points to include in the presentation and on how to articulate them on each slide. While doing so, each student wrote down some notes and sketches. Niclas, for example, wrote a list of the main issues that, according to him, should be tackled in the presentation, while everyone else paid attention to his words and his drawings, as well. A group discussion followed and, eventually, Emily summarized what had been said by representing the same concepts as dots – each one standing for a topic – and arrows – each one standing for the links among them. At this point, Niclas copied Emily's notes into his notebook and afterwards, he added some squares on which Emily scribbled as well. This discussion went on for about one hour and a half and, by the end, the students had agreed on the topics to include and on how to present them on each slide, headings included. Eventually, they divided up the work and they decided that everyone would work individually on some slides. Afterwards, Niclas would put them together. Before leaving, they agreed to meet again on Monday in order to revise the final presentation, half an hour before the lecture would begin.

Preparing the slides

After having divided the work, the three students agreed on preparing the presentation individually, during the weekend. Monika was the first one to finish the slides and she sent them to Niclas, by email. As these were the first slides to be received, he used the same font, text size and background color for the whole presentation. No PowerPoint or similar software was installed in the computer

Emily was using at home, thus she sent Niclas a simple text file, whose contents he copied to the presentation.

Revising the presentation
On Monday, just half an hour before the lecture began, the group members met up in the corridor outside the lecture hall, where they found a small table to go through the presentation, to proofread it and to make sure it met the time requirements.

5.4.3.1 Some general commentaries

The vignette above raises a set of interesting issues that will be further addressed throughout the analysis. Firstly, the alternation of at distance interactions with co-located working sessions was *a strategy adopted by the students to cope with the lack of a shared workplace*, but also with the contingency of working at irregular working hours. In fact, as it was decided to schedule the writing of the presentation during the oncoming weekend – a lapse of time not usually associated with working at the university campus – the three students preferred to divide the work and edit the presentation in parallel, while at home.

Secondly, choosing the library cafeteria as a suitable place to negotiate the contents of the presentation, but also to meet up with the group members who edited the video scenario, is an example of how *social relations may be relevant in determining what makes a location an amenable workplace*. Despite this site was crowded and noisy, it was comfortable for the participants (both the ones who had edited the video scenario, and the ones responsible for the presentation) to hang out there and wait until the others would come. As illustrated in the two images below (Figure 5.1 and 5.2), the cafeteria is, in fact, a cozy, bright area within the building. Tables and chairs are available immediately by the counter (it is at one of these tables that the Emily, Monika and Niclas were working), while a set of additional desks, all provided with Ethernet cables, are disposed in the left part of the open space. At these desks, students often spend time surfing while sipping coffee, or working on individual tasks.

Figure 5.1 and 5.2. Two different angles of the library cafeteria.

Moreover, being in the cafeteria, rather than in one of the groups' room, *made it easier to be seen by other fellow peers*. This aspect is also recognizable in the unusual case of revising the presentation in the corridor, where the other team members would walk by to go and attend the lecture.

Thirdly, another relevant aspect, to which I will come back throughout this thesis, is the *lack of the proper tools and technologies needed to accomplish a certain task*. Emily, for instance, did not have any application she could use for preparing the slides, and she used a word processor to annotate the text her fellow students were expecting from her.

A concluding remark can be made about the way students used their sketches as external representations to mediate the ongoing discussion.
While planning the presentation, the students did not communicate with each other merely by talking. In fact, as illustrated in the vignette, on several occasions, they needed an external, shared representation – such as a graph, a diagram or just some dots on paper – in order to better express the relations between the concepts and the ideas they were discussing about. The use of these representations varied and, whereas some sketches were written and used individually, they were also used by the other peers, who occasionally scribbled on someone's else drawings in the attempt to clarify or elaborate a certain idea. With this regard, the narrative shows how some notes taken by Niclas evolved in Monika's diagram and how the additional information conveyed by the latter was eventually integrated into Niclas' original notes. One interesting aspect observed was that the selection of the representation to refer to, to look or to point at happened naturally, without any explicit negotiation or the need to draw someone's attention to one of them.

By recounting the use of external representations, I do not intend to draw attention to how knowledge was elaborated and evolved during the work session in question. My objective here is rather to emphasize that

being able to scribble on the other peers' notes contributed to the participants' involvement with the ongoing tasks. In fact, the particular physical organization of the working area – the three students sitting at a round table – and the use of paper artifacts encouraged and facilitated the discussion on how to structure the contents in the presentation. Furthermore, it is important to note that it would be difficult to clearly identify a participant's area of engagement with the physical layer of the environment.

Insofar, the accounts and related remarks of two different writing activities observed during study A have been presented. In the sections to come, the prototyping and the writing processes investigated within study B will be introduced.

5.5. Summarizing study A

The main points addressed by the first of the field studiy can be summarized as follows:

- Given the large size of the groups, the students decided to divide the assignments among smaller ensembles. This was supposed to make coordination easier and to facilitate the students to juggle with different schedules. However, communication problems between the subgroups arose.
- It was often important for students to work at places where they could make themselves visible to other peers not directly involved in the ongoing tasks.
- Writing the report was important for the students, but it was not regarded as the main assignment. Moreover, although the writing process was mostly performed during the last week of the project, its beginning did not coincide with the actual moment when the outline was initially sketched. Notes taken after every meeting held throughout the project where used to plan and write the report.
- The alternation of different writing strategies (for instance, writing different sections in parallel, or in a sequential fashion) was a way to cope with the impossibility to write together at anytime, but also with the need to work in the evening or at weekends.

- As illustrated in the last vignette, the students who wrote the project's presentation did not always have the same tools needed to accomplish their tasks.

5.6 Field study B

In the following sections, some of the activities observed during the second field study will be introduced and discussed. For the purpose of this study, three main group work sessions were followed: a meeting held at distance, a meeting carried out in one of the department rooms and a meeting arranged in a seminar room. These three meetings, which will be here introduced in a chronological order, constitute the main events around which a discussion will be articulated. More specifically, the first event draws attention to a set of problems deriving from working online by using a particular collaborative application. The second and the third one are reproduced, instead, in the forms of vignettes. This choice is partly forced by the type of information I was able to collect. In fact, although I asked the team members to retell the story of what happened during the online meeting, the discussions always shifted towards the technology and the various problems they had to face while using it.

5.6.1 Managing a meeting at distance

The following section reports on a meeting held at distance. As already explained (section 4.3), after having established a contact with the group that participated in this study, I asked the students to keep me informed about their scheduled meetings, so that I could attend them as well. When I received the first email from one of them, the work session that is about to be presented had already taken place and its reconstruction is, therefore, based on interviews held with the four team members. Although this episode is not retold in the form of a vignette, I have chosen to discuss it here for various reasons. Firstly, it anticipates some of the issues regarding the students' use of technology, an aspect that will be further addressed in the following chapter (see section 6.3) and that, as we will see, distinguishes the student setting from other professional nomadic workers. Secondly, the experience of using this technology had a significant impact on the course of the group's work process, as the participants gained an awareness of what working at distance was like and of the problems involved in it.

The organization of the meeting under discussion was suggested by Ethan, a group member, who used to commute from another town, but

who, at this occasion, could not come to Stockholm to meet up with the rest of the group. Because of this reason, he proposed the adoption of Click to Meet, an online conference tool he had already used to work in other projects, and whose usage was now suggested in order to hold a brainstorming session, when the group was involved in the outset of the prototyping phase. Click to Meet is not a free application, thus buying an access to a Click to Meet server is required in order to be able to use this tool, which supports video and audio communication, instant messaging and which allows users to share links and other types of resources, such as images and documents. Furthermore, the availability of an electronic whiteboard enables each participant to share a working surface and to see on the screen what the other coworkers are doing or pointing at on the whiteboard (Figure 5.3).

As Ethan explained, with respect to other tools – such as instant messaging or email – this software was regarded as more suitable for distance meetings. In fact, compared to instant messaging, the video chat enabled more than two people to participate, simultaneously, in the same discussion; whereas compared to email, it allowed synchronous and "real time" interactions. Specifically to this case, the four team members thought that the shared whiteboard would be particularly suitable for brainstorming, as every participant could use it to jot down and share ideas about the functionalities to include in the prototype to be designed.

Thus, during the brainstorming session, they firstly wrote down on the whiteboard all the different functionalities they wanted to include in the prototype (Figure 5.3) and, then, tried to group them together under a number of different categories (Figure 5.4). Nonetheless, after several attempts, the participants decided to give up, as they realized the application did not provide an adequate support either to move objects on the screen or to actually sketch the prototype. For these reasons, the group session was interrupted and the students agreed on arranging a meeting to be held in presence instead. The following quote exemplifies one of the participants' feelings about working with Click to Meet:

> "It was exciting to try it out, I enjoyed it, but it was really hard to communicate with each other and design the prototype with it […]. Thus, we decided to meet face-to-face. We worked for four hours and most of the work related to the prototyping was done, while we did not manage to do much after working on line for two hours". (Joel, a participant in study B)

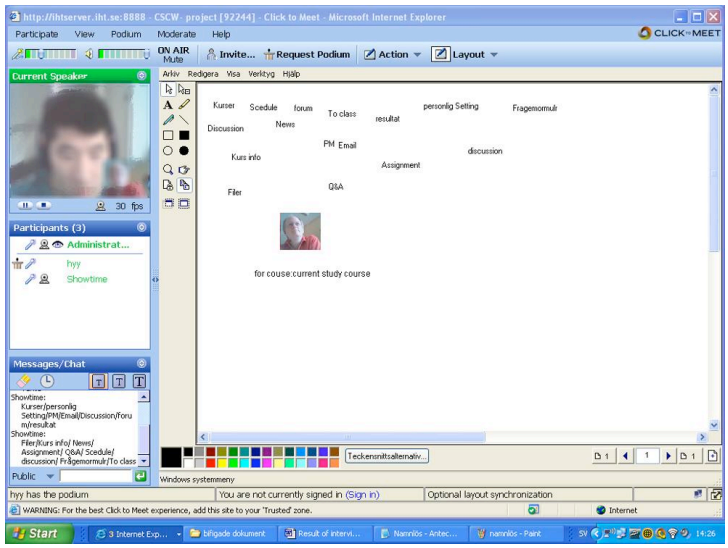

Figure 5.3. A screenshot of the software Click to Meet illustrating the use of the whiteboard during the brainstorming session.

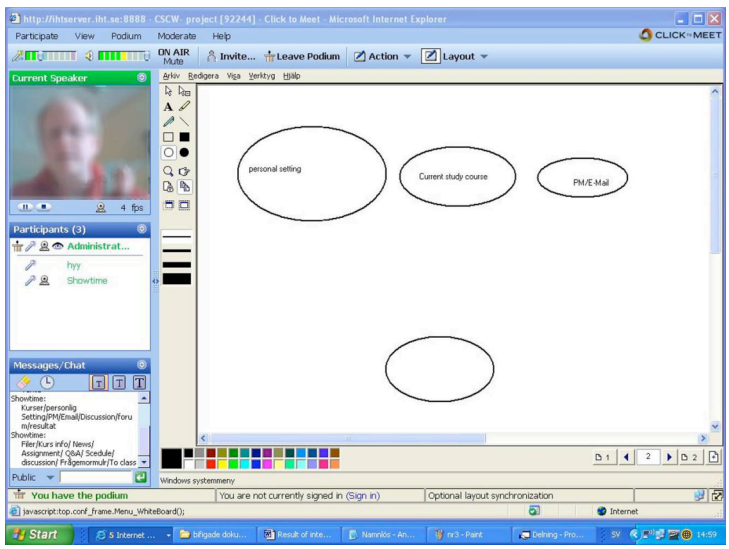

Figure 5.4. A screenshot of the software Click to Meet illustrating the use of the digital whiteboard to group together similar ideas and functionalities.

The use of this application also raised a number of relevant issues emerging from other field data as well.

Firstly, although files could be saved and uploaded to Click to Meet, the group account was not used as a shared repository where to store references, pictures, documents and other relevant material for the project work. As one of the students explained, that would have resulted in one more tool to keep track of.

Secondly, another problem which occurred several times during this on line meeting, was that one of the group members often got disconnected from the conference room and, before being able to continue working, the others had to wait for him to be connected again. The quote reported below illustrates this particular breakdown.

> "One of the problems was that one of the group members had problems with the setup of his own local network, so every time the phone rang, he got disconnected and then we had to wait for him to connect again, but that was just a technical issue!" (Ethan, a participant in study B).

Certainly, the fact that one of the students got disconnected when the landline phone rang can be regarded as a technical problem. Nevertheless, in the context of the group work, it becomes a social aspect of work as well, as *the same infrastructure was not available to everyone or, at least, not in the same configuration*. Another related matter is that one of the group members did not have a video camera, and "she could not be present"[18] to the others by video. This resulted in the sensation of not being able to participate in the ongoing discussion as much as the other peers.

5.6.2 Vignette 3: Meeting in the department room to finish the prototype and to plan the report

In the vignette that follows, one of the group's work sessions will be introduced. All the team members participated in this meeting and their main objectives were to design the prototype and to plan the project report. Although planned to take place at a given location, the meeting was moved somewhere else because of unexpected circumstances.

I was personally present the afternoon when this meeting took place, and the account presented below is based on notes taken during the

[18] This expression was actually used by the participant who retold the event being discussed.

observation as well as on the analysis of the videos recorded. Follow-up interviews with the participants were also useful to reconstruct what had happened before this event (e.g. what the students had worked on before, why they had decided to meet at this particular location, where they were before the current meeting took place and why) and to clarify aspects of their activities which had remained unclear during the observation.

In what follows, the vignette is reproduced in smaller fonts. In the commentary sections extracts from the interviews with the participants at the meeting are used and represented between quotation marks. The narrative presented introduces issues related to:

- The students' relations to some of the of places they usually work at within the university area;
- The way the basic conditions to work together are created, by rearranging elements within a room, circulating objects and information or appropriating the environment itself;
- How working at a number of places shapes the writing processes, with regard to the division of work, the quality of the text to be written and the priority given to some parts of the text rather than others.

Meeting up

Siria, Jack, Ethan and Joel, the four members of the group studied, planned a meeting in order to finish the prototype they had started to sketch the week before and start working on the project report. Similarly to previous occasions, they had decided to meet up in the Torget[19], an open space within the university building, often used for seminars and meetings when a large number of people is expected to participate. Ethan was the first one to arrive, just a few minutes before the time scheduled for the meeting. Once there, he realized that the open space was already occupied, as another project meeting was taking place therein. He, thus, went to Siria's office, which was located nearby, and suggested to meet up in his office instead. Ethan's office was a department locale, where the journals the department subscribes to were stored. However, this room also served as a regular office, mostly for department guests. Ethan, who was a PhD student both at KTH and at a research institute located in another town, used this room as an office when he was in Stockholm. Before participating in this meeting, the four students were at different locations, attending to diverse matters, not necessarily related to the current project work. Ethan commuted from the other town where his main office was located. He usually traveled to Stockholm to attend lectures, or to meet up

[19] Torget is the Swedish word for "the square".

with people to collaborate on a project. Jack was already at the university campus for another project meeting. Joel was at home and he had come to the university campus only to attend this meeting. Siria, the other doctoral student participating in this project work, was working in her office.

Setting the stage for work

When the four students finally gathered up in the department room, they started by preparing for the work to be accomplished. They moved one of the desks to the center of the room, while Siria wrote on the whiteboard the agenda of the day which included two main activities: designing the prototype and writing the report – more specifically, agreeing on what to write, on how to write it and on how to divide the work. During a previous meeting that had taken place at the Torget, the four students had begun to sketch several interfaces of their prototype on a whiteboard available within that site. At the end of that session, Jack had used his mobile phone to take pictures of the whiteboard so that the drawings could be stored and used again for the work still to accomplish. Thus, part of the preparation consisted in transferring those pictures from Jack's to Ethan's mobile phone, from where they were offloaded to Ethan's laptop and, finally, printed out.

Designing the prototype

The first activity the students engaged with was working on the prototype assignment. Siria took the initiative to recall what they had done during the previous meeting and she suggested to focus on aspects related to the prototype interfaces, in particular, on how the different elements and functionalities should have been displayed and distributed among the different sections of the prototype. They decided to draw each interface on different sheets of paper they found by a nearby printer. Afterwards, they started the prototyping work by discussing issues related to the navigation, such as how they could enable users to move from a section of the system to another. The main goal of this ongoing activity was to group together different functionalities and define on which interface they should be made available. As the work proceeded, the group members realized that they needed to further elaborate some central issues of their design, such as the schedule functionality and what it should be used for.

Planning the report

During the second part of the meeting the four students had an intense discussion on how they could manage to finish the report efficiently, by making the best use of the time left. In fact, only four days were left before the deadline, Ethan could be in Stockholm only the following day and Siria had to work on another assignment as well. It was, therefore, important to manage the time so that everyone could contribute to the assignment and still attend to other errands as well. Ethan, who had sketched an outline of the report the day before, printed it out in four copies, one for each group member. Afterwards, the four students started to discuss the difficulties of the different text sections, in order to decide what parts could be written individually and which ones required, instead, a joint face-to-face effort. Thus, they agreed that, during the following evening, they

would be writing individually the simpler sections and that they would leave for the next meeting those parts of the report – such as the prototype functionalities and the scenarios of use – requiring further development and agreement. They preferred, in fact, to discuss these parts in presence and to write the conclusions together, so that a common vision could emerge. After deciding *how to write*, they divided the report into different parts that each student would be responsible for. Besides that, the four students talked about the course readings and about which of them to include in the report as relevant reference. Ethan showed the others some articles he had brought along from his home which they could consult while writing. They agreed that in the forthcoming evening they would only add references they were familiar with. Only when the report would be ready, they would look through the references recommended throughout the course. Finally, before parting, Siria volunteered to scan the final sketches of the prototype and to send them to the others, so that they could be used in the report.

Booking another room

At the end of the work session, Ethan, Joel, Siria and Jack decided to start working early the following morning, as Ethan was busy with another project as well. Whilst discussing the outline and how to go about the writing activity, they decided to book a room, usually used for seminars by the department staff, for their next meeting. This particular room was selected because of a wide screen that the students believed would be useful to edit the text together.

5.6.2.1 Outlining the places for work

Although the first part of the vignette (*"Meeting up"*) does not specifically describe any activity, it raises some relevant considerations about the places the students observed usually worked at.

The university main campus, with its several buildings and sections, is a rather vast physical infrastructure, of central importance in students' academic life. This is certainly due to the fact that most of the educational activities, such as lectures, meetings with supervisors, attending libraries and labs, take place there and students are often already close to the place chosen for a meeting. Jack and Siria, for instance, were already within the campus because of other project work – the former working with peers from another group, the latter attending her daily work.

Moreover, in a big city like Stockholm, the fact that the campus where the study was carried out is located in a central area makes it easier to be reached – in a relatively short time – for everyone leaving within the city center or in the nearby surroundings. Most of the students interviewed, in fact, found quite convenient to travel to the university campus to meet up with the other peers:

> "It takes me about thirty minutes to get here from home so, as far as I'm concerned, it is rather near" (Jack, a participant in study B).

