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A First-time Wireless Internet Connection: More Than Just Clicking on a Link

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ABSTRACT

In the context of understanding the particular use made of nomad Internet and mobile computing in its interactional dimension, this article examines the detail of a first-time connection to the university's Wi-Fi network. Through video ethnography, we analyse the collaborative *talk as work* between two participants in a public place and finely examine their use of artefacts and distributed information in the accomplishment of connection activities. Both their speech and their actions have been transcribed using the conventions of Conversation Analysis. We therefore follow the connection procedure step by step and demonstrate how handling computerized artefacts is not transparent and requires a certain degree of learning concerning this particular communicative and working tool.

Keywords: *Video ethnography, situated action, human computer interactions, cooperative activities, nomad Internet, ubiquitous computing.*

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1. Introduction

From our ethnographic observations on the campuses, we have noticed that personal mobile equipment has been increasingly appearing in lecture theatres and teaching rooms in French public universities. Gradually, the campus has become a particularly good place for ubiquitous computing (Weiser, 1998), where we have been able to observe the taking place of heterogeneous nomadic and mobile activities using IT equipment. A campus environment with new practices is therefore being created and these new technological practices are closely observed *in situ*. It is therefore important to study members' practices as such, which at first may seem "essentially uninteresting" both for members and for the analysts. Video recording is a practical way of obtaining data, while preventing the problem of "the invisibility of common

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sense procedures" (Have, 2002). The spatialization of a place emerges in and through the practices, where the spaces are made intelligible in terms of occupancy and patterns of hidden and potential familiarity (Williams & Dourish, 2006). Our understanding of this place is that rather than being an object or container, this place is involved in a process where it is continually being redefined by the usages (*ibidem*). Thus, only empirical detailed observation and precise analytic characterisation of the field can reveal the relevant phenomena.

Supported by video ethnography, our participant observation approach follows a five-month fieldwork observation of the campuses[1], where one of the present authors, *Bg*, was one of the actors in the accomplishment of a first-time connection. Being a member of the university, *Bg* has been "doing being" (Garfinkel, 1967; Heritage, 1984) both an ethnographer and a student-user of the Wi-Fi access, as he shares the same background knowledge about the day-to-day activities at the university. *Bg*'s participation is treated as an interactional event. We will question the relevance of the membership category (Sacks, 1972) of *Bg* related to the participants' orientation to one category or the other, and how this category is consequentially procedural to the development of the activity. We will also investigate the temporality and sequential organisation of the participants' speech and on-screen activities as well as their interactional and corporal orientation to the informative artefact. Both ethnographer (*Bg*) and first-time network user student (*Ji*) are seated side-by-side and facing the laptop screen. By examining the interaction's structural organisation, we focus on how the "collaboration-oriented" achievement of a first-time connection during the ethnographic observation, is rendered salient and relevant in the activity. How does the "collaborative" nature of this talk-in-interaction emerge? Is it as a matter of the contextual definition of the activity in which they are engaged: an observed first-time connection? Does it emerge by the participants' orientation to this specific talk and the special practices they employ to co-construct their conversation (Schegloff, 2002), for example an incipient state of talk during the activity of connection?

[1] We would like to thank Professor Chantal Charnet for having permitted our access to the research field of the campuses of the universities of Montpellier 2 and Montpellier 3 and for having obtained us the necessary authorisations for video recordings on the universities' premises for our five-month ethnographic observations. We also thank Marc Relieu for having raised relevant questions.

Figure 1. The entrance hall of the university's administrative building

The data presented in this article were video recorded[2] in an entrance hall. Although our corpus of data is composed of various types of activities (work, leisure or communicative) on the computer, we voluntarily limited our analysis to the uniqueness of this particular activity of a first-time connection. Through the deployment of situated practices articulated within ongoing processes of human interaction (Goodwin, 1994), we are able to analyse the "relationship between technology use and a local cultural practice" (Barkhuus & Dourish, 2004), that of getting connected and surfing the Internet. The unique nature of this activity focuses the analysis on the accomplishment of the specific steps of connection.