Having carried out my undergraduate studies in an Italian university, where working in pairs or groups at someone's habitation is a widespread practice, I was struck by the fact that the students observed seldom gathered up to work together at a private home[20]. As the fieldwork was carried on, I assumed that the main reason was a concern for privacy and a clear-cut separation between home and not home, between working individually and with peers. However, as I interviewed some students, distance seemed to be another relevant reason for choosing to meet up at the main campus, rather than somewhere else. The quote below, for instance, summarizes one of the participant's comments about this issue. Furthermore, it seems to suggest that the limited dimension of a standard student accommodation might inhibit the possibility to work in groups at someone's home.

> " We almost never work at someone's home. We all live in different parts of the city and Stockholm is big, thus it could be too far to travel all the way […]. Besides, most of us live in small student rooms, it is not practical to meet there if many people are working on the same task" (Joel, a participant in study B).

The following excerpt confirms students' concern for distance (*"here"* in the quote refers to the main campus), although, at the same time, it also anticipates a central issue of the nomadic character of the work being investigated. In fact, for the students participating in the field study, the main reason for traveling to a meeting place is to meet up with other peers and to attend to specific project activities.

> "It is ok for me to come here! It takes only about ten minutes by tube and I prefer to be somewhere where everyone can meet up. It could not necessarily be a physical place, but then it gets more difficult; it's easier to talk face-to-face!" (Joel, a participant in study B).

As previously illustrated (see section 5.6.1), the particular technology available to the students did not always provide adequate support for meetings at distance, and the participants thought that many tasks could be

[20] The only exception to this was an occurrence within one of the groups studied during the first field study. However, I was not the person that followed it.

more easily accomplished face-to-face, in the same physical environment. The group in question used to hold its meetings in the open space within the university building for other reasons as well. For instance, the teacher supervising the project had her office at a close distance and was, therefore, easily reachable whenever help was needed. Moreover, such a place was chosen because no booking was required and it was perceived as suitable for project activities.

> "We usually met at the X[21] Torget or in the contiguous area, between the Torget and the kitchen because there are some available tables there. Besides, we used to meet there because it is a public space and there is no need to book it in advance. We never chose to meet in the kitchen because it is not proper for working, it is more an area for leisure" (Siria, a participant in study B).

Finally, the first part of the vignette anticipates an essential aspect of students' work, namely the fact that *no specific place is permanently available to a specific group*. On the contrary, most of the places are usually accessible both to other individuals and groups. Although the members of this particular group had got used to meeting and working at the open space, they had to change their plans because of the presence of a large number of people, not involved in the work under discussion. In this case, changing the original plan did not cause any major problems, Ethans' office being near and available, Siria being easily reachable and the other two groups members about to arrive at the prearranged meeting place. Nonetheless, it might be relevant to note that Ethan's office was occasionally used by other people as well (for instance, by department's guests), and that it was just a coincidence that he was the only person using it when the study was carried out.

5.6.2.2 Setting the stage in the department room

The meeting described is in all respects a collaborative design session, the ultimate objective being the finalization of a prototype for collaborative learning. Nevertheless, the physical environment in which it occurred had not been thought of as a group room, neither equipped with instruments which could have been needed during a prototyping session. The presence of a bookshelf, containing a set of specialized journals, had turned the room into a small library available to all the employees working on the floor

[21] X is used to anonymize the place.

where the room itself was located. Moreover, it was a spare office where three desks were located for temporary guests of the department.
For all these reasons, some important adjustments were needed before the students could actually accomplish their work.

Figure 5.5 shows the desk after it has been moved to the middle of the room. It also shows a whiteboard and the bookshelf where the journals are stored.

First of all, the furniture in the room was rearranged (Figure 5.5). One of the desks, for example, was moved to the middle of the room so that all the group members could sit around it and share a physical working surface. Although the reconfiguration of the room – resulting, as in the example before, from rearranging the furniture – might appear as unimportant if considered in isolation, it indeed reflects an essential aspect of students' work, namely the fact that the *environments they work at are not always designed for their group activities*. This is, in fact, an important issue for this work aiming at exploring how the variability of places within which work is accomplished influences and shapes students' collaborative practices. For instance, with regard to this aspect, the setting described herein does profoundly differ from the iLounge, an interactive space designed and built to support co-located and collaborative work (Sundholm et al., 2004). This interactive room is, in fact, available to students and intended to support and enhance groups' creativity, is equipped with touch-sensitive displays, an interactive plasma screen table at which six up to eight people can sit

simultaneously. Furthermore, it also contains several computers, a laptop, wireless keyboards and mice, while other personal artifacts – such as laptops – can be introduced into it.

Coming back to the setting addressed in this thesis, it can be interesting to notice that, while the physical affordance of the room was easily modified and adapted to the current task (it took the students a few minutes to move a desk and some chairs to the middle of the room), some aspects related to the use of information were more complicated to deal with. A first step to make the room more suitable for the current, collaborative activity was to lay down the outcome of the previous prototyping meeting on a desk, thus making it available to everyone (Figure 5.5). It is also interesting to note that the post-its grouped together on the desk visible in the picture represent the different functionalities the students were trying to categorize while using the online conference tool discussed before.

Another way of turning the room into a place suitable for the work to be accomplished was *to bring in informational resources and to make them accessible to all the group members*. Some of them were created in situ. Siria, for instance, wrote on the whiteboard a meeting agenda (Figure 5.6) that was visible to everyone and that was used to set explicitly what was going to happen during the following hours. It was, therefore, an implicit agreement about the planned activities: prototyping and writing – more specifically agreeing on what to write, on how to write it and on how to divide the work between the group members.

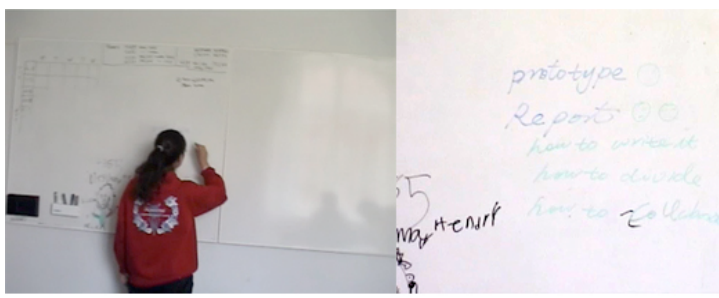

Figure 5.6. In the left side of the image Siria sets the agenda for the meeting. The right side shows a close-up of such agenda.

In the meantime, other resources were brought in from other locations. The section of the vignette *"setting the stage for work"* illustrates how the sketches of the prototype were moved to the current room. As already

mentioned, during the meeting that took place in the open space, the four group members used a whiteboard to sketch their prototype. However, as the locale had to be cleared out at the end of the working session, Jack took some pictures of the whiteboard by using the camera of his mobile phone, and promised he would send them to the others by email. Despite the agreement, he forgot to do so and, for this reason, during the meeting, the pictures were firstly sent from his phone to Ethan's one, then offloaded to Ethan's laptop (Figure 5.7) and finally printed out to be used for designing. The transfer of photos was slow, as only one photo at the time could be transferred between the two mobile phones. Hence these two students decided to join the others at the desk located in the middle of the room and start working while the photos were still being transferred (Figure 5.8).

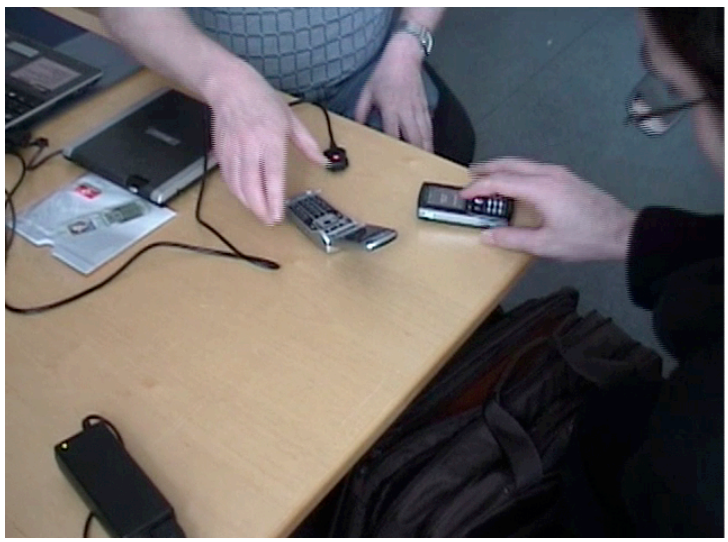

Figure 5.7. Ethan (on the left side of the picture) is about to activate Bluetooth in order to enable the transfer of photos from Jack's mobile phone to his.

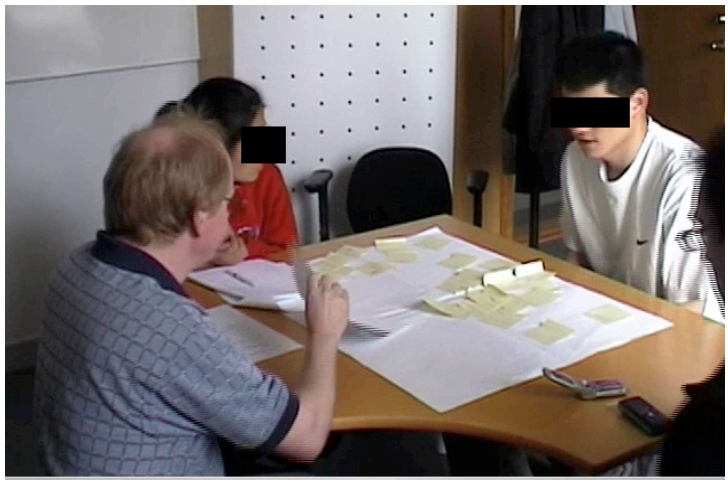

Figure 5.8. Images are still being transferred from Jack's mobile phone to Ethan's. The two mobile phones are shown in the low-right corner of the figure.

The episode discussed above illustrates a concrete example of how artifacts and the information they convey were circulated between places. Additional work and the use of several physical devices (two mobile phones – one of which is used as a camera – a laptop and a printer) were required before the real work could actually be accomplished. Oulasvirta and Sumari (2007) define this aspect of mobile work as *multi-device management*, referring to the actions oriented towards a set of information devices, implemented with the purpose of securing the conditions for work. In the episode described herein, the effort required to manage a set of physical devices was supposed to ensure the access to the resources needed for the ongoing work session. This specific circulation of information had been planned by the students:

> "Last time we met, we drew our prototype on a whiteboard, but we could not take the whiteboard with us, thus we decided to take some pictures so that we could store it" (Joel, a participant in study B).

Nevertheless, the way information was actually managed was a consequence of the fact that one of the group members forgot to send the pictures to his peers' mailboxes.

As the students explained to each other before they actually began to work, the pictures were needed to make sure that during the current work

session they would include everything discussed during the previous meeting. In other words, the pictures were supposed to serve as a reminder of all the points that needed discussion and further development in the prototype. Within the group, only Siria had copied some of the sketches written on the whiteboard to her own notebook, but they did not include all the sections of the prototype previously brainstormed. Furthermore, by observing this specific work session, I noticed that for the others it was difficult to understand Siria's notes and sketches, although they were a partial reproduction of what the group had collectively developed on the whiteboard. For the group members, it seemed to be easier to understand and to work on those drawings that were the outcome of a shared effort.

5.6.2.3 Prototyping in the department room

The main goal of the design session depicted in the vignette was to define what functionalities had to be included in the different sections of the prototype, and to complete those tasks the students had not been able to carry out during their on-line meeting (section 5.6.1). In doing this, the pictures of the whiteboard, taken during the previous meeting and finally printed out, were used as the different interfaces of the prototype to which the students attached a number of post-its – standing for different functionalities and possible actions – on each one of them (Figure 5.9).

Figure 5.9. While sitting around the table in the middle of the room, the students distribute the various functionalities (post-its) to the different interfaces (the printed pictures) of the prototype.

Figure 5.10. The sketches that have been designed are moved to another table in the same room.

Within the current locale, three desks were available when the study was conducted: one in the middle of the room (Figure 5.5), one on its left (Figure 5.7) – where Ethan had placed his laptop and which seemed to be his personal working space – and one on the right side (Figure 5.10). As the work went on, the students moved the interfaces they had worked on to the desk, located in the right corner of the room (Figure 8). While anticipating how external representations are used and evolve throughout the work process, this aspect exemplifies how *different areas of the room may be used for different, but yet related purposes*. More specifically, having several working surfaces assisted the four participants in separating the tasks that had already been completed from those to be still accomplished. This particular aspect will be further addressed as the analysis develops (see sections 5.6.4.3 and 6.2.3). What seems to be relevant to this episode is that the physical, low-tech artifacts (such as the post-its and the paper interfaces the students were manipulating) and the various surfaces to work on (i.e. the different desks) facilitated the exploration of differing ideas, the development of the activities at hand, and the way the participants made sense of them.

5.6.2.4 Unplanned use of local resources

Besides illustrating how the use of information was planned by the whole

group, the event recounted so far also highlights other situations in which such a use – or even the potential need – had not been foreseen.

An example might be the realization that a lot of paper would be needed to jot down sketches of the prototype. Figure 5.10 depicts how the sheets of paper were used during the work session. In the lower left corner, the blank paper stands for one of the prototype interfaces, while the post-its attached to it represent the different functionalities and the various actions users were allowed to perform on the given interface. The paper was, therefore, used an as extra support for the ongoing discussion and to externalize the design suggestions discussed by the group.

Throughout the meeting, this unplanned and situated use of resources was often determined by the need to further develop current issues and justify what was being said. During an ongoing discussion, for instance, Ethan, printed out the screenshot of an application he was familiar with, to show to his peers how the course page of their prototype could have looked like. At another occasion, in order to answer a question on how much room the description of a lecture would require, he took his laptop and held it over the table, to let everyone formulate a possible answer to the issue at hand by reflecting on the information displayed on the screen (Figure 5.11).

Figure 5.11. Ethan holds his laptop, thus allowing the others to look at the example being displayed on the screen.

Why did Ethan print out the interface in one case and hold his laptop in the other? There is no real answer to this question, perhaps he simply did not want to go to the printer a second time. What is really relevant is that *the use of the printer and the laptop was unplanned and situated, and that their use was essential in order to prompt the ongoing discussion and maintain the four students' engagement with the current task.*

The access to a printer, which was eventually essential to the objectives of their work, was not particularly problematic for this group, as two of the group members were PhD students and, as such, they were allowed to use the department facilities and resources.

This situated use of local resources emerged from other aspects of the students' activities as well. For instance, during the design session under discussion, the students had to decide and clarify to each other why two different schedules were needed in the prototype. While Jack tried to express it verbally, Ethan moved to the whiteboard and started to draw on it. The large size of the whiteboard allowed everyone to see what was being drawn and to actively participate in and contribute to the discussion. Thus, different areas of the room were used for different activities: the whiteboard was used for discussion and to reach a common agreement, while the desk in the middle of the room was mostly used to proceed with the work that did not require negotiation.

This example suggests how different surfaces and different artifacts available in a given place can be used depending on the activities at hand. In other words, it illustrates the emergence *of local areas for dedicated discussion,* an expression used elsewhere (Spinelli et al., 2005), to underline the fact that participants in a meeting could occasionally move a board to a corner of the meeting room, in order to denote that their current tasks were separated from what the rest of the group was doing.

Although in this specific case, the students did not actually move objects around the room, the fact that they approached the whiteboard emphasized that another task was being undertaken, and that assisted in making sense of what was going on. Their practices also suggest that *they implicitly distinguished between spaces and artifacts for the negotiation of emerging issues – the whiteboard – and space and artifacts for the execution of current tasks – the desktop.*

5.6.2.5 Discussing the quality of the report and managing the writing process

During the second half of the meeting (*"planning the report"*), the four students began to write the project report, which was one of the course

assignments. After printing out the outline, they became mainly concerned about dividing the text so that everyone would be responsible for a section to edit in the following evening. During this discussion, one of them pointed out that because of their different writing styles, they would also have to schedule a common writing session to refine the report and make the various sections homogeneous. This would include aspects such as the choice of words, the construction of sentences and the entire text flow. This particular student explained he was aware that these are problematic issues and that dealing with them is a time-consuming task.

Nevertheless, the group members also agreed that, because of time constraints, they did not have enough time to reflect carefully on what was good and what was bad in the report. According to them, the whole writing activity could be carried out in relatively short time if they prioritized the description of the project, rather than the style of the report.

Whereas students' concern for time played a fundamental role in planning the writing process, its organization also reflects a practical concern for place and the related opportunity to work either individually or together with other peers. With this regard, the observations and the interviews conducted suggest that both the design work and the writing process were carefully planned in relation to the sites at which each task could be carried out.

As already mentioned, it was important for the group members to meet up with the other peers to write together those sections of the report that required negotiation and discussion. Thus, the students used the outline to filter away those parts that could be written individually at home and which, in such a way, were separated from the ones requiring collaborative efforts. More specifically, they expected that the most complicated sections would be the ones about the actual design work and the prototype itself, because of the many issues to be taken into account. They all believed that the discussion about "different points of view[22]" would be complicated as well and that they would have to write it together.

Furthermore, because of the time limits, they agreed that in the following evening they would write as much as possible without paying attention to the references to include in their text. The following quote illustrates this strategy:

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[22] This is a real the heading of the outline, used by the students, to define the section of the report concerned with the possible stakeholders involved in their project.

> "That afternoon we had a thorough discussion on how we could manage to finish the report as soon as possible, thus we agreed that everyone of us would write as much as possible during the following evening […]. Moreover, we decided that for the moment we would not care about the references unless they were obvious and well known to us, we would add them *(the references)* only afterwards" (Siria, a participant in study B).

As further explained, in fact, adding references was not a main priority, but rather a matter they could take care of at a later stage.

> "The quality of a paper does not really depend on the number of literature references one quotes, therefore we should not be too concerned about that *[looking up references]*, as long as we add references to the most important parts [of the paper], which I'm quite sure we will be able to do eventually" (Jack, a participant in study B).

The organization of the writing process was also shaped by other causes, such as the students' participation in other projects. Ethan, for example, was not going to be in Stockholm on Friday, and the next meeting was scheduled for the following day (Thursday). It was also decided to begin early in the morning, as he also had to attend another meeting for about two hours.

Finally, the data presented show the *importance of planning and the different levels at which it takes place*:

- Planning the text in terms of contents and topics to be tackled;
- Planning the quality of the text, in terms of what to prioritize and what to leave aside;
- Planning the division of work;
- Planning the places at which work may be accomplished;
- Planning the access to working resources.

Planning the division of work and the sequence of tasks seems to be a relevant strategy to manage co-located work sessions and remote interactions among the group members. This conscious alternation of group and individual activities is intertwined with a distinction between places suitable for collaboration and places suitable for individual work.

Moreover, another criteria to choose a place to work is the presence of artifacts and technologies. In fact, as illustrated in the final section of the vignette, the students decided to hold the following meeting in a specific locale because of the presence of two technologies – a wide screen and a projector – thus, indicating an *instrumental and opportunistic use of locales*.

5.6.3 Vignette 4: Writing the report in the office, at home and in a hotel room

The vignette presented in this section represents a different phase of the same writing activity introduced in section 5.6.2. At this stage, the process was carried out individually by the four team members, each contributing to different sections of the project report. The different accounts are based on information gathered while interviewing the four participants. The four episodes retold below occurred during the evening that followed the meeting in the department room. Siria worked in her office at the university, the others at various locations outside the campus – more specifically, Ethan wrote in a hotel room, the other two at home. The following vignette highlights:

- How the writing activity undertaken in the afternoon evolved into a temporary, individual task;
- The instruments used by each participant;
- The strategies adopted by each student in order to share the outcome of this writing session with the rest of the group.

Joel writes at home

After the meeting in the department room, Joel left the university campus and went home, where he had planned to work in the oncoming evening. As agreed during the meeting, he would write the second part of the report and describe the main advantages and disadvantages of an online software for teaching that he had already briefly examined some months before. Moreover, he was supposed to list some requirements emerging from the interviews the group had conducted with the target users they were designing for. It took him about three hours to finish this task, for which he used a word processor to edit the text and an Internet browser to check out the software accessible online by a university account. As previously agreed with his peers, he only focused on the text flow and did not look up any reference. When he finished, he sent the document to his own email account so that the following day it would be accessible from any computer within the university campus.

Jack writes at home
After the meeting, Jack went home as well to work on his part of the report. For this phase of writing he did not use any word processor, but just pen and paper. His objective was to highlight the main requirements the prototype should support and, at that moment, he just listed them. As he wrote them down on paper, he did not send his text to anyone.

Ethan writes in the hotel room
After the meeting, Ethan went to the hotel where he used to stay overnight when he was in Stockholm for work. He contributed to the first part of the report, by presenting an online software and by discussing to what extent its functionalities could be useful to the two cohorts of users the group was designing for. Moreover, he checked out some articles that he would have liked to include in the report. When he finished with the text, he sent the document to the others as an email attachment.

Siria writing in her office
After the meeting Siria went to her office where she wrote the section of the report she was responsible for – a short description of another software and a list of the requirements to support teachers' activities within the system. She used a word processor and did not include any reference. When she finished the document was sent to the others as an email attachment.

5.6.3.1 One strategy four different environments

The four activities presented above are examples of how each student contributed to the collaborative process of writing. As the time available was short, the group members felt they did not have enough time to be together at the university campus in order to work on the document. The time constraints seemed to be the main reason to decide to write the different sections of the report in parallel and without exchanging comments (at least for the moment). The quote below exemplifies a participant's concern about this issue:

> "I had limited time that night and I just had to write, I did not have enough time to ask for the others' opinion". (Joel, a participant in study B).

While two of the group members carried out their activities at the respective homes, Siria preferred to work in her office.

> "I only work here in my office! […] I keep them [references and other working material] together here in a paper folder, which I use only for this course, placed in the bookshelf in my office; all the

material is here, so every time I want to check it out it is quite convenient for me". (Siria, a participant in study B)

By saying that she only works in her office, this participant mostly refers to individual tasks undertaken within this course and to other activities associated with her work as a PhD student. In fact, in her office she keeps the resources that she might need during an ordinary working day and, not surprisingly, the availability of an office determines a more defined separation between working and not working places.

Finally, another interesting aspect regards the strategies adopted by each group member to get practically (re)connected to the rest of the team. Sending emails either to oneself or to the others seems to be essential to reach the other peers and to prepare for the upcoming collaborative session.

5.6.4 Vignette 5: Completing the prototype and the report in a seminar room

As arranged the day before, the four students held a meeting in the seminar room, in order to finish their prototype and to continue writing the project report. In the following vignette, the main phases of the practices observed during this meeting will be unfolded and the details of the emerging interactions provided. As I was personally present at this group session, the account below is based on the notes taken during the observations, on the analysis of the videos recorded and on follow-up interviews held with three of the participants.

After illustrating additional examples of what the students did in order to create an amenable workplace (see also section 5.6.2.2), the present vignette seeks to highlight:

- The intertwinement between this writing phase and the prototyping activities;
- Students' simultaneous participation in other projects and its influence on the ongoing processes;
- A number of issues – such as the simultaneous use of several technological artifacts, the negotiation of contents, the distribution of different sub-activities to various areas of the same physical environment – that seem to justify the students' habit to carry out demanding tasks together and in presence.

Getting ready

Soon after meeting up in the seminar room, the students started to prepare for the work to be done. Ethan tried to connect his laptop to the projector and, hence, to the wide screen in the room. However, he encountered some problems with it, as the cable available in the room did not work with his laptop. Thus, a first challenging task for him was devoted to figuring out how to connect his computer to the plasma screen available in the room. At the same time, a number of references was arranged by topics on the table in the middle of the room, while Joel connected the laptop to the wi-fi, in order to access his web-based mail and to download the document he had written the day before.

Siria, the fourth group member, was not there yet. She was late, but she had not informed anybody about her delay; nevertheless the three fellow peers did not seem to be bothered by her absence.

Writing the report

Once they felt that the room had been properly arranged, they began to work and, by using Ethan's laptop, Joel pasted the sections, that Siria and himself had written the night before, into the outline previously used to plan the text and divide the work. After putting the different contributions together, he handed over the laptop to Jack so that he could type the points he had jotted down the evening before. In the meantime, while Jack was attending to this task, Joel took a paper copy of the outline and, together with Ethan, he moved to the whiteboard to discuss what functionalities of the prototype should be presented in the report and what aspects of their work should be foregrounded. When Jack finished editing his piece of text, he joined the other peers in the task they were carrying out. This task went on for about forty-five minutes until Ethan left for another meeting, for which he had planned to be away for about two hours. Once alone, Joel and Jack moved back to the laptop and started to proofread the text Joel had written and they kept on doing that until Siria arrived.

Developing the scenario and planning what to write

While engaged in writing the report, the group members realized that the prototype functionalities were better explained by using a scenario. They therefore moved back to the whiteboard to brainstorm the different steps to be highlighted in their narrative. During this phase, they drew on the sketches of the prototype, in order to better explain what they referred to or to express a concept. The four students engaged in this activity differently. In the beginning, Ethan and Siria took turns to annotate on the whiteboard the main activities to emphasize in the scenario. Later on, Ethan temporarily moved to the table, searching for references to describe the relevance of the functionalities illustrated in the scenario. When they finally agreed on how the activities would be supported by the envisioned technology, one of the peers started to write down the scenario, while Jack contributed by reading aloud, from the big screen, the text being written. This task went on for about four hours.

Discussing the conclusions for the report and dividing the work
One of the last things the students did together was to plan what to write in the conclusive section. As the main goal of the writing assignment was to illustrate and document the work process and the design work, one of the students suggested to wait until the report was almost complete before writing the conclusions. When they had finally agreed on the scenario, Siria suggested to divide the work so that they could work separately. Thus, they agreed that the three of the group members would continue working together on the scenario, while Siria would work on another section by herself. Furthermore, they decide that during the weekend Jack would proofread the text and Ethan would add the references.

5.6.4.1 Setting the stage for work in the seminar room

As suggested by the name, the seminar room is a locale often used for seminars and meetings. The room is about thirty square meters in size, equipped with a table big enough for about ten persons, two large whiteboards, a projector connected to a plasma screen and a desktop computer usually connected to the large plasma display. This locale is often used by the department staff and previous booking is often recommended. The picture below (Figure 5.12) shows how the room looks like when it is not being used. Except from the standard equipment, nothing else is to be found in the room (sometimes notes from previous meetings on the whiteboards). Moreover, it is not a site people usually experience by walking by, as the door is always locked.

Figure 5.12. The seminar room when it is not being used.

Similarly to what highlighted about the previous meeting, also on this occasion, the group members needed to modify the room to recreate the basic conditions that would allow them to work. In this regard, the first part of the vignette illustrates the different levels at which the seminar room was turned into a suitable workplace.

One way the workplace was created was by arranging the physical devices in the room. The students, for instance, tried to connect one of their laptops to the projector, so that everyone could use the plasma screen as a shared surface to display the document they were to write. Nevertheless, this was not an easy task because of some problems that occurred with one of the cables (Figure 5.13) and whose causes the students were not able to figure out. While trying to get the projector started, one of them suggested, in dismay, that the problem might be connected to the fact that they were using a PC. Anyhow, the problem was eventually solved out by connecting the cable directly to the projector hanging over the table in the middle of the room (Figure 5.14).

Figure 5.13. Ethan and Joel are trying to connect their laptop to the plasma screen. On the table, articles and other papers have already been arranged by topic.

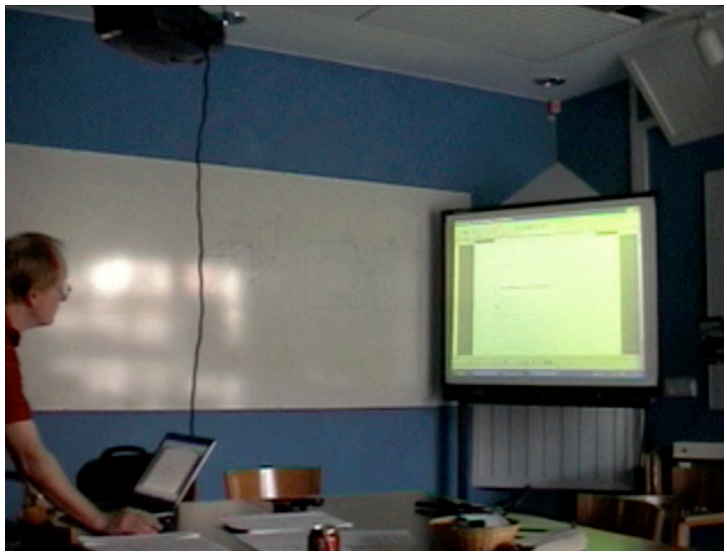

Figure 5.14. Rearrangement of physical devices in the seminar room: the cable connected directly to the projector.

Moreover, similarly to the previous meeting, the students *needed to move artifacts and information into the locale they were about to work at*. On the one hand, as described above (section 5.6.3), Joel had consciously planned to make the document he had written the night before accessible from anywhere by sending it to his email account. On the other hand, before the other fellow students arrived, Ethan had laid on the table a number of references which had been arranged by topic (Figure 5.13). These different ways of making resources available seem to embody two, complementary modalities to access and use information throughout the work process: the former to enable a single person to access his own document, the latter to enable the whole group to use someone else's resources. In both cases, informational artifacts are moved from a place, and this movement seems to be a main concern and a conscious strategy adopted by the students to make their work possible at a number of locations. Although being a relevant part of the work process, *this circulation is distinguishable from the main designing and writing activities and it emerges as a range of additional tasks needed to enable work*.

In addition, it seems that *several media were often used by a single member to ensure access to various informational resources*. For instance, the student, who had made his text available to himself as an email attachment, had also brought his own laptop to the meeting, so that similar papers that he had written for

previous courses, would be available and could be used as a model for the current report (Figure 5.15).

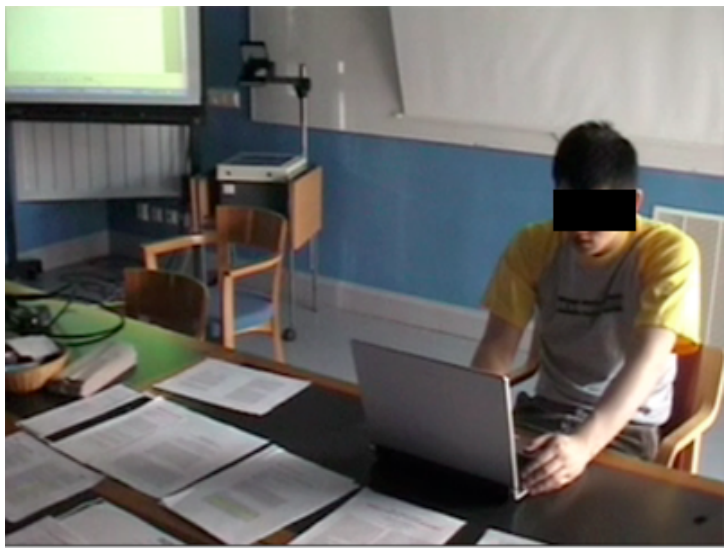

Figure 5.15. Joel is looking for an old report.

5.6.4.2 Still writing the report

As recounted in the second part of the vignette, the first phase of the writing activity described was characterized by putting together the different individual contributions: Joel, in fact, pasted to the main document the sections that Siria and himself had written and, afterwards, he gave it to Jack who used it to write down and elaborate the notes he had taken on paper the evening before. At this point, as shown in the following picture (Figure 5.16), the other peers moved to the whiteboard, in order to reconstruct the work process (e.g. brainstorming, conducting interviews, data analysis, design of the prototype) and its main phases to be highlighted in the report. Thus, while one participant was temporary involved in the transcription of some contents, the others were about to decide what to foreground in the report.

At this stage the collaborative writing activity was characterized by the simultaneous execution of related tasks, by different individuals and by means of various artifacts and technology. On the one hand, the combination of subjects, tasks and artifacts was related to what needed to be done. Thus, when Jack finished integrating his contribution to the rest

of the report, he moved to the whiteboard and joined the other peers in the ongoing discussion. On the other hand, this combination was also determined by the number of people currently present in the room. Joel, for instance, immediately shifted task and joined Jack in proofreading the document, soon after Ethan left for another meeting, and they continued this task until Siria arrived.

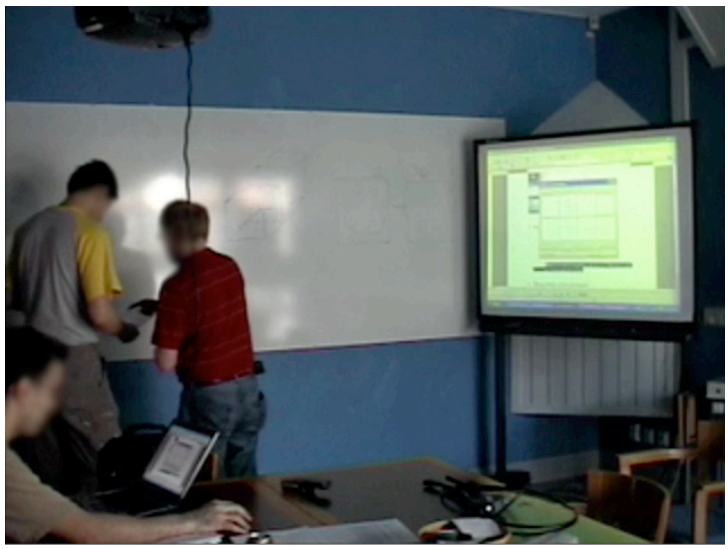

Figure 5.16. One of the peers is writing pieces of text, while the others, by the whiteboard, are planning what to include in the other sections.

5.6.4.3 Facilitating collocated activities

As already remarked, the students' practices seem to be characterized by a tendency to plan and distribute the group activities so that they can be carried out individually or together with other peers. More specifically, the participants in the fieldwork explained that they preferred to meet up in public spaces to undertake those tasks that were expected to be more demanding. In the attempt to further explore this aspect, by drawing on the last vignette introduced, in the sections below I will discuss what seems to be facilitated by working in presence, in the same physical environment.

Recapitulating and explaining what tasks have been accomplished

First of all, being collocated in the same physical environment *made it possible to join an already ongoing work session and to gain an awareness of what had been accomplished throughout it.*

One of the group members, for instance, did not participate in the last meeting from the very beginning. When she finally arrived, after attending to some personal tasks – such as checking email and reading the news – she asked what the papers on the table were and whether she could read the latest version of the report. Thus, one of the team members explained her that they had written on the whiteboard the functionalities of the prototype to be discussed in the report and that, after talking to the lecturer, they had decided to slightly modify its structure.

Shifting between artifacts

A second aspect that seemed to be facilitated by co-presence was the *smooth shift from private to group representations and from a physical device to another*. Referring to the activities observed may help to clarify this point. When Siria arrived, for instance, although the text document was being displayed on the large screen, she wanted to have a personal version she could check out on her laptop and she, therefore, asked Joel to send it to her. The file was transferred from one computer to another via an instant messaging application, but a new contact had to be created before the transfer was actually possible, because Siria's contact was not available in the laptop being used by the other peer. A plausible explanation of this behavior is that Joel was using Ethan's laptop and, probably, he did not want to send any attachment from someone else's email application. However, the issue I would like to emphasize here is that, at this point, the three group members were all working on the same report, although on two different versions of it, and by using two different laptops. Thus, while Siria checked out the report, and made small changes, such as justifying the paragraphs and adding portions of text to the different sections, the two other peers continued with the text revision,

Another aspect that deserves some attention is the fact that, once Siria noticed that the structure of the current report did not correspond to the outline the group had discussed during the previous meeting (see section 5.6.2.5), she transcribed the changes on the paper version of the outline she had taken with her. Although she already had the latest digital version of the report, it was the paper outline that she referred to in order to get and keep an overview of the whole document.

Supporting the negotiation of contents

Elaborating and negotiating ideas (for instance, agreeing on the prototype functionalities to highlight and on the correlated contents to include in the text, deciding their relevance and order in the document) are other aspects of the work studied that seem to be facilitated by being co-present. With respect to the whole project, these moments were regarded as important by the participants and they were, therefore, attended by every group member. Moreover, as the students explained, these tasks were experienced as troublesome, as they were not completely sure about each other's opinion and, for this reason, they really needed to sit down and work on those parts together.

Face-to-face interactions provide contextual cues, such as gestures, body postures and facial expressions that can help people to make sense of what is going on (Goffman, 1959). Olson and Olson (2000) have provided an exhaustive account of different characteristics – such as overhearing others and spatiality of human interactions – that might facilitate collocated synchronous interactions. Similarly, other research shows that, during a conversation, speakers take into account what the others can see (Schober et al., 1989) and notice where the interlocutors' attention is focused (Argile et al., 1976; Boyle et al., 1994), and they point to objects (Bernard et al., 1996) and make gestures (Bekker et al., 1995) to clarify what they mean.

During the meeting in question, an aspect that seemed to be essential to the interactions between students was the use of paper artifacts, particularly the sketches of the prototype. In fact, although a digital version of the prototype was available[23], the *paper version was the paramount medium the students used* to support discussion, elaborate ideas and refer to a shared, concrete representation everyone could point at and talk about (Figure 5.17).

[23] At the end of the previous meeting, one of the team members had promised to scan the sketches of the prototype and send the files to everybody.

Figure 5.17. Two different moments, in which the group members elaborate the scenario to be described in the report by referring to the paper sketches of the prototype.

Parallel activities and spatial practices

Throughout the meeting, the students temporally worked on parallel (but still intertwined) tasks, distributed to different areas of the same room. The ongoing allocation of tasks, the combination of people attending to them with the artifacts used, the individuals' position on the spatial dimension of the room changed continuously and dynamically. While exploring the role of space on collocated collaboration, Sundholm (2007) sees this aspect as the indication that participants can contribute to different tasks in the way they prefer. The following images (Figure 5.18) illustrate several instances of this particular aspect with respect to the activities observed. More specifically, in the left upper part of the image, Ethan and Joel are discussing the functionalities to emphasize in the scenario they are about to write, while Jack elaborates, in the current version of the report, the notes he has jotted down the night before. In the left lower corner, Ethan and Joel have temporarily moved away from the whiteboard, in order to check out some references. Moreover, in the upper right part, Jack and Siria are discussing the choice of some words, while the two other students are chitchatting with each other. In the right lower part, Siria is surfing pages that are not related to the project, whilst Joel is writing the report with Jack (standing by the plasma screen and not visible in the image).