We therefore consider this situation of connection from a *flexible* procedurally consequential point of view (Schegloff, 1991) when, in the development of the activity and the talk-in-interaction, the participants orient to the distinctive features of the network-covered area. In this way, we avoid the "bucket theory" (Drew & Heritage, 1992) where the interactions are determined by their occurring in this space. Rather, the specific characteristics of the Internet space become relevant in the *situated* activity: the framework does not determine the type of interaction that will be produced; it only becomes relevant for our analysis, through the talk-in-interaction and in terms of the participants' orientation to it, and in relation to the accomplishment of the connection activities. We thus favour a situated approach where we centre the analysis on *how* the participants create, assemble, produce and reproduce the social structures to which they orient themselves, in their familiarity with, or adoption of, novel technologies, such as using the Wi-Fi network on the campus for the first time. Through the analysis of one single interpersonal collaborative interaction in the Wi-Fi covered entrance hall, we aim at examining how these two participants use physical artefacts (student card, computer screen) and affordances (Gibson, 1979; Conein & Jacopin, 1993; Conein, 2006) of the laptop's keyboard during *Ji*'s first connection to

[2] We would like to warmly thank Myriam for her kindness in collaborating.

the wireless network. The accomplishment of this first-time connection procedure allows us to grasp the difficulties and the specific usage made of mobile Internet.

Since using the Wi-Fi network depends on the student's identification and successful connection, our study focuses on the accomplishment (Garfinkel, 1967) of the procedures required to access the network, and more specifically on how the state of "knowing how to connect oneself" becomes relevant. Beyond the personal identification capabilities of personal mobile devices, we look into the collaborative knowledge work between actors, made accessible in their talk-in-interaction and their orientation to the activity. Above all, we question the difference between this connection and the processes of establishing a 'traditional' cabled connection, which is for *Ji* 'unremarkable', 'unobtrusive' and 'commonplace'. Do the differences in the connection procedures constitute an evolution, and is this evolution a characteristic of mobility and a specificity of the nomad internet? How should the difficulties in this first-time connection as regards to the characteristics associated to ubiquitous computing be considered in terms of a transparent interface and simplicity of utilisation? Weiser (1991) proposed the futuristic notion of a truly ubiquitous computing which would eclipse the "PC era" (Weiser 1998); the users would be less dependent upon the computer technology, and where it would be woven into the fabric of everyday life (Crabtree, Evans, Fraser, Tolmie, & McMullen, 2005). The first harbingers of ubiquitous computing are the small handheld computers – the laptops – which are starting to be widespread on the campus (Weiser 1998). Thus, nowadays, how far can we consider the use of mobile internet and laptops as being part of an augmented space? We also aim at examining in what manner and to what degree the new parameters brought along by mobile computing influence the way university members define and consider what is a 'working area' or a 'public space'. The term tends to become problematic for users because of the newly hybrid nature of this public space, this socially-organised setting (Williams, Kabish, & Dourish, 2005).

2. Local Circumstances of Practice

This practical action of establishing a first-time connection can be broken down for analysis into four distinct and successive steps, each of which has been transcribed in detail (extracts 1 to 8). These steps are: 1. the initial failure in the connection; 2. an evaluation of the situation with regard to previous practices; 3. recognition of the network by the laptop and 4. the student's identification on the university's intranet. We

focus on the temporal development of the activity, that is, from the moment the participants orient to the potential use to be made of the Internet once they enter the network-covered area, until they are connected and actually surf the Internet. The analysis of the following extracts, made up of the connection steps and accessing the Internet, empirically questions the types of activities that take place in this Wi-Fi network space.

The activities linked to the use of the Wi-Fi Internet render this entrance hall an unusual place, both in terms of socialisation between the passers-by and the laptop users, or among the laptop users; and in terms of the specific, new use which is made of this space. This corridor, initially designed as a space for transient visitors to pass through, has been transformed and furnished, and can also, therefore, welcome students for didactic activities, since they have access to the university's pedagogical intranet. Nevertheless, by definition, this corridor and information space is noisy, and conversations among different groups of interactants who use the entrance hall constitute a constant but irregular background sound, even if at certain hours, the hall is much calmer, e.g early in the morning or during lunch time. We would therefore not expect working activities in such a place, and are more likely to observe them in the library.

2.1 Establishing an Ecological Framework

From the contextual information (Have, 2002) she gave us, we know that *Ji* is used to connecting to the Internet via the cabled network of the student residences where she lives. In her room, she has a broadband connection through a wired connection to her laptop.

In this sequence, the conversation between the two participants in action deals with the difference in the procedures involved in the connection between the cabled network at home and the wireless network at the university, where they are presently located. Most laptops, for instance, can connect through many different network set-ups, in the office, home, or on the road, and can move between different environments and network infrastructures (Dourish, 2004). The connection configuration is *a priori* not the same depending on whether one is using a desktop computer or a laptop, or, in the case of *Ji*, whether the connection is a cabled or wireless one depending on the locality. Therefore, the procedures and the practices linked to *Ji*'s Internet connection change. How can the characteristics of "ubiquitous computing" be applied to these two methods of connection?