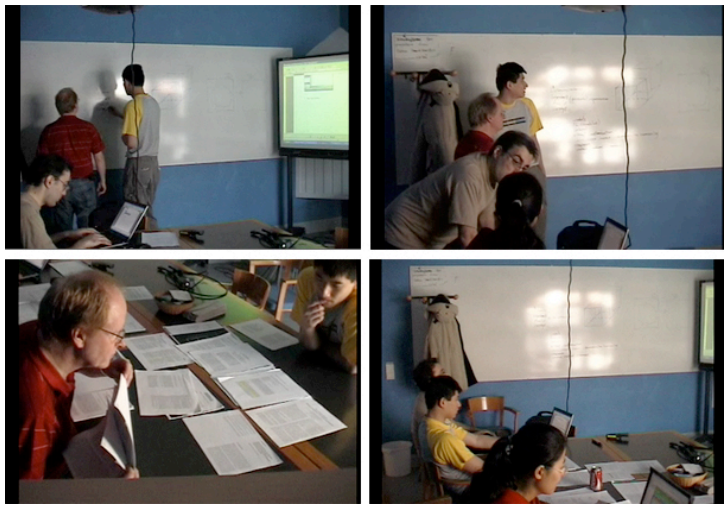

Figure 5.18. Instances of different tasks being accomplished simultaneously by the different team members.

While these various tasks were carried out separately, every student seemed to have a sufficient level of awareness of what the others were doing and was prepared to shift tasks, as soon as he felt that his own contribution could be useful to what the others were doing. *Although collocated in the same room, not all the participants were simultaneously attending to the same task.* Their distribution to different areas of the same physical environment supported and encouraged changes in the combination of people and activities being carried out and of the artifacts used.

This particular way of articulating and distributing work among the group members can be regarded as a way of accommodating locations to the current needs.

5.6.4.4 Managing work and places

As illustrated, while during the first meeting (section 5.6.2), the main writing goal was to divide the text in different parts, during the following one, the group members were mostly concentrated on elaborating complex issues about the description of their prototype and, consequentially, about what to emphasize in the document.

Nevertheless, even during the second work session, when the collaborative effort of developing the scenario was over, a concern for the practicalities of how to manage the process of writing emerged. In fact, at this point, Siria thought that it would have been appropriate for her to leave

and work alone and, as she also had to work on another assignment, that would have saved her time.

> "We divided the assignment into four parts, my part was about the method we adopted to design the prototype. This section was quite independent from the rest of the report. The other parts *[of the report]* were very much intertwined, the section about functionalities, for instance, was very mach related to the scenario […]; for the same reason the person in charge of writing the requirements for our prototype was also responsible to take care of the references, as he needed to use them to justify our choices. But my part was independent and I could do it in my office, I did not need to work face-to-face with them". (Siria, a participant in study B)

The quote illustrates three relevant issues. Firstly, it tackles the students' need to juggle with different schedules and time constraints deriving from participating simultaneously in different projects. Secondly, it shows the correlated concern to arrange the work process so that it could take place in collective or private places. Furthermore, it exemplifies the way Siria made sense of her contribution to the report, in relation to what the rest of the group was currently doing. As the section she was going to write about would not have any substantial consequences on the parts the other fellow peers were elaborating, she thought it was more practical to move to her office, from where she could attend to other tasks as well. From her office, she maintained a connection to the rest of the group, by being available through an instant messaging application.

5.6.5 The final revision of the document

The final revision of the document took place during the weekend. Every student worked from home, including Ethan who was back in his home town.

> "I was working on another project during the weekend. Thus we decided that Ethan would add the references and that, afterwards, Jack would proofread the document and we will all read the document during the weekend". (Joel, a participant in study B)

This last phase of writing was not especially demanding and the students thought that a short chat on instant messaging would have been enough to discuss what to do.

> "During the weekend I talked to Jack and Joel via instant messaging about what needed to be done. After that we just did what was left and we sent the document to each other by email. This time we did not work on different sections of the text, but on the whole document. We added words, we deleted and changed small things of the report. Afterwards we sent it to each other". (Ethan, a participant in study B)

During this final stage, the students consciously agreed to adopt what has been defined elsewhere as a *sequential writing strategy* (Sharples, 1993). In other words, they decided they would work on the document in a sequential order and, hence, only when one of them had finished, the document would be sent to another group member. During this phase the students used different colors in the word processors to highlight the text that had been modified. They used the revision functionality to compare the different versions of the report and they also attached comments to the text when the need to better explain something arose. It is at this point, that a soft discontent regarding the revision of some parts of the report was discerned:

> "I got the latest version of the document by email. There were some small things that I would have liked to have in it, things that I would have liked to have but that someone had taken away, thus I wrote down the sentence again and tried to motivate why I wanted to have it". (Ethan, a participant in study B)

Email and instant messaging were mostly used for this final phase of the project. Although the students had not explicitly agreed on their use, their familiarity with these applications made them an "obvious" choice. Thus, despite the fact that the student who had originally introduced Click to Meet to the rest of the group thought that the conference system could be used again for this final phase, it never was.

5.7 Summarizing this chapter

Introducing the vignettes has provided a first possibility to outline the group activities observed and to anticipate a number of issues characterizing the nomadic practices embedded in them. In so doing, particular attention has been drawn to the relationships between places, activities and the tools and technologies mediating them.

Moreover, by drawing on the initial conception that nomadic work can be regarded as a type work bound to different places – and not merely on the move – this chapter aimed at illustrating how students carefully organize their project activities in order to be able to accomplish them at a number of sites. With this regard, attention was paid to (i) the strategies and tools adopted to connect the different locales with each other; (ii) the way such locales were appropriated and modified by the students to create suitable work conditions.

The places observed

The second point mentioned above is particularly relevant for the setting investigated. As already mentioned, most of the places are not designed to support group activities, or they just provide basic support for them (e.g. a table and some chairs). Consequently, the students often engage in this type of activities aimed at rearranging the physical environments, and at moving informational resources, working material and artifacts into them. Careful practices are often planned and enacted, to make sure that the aforementioned resources and artifacts are available both to the whole group and to its single members.

Moreover, these locales are used ephemerally, as they are available to other groups as well. This fact has some important consequences, as different working resources cannot be stored in there and they have to be cleared out at the end of each work session.

Places are often chosen instrumentally, because of the resources available within them. Nevertheless, deciding where to hold a group session might be determined by other reasons as well. The second vignette, for instance, suggests that the presence of other peers, indirectly involved in the ongoing tasks, might play an important role in the selection of where to get together.

Finally, the alternation of at distance interactions with co-located working sessions seems to be a strategy, often adopted by students to cope with the lack of a shared workplace, with the contingency of working at irregular working hours, and participating simultaneously in several projects and courses.

The activities observed

As clarified in chapter four, this thesis seeks to explore how being nomadic reflects on the groups' activities that were observed, particularly the writing process. The data presented in the current chapter enable to outline a number of possible answers related to the way it is actually carried out.

Although during the two field studies, the writing activity was mostly performed at the end of the project, its beginning does not coincide with this phase and with the actual moment when an outline was firstly suggested within the different groups. Both the vignettes and the interviews with the participants illustrate how the contents to be used in the final report were created throughout the project. A common strategy to all the groups, was, for instance, taking notes of each meeting and reporting important decisions made by the group.

In the first vignette, the two actors involved mostly worked at distance, from their respective homes. Although some coordination problems emerged at the beginning of the process, the two participants did not change the writing strategy adopted, and continued to exchange with each other the document which they took turns to write. Eventually, towards the end of the project, the whole group was invited to give comments, while someone else adjusted the document layout and handed it in.

The writing process described in the second vignette involves three actors, who alternated working together and individually. More specifically, the contents to include in the presentation were planned together at the library cafeteria. Thereafter, during the oncoming weekend, each actor edited individually a certain number of slides which were eventually pasted together by one of the students, whereas the final revision was made the following Monday, just before the lecture began.

The writing process observed during the second field study profoundly differs from the two just mentioned. As seen, it would be difficult to separate it from the rest of the prototyping work, the students shifting from one activity to the other during the same session. In this case, the report outline was sketched by one of the participants and, then, discussed by everybody during a joint session. Once agreed on what to write about and how, the different sections were written individually at home, but merged together and improved during a following session attended by all of the team members. The final revision was carried out from home, each students taking turns to edit the latest version received from one of the fellow peers. In short, the students explicitly agreed to write together the sections they expected to be more difficult.

By recalling these different writing activities, my intention is to start exploring how the lack of a fixed and stable working place may shape the practices embedded in them. A first reflection concerns the interplay between the three activities described and the locales students could access. Two of the participants in the second field study were PhD students and, as such, they were allowed to use some department facilities which regular students could not. This made possible for them to arrange a long writing session (section 5.6.4) to write together the sections of the text requiring negotiation and discussion – i.e. the conclusions and, as seen, the scenario describing the prototype.

Moreover, the relationships between the work activities and the variety of locations at which they occur seems to be characterized by different types of planning: (i) planning access to resources; (ii) planning the text in terms of contents and topics to be tackled; (iii) planning the quality of the text, in terms of what to prioritize and what to leave in the background; (iv) planning the division of work; (v) planning the places at which work can be accomplished.

The technologies and tools observed

As already discussed, it is problematic to identify a stable correlation between a particular technology, the activity it supports and the place wherein it occurs. This is a major difference with other mobile settings (Bartolucci, 2007, Luff et al, 1998; Wiberg et al., 2001). On the one hand, this is related to the fact that an activity such as writing can be carried out at various locations; on the other hand, it is partly related to that fact that the students are free to choose the tools and the technologies they prefer to collaborate on projects[24]. This point will be further explored in the following chapter.

It is relevant to note that a combination of physical artifacts and digital technologies are used, and that the latter may be public – that is belonging to the university – or may belong to students.

Moreover, it is relevant to note that some technologies may not be used for their immediate and obvious goals, and this depends on the preferences of the single group. For instance, within one of the teams followed, mobile phones were not used to communicate with each other (this was regarded as too expensive); however the phone played a central role in circulating the prototype from a locale to another. This episode also shows that a set of

[24] Tools and applications, such as learning platforms, supporting the communications between teachers and students are not included in this point.

aligned physical devices was needed to actually achieve this goal; in fact, before being printed out, the pictures of the prototype were transferred to a second mobile phone.

The use of technological artifacts and applications is often planned, depending on the number of people involved and the errands to be accomplished. In the first vignette, the two writers explicitly agreed to exchange comments and different version of the document by email, while they were working from home. Section 5.6.1 introduced the use of an online conference tool, to bridge the different places the participants where located at. Moreover, it discussed the social and collaborative problems arising from a fault in one of the participants' local network.

Paper and other physical surfaces to write one (e.g. whiteboards) are essential to share and elaborate ideas. The possibility to actually touch and point at physical artifacts might be a reason to prefer them to their digital versions.

Finally, another relevant issue emerging from the vignettes is the students' lack of shared tools and technologies needed to accomplish specific activities and tasks. The second narrative, for instance, points out that one of the participants responsible for the project's presentation did not have any application she could use to edit the slides.

6 Analyzing nomadic practices as bound to several places

Within the present chapter, I will further analyze the group activities and practices introduced in the previous chapter, by focusing on their nomadic aspects and on how they are experienced by the students themselves. In so doing, I will complement the data, gathered during the observational fieldwork, with quotes and reflections stemming from a workshop, which some students were invited to participate in (see section 4.4).

As explained before (Chapter 3), according to Casey (1996), an important aspect of place is that, although stable and perduring in relation to its identity and essence, it may still be dynamic and changing in relation to the experience of a lived body. In other words, while a place may be understood for what it is by an individual or group of individuals, the experience, appropriation and use of it may differ depending on the people within it, their current activities and their situated needs. A place, thus, does not just exist *per se,* but is rather embodied in individuals' activities and experience of it through space and time. In this perspective, similarities between places do not derive from merely sharing the same physical location, geometry or structure, but rather from the intertwinement of traits related to individuals' *lived experience,* along a psychological, a physical, an historical and a social dimension. It is this lived dimension that enables similar experiences and the engagement in activities of the same type. McCarthy and Wright (2005) describe this aspect of place by adopting a

dialogical metaphor that explains the emergence of place as the situated outcome of a conversation between place, self and technology.

As argued, the focus on place as an *event* (Casey, 1993; 1996) and the emphasis drawn to its emerging and negotiated nature make this concept suitable to understand nomadic settings. More specifically, Casey's articulation of place (Casey, 1996) along four dimensions (psychological, physical, historical and social) provides a framework to investigate the relationships between places and activities.

By drawing on this theoretical framework, I will be attentive to two particular aspects. Firstly, I will seek to highlight how *places are managed*, with regard to the strategies adopted and the tools used to overcome the problems deriving from carrying out group work at several locations. In so doing, I will examine how students, as a particular cohort of nomadic workers, experience different environments, attribute meanings, feelings, activities and values to it. Thereafter, I will focus on the event metaphor and discuss how *place happens (place-making)*, how it emerges from students' interactions with the environment they inhabit, and how it is mediated by the technology they use. Although making place and managing places could be perceived as two complementary classes of activities, the analysis of the data suggests that they are not always clearly distinguishable from each other. Thus, the reason for referring to this distinction is not to force the data into one class or another, but rather to emphasize two different ways of creating and maintaining a workplace.

Particular attention will also be paid to the use of technological artifacts and how they mediate the aforementioned aspects. Although a specific section of this chapter is explicitly dedicated to technologies (section 6.3), it would be problematic to discuss the activities observed without mentioning the tools and technologies supporting them. For this reason, I will elaborate on the specific use of particular technologies also within different sections of this chapter, when it helps to clarify a point at stake.

In concluding this chapter, I will argue that working at a number of locations seems to characterize students' collaborative activities in terms of: (i) preparation moments, aiming at creating a workplace and the necessary conditions for work; (ii) disassembling moments, aiming at moving out of a temporary workplace. Moreover, the analysis suggests that the participants experienced planning the division of work as essential in order to manage coordination and collaboration within the groups, to organize collaborative and individual activities, and to distribute them to differing physical places.

6.1 Managing work at several places

By using the expression *managing places*, I refer to the way work at several locations is organized in order to enable an engagement with the activities at hand. Managing places encompasses the strategies students adopt and the tools they use to create a connection between a locale and another and to overcome problems deriving from carrying out group activities at various locales. As already discussed, although many elements may already be *in place* (specifically to this case, chairs, whiteboards or desks, for instance), places do not exist *per se*. On the contrary, the circulation of objects, agents and entities of various nature may contribute to their creation (Latour, 2005). It is in this regard that reflecting on the students' practical achievements (the adoption of specific collaborative strategies, the situated use of technologies, the circulation of objects and resources, etc.), that are necessary to create suitable conditions for work, will be a focal point of in the following sections. At the same time, the analysis will also be attentive to the students' activities emerging from the interactions with the physical structure of a given environment, and to the social and psychological aspects that can help characterizing the relationships between nomadic practices and places.

6.1.1 Places, meanings and social relations

The students who participated in the fieldwork did not engage in frequent long-distance traveling to meet their peers, but they mostly moved within the urban area in which the studies were conducted. Moving around was mainly determined by the need to meet other peers and, for this reason, it was not regarded as a main problem.

In contrast to other mobile work settings (Bartolucci, 2007), for which a correlation emerges between the use of specific tools (e.g. a digi-rod[25] and a measuring tape), well defined activities (e.g. measuring) and a certain class of places (e.g a building site), it is problematic to define a stable correlation between a typical students' activity and the place where it is accomplished (being a group room at the university library, a lecture hall, a cafeteria, an open space within the university building, a seminar room or home). Thus, as illustrated before, the final revision of a presentation could take place in the corridor outside a lecture hall, while a lecture hall, generally used for regular teaching activities, can also be used by students for disparate goals,

[25] A digi-rod is an electronic measuring device.

such as organizing various group activities, writing a report, preparing a project presentation, etc.

Sites to work at are not chosen randomly or merely because they are free and available, but other reasons, peculiar to a social dimension of work, may determine this choice as well. The places wherein the meetings were held varied considerably depending on different factors such as: the number of people participating, the presence of resources to be used during the working sessions (e.g. a whiteboard, a wide screen, etc.), the possibility of engaging in social interactions with third-party people – a teacher or other peers, for example – not directly involved in the task at hand, but still essential for it (section 5.4.3.1).

As it was observed, locations wherein work could actually be accomplished were often chosen in advance. However, it also happened that the students would temporally gather up somewhere to wait for latecomers – typically in the university library cafeteria, or by an entrance hall – and would then move to a more private room such as a free classroom or a meeting room (Normark et al., 2005).

6.1.2 The university main campus as a paramount place for interactions

The university main campus, with its several buildings and sections, is a rather vast physical infrastructure, central in students' academic life, and it can be regarded as *a paramount area for face-to-face interactions*. This is certainly due to the fact that most of the educational activities – such as lectures, meetings with supervisors, attending libraries and labs – take place there and students are, at times, already in nearby places. Furthermore, in a big city like Stockholm, the fact that the campus (at least the one where the studies were carried out) is located in a central area of the city makes it easier to reach, in a relatively short time, for almost everyone living in the city.

Erickson (2001) uses the expression interaction trajectories to refer to his own wandering across the halls of the building he worked at which were intentionally scheduled to encounter colleagues and have the chance to talk to them. Concerning the settings investigated in this thesis, unplanned encounters and the related short, informal meetings were also common and they often took place within the campus area. As the participants explained, such occasions were useful to maintain the awareness of what the other group members were currently involved with, or to see that everyone was up-to-date concerning the latest project development.

> "We had a lot of informal meetings since we were always in school and we met all the time anyway. If the film group, they had a meeting and, as I was nearby, I just walked by and listen to the meeting and, if I had had some ideas, I could have just told them, it was kind of open. […] We aren't all from the same program […], but we use the same buildings so it's not that difficult to meet the others. Usually we see each other quite often". (Caroline, the Game Project group)

This aspect of work was particularly evident within the groups who participated in the first study, as peers divided themselves in subgroups involved with different assignments. Moreover, as the quote suggests, attending the same program made it more likely for the students to encounter each other within the same buildings. This issue is further explained in the citation below, in which the participant expresses her concern to keep in touch with everybody in the group:

> "Yes this is what has happened, but I think it depends more on the fact that we meet each other and that we move about the same locales […]. You may see some people at the library, like Andreas for instance; he has been very much involved and he used to reply to email or so, I don't know what he thought about it, but there was no problem to keep in touch with him. It is more problematic to be in touch with those from Media[26]". (Erika, the Sound Project group)

6.1.3 Instrumental use of places

Locations such as group rooms, public open space within the university buildings and seminar rooms are often *selected in an opportunistic and instrumental way*, depending on the resources available within them. The selection of a seminar room to get access to a large video display to be used as a shared surface, and the selection of an open space, because of the possibility to use a whiteboard, are two instances of this.

Nevertheless, to merely account for the presence of specific tools and technological artifacts would be reductive to explain how locales to work at are chosen. In fact, as the data suggest, such a decision may also be determined by *the possibility to carry out specific social activities within them.*

[26] Here the participant refers to the program Media Technology, which was attended by some of her fellow students.