In this extract, the two participants are sitting at a table in the entrance hall, and are preparing to establish a first-time connection. *Bg* is setting up the camera when he asks this question, while *Ji* is switching on her laptop. It is their first verbal exchange concerning the connection issue. *Bg* asks for an information concerning *Ji*'s usual use of her laptop. By her negative response "∇∇>no.<∇∇" (extract 1 – line 3) to *Bg*'s question "∆>have you already? surfed on the internet↑<∆ (.) here?" (extract 1 – line 2), the 'first time' nature of this connection is made explicit as the participants orient to it.

1		(0.1)
2	Bg	∆>tu es déjà? allée sur internet↑<∆ (.) ici?
		∆>have you already? surfed on the internet↑<∆ (.) here?
3	Ji	∇∇>nan.<∇∇
		∇∇>no.<∇∇
4		(0.4)

Extract 1. Question-answer sequence concerning past experience

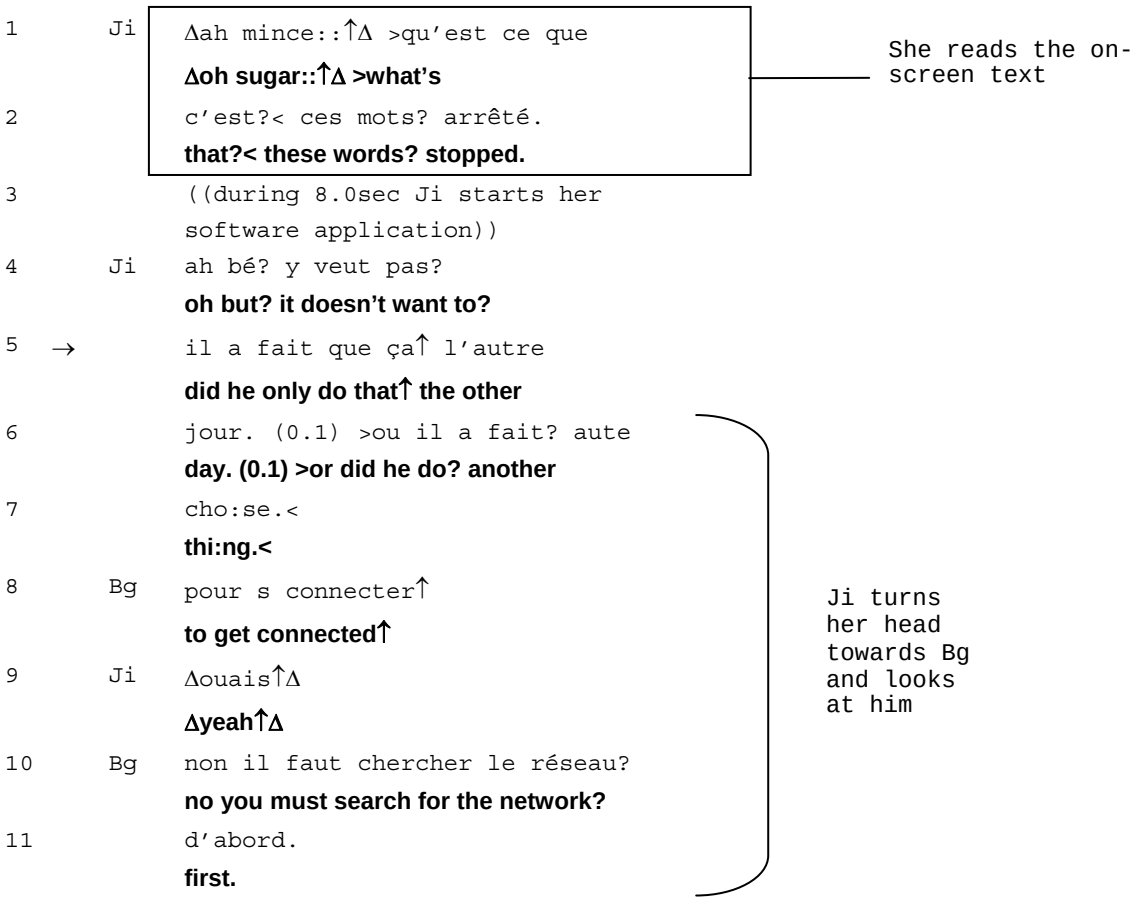
This question-answer sequence is not directly linked to the procedure needed for the connection, but deals with the very nature of the research activity itself. This pre-sequence constitutes the opening of the interaction once they are seated side by side at the table. It is anchored in a spatialized connection activity; the categories "ethnographer – laptop user" are accomplished by the reflexive articulation of a positioning on an observation activity which starts with a question (Relieu, 1999). This talk-in-interaction collaboratively sets up the ecology of the activity of connection to be observed, towards which the participants orient themselves. This conversation is organized as one in a series, or more specifically, as the first conversation in this observation activity, and is used by the participants to structure some parts of their conduct (Button, 1991). This talk-in-interaction - situated at the beginning of the activity of getting connected - reveals their orientation to the multi-level activity and the coordination of interaction both for the connection and the research observation, as well as their knowledge of standard connection procedures.