Another large video display, for instance, was available at the open space where the group that participated in the second field study used to meet. However, the group in question never considered using it, as it was located in the middle of the open space, an area of transition for many employees and visitors wandering from one side to another of the floor where it was located. Moreover, while enumerating the different places wherein the group used to hold its meetings, one of the participants explained that for a similar reason, the kitchen area, adjoining the open space, was never chosen as it was regarded as a place people usually go to when having breaks from work:

> "We did not sit at the tables [in the kitchen] because it's not a place for studying, it is more of a leisure time area". (Siria, a participant in study B)

The importance given to a sense of privacy and silence characterized the participant's experience of actually being able to actually engage with project-related activities. At the same time though, it is important to underline that these values, which can be related to the psychological and social dimensions of place (Casey, 1996) discussed in section 3.3.2, are not univocal but dependent on the range of locales the different group members have access to. Siria, for instance, was a PhD student and she could, as such, use seminar rooms, resources and other department facilities that undergraduate students usually do not have access to. Thus, having the possibility to choose from a broader range of locales might be one of the reasons for which her group did not regard the kitchen area as a suitable workplace, while other groups often selected the library cafeteria, a very noisy place, as a meeting place.

6.1.4 Ephemeral use of places

Finding a meeting place is often interwoven with the problem of organizing meetings and booking group rooms, especially when long working sessions are expected to take place (section 5.6.2). As exemplified by one of the participants, first of all, a long time is spent to juggle with different schedules and, afterwards, once in the campus area, there may still be no places available for the upcoming meeting. On similar occasions, walking around in search of a meeting place can be quite frustrating, as it takes away time from real work before it is time to move on to other courses or projects.

> "If you go there and work and then you go for lunch and…when you come back you have to switch place because the room has been booked by other groups…if you're in a group of five people, you have to go around and it can be quite frustrating". (Manuel, a workshop participant)

As the citation suggests, locations are usually occupied and turned into places to work at for a limited amount of time, spanning from a few hours to an entire day. Most of these places are available to other people as well and, hence, they have to be cleared out when the work session is over (Normark et al., 2005; Rossitto et al., 2007). As a consequence, the appropriation and the use students make of places, especially the public ones, are *ephemeral* and this is a serious issue. In fact, as the locales are also available to other people, working artifacts produced and used by the whole group (e.g. mock-ups and other prototyping material, paper references, images) cannot be stored there. As it will be further explained (section 6.2.1), that has important consequences on:

- The way resources are accessed and made available both to the whole group and the single individuals within it;
- The technologies and strategies adopted to overcome the limitations inherent in this aspect.

6.1.5 Planning collaborative and individual activities

For the students who participated in the field studies, the main reason for traveling to a meeting place was to meet up with other peers in order to carry out, together, those parts of the group work which required negotiation and discussion. This could include, as we have seen in the previous chapter, defining the goals of the ongoing project, deciding what to include into a report or a project presentation, writing together the conclusions of an essay to avoid conflicting opinions, or sketching a prototype and defining its main functionalities. As it has been illustrated, places such as homes were often considered to be more suitable for tasks that could be accomplished individually and that did not require thorough discussions with the others. In contrast, some other locations, spanning from areas within the university buildings (open spaces, corridors, group rooms, classrooms) to cafes and fast-food restaurants, were regarded as suitable for working together with peers.

Moreover, planning the division of work and the sequence of tasks was a relevant and prevalent strategy to manage co-located work sessions and remote interactions among the group members. This conscious alternation of group and individual activities intertwines with a *distinction between places more suitable for collaboration and places more suitable for individual work*. The importance of adopting this strategy emerged from the workshop as well, and not only from the field studies. One of the participants, in fact, explained that, within a group he had worked with some years before, the use of IRC (Internet Relay Chat), a text based chat, was regarded as convenient by all of the group members, because some of them did not live in central area of the city. The following quote better explains this point:

> "To come here [to the main campus] just for half an hour meeting would have been too time-consuming, including finding a place to meet and it was not worth it just for those small things that we wanted to discuss. In those cases, we used the IR channel. But still we had meetings [face-to-face] to write the report, for instance or to do all the other things we needed to do in presence". (Karl, a workshop participant)

At the workshop, only two of the participants did not recognize this way of managing collocated and at distance interactions. As they explained, every time they had to discuss about something, they preferred to meet up rather than writing emails or chatting online. Meeting in person was considered to be easier, especially when ideas were not well formulated yet, or whether technical problems had to be solved out and the team members had come up with different technical solutions they wanted to compare. In such cases, they did not regard the search for a meeting place as problematic. Differently from the other participants (both in the workshop and in the field studies), the two students in question attended a course called "Wireless Networks"[27]. When the issue of organizing meetings was further discussed, it emerged that a special lab, equipped just for this course, was available to the students and that they regarded it as their workplace, usually occupied at "regular" working hours. By regular, I mean resembling office hours people are generally accustomed to in Sweden, roughly between 9.00 and 17.00. Moreover, students attending that course had access to seminar rooms and other department facilities, otherwise precluded to students.

[27]This course is part of the program Personal Computing and Communication, held in Kista, where a KTH branch is located.

Thus, it seems to be plausible to relate their unconditioned preference for face-to-face meeting to the availability of a stable workplace.

Planning the activities that can be accomplished remotely or while on the move is a typical feature of nomadic work that has been addressed and thoroughly discussed in different work settings (Brown et al., 2003, Eldridge et al., 2000; Lamming et al 2000; Perry et al., 2001). In this section, I have sought to emphasize that *this type of planning encompasses collaborative aspects* as well, as the students explicitly discern what can be accomplished alone from what is better achieved in the presence of the other peers.

Differently from other professional nomadic settings, within which individuals often engage in long distance traveling (Su et al., 2008), students' movements were mostly limited to the city area. The only exception was one of the participants in study B who, when the study was carried out, used to live in another town. Confirming the findings from other research, he explained that he usually saved up writing and reading for his train journey that he regarded as a very relaxing moment, mostly because the unstable telephone network along the route made it problematic to make or to receive phone calls:

> "People know that there is a bad network and thus they are quick [on the phone] and I can concentrate and carry on working […]". (Ethan, a participant in study B)

Furthermore, this student thought that working on the train was usually quite productive, since he felt that he had to make the best of the limited time available while traveling. Besides this particular case, the students followed were not used to work on trains, mostly because the underground trains are often too crowded and because the journeys are usually short – between 10 and 30 minutes.

The students' wanderings were, therefore, mostly limited to the main campus and to the city area which means that, for the most part, *they were quite aware of what infrastructure* (e.g. wireless hotspots) *was available* and where, especially within the campus. The following citation exemplifies this point:

> "KTH is the very trusted place because here I know the wi-fi always works, but still in the city you find a network sooner or later". (Manuel, a workshop participant)

6.1.6 Managing meetings rather than work

The fact that a long time is usually spent on practicalities about meeting organization, rather than reflecting on the work that should be undertaken, is tightly related to the management of the work process discussed in the previous section. As the participants explained, *the work itself is often overshadowed by a concern for the meeting organization* and issues such as when it should take place and at what location. While this can certainly be associated with the number of group members – the more they are, the more problematic it seems to be to find a common date fitting everyone's schedule – it is also determined by students' simultaneous participation in several projects. The following quote exemplifies this point:

> "One thing is that in students' project, we spend a lot of time just arranging the meetings. When should it be? When does everybody have time? Especially now, in the 3rd year, everybody has a different schedule and, in some projects, there might be 6 or 7 individual schedules that have to fit together". (Johan, a workshop participant)

One of the informants, interviewed during study A, explained that the group's account on Yahoo!Groups ® worked quite well for the organization of meetings. While the exchange of emails resulted into an email overload, because of the large group size, the Poll functionality, used by the group members to vote suitable meeting dates, was regarded as highly useful.

> "The problem was that we were too many. We were always different people [attending the meetings] and it wasn't always the same group [of people] who showed up. It was hard to communicate…if you wanted something done, you had to do it yourself. The communication went quite well on the web with the Yahoo Group, our forum there. The Poll [functionality], used to write when someone could [attend a meeting], was very good. We used to mail each other, but emails from more that four people becomes enormously much mail." (Staffan, the Sound Project group)

The group size and the fact that group members were often located at different physical places made the communication problematic, thus to

know that most of the information relevant to the group was kept in the same digital environment was regarded as practical.

Consequently, the problems arising from the organization of meetings, which the students referred to as *a shift of focus from the "real" to the organizational work*, was reflected on the use of technologies as well. In the following quote, one of the participants further explains this point in relation to the programming activity he often engages in. According to his experience, whereas the applications generally used enable the organization of meetings, they do not provide adequate support for exchanging comments and opinions on the work being carried out.

> "The technology available today supports managing the group, such as setting dates, etc., but it overshadows the work to be carried out at those meetings. For example, we have Yahoo!Groups and Google Groups, but I don't think we have any programming tool or something like that […]. You cannot have any discussion [by using those tools]". (Johan, a workshop participant)

Furthermore, it seems that the difficulties to manage meetings were also determined by the number of different technologies often used for such tasks. With regard to that, one of the workshop participants explained that within a group he was member of, they had explicitly agreed that throughout the project they would have used: (a) *Google calendars ©*[28] to share their different calendars; (b) *Basecamp*[29] to manage their project, particularly to share files and post comments. However, as the project was carried out, Google calendars © was slowly put aside and the habit to negotiate meetings directly within Basecamp emerged. It seems, in fact, that the possibility to post a message within Basecamp was good enough to propose a date for a meeting and to inform the others about it. Moreover, the whole group did not really appreciate the use of Google calendars ©, because it did not allow them to synchronize all the individual calendars and, thus, to be aware of the others' schedules. According to one of the participants, that would have made it easier to negotiate a time frame for possible meetings. While illustrating this point, the quote below clarifies that this problem was partially due to the fact that "communication"

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[28] Google calendars © allows users to share someone's calendar with other people. For more detail, see the URL: http://www.google.com/intl/en-GB/googlecalendar/tour.html

[29] Basecamp is a web-based application for managing projects collaboratively. For more details about it see the URL: http://www.basecamphq.com/

between applications is not easily achieved, even when those applications provide similar functionalities.

> "It is very hard to synch. If you want Google calendars to appear in your ICalendar, for example, it is done automatically, but the other way around is very problematic". (Manuel, workshop participant)

One more issue regarding the use of several technologies, and the way they support the organization of work, is that one can never be sure whether other people in the group have checked out each of them or not. Because of this problem, one participant explained that, when starting up a new project, he usually seeks to figure out whether everybody checks email regularly and, if that is not the case, he tries to communicate by other means, such as by mobile phone or speaking in person, when possible.

6.1.7 Bridging places by means of technologies

Defining, once and for all, what are the most representative technologies and tools used by students in the context of their group work is not a straightforward matter. It could be said that these are used differently depending on the task at hand, on the number of individuals involved in it, and on the particular location wherein work related activities take place. Email, generic groupware, instant messaging applications, pens, paper and whiteboards were normally used to support both the writing and the prototyping activities studied. Furthermore, some of the findings presented have implicitly illustrated how these technological artifacts were used to manage the uncertainty of places – the use of mobile phones to store and circulate files, rather than for keeping in touch with the other peers, constitutes an example. The fact that, within some groups, mobile phones were seldom used for communicative purposes was somehow a surprise. When participants were asked about this issue, they explained that it was too expensive[30] and that, for this reason, they preferred to use instant messaging or email if they needed to talk to each other.

> "I think that most of us use more and more the laptop as a mobile device, because of the open w-fi [networks] that are available almost everywhere [in the city and at the university], I think we use

[30] This data refers to year 2006.

> the mobile phone less and less for actual communication, we often use Skype or Jaiku[31] instead". (Johan, a workshop participant)

Email was also a reliable medium to assure that documents – report sections, meeting minutes, prototype sketches, etc. – could be accessible from anywhere a connection was available. Thus, sending files to oneself, in the form of email attachments, was a strategy often adopted in order to make work more adaptable to several places.

In the previous chapter (section 5.6.1), the use of an online conference tool, adopted by a group to physically bridge the different places its members were located at, was discussed. With regard to it, two main problems emerged; on the one hand, the lack of a technical infrastructure common to all the group members; on the other hand, the students' difficulty to internalize it into their work practices, especially for those members who had not used it before.

In the following section, the use of Yahoo! Groups ®, a generic groupware application, mostly used by the Sound Project group (Normark et al., 2005), will be addressed.

6.1.8 Generic groupware and common problems

The Yahoo!Groups ® is a web based application which allows groups to manage projects, discussions and other events not necessarily pertaining to a working sphere. The main feature characterizing this tool is that it can be used to store and organize email and mailing lists, so that all the emails sent to a specific address, and appearing on a Yahoo!Groups ® mailing list, are stored in the group's account. Furthermore, the application provides a chat channel and the possibility to upload and store various types of files such as text, pictures, audio and so on. When a new file is uploaded, a notification email is sent to all the group members to announce that something has happened within the group's account.

This specific groupware was extensively used within the Sound Project group which, from the early stages of the project, experienced a problem caused by the fact that the email addresses, used for the Yahoo!Groups ® account, were not checked regularly. Some students, in fact, had created special email addresses for the group account in order to avoid spam, but the corresponding email accounts were seldom checked out. Moreover, as mentioned above, email notifications were sent out every time something

[31] See section 6.2.2 for more details on the use of this application.

happened in the account, but that resulted in a large number of emails being sent everyday, and in the consequent difficulty to keep track of them. With regard to that, a student said:

> "None of us had used Yahoo!Groups for such a project before, so perhaps one isn't aware of [how it should be used]…it is much better to receive an email even though it was irritating sometimes to get about 25 emails in a day. But at the same time it comes to me directly and I don't have to go and check. Even though it is disturbing I think it's better to have it popping up on the screen. But on some days it was really annoying when nobody answered to emails…and some [members] were worse than others. Then it was always possible to use the mobile phone and call the group member, but we didn't have the phone number of one [person] and that was really irritating". (Erika, the Sound Project group)

Besides exchanging emails, the Yahoo!Groups ® account was used as a storage space for documents such as minutes and different versions of the report. The students experienced this particular aspect as useful, as it allowed all of them to store everything that might have been important for the final documentation of the project.

> "We did not know what type of documentation was required from us, if it was every email we had sent, or every design decision we had taken. And it helped quite a lot that we had collected everything in the same place, that we hadn't just emailed a bit here and a bit there." (Staffan, the Sound Project group)

Despite the possibility to upload different types of files, *the storage space was not large enough* and files such as photos and video clips were, therefore, kept elsewhere, on individual user accounts. Moreover, during the last phase of the project, the space had been used up and the last versions of the report could not be uploaded.

As already mentioned, the poll functionality was also extensively used by the group in order to negotiate and arrange dates for the meetings. This practice was appreciated by most of the team members.

> "Yahoo!Groups is very good, because all the emails are there…the calendar is there so you can go and check out what is to be done and what has been decided. As we were eight persons and we could not be present all the time, I think that made it easier to

> communicate. When you are present in a meeting there is always a chance that not everyone is there and remembers everything that has been decided or so". (Staffan, the Sound Project group)

However, it occasionally happened that people missed some meetings because information about them had not been posted on the Yahoo!Groups ® calendar and notifications about them had not been emailed to everybody. Consequently, some people got to know about meetings by chance, just because they encountered other peers within the campus.

It seems that logging in to the group account was a useful way to get a *general and loose awareness* of what the other group members were doing in the context of the project. And that was particularly important as different groups were responsible for different assignments and the respective group members were often located at different places.

> "There was a period around Easter when it was really hard to get a feeling of what had happened, some people were away and I was away as well, but still things happened. Otherwise, I think it has been good to receive those messages where it was said…Hi! We should meet in the video group…so that even if I did not know what they really did, they were doing something, so at least I knew that they had taken some responsibilities for it and I did not need to think too much about it". (Erika, the Sound Project group)

6.2. Making place

In the following sections, particular attention will be devoted to the way students make place, that is to the way they transform and turn the sites they travel to into adequate (work)places. The use of technology and artifacts, the appropriation of resources within a given location, the rearrangement of elements and the investment of a location with overarching activities are all regarded as significant instances of activities enacted in order to create a workplace.

In discussing place-making, I will draw on the notion of place as an event introduced in section 3.3.5 and seek to highlight how place *happens*, how it emerges from students' interactions with the environment they inhabit, and how it is mediated by the technology they use. Approaching place as the outcome of people's experience, articulated along a psychological, physical, historical and social dimension, is particularly

relevant to the case studies described throughout this thesis. In fact, emphasizing its changing and dynamic nature provides some insights to understand how a location can be appropriated and turned into a temporary workplace.

6.2.1 Accessing and sharing resources

As suggested in the previous chapter, a relevant characteristic of the nomadic work presented here is to provide access to resources – namely working documents, references, prototype sketches and other heterogeneous artifacts – produced throughout the project. In fact, making sure that working resources are available and that everyone can access them seems to be one of the students' main concerns when setting the stage for work related activities, when creating a workplace. This is a serious issue because, as seen, the appropriation and the use students make of places, especially the public ones, are ephemeral. The strategies adopted by each group in order to overcome this problematic aspect of their work are different and the vignettes have depicted various instances of them. The student who used to commute, for example, used to select some articles and books to bring along, so that the whole group could consult them while writing the report. Another student, within the same group, sent to himself, as an email attachment, the part of the report he had written the day before, so that it would be accessible from any computer at the university and, at the same time, he brought his own laptop to the meeting, in order to have an archive of past assignments to use as inspirational material (section 5.6.4.1). Other pertinent occurrences are the use of group accounts such as Yahoo!Groups ® to store working resources, but also the manual delivery of the video scenario from one subgroup to the one responsible for the project presentation – an event that was observed during the first field study (section 5.4.3.1).

Planning the availability of working material and resources is, therefore, an important, social aspect of setting a workplace. Enabling this access and use is not limited to an individual usage, but to the whole group as well. For instance, all the paper articles, brought by the commuting student, were arranged by topic on the table so that every group members could use them during the writing session. Whereas this particular episode describes a *flow of resources* from an individual to the whole group, this flow is not unidirectional and efforts are also made to make sure that each single group member gains personal access to something created by the whole group. For example, at the end of one of the work sessions (section 5.6.2) one of

the team members promised to scan the sketches of the prototype and send them to the others, so that everyone could have a copy of it.

Although in this section, I have mostly emphasized the access to working resources, it would be restrictive to consider it as the only relevant aspect involved in making place. In fact, to be able to reach and to connect to other peers is another fundamental aspect of the group work that seems to be hindered by being distributed at a variety of places and by being simultaneously involved in a number of projects. Moreover, this aspect can also be related to the short life of a group and to the fact that working ensembles are often made up of members who did not know each other before, and this might cause some communication problems. For instance, as reported in an earlier section of this chapter (6.1.5), one of the participants complained and regarded as irritating the fact that she did not have one of the group members' phone number, and that made it problematic to get hold of her.

Furthermore, in closing this section, it is important to underline that, despite the thorough planning, the unexpected need of informational resources often occurred. While this was not traceable in the interviews, it was quite a common occurrence during the sessions that were observed (see section 5.6.2.4).

Nomadic workers have to deal with the unpredictability of the locations they travel to and of the infrastructure available within them (Su et al., 2008), and this is often described as a preparation phase, before the real work. Perry (2007) refers to this phase by using the expression *mobilisation work*, that is the work needed to enable mobility and to be able to carry out the planned activities at a variety of locations. A similar observation can also be made with respect to the settings analyzed in this thesis. In fact, several episodes illustrate how the need to create the necessary conditions to perform specific activities can be regarded as an extra work needed before actually being able to work[32]. Nevertheless, in this particular setting, this aspect is also characterized by: (i) *marked collaborative features*; (ii) an *intertwinement of digital and physical media.*

6.2.2 Maintaining a sense of the others

While introducing Casey's phenomenological notion of place, I argued that it may be used as an analytical framework for the analysis of the data discussed herein. According to Casey (1993; 1996), the simultaneous

[32] The wording of this sentence was inspired by Bowers (1994).

experience alongside four specific dimensions – physical, psychological, historical and social – contributes to defining the emergent and unique nature of a place. In this section, the social dimension will be foregrounded by specifically seeking to understand how the presence of other people contributes to the creation of a workplace.

As already mentioned, it is possible to characterize students' nomadic practices as the intertwinement of collocated and at distance work sessions. One of the main consequences is, not surprisingly, the resulting presence or absence of the other group members. In this case, even when distributed at several sites, *to maintain a feeling of where the others are and of what they are doing might play a fundamental role in the context of the project work*. While it has already been mentioned that a site to work at can also be chosen because of the presence of other people, what is at stake here is not necessarily someone's physical or digital presence (I do not argue that an online presence is comparable to someone's physical presence!), but rather *the feeling that is possible to know about the others and about what they are doing*.

During the workshop, a discussion about the use of two specific applications raised interesting issues regarding this point. The first one, called *Jaiku*[33], is a web-based application that broadcasts someone's messages to all the contacts, members of a network of friends. In Jaiku, someone's status and messages can also be upgraded and read from a mobile phone and not just from a computer. As the students explained, broadcasting is useful because one does not need to text everybody, if something important is to be communicated. The second application is called *Plazes*[34] and it allows to display where someone is located, depending on the network the person is using. One of the students, who had been using it, explained that to see who is connected to a network can be a very useful feature to get to know who is in the surroundings and who is not. For instance, within his group, such an application had been an effective tool for collaboration, especially to arrange last-minute meetings. In fact, using Plazes enabled them to see who was using the university network and was, therefore, present within the campus area. The students regarded the combined use of these two applications as useful, the former providing information about what other people are doing, the latter about where they are located.

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[33] See the URL http://jaiku.com/ for more details.

[34] See the URL http://plazes.com/ for more details.

6.2.3 Parallel activities and spatial practices

While presenting the vignettes (see, for instance, section 5.6.4.3) it has been discussed that during collocated meetings the students: (i) often worked on parallel tasks, while still being able to maintain a sufficient level of awareness of what the others were doing; (ii) were prepared to shift from a task to another, as soon as they felt that their personal contribution could be constructive to what the others were doing. With respect to the latter point, it was noted that the allocation of tasks, the combination of people attending to them and the artifacts used changed continuously, and it also involved the individuals' distribution on the spatial dimension. The notion of knotworking has been used (Engeström et al., 1999) to characterize these aspects of work, by drawing particular attention to how the ensembles of people attending to certain tasks may change over time.

It should also be noted that aspects such as the ones mentioned above were facilitated by the participants' physical engagement with the environment in which they were located at. As seen, the interactions with various areas of the spatial layer supported the participants' involvement in various tasks, and assisted the sense-making processes of the activities at hand, for instance, by allowing the students to separate the finished assignments from the ones still to accomplish (section 5.6.2.3). The engagement with the physical dimension facilitated the possibility to contribute to different errands by shifting between differing artifacts and technologies, between private and shared working area (section 5.4.3.1 and 5.6.2.3), and between artifacts for negotiating tasks and artifacts to actually perform them.

Similarly, the exploration of physical objects facilitated the discussion and the elaboration of the topics that were discussed. The individual and collaborative use of a whiteboard (section 5.6.4.2) and of the paper copies of the prototype (section 5.6.4.3), to clarify a number of deign issues, are examples of how the physical engagement with objects assisted discussion and exchange of comments among the participants.

6.3 Constellation of technologies

It is problematic to define, once and for all, what are the most representative technologies and tools used by students in the context of their group work. It could be said that these are used differently depending on the task at hand, the number of individuals involved, and on the particular location wherein work-related activities take place. Email, generic

groupware, instant messaging applications, on-line conference tools, but also pens, paper and whiteboards were used to support both the writing and the prototyping activities. Some of the findings presented have already illustrated how these technological artifacts were used to manage the uncertainty of places. The use of Yahoo!Groups ® to store files and arrange meetings, the use of Click to Meet to hold at distance meetings, and the use of mobile phones to store and carry files, rather than to keep in touch with the other peers, constitute a few examples.

Before carrying on with the discussion about technologies, it is worth underlining that, regardless of the particular technology addressed, it would be reductive to seek to understand its use in isolation. In fact, the students who participated in the studies used a variety of tools to collaborate with each other. The most common ones (phones, email and instant messaging applications) were often combined with the use of free groupware, online conference tools, but also with applications for managing projects and for broadcasting presence. In other words, a *constellation of different technological artifacts was usually deployed within each single group.*

Furthermore, some of these technologies are available to everybody (such as email, instant messaging, etc.), while others are only adopted within certain groups (like in the case of the online conference application) and, as a consequence, the same person might be using different technologies within different groups. Another important point that can be raised is that *the same technology can be used for different purposes within different groups*. For instance, the fact that mobile phones were seldom used for communicative purposes was somehow a surprise. When participants were asked about this issue, they explained it was too expensive and that, because of this reason, they preferred to use instant messaging or email if they needed to talk to each other. Nevertheless, other groups strongly relied on it. Some of the workshop participants, for instance, considered communicating by mobile phone as more reliable, because one can almost be certain that messages, both verbal and textual, reach other people at once.

> "You start with a meeting on Basecamp, when you get closer to the meeting and something changes, the time, or the room for instance, you cannot notify those changes on Basecamp and expect that people will see them; that's the good thing about mobile phones, the closer you get to…" (Erik, a workshop participant)

Before being able to finish the sentence, Erik was interrupted by another participant who wanted to contribute to the discussion by emphasizing that *the closer one gets to a meeting, the more suitable and effective mobile phones are*, as they allow to contact the others also at the very last minute.

One application broadly used was, unsurprisingly, email. In the previous chapter, the description of the writing activity within the Game Project group exemplified how email was used by the two co-authors of the report as a means to communicate with each other and agree on issues such as the division of work, timelines, but also to exchange the different versions of the reports and comments about it.

> "I think all of us are very used to checking out mail often…we use email a lot as a tool to communicate within the course…this is especially true for the Media Technology program[35]" (Camilla, the Game Project group)

Although most of the students were quite accustomed to using email, the adoption of this medium was not always straightforward. The late reply from one of the co-authors, the impossibility to meet up and the lack of an explicit agreement on the distribution of work resulted, as we have seen, in the problem that both students started to write the same section.

While discussing the use of email, another member of the Game Project, explained that email was more suitable to communicate those things that were not urgent and did not require a reply on the same day. Otherwise, problems were likely to occur, partly because of the broad span of working hours and the different personal routines, especially in regard to the separation between work and personal life. In fact, by comparing her evening routines with other peers', Caroline stressed that one cannot expect everyone to regularly check email in the evening, because this is not what everyone in the group was accustomed to.

> "If everyone were always using a computer like Alexander and Simon do…they have ICQ or something like that…it would be different. In our group, the time each of us spent at the computer in the evening was very different. For instance, I usually don't use the computer that much in the evening. And I know that other people don't do it either". (Caroline, the Game Project group)

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[35] Media Technology is an educational program that some of the students were attending when the study was conducted.

This issue was also remarked during the workshop as well. With regard to it, some of the participants explicitly addressed *working* at *irregular and different working hours as the cause of problems in the communication between group members, regardless of the tool used.*

> "If you upload a new comment on Basecamp at 11.00 PM, you cannot expect that everyone has read it by the next morning, so there is a certain level of implicit agreement you have to rely on" (Johan, a workshop participant).

The implicit agreement, underlined in the citation above, refers to the common understanding of discerning when it may be late to inform other peers about something important. As the discussion evolved, the participants agreed that in a group of four or five people this agreement is seldom shared by everyone, especially if team members have not previously collaborated on a common project and if their daily routines are very different.

Another remark concerns the fact that all the group members might not share the usage of a particular technology. Within the Sound Project group, for instance, only a few students used an Instant Message application to be in contact with each other, and this was experienced as hindering the possibility to collaborate with the other peers:

> "Maria, Anneli and I have used the instant messaging application quite much. Maria was working with the website, while Anneli and I were busy with the report and, whenever we ran into a problem…"how do we do this"…, we could write to Maria, even if she was not in school. Maybe it would have been good to be able to see also the others, to see that there were other persons I could throw a question at" (Erika, the Sound Project group).

As this participant further explained, the difficulty in reaching all the group members was experienced as frustrating and annoying towards the end of the project, when it was crucial to undertake and accomplish a task, and nobody answered to emails.

> "One, of course, always had the possibility to take the mobile phone and make a phone call, but we did not have the phone number of one of the group members and that was really irritating" (Erika, the Sound Project group)

6.3.1 Difficulties in keeping track of every tool

As explained in Chapter 4, to create a project website was one of the assignments required from the students who participating in the first study. From the very first phase of the project, the group members realized that they had problems to follow the large number of emails sent within the group and that they also needed a repository to store the files they created. For this reason, they agreed on using the website as a shared space to be used by the whole group.

> "I don't know how many people actually checked the website to keep track of what was going on….I only checked it three or four times…I forgot it was there. I am so used to checking my mail, so I just read it…and I think this is enough. Email was the way people communicated with each other, it was not the website. I never looked at the calendar on the website, just a few times at the beginning when it was new. […] I have no idea of how often people looked at it, but I forgot to do it ". (Camilla, the Game Project group)

The initial idea of using the website as a shared repository for the whole group was not regarded negatively, especially because inboxes used to get full easily with all the attachments that were sent and received. However, its introduction was not completely successful since the group members (not all of them at least!) were not used to it. Something similar emerged within the group in study B with regard to the use of the on-line conference tool. In fact, although working documents and resources could have been uploaded and stored in the conference room, this application was never used as a shared repository for the whole group. On the contrary, two of the group members experienced it as one more tool to keep track of:

> "I assume there are some pictures there, but I'm not sure". (Siria, a participant in study B)

It seems that one of the consequences of using various tools to collaborate and communicate with each other could result in the fact that working files are scattered all over, and *this makes it problematic to keep track of where resources are stored.*

6.3.2 Appropriating technologies

The process of appropriating technologies has broadly been discussed within the field of CSCW. By emphasizing its inherently collaborative and social nature, Dourish (2003) describes appropriation as:

> "[…] the way in which technologies are adopted, adapted and incorporated into working practices. This might involve customization in the traditional sense (that is, the explicit reconfiguration of technology in order to suit local needs), but it might also simply involve making use of the technology for purposes beyond those for which it was originally designed, or to serve new ends". *(ibidem: p. 466)*

As discussed elsewhere (Bogdan et al, 2006), there seems to be a fundamental difference between student nomadic settings and professional nomadic workers, whose technological artifacts (e.g. smart phones, PDAs, etc.) are often provided by the companies they work for. *This point bears important consequences for students' work practices, as an essential concern for the groups is to agree, implicitly or explicitly, on the technologies and tools to be used throughout the project.*

Different persons have different personal preferences with respect to the use of particular technologies, and they often seek to convince other peers to adopt the ones they are fond of. However, several episodes and issues addressed within this thesis have illustrated that the same enthusiasm is not always shared by all of the group members, for a number of different reasons. Students, like other people, certainly have their own preferences and range of choices, so that they may choose certain technologies rather than others. Another possible reason is that *the short life of a group hinders a comprehensive appropriation within the group's practices.* As it was emphasized during the workshop, it may take too long time to get used to new tools, especially when one is in the final stage of his educational program and personal preferences are already consolidated. Furthermore, to get acquainted with new technologies may require efforts that are not necessarily worthwhile, especially if an application is going to be used only in the context of one course.

> "It is really hard to convince other people, in different groups to use a certain tool. It has happened to me with Basecamp. Basecamp is an excellent tool, but it is enough that one person does not log in and does not check messages or other things, that the use fails [for everybody in the group], the whole work fails, because that person

> is never up to date when meeting the next time". (Manuel, a workshop participant)

Similarly, as already discussed, the use of an online conference tool caused differing feelings among the students who adopted it. On the one hand, it was exciting to try out a new tool; on the other hand, though, the concrete experience of using it was not rewarding enough to compensate the efforts of learning how to use it.

> "It was funny to use it [Click to Meet], to try it, but I don't know if we'll use it again. Click to Meet is good, because it allows more than two people to work and communicate at the same time. It was funny to use it, but the interface is a bit messy, there are too many functionalities there, and it takes a while to understand what they are for. We did not use all the functionalities available, and the private chatting crashed my computer and it was not possible to use it". (Joel, a participant in study B).

The discussion raised during the workshop corroborated an aspect of students' group work that had already emerged from the analysis of the two field studies. *It seems to be a common practice that the same student may use different technologies and applications within different groups, both with regard to past and present projects*. For example, one of the students interviewed complained that, within the current group, he could not use *OneNote*[36], because other peers did not have it. While discussing the same issue, one of the informants explained that it would be hard to convince other people, outside his social network, to use an application such as Jaiku.

> "You need a laptop, you need to keep it updated, you need to care about not just in relation to the group...because we use it not as a tool in school, but for our social life. […] If you had to convince someone else to use it for a project, just for one month, it would be hard, not merely to use it, but use it in the right way". (Erik, a workshop participant)

In other words, it is not enough to use a certain tool, but it is important to use it in the "right way". Specifically to this case, "the right way": (i) is a way commonly acknowledged by all the group members; (ii) it encompasses

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[36] OneNote, is a commercial application that supports remote, synchronous editing of text documents.

both working and, like in this case, non-working practices; (iii) it concerns the student's experience of himself in relation to the social groups he belongs to. For all these reasons, it is not enough to update someone's own status every now and then, but it is also important that others can rely on the fact that this is done regularly.

In closing this section about technologies, I would like to mention one more issue. New applications and tools are released continually and students often show some interest towards them and the curiosity to try them out. For instance, when the first field study was carried out, *Google Docs*[37] had not been released yet. However, at the time when the workshop was conducted it had become one of the most commonly used applications for editing and sharing documents online.

6.4 Discussion

So far, I have discussed how students manage their activities at a number of places and how they turn locations into suitable places for their group activities. Furthermore, I have devoted particular attention to the way students use various technologies both to carry out their projects and to overcome the drawbacks deriving from the lack of a stable, physical workplace.

In the following sections, I will first consider what being nomadic means, and what it entails in the context of student group work. Thereafter, I will discuss the differing ways in which being nomadic reflects on the group activities that were studied.

6.4.1 Relationships between nomadic practices and place

As clarified earlier, regarding nomadic work as bound to several sites raises important analytical issues, such as understanding the relationships between activities and the places wherein they occur, and making sense of work context[38] comprising a number of sites individuals move between. Within this section, I attempt to characterize the relationships between the

[37] Google Docs is a web-based word processor and spreadsheet that allows people to co-edit and share documents over the Internet. For more details, see the URL: http://docs.google.com/

[38] By using the term context I refer to the set of physical environments used by the students for their project activities, without drawing on any particular conceptualization of this notion (see for instance, Dourish 2004; Räsänen, 2007).

students' activities and the physical environments they were performed at, by referring to the dimensions of place introduced in section 3.3.2.

Psychological dimension

Arguing that place can be experienced alongside a psychological dimension puts emphasis on the values and meanings that individuals attribute to it. The investigation of the student setting shows that the selection of sites for work is often opportunistic, depending on the physical resources available within them (whiteboards, tables, projectors, etc.) and the infrastructure they provide (wireless). Nevertheless, students were also concerned about other traits of a place, such as the quietness or the sense of privacy it provided. It is important to note that these values are not fixed labels and that the experience of them varied within the different groups, the facilities they had access to and third-party people who used to attend the same places.

The participants experienced the use of the various campus sites as ephemeral, and this generated discomfort, especially if long group sessions were planned.

Furthermore, some participants regarded some places as more inspiring than others. However, the data suggest that this emotional orientation to place – emphasized in relation to individual activities – was often overshadowed by a practical concern to find a place for the whole group and to get the job done. This last aspect is tightly connected to the social dimension.

Physical dimension

The data illustrates that the participants' interactions with the spatial layer and with different areas of the same environment assisted the execution of parallel tasks. Furthermore, a member's physical position and his movements within a room were meaningful for the other peers, as they indicated a person's current involvement with a task or the act of shifting to another one.

The engagement with the physical dimension was also central to the way students made sense of the activities at hand. In this respect, section 5.6.2.3 describes, for instance, the way the students used to move the sketches, which had already been designed, to another table, thus separating them from the ones still being designed.

The exploration of physical objects and the students' engagement with them played an important role in the elaboration and negotiation of ideas. Paper was for example a paramount medium within the group work. In

fact, besides being portable and easy to use at different locations, it often constituted a shared representation for face-to-face communication.

Finally, being aware of the physical infrastructure was important for the students, as it allowed them to plan and organize their individual and group sessions, both within the campus and within the city area. This aspect is connected to the psychological dimension and to the students' past experience of specific places.

Social dimension

Individuals' experience of place alongside a social dimension draws attention to aspects, such as presence of other people, ongoing activities, rules and norms, that can influence the choice of places for project work. The nomadic practices investigated were characterized by an alternation of face-to-face and remote interactions, of collaborative and individual sessions. This alternation is tightly related to a way of managing activities requiring a collaborative effort and activities that can be carried out individually. Thus the choice of a locale wherein the actors involved could meet was often preferred for activities that required negotiation and discussion.

The nearby presence of people, not directly involved in the activity at hand (other peers or a supervisor), was often relevant for the students' selection of a site.

Historical dimension

Students' past experience of the campus and of its different areas played an important role managing the project activities. Being familiar with the campus region seemed to facilitate the students' organization of the group activities, with respect to specific locations and the situated use of particular technologies

Presenting the data has shown that these dimensions are often intertwined with each other, and that it is important to understand the students' physical wanderings and their feeling of being temporarily settled within a given site (see section 3.3.4) in relation to all of them. As recounted in Chapter 2, anthropological investigations define the degree of nomadism of a given community on the base of heterogeneous factors (water sources, herd-composition, pastures, a tribe's socio-economical organization, etc.). Similarly, it is possible to characterize the extension of the students' spatial movements as the situated outcome of the interplay between the

heterogeneous aspects encompassed in the four dimensions discussed above.

6.4.2 Moving to a place and moving away from it: the different moments of nomadic work

In discussing the relationships between place and activities, the metaphor of the place-ballet (Seamon, 1980), a set of routinized performances combined with a particular location and time frame was introduced (section 3.2.2). While pointing out that understanding activities in context is fundamental in order to know a place, the importance of taking into consideration *emergent activities* was also emphasized. On the one hand, emergent activities are determined by the physical affordances provided by each place; on the other hand, they might also be determined by the need to create a suitable workplace.

Analyzing the data has highlighted many aspects of nomadic work that can be regarded as emergent activities enacted in order to make place – for instance, planning the locations to work at and the access to specific working resources, the alternation of individual and collaborative sessions, being aware of other people's availability, the circulation of objects, information and so on. As suggested elsewhere, it is possible to regard these activities as the *work needed to be nomads* (Su et al., 2008) or *the work needed to enable mobility* (Perry et al., 2001; Brown et al., 2003; Oulasvirta et al., 2007).

In order to emphasize that a practical objective of these practices is the preparation of a suitable workplace, I refer them as *preparation moments*. As the data analysis suggests, they are often distinguishable from the real work, they present marked *collaborative aspects* – the flow of resources from an individual to the whole group is an example – and are characterized by the intertwinement of digital and physical artifacts. Moreover, these practices can be enacted by a single team member or by the whole group, they can be the outcome of someone's own initiative or of a shared, common agreement.

Another significant facet of nomadicity, that seems to stand out from the fieldwork, is *the extra work required to move out* of a certain place. This aspect is particularly relevant with regard to the students' ephemeral appropriation and use of places, especially the public ones. In fact, as most of the locales are also available to other people, the working artifacts produced and used by the whole group (e.g. mock-ups, paper references, images, physical devices, etc.) cannot be stored therein, and workplaces have to be cleared out when working sessions are over. *In other words, not*

only a place has to be created, it has to be disassembled as well. I regard the number of practices involved in moving out of the current workplace as the *disassembling moments of nomadic work,* determined by the fact that work practices seldom occur at the same locale.

As the data suggest, disassembling moments may involve a range of activities aiming at:

- Finding and agreeing on the next location to work at;
- Arranging the next meeting;
- Agreeing on strategies to go about work – division of work, definition of time frames, assessing possible communication needs;
- Agreeing on the tools and the technologies to use during the next work session;
- Conceiving a way to bring individual work (back) to the group – for instance, sending documents as email attachments or storing them in online digital environments;
- Transforming physical artifacts into digital media, thus allowing the group to move and store them at other locations.
- Transforming digital artifacts into physical media, thus allowing the group to explore and negotiate ideas together.

Similarly to the preparation work, these moments present marked collaborative aspects, they are characterized by the use of both digital and hysical artifacts and can be enacted by one single individual or by the whole group.

It seems to be plausible to argue that being nomadic shapes the collaborative activities studied, through the emergence of preparation and disassembling moments (Figure 6.1). In the figure below work activities are placed in the middle of the image to suggest that the idiosyncrasies involved in assembling and disassembling moments do not necessarily correspond to the real work to be accomplished. Moreover, the circular shape is meant to convey the idea that these moments do not occur in a fixed, sequential order, and that disassembling is already preparing for future work sessions.

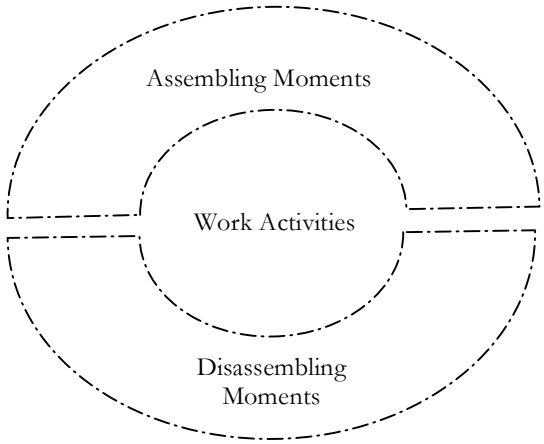

Figure 6.1. The different moments of nomadic work

An initial notion of nomadicity as characterized by discontinuities underlies this work (Bogdan et al., 2006). As already mentioned, discontinuities can be regarded as changes occurring in the work settings, in the group work, in the group organization, in the physical environments, but also in the tools and technologies supporting the work activities. Nomadic workers, more specifically the students who participated in the two field studies, develop practices and adopt strategies in order to "bridge" and manage discontinuities and, thus, to be able to carry out their activities at a variety of locations. The presentation and the analysis of the field studies have provided several examples of how this is practically achieved, and how various discontinuities can intertwine with each other.

While reviewing a corpus of studies on nomadic work, the expression "variation without boundaries and transformation without discontinuity" was introduced (section 2.2.5). Such an expression has been proposed (Kakihara et al., 2002) to emphasize that mobile technologies enable geographical movements and the possibility to move work across spatial boundaries, thus reducing discontinuities between places. Although it is certainly true that mobile technologies enable fluid interactions – that is, work practices across heterogeneous places – *the data analysis also illustrates that it is not costless, but rather achieved through the enactment of practices distinguishable from the real work.*

6.4.3 Nomadic practices shaping the project activities

One of the objectives of this thesis is to understand how being nomadic reflects of the students' group activities, with special regard to their collaborative practices. As we have discussed, the members of the groups followed during the first study decided to distribute their assignments between smaller ensembles (see section 5.4.1). By doing so, they expected it would be easier to synchronize several individual schedules, to keep in contact with other peers, to agree on meeting places, and to adjust their working plans to the current situation.

The members of the group followed during the second study never divided the assignments in such a way. In fact, although each student took responsibility for a number of tasks that were performed individually and at distance, all of them participated in the different phases of the project. Moreover, the students always decided how to divide activities (for instance, sketching or refining the prototype) among each other at the end of joint work sessions. In other words, in the first study the groups often engaged in a high level process planning and decided how to distribute the different assignments even before the projects had actually started; in the second study, instead planning the division of work was often situated and the four students decided, from time to time, what was to be done, how and where. It seems to be plausible to regard the number of members in each group (seven up to nine members in the first study, four in the second) as a reason accounting for these differences. Nevertheless, another reason can be found in the fact that two PhD students participated in the second study. As such, they had their own office where to be reached by the others, and they could access departments' facilities and resources that were eventually used by the whole group. We have already discussed (section 5.6.2), for example, that the students in the second study did not consider it as problematic to be forced to move one of their meetings to another location. In fact, they knew that even though the change occurred at the very last moment, they could still use the office of one of the two PhD students.

The analysis seems to suggest that the students experienced as fundamental to their projects different types of planning: planning the division of work and planning the coordination between group members, and between subgroups (particularly in study A). One of the participants explained, for instance, that planning the division of work between smaller ensembles influenced his sense of what each subgroup was involved with:

> "The report group mailed the report late, it was quite late in the project so there were many things going on in parallel, and it was not completely sure that everyone would read the report. I just read it superficially. The video instead was quite difficult to put on the net. I felt I had relatively good control on the presentation, as we had decided that everybody could contribute and I went through the points I thought should be brought up. If one learnt something during the course, that was how to coordinate with each other (Staffan, the Sound Project group)

The citation above suggests that the lack of coordination concerning the report hampered the possibility to contribute to its development; moreover, the lack of proper applications to share a large file limited the participants' awareness of what the subgroup working with the prototype was doing.

The relationships between the work activities and the variety of places at which they occurred was also characterized by a *strong role of planning* – planning the places to work at and the activities to be performed, planning the access to resources and tools to be used. The participants in the second study were asked to keep a diary in order to annotate, among the other things, unexpected changes of the working environment and of the related technologies. My initial assumption was, in fact, that the lack of a stable place would result in the engagement in a number of unplanned and unforeseen errands. This assumption was wrong! In fact, besides a few episodes being nomadic and working at a variety of places resulted into a careful planning of the sites to move to and work at. Many of the students interviewed regarded the problems connected to managing projects as the consequence of having too general plans. In such cases, they thought that there should have been a more thorough planning concerning what each team was supposed to do and at what point in the project timeline. In fact, as they explained, the subgroups ended up completing their own errands at the last moment, which made coordination between groups and the possibility to contribute to other assignments problematic. In the quote below, a participant reflects on this aspect:

> "Not so much, but all the time we sent out information about what we had achieved so far and everybody had the possibility to come up with comments or so. But I think that…I think that many were not interested about what the other groups did. But I read the text of the report and I gave some comments here and there. But it is like…if one doesn't have such a thing as part of the planning…"on

this day I should read the report and give some comments…". (Johanna, the Sound Project group)

The problem here seems to be not just including a task in the work plan, but also the feeling that one can actually contribute to it.

6.5 Nomadic practices shaping collaborative writing

There has been a tendency to study writing activities as detached from the context in which they occur. Whereas studies on writing conducted within a cognitive tradition include the *composing medium* and the *text produced so far* into the *physical environment* of the writing activity itself (Hayes et al., 1980; Hayes, 1996), they pay little attention to the remaining elements of the physical environment and how they come to shape this process. In general terms, it could be said that these studies treat the writing physical environment as external to a writer's mind. Although writing is regarded as a social activity (e.g. with regard to the audience one may write for), the physical and social spheres are considered as inputs that, only after active reflection, may influence both the writing process and its products (e.g. modulating a given text depending on the audience that will read it).

While the influence that writing tools might have on the different phases of writing processes have been extensively discussed (Haas, 1989; 1996), the role that the physical environment may play remains unexplored. Although this thesis does not aim at extending existing models of writing (see, for instance, Hayes et al., 1980; Hayes, 1996), some of the findings suggest how writing at a number of locations may shape such an activity.

6.5.1 The role of planning

Firstly, recognizing the emergence of preparation and disassembling moments may apply to the writing activity as well. Considerations about these phases were, in fact, inspired by observing the writing activities the participants were involved in (see sections 5.4.2, 5.4.3, 5.6.2.5, 5.6.3, 5.6.4.2). Secondly, a systematic and careful planning seems to be a main influence that being nomads exerts on this particular collaborative activity.

A body of research identifies planning as an essential moment of the writing process (Torrence, 1994a; 1994b), a phase when the goals of the text are made explicit, ideas are generated and organized into a coherent structure. Nevertheless, as the fieldwork suggests, it is possible to identify additional levels at which planning takes place (section 5.6.2.5). With this

regard, this phase does not merely aim at deciding what to write about, in what order and for whom, but it also encompasses planning the process of writing, including the division of work, the places to work at, the access to working artifacts and other resources that might be useful throughout this activity. Moreover, planning is an important moment to decide what can be written individually or together with other peers. The data analysis has illustrated, for instance, that planning the contents and the division of work seemed to be a conscious strategy adopted by students to overcome the lack of a stable environment where to meet up and work together for a long time, while face-to-face meetings were often preferred if discussions and negotiations were expected to be needed.

6.5.1 Planning the text quality

Although assessing the quality of the documents written by the various groups has not been among the objectives of this work, the data provide some insights concerning the relations between their quality and the writers' nomadic conditions. Because of time constraints and the impossibility to be together all the time, the students consciously decided to give priority to some aspects of their reports (such as the project description) rather than others (searching for additional references, improving the style of the report and integrating the different individual contributions). Thus, once the text had been planned, divided and written individually, the different parts were pasted into the same document, which was quickly revised and turned in. Comparing the different versions of the reports, collected from two of the groups studied, shows that no major changes were made to the original outlines. When the participants were questioned about this issue, they explained that such changes often require further negotiation and they are, therefore, time-consuming.

At the end of the project, both the teachers and the students themselves recognized that the resulting quality was not satisfying and that the different sections were heterogeneous and not well connected with each other. This was experienced by the students as a drawback of writing under time constraints, but also of lacking a stable, common workplace. The quote below exemplifies this point, while suggesting that a concern for being efficient might be stronger than striving for quality:

> "The teacher said that the report was hard to follow and that the different contributions were obvious […]. Of course the best thing would be to be there and write together, but we can't […]. I'm not

> sure this is the best way of doing it, but it's the most convenient"! (Joel, a participant in study B)

Although the quality of the text was planned (at least to some extent) at the beginning of the writing activity, some difficulties, experienced while working at distance, might have contributed to determining the final state of the report. The collocated writing sessions, observed during the fieldwork, were characterized by active collaboration (for instance, suggesting someone else to undertake a specific task) and by a continuous exchange of opinions about what to do and how to do it – e.g. merging different sections together, deciding how to present the prototype work and elaborating the related scenario, moving a piece of text to another section, using a term instead of another. In contrast, some of the negotiation problems (e.g. the lack of explanations for changes made to the text), experienced by the students seem to be due to working at distance.

> "There was a lot of changing things back and forth. She sent me something and I thought maybe it would have been better if we had formulated it differently. I sent my suggestion to her and I think she added things, made some changes, sent it back to me. Then, I looked at it [the document] again, made changes and sent it back…but it felt like that I'd changed a sentence or a paragraph and then she changed it back to what it was before…she wanted it in one way and I wanted it in another, so we were changing the same thing back and forth. It happened more than once". (Camilla, the Game Project group)

6.5.2 Nomadic practices and collaborative writing strategies

Studies on writing, either carried out under experimental conditions (Barile et al., 2002) or on "real" tasks, have focused on the collaborative aspects of writing by analyzing its social dimensions, its complex interactions and the way writers manage the amount of information generated by others (Tammaro et al., 1997). Aspects such as: writing strategies, adopted throughout the writing process (Sharples et al., 1993), the division and distribution of work, negotiation problems, sharing resources and exchanging comments are typical concerns of this research. Other research on collaborative writing has focused on reviewing practices (Kim et al., 2001); the technological support people use to co-write documents (Noel et al., 2004; Rodriguez, 2003); comparative studies of face-to-face and

computer mediated collaborative writing (Barile et al., 2002; Cerratto Pargman 2003; Swarts 2004).

Most of these studies look at collaborative writing through a series of dichotomies such as synchronous versus asynchronous or face-to-face versus computer-mediated interactions. Nevertheless, as the data analysis suggests the writing activities observed are characterized by an intertwinement of different strategies, by the shift between face-to-face and distance interactions and the selection of several tools to carry out the same activity. As suggested, the combination and alternation of the aforementioned aspects seems to be determined by the students' needs to organize and manage their writing process at a variety of places, and often in relation to the parts of a document to be written.

However, it would be a mistake to believe that the adoption of a strategy or of modality of interactions is always planned; the emerging of breakdowns may, in fact, determine such a choice. For instance, in the vignette described in section 5.4.2, as soon as the two co-authors realized they were both working on the same parts of the report, they modified their working plans. Thus, one of them put aside the document she had created and shifted to the one written by the other peer, to which she added small pieces of text under different sections.

Reflecting on this aspect may be relevant, as it illustrates how the lack of communication between two persons located at different sites, resulted in the need to reshape the plans concerning the writing activity and the strategies of how to concretely go about it. That is why the initial proposal to divide the text in different parts, that the two writers could edit separately and in parallel, was abandoned. The flexibility of the writing plans and the strategies adopted is, therefore, an aspect reflecting the situatedness of the activity in question.

Studies on group writing (Sharples 1993; 1999) have identified different strategies of collaboration: (i) *sequential*, if writing is divided up in a way that the output of someone's work is the input for the next writer in line; (ii) *reciprocal*, adopted when partners write synchronously and their work is mutually adjusted by everyone's contribution; (iii) *parallel,* characterizing a division of writing into different tasks, each one being carried out simultaneously by the different writers. Although it is not my intention to propose a mapping between these strategies and the places discussed, the data suggest that adopting one of them was often determined by the need to manage writing sessions at a variety of locations. As seen (section 6.4.1), this organization can be understood with regard to the values, the meanings

and the activities the students attribute to the sites wherein they carry out their projects.

Moreover, even when collocated in the same physical environment, an alternation of sequential, parallel and reciprocal strategies characterized the writing sessions observed. As already mentioned, this often depended on the current needs and on the number of people present. In fact, it was enough that a team member left or arrived to determine a change in the strategy adopted and in the combination of people attending to a specific writing errand.

6.6 Summarizing this chapter

This chapter has been attentive to the way students organize their projects at various sites, to their practical achievements enacted to transform a location into a workplace, and to their sense of place emerging from the experience of a psychological, a physical, a social and a historical dimension.

The interpretation of the data points to the emergence of preparation and disassembling moments as important aspects to keep into consideration in a study of nomadicity in collaborative settings.

The analysis also suggests that the extent of groups' physical wanderings are determined by an interplay of the dimensions of place mentioned above, and that the students' strongly rely on the role of planning in order to manage the collaborative activities they perform within projects.

Concerning the use of technologies, it has been noted that: (i) the participants used a constellation of technologies in the context of their project work; (ii) the same students might be using different technological artifacts and application within different projects; (iii) tools are sometimes not appropriated by the whole group, because of members' personal preferences and because of the relatively short life of a group.

7 Summary and conclusions

7.1 Summary of results and contributions

Four main questions underlie the research presented in this thesis:

- How is it possible to study nomadic practices, both on a methodological and on an analytical level?
- What does being nomadic mean in the context of the students' collaborative activities studied, in particular writing and prototyping, and how does it reflect on the group activities students engage in?
- How do students turn the locations they travel to into places suitable for their work?
- How do students manage and organize their work at several locations and how do they use technologies and artifacts to do so?

The literature review discussed in Chapter 2 allowed me to identify what aspects of nomadic work can be regarded as central to its understanding.

In Chapter 3 and 4 a set of issues pertaining to the first question has been tackled. In so doing, I have introduced the phenomenological conceptualization of place proposed by Casey (1993; 1996) and argued that its theoretical tenets can assist ethnographically-informed studies of nomadic work, both on a methodological and on an analytical level. More

specifically, I have suggested that, by overcoming the mere physical and geometrical dimensions, such a concept can be useful to understand how nomadic workers encounter places, perceive them and invest them with meanings. Concerning the setting discussed in this thesis, I proposed that Casey's conceptualization of place may be particularly relevant. Firstly, approaching place as an event, as something that continually happens and that is negotiated and created by its inhabitants' experience alongside four dimensions – physical, physiological, social and historical. Secondly, the idea that similarities between places do not merely derive from sharing the same physical locations and geometry, but also from the intertwinement of other traits related to individuals' lived experience of it. Finally, and consequently, the notion that the lived dimension enables, across borders similar experiences and the engagement with activities of the same type.

In Chapter 5, I have described the project activities students engaged in and discussed the nomadic practices embedded in them. In Chapter 6, I have further analyzed: (i) how students keep an engagement to their current activities across locations, and (ii) how they distribute their group work to a number of physical environments. Concerning the former point, the data reveals that *assembling moments* – aiming at creating a workplace and the necessary conditions for work – and *disassembling moments* – aiming at moving out of a temporary workplace – are important practices enacted by the students to manage their projects at a number of places. Concerning the latter point, the analysis indicates that it is possible to understand the relationships between activities and locales in terms of the psychological, physical, social and historical aspects encompassed in individuals' experience of place. In addition, it indicates the relevance to understand the extent of students' geographical wanderings as emerging from the interplay of these different dimensions and, therefore, as reflecting different degrees of nomadicity.

Furthermore, the analysis illustrates that the students experience planning the division of work as essential in order to manage coordination and collaboration within the groups. A strong role of planning seems also to characterize the allocation of the project activities to different physical places and the execution of the collaborative writing processes with regard to the quality of the text and to the particular writing strategies to adopt.
The main contributions of this thesis can be summarized as follows:

- Exploring how a philosophical notion of place can be used as a methodological and analytical framework to investigate nomadic practices. The data analysis has provided an

example of how it is possible to make sense of and hold together a number of sites were project-related activities are carried out.

- Presenting two qualitative studies of university students as nomadic workers and considering in what way being nomadic reflects on their project practices.
- Regarding assembling and disassembling moments as central aspects of managing collaborative work in a nomadic setting.
- Outlining how the place-framework elaborated may be used to think of the design of educational places.

I believe that the methodological approach could be adopted for the investigation of a different nomadic setting, and that assembling and disassembling moments could be an initial step for future studies. Furthermore, being aware that the four dimensions, along which the experience of place is articulated, reflect on the different ways individuals may be nomadic, and on the type of knowledge work examined might help to frame further analysis of similar activities. The latter of the contributions listed above will be considered in the sections to come.

7.2 Design reflections

In discussing the findings, I have attempted to illustrate the relations between a particular cohort of nomadic workers, their work activities and the places wherein these activities occur. Furthermore, I have sought to highlight the situated use of a number of technologies in order to manage group-related activities at a variety of places and to provide access to working resources. Understanding the interactions and the relationships between individuals and places, and how they are mediated by technologies has been a central analytical concern to explore how students manage to keep an engagement with their work activities at several places. In this respect, the analysis has drawn attention to:

- The students' concern to plan and adjust their group activities so that they can be carried out at a variety of places, collaboratively or individually, at distance or face-to-face;

- The students' efforts to organize the access to technologies, working artifacts and information resources to make them available in specific places and at particular moments;
- The students' concern to manage a constellation of technologies;
- The students' need to create a workplace and to disassemble it when work sessions are over. This might include organizing working material so that they can be stored or moved somewhere else; agreeing on the strategies to go about work and on the tools to be used; conceiving ways to (re)connect individual contributions to the rest of the group.

Throughout this chapter, I will reflect on how such analysis could help to think of the design of educational places wherein students could engage with their university activities. Moreover, I will consider how technological artifacts could support the nomadic practices tackled by this work. It should be noted that examining design ideas is not the main contribution of this thesis, and that I will only outline the role (Houde et al., 1997) that technologies and places could play in facilitating the students' group work investigated.

7.2.1 Educational environments

The participants observed during the field studies often carried out their group activities in environments, such as lecture halls and computer labs, which are regarded as formal learning places (Temple, 2007). Nevertheless, the data discussed show that most of the project work was performed at informal learning places, such as cafés, corridors and open spaces. Certainly, environments such as computer labs serve specific purposes (i.e. learning a programming technique or how to use a particular software), thus playing a significant role in the organization of educational curricula. However, while lab activities may be significant moments of students' learning process, the physical arrangement of a lab does not seem to provide support for the type of group activities investigated throughout this thesis. In fact, with the exception of two participants in the first study, who arranged a writing session in one of the computer labs, most of the students observed did not make any use of this type of public places. On the other hand, it would be difficult to imagine a collaborative activity, such as sketching a prototype, being undertaken in an environment wherein

computers are organized in rows, each one meant to be used by a single user. In what follows I will consider:

- How students' collaborative activities could be supported also outside the classroom, the lab or other formal learning places;
- Which aspects could be taken into account when exploring the design of such environments.

Recent research has begun to emphasize the importance to plan educational activities by considering contents and technologies delivering them, but also by addressing the organization of learning environments (Barnet et al., 2006; Marti et al., 2007; Savin-Baden, 2008). Nevertheless, design efforts oriented towards the creation of places for collaboration and creativity outside the classroom are only beginning to emerge (Temple et al., 2007) and, as we have seen, the sites at which the students observed used to work provided minimum support for their group activities – in most cases a table, a few chairs and, at times, a whiteboard.

Learning places include the physical space, in which individuals locate themselves, while offering opportunities for creativity, dialogue and elaboration of ideas (Savin-Baden, 2008). A thorough investigation of how to design such environments should encompass issues such as university policies and the organization of academic curricula, learning orientation and pedagogical approaches, delivery of teaching material, but also aspects related to sustainability, maintenance and costs. However, since exploring the design of such environments is not the main contribution of this thesis, I will not tackle the aforementioned aspects, thus limiting my reflections to the role that such locales could play in the context of student group work. In the following sections, I will address issues regarding the possibility to design technology-enhanced places enabling to:

- Support collocated and remote interactions;
- Support the integrating information between different applications and physical devices;
- Support instant articulation of work;
- Support different types of awareness.

7.2.2 Supporting collocated and remote interactions

Throughout this thesis, I have emphasized the relevance to understand the nature of mobile interactions, and how neglecting them may undermine the introduction of new technologies. What happened at the construction site studied by Luff and Heath (1998) was determined, for instance, by an erroneous assumption on the nature of the foreman's wanderings, an important collaborative moment hindered by the introduction of the electronic notebook.

Concerning this point, the data analysis suggests that being within the university main campus plays a central role in students' academic life. This is certainly due to the fact that most of the educational activities – such as lectures, meetings with supervisors, attending libraries and labs – take place there and students are, at times, already in nearby places. For this reason, the choice to meet up at the library cafeteria, in one of the library group rooms or somewhere else within the campus may be determined by the fact that the students involved are already within the university area. Furthermore, while some locations are selected instrumentally, because of the resources available within them, such a choice may also be determined by the nearby presence of other persons, such as a group supervisor or other peers, who play an important role in the project.

Being present within the campus also facilitates unplanned encounters between the students and the related possibility to engage in short, informal meetings. As the participants explained, such occasions were useful to maintain a certain awareness of what the other group members were currently involved in. These encounters were, therefore, important to keep an overview of the evolution of a project, while actually performing another task (e.g. going to attend a lecture or, as seen, delivering the video scenario). The university campus is, therefore, an important area for face-to-face interactions.

In this respect, a first reflection addresses the role that informal learning places could play in making a student visible to other peers within the campus. This might include, for example, the possibility to make oneself visible at distance, through the use of digital technologies (using, for instance, the online status in instant messaging applications, or rfdi tags and readers), but also the possibility to make oneself physically visible to others while dwelling in a particular place. On a design level a particular challenge would be to design private and quiet areas and, at the same time, to maintain a sense of openness towards the others outside it.

A second reflection addresses the possibility to support individual and social activities, but also collocated and distributed work. As the findings

show, the nomadic practices analyzed do not primarily encompass work taking place during long distance traveling, but rather an intertwinement of at distance and face-to-face interactions. With this regard, learning environments, and technological artifacts within them, could be designed to support both face-to-face work sessions and remote interactions, rather than replacing collocated work with computer-mediated interactions. This idea is also grounded on the observation that some of the activities analyzed (e.g. sketching a prototype) rely on a high degree of physicality, and are facilitated by the possibility to explore and manipulate tangible artifacts.

7.2.3 Integrating information

Students use a number of tools and technologies in the context of their group work. Throughout this thesis, I have explicitly referred to email, instant messaging, mobile phones, generic groupware and synchronous conference tools used to communicate, interact with each other, and to store information and working material that may be needed at different stages of a project. As noted in the previous chapter, this often results in a constellation of technologies and applications that students have to manage and keep track of (section 6.3.1). A number of issues can be raised concerning this point: (i) the intertwinement of public (e.g. computers available at the university) and private technologies (e.g. one's own computer); (ii) the use of a given technology not necessarily reflecting its obvious and most common usage (e.g. the use of a mobile phone to circulate files between places and group members); (ii) the fact that students might simultaneously use different technological artifacts for different projects or courses; (iii) the fact that applications are often introduced to a group by one of its members, and that it may be difficult, for the other peers, to integrate them into their work practices. A main consequence of adopting a constellation of technologies is that information, relevant to the group work, and knowledge, produced throughout it, are scattered over different applications and physical devices. Consequently, it may be problematic to keep track of where relevant information is stored, when it was last updated and by whom.

With regard to these issues, another design reflection concerns the possibility to share and integrate the knowledge generated throughout the different phases of a project work. More specifically, it addresses the integration of existing technological artifacts in order to make information – e.g. comments, notes, working documents, pictures, sketches, storyboards, etc. – shareable among different technologies and applications.

A concern to orient design efforts towards the integration of different applications and technological devices is emphasized by other research as well. In fact, because of the increasing number of new technologies, physical devices and applications continuously made available, the problems of managing multiple devices are unlikely to disappear and that calls for an understanding of humans-computers interaction and not merely human-computer interaction (Oulasvirta et al., 2007).

The problem that information and communication between team members are scattered over different technologies, applications and computer communication protocols was also discussed by some of the students who attended the workshop. In fact, as they explained, that may hinder the possibility to reconstruct the situation in which specific information is created, and to follow how it evolves throughout a project.

Although the idea to enable the integration of information between different applications and physical devices may be in contrast with companies' economical interests (e.g. proprietary file formats), it seems to be a main functionality that nomadic settings would benefit from. In fact, as illustrated, a certain amount of extra work is often required to enable work at a variety of locations, to create a suitable workplace and disassemble it, and managing the access and the use of information is an essential aspect of it. Exchanging and sharing informational resources should be enabled both between different applications, and between students' physical devices and the ones available in the learning environments.

7.2.4 Supporting the use of physical and digital resources

Another remark regarding the integration of information concerns the possibility to access and use both physical and digital resources. Some of the work reviewed in the beginning of this thesis (Luff et al., 1998; Eldridge et al., 2000; Lamming et al., 2000) emphasized the importance of paper documents in face-to-face interactions. Moreover, the prototype designed within the Workspace Project (Büscher, 2006), meant to support the landscape architects' main activities, is a significant attempt to enable interactions both with digital and physical objects and information.

Many episodes observed during the field studies have also shown how the use of paper artifacts seemed to be essential to the interactions between students, in order to elaborate ideas, clarify them, mediate the division of work and annotate relevant pieces of information. The tangible nature of paper and the fact that it could be used as a shared representation made it

an important resource for communication and collaboration among the students.

For these reasons, it would be interesting to explore design possibilities aiming at integrating physical and digital artifacts, rather than at replacing tangible artifacts with digital resources.

7.2.5 Supporting instant articulation of work

Being present in the same place does not necessarily entail to actively participate in every activity undertaken. On the contrary, tasks are distributed and reallocated among group members and accomplished in parallel. During collocated work sessions, the combination of people attending to a task, the artifacts used and their distribution on the spatial dimension of a room can change depending on situated needs. While tasks are carried out separately, being collocated enables a sufficient and proactive level of awareness of what the others are doing.

Most of the current technologies supporting synchronous work (e.g. on-line meeting and conference tools) seem to be based on the assumption that being present implies being active or attending to the same task. Besides, they do not provide support for instant articulation and distribution of tasks among working ensembles smaller than the whole group. With this respect, another challenge would be to explore how technologies and informal educational places could be designed to support these aspects of collaborative work, and how they could allow for seamless transitions between individual and collaborative efforts, between shared and personal space. Furthermore, it would also be interesting to investigate how various spatial elements could be reconfigured within the learning environment in order to support a number of individual and group activities – studying, working on projects or relaxing.

7.2.6 Supporting awareness

In collaborative nomadic settings awareness is a fundamental work issue. Being aware of other people's location and of the errands they are currently engaged in (Bellotti et al, 1996; Bergqvist et al., 1999; Brown et al., 2003), or being aware of the type of information they have access to (Heath et al, 1998) constitute a few examples.

Defining once and for all the aspects of awareness involved in the student groups observed is not a straightforward matter. For instance, with regard to collaborative aspects, it was important to know who of the other peers was currently writing the report and where the document was located;

it was important to know who of the other peers was responsible for a given task, although it was occasionally enough to be sure that someone had undertaken it, without getting into the detail of the way errands were being taken care of. Moreover, as discussed during the workshop, it might be useful to be informed of other fellow students' within the campus area, because that gives the possibility to hold meetings (whenever needed), even if they have not been previously planned. Applications for broadcasting presence and micro-blogging are becoming popular among students. It would be interesting to explore how these various aspects of awareness, which might be essential in collaborative nomadic settings, could be supported in relation to (i) applications for broadcasting presence and micro-blogging, and (ii) the design of technologies embedded or present in the learning environments. In either cases issues such as belonging to several groups, the overlapping of personal and work-related relationships, the tension between being available to the others and the need for privacy should be taken into account.

7.2.7 Introducing "place" to the design of educational environments

As discussed elsewhere (McCarthy et al., 2005), considering place as a responsive dialogue between place, self and technologies bears important consequences for design. Firstly, it draws attention to the quality of engagement as the outcome of individuals' interactions with a given environment and with technologies, thus suggesting that any attempt to design for engagement should address the place wherein interactions will occur and not merely the technology that will be used. Secondly, the dialogicality of place involves cultural and sensorial transactions and not merely the physical emplacement. I believe that Casey's conceptualization of place introduced in Chapter 3 can draw attention to design efforts addressing how to enrich (a) the students' experience of feeling settled within sites that are occupied ephemerally, and (ii) the students' meaningful engagement with activities which are carried out at a number of sites.

Moreover, the articulation of place alongside the dimensions discussed in section 3.3.2 provides a framework that can help designers to think of the design of learning places. Thus, the design reflections outlined in the sections above could also be interpreted and organized as follows:

- *Physical dimension.* Exploring how the structural layer of learning environments could support: (i) socializing and working, individual and collaborative activities; (ii) the

emergence of flexible places lending themselves to a variety of uses, and in which groups of various size could simultaneously undertake different activities; (iii) the physical exploration of objects and artifacts.

- *Psychological dimension.* Exploring the design of sites that students might associate to their needs, but also to the way they see themselves within a particular educational context. Exploring how to enrich students' sense of belonging both to the projects groups and to the broad educational context of an educational program. Exploring how to support the feeling of being located in a private area, but still being available to the others and connected to them.
- *Social dimension.* Exploring how to create an environment that could encourage social interactions and collaboration, both formal and informal (for instance, supporting hanging out time, but also the possibility to engage in group discussions). Exploring how to provide technological support that would allow circulation of informational resources and other relevant aspects, such as awareness of where other peers are located and of what they are currently involved in.
- *Historical dimension.* Exploring how learning places could reflect a connection to the past of the institution hosting them and to its identity. At the same time, however, it should also reflect students' past and present experience of being a member of a given institution.

7.3 Reflections on the methodology

Investigating a nomadic setting has raised a number of challenges regarding the processes of data collection and analysis.

Concerning data collection it was necessary, for instance, to deploy a set of methods that would allow me to understand the student project practices undertaken at places in which I could not be present – home, for instance. For this reason, during the second field study I asked the participants to fill in a diary and take pictures of their various work environments. Before that, I had been involved in a pilot study that explored the use of diaries as a means to collect details of the students' activities at home. On that occasion, about ten diaries were given to

students attending the same course[39], but only one diary was actually filled in and returned. Certainly, different factors, such as the students' lack of motivation to participate in the study, but also our difficulty to communicate our objectives and interests to them, might have influenced this result. However, another explanation could be that asking students to fill in a diary was not the most appropriate choice. In fact, they were required to provide details of their group activities while they were actually involved with them, and the deadline was approaching. It could, thus, be plausible to assume that the students felt that filling in the diary would have interfered with their course assignments.

To conduct contextual interviews was problematic for reasons of different nature. Firstly, most of the participants lacked a stable work place at which I could meet them. Secondly, to follow both collaborative and individual work sessions caused some problems in terms of resources and time available. For example, after a group work session, the only way to avoid choosing whom of the members I could follow – either for a debriefing interview or to shadow him/her to the next workplace – would have been to be as many researchers as the members of the group. For this reason I could only follow one of the team members at the time.

While planning the field studies, I decided not to use methods such as physical walkthrough[40] (Ciolfi, 2004a) and bodystorming[41] (Oulasvirta et al., 2003) for data collection, since I expected that the lack of a stable workplace would have made the adoption of those methods unsuitable. Nevertheless, during the analysis I have come to realize that even though the students' workplaces were not stable, they were often occupied and used recursively. Thus, both physical walkthrough and bodystorming could have been adopted in the field studies.

It was problematic to motivate students to participate in the studies. We were fortunate that four groups participated in the first one. In fact, when we tried again the following year only two students, belonging to different teams, replied to our call. Similarly, only one group out of five volunteered to participate in the second field study. A possible explanation

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[39] None of these students had previously participated in the field studies.

[40] A physical walkthrough consists of an informal walk about a physical place. During the walkthrough, while talking to a possible user, the researcher can collect stories related to the particular environment, and seeks to gather information regarding the user's connection and perception of it.

[41] Bodystorming is a technique used to brainstorm about a particular technology in situ, and to imagine how it would be like if it were there.

is that the other students were concerned that our research could have distracted them from their projects.

The field studies were carried out in a technical university, and the participants were generally quite familiar with technologies and eager to try out the latest applications. It would be interesting to explore different educational settings that do not regard technology as a central object of study.

On an analytical level two main challenges were to be faced. Firstly, holding together a set of tasks, often related to the same activity, which were undertaken at various locations. Secondly, making sense of the number of multiple facets of nomadicity emerging from the analysis – e.g. the alternation of individual and group work sections, the choice to work in some places rather than others, the relationships between places and the use of technologies, circulation of objects and information. In this regard, using place as a theoretical notion has been useful to explore the students' nomadic practices and the relationships between their activities and the number of environments wherein they occurred. Moreover,
the event metaphor and the emphasis on place as a unique, emergent entity provided an analytical lens to understand place-making and place-disassembling activities. I am aware that more investigation would be needed to further explore:

- The historical dimension of place, both from the students' and from an institutional perspective; how places become meaningful for students and their group activities, the way they relate to past project experience; meanings and values that institutions may want to convey with the design of specific buildings.
- The home office, which is the place where students spend a lot of time, often working on their assignments.

7.3 Future work

The work presented in this thesis has sought to provide a broad understanding of nomadicity as a work condition.

For future studies, it would be interesting to focus more explicitly on learning aspects (e.g. elaboration of knowledge) and explore how they are mediated by mobile technologies.

I would also like to consolidate the use of place as a methodological and analytical framework in order to investigate nomadic practices. While in this thesis I have provided a broad picture of the dimension involved (physical, psychological social and historical), it would be interesting to explore further details of each one of them. Moreover, it would be challenging to adopt the framework to explore the work practices and experience of different cohorts of nomadic workers.

It would also be interesting to explore nomadic workers' sense of place by explicitly focusing on the framework of experience elaborated by McCarthy and Wright (2004). This would involve an explicit focus on: (i) the variety of processes by which individuals make sense of their experience of place; (ii) the sensual, emotional, compositional and spatio-temporal aspects people associate with a specific place and how they influence their experience of it.

For further research, it could be useful to use probes and inspirational material (Gaver 1999), such the collections of objects participants may find particularly representative of a particular site, in order to explore the psychological and personal values characterizing the relationship between place and individuals.

Finally, it would be compelling to further develop the design reflections presented in this chapter and to organize design sessions to explore and evaluate different prototypes addressing the ideas discussed. In this regard, the vignettes introduced in Chapter 5 could provide the material to create scenarios (Carroll, 1995 and 2000; Nardi, 1992; Rizzo et al., 2004) to be used throughout this phase.

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