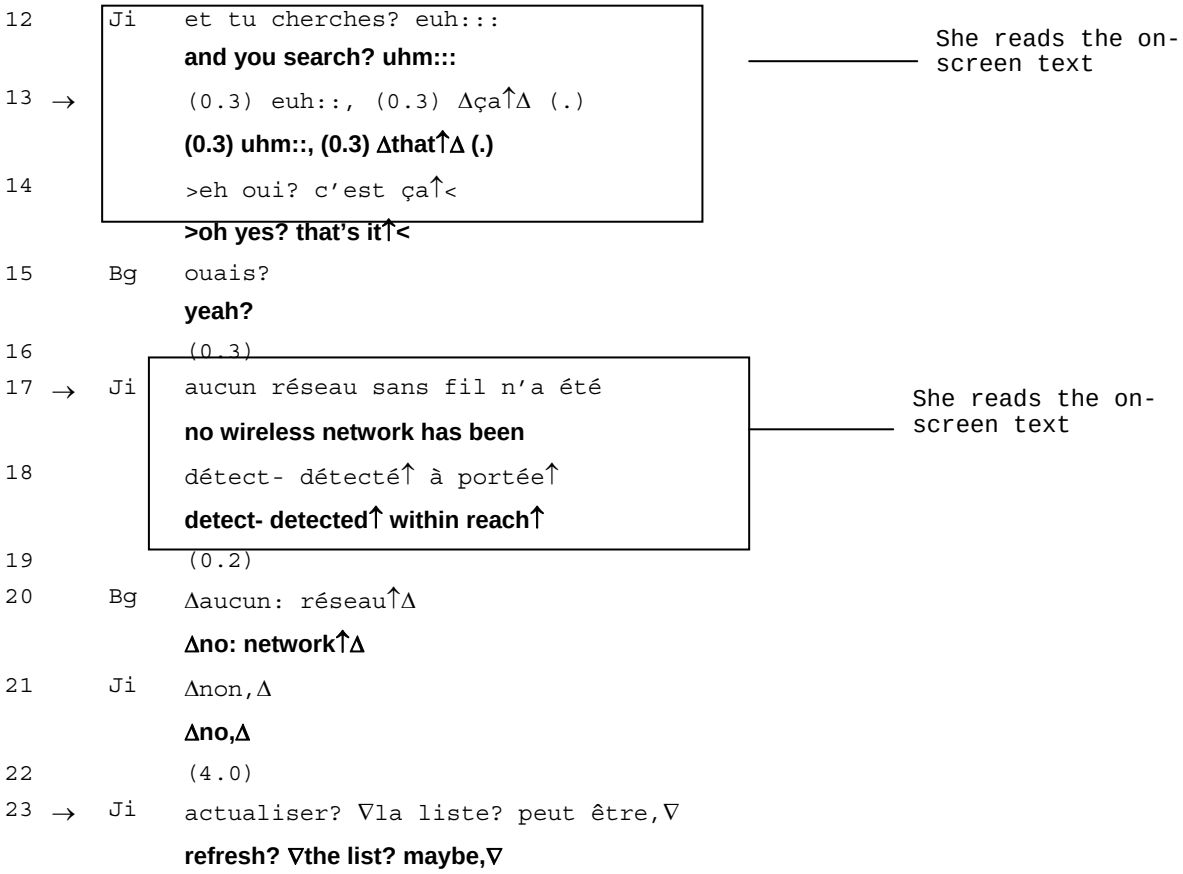
2.2 First Failure in Connection

Ji's first attempt here to obtain a connection is not successful. The result of this attempt is a message displayed on the screen: "aucun réseau sans fil n'a été détecté à portée", which means that no wireless network has been found. From our

observations during our fieldwork, this type of error is common when students attempt to connect for the first time. This is probably due to the fact that a first connection implies several successive steps, which some students have difficulty in accomplishing. As it has often been described, the manipulation of technological tools (Suchman, 1987; Dourish, Grinter, Delgado de la Flor, & Joseph, 2004; Norman, 1998) or more specifically the interface of digital information (Ishii, 2004) requires a certain degree of learning and knowledge acquisition concerning this specific communicative and working tool.

In the extract transcribed below, the two participants try to obtain wireless access from the laptop, which is not the procedure to which *Ji* is used – a cabled connection from the student's residences. However, *Ji* knows that *Bg* has already observed and recorded a first-time connection with another student, and interestingly *Ji* exploits *Bg*'s experience as a resource.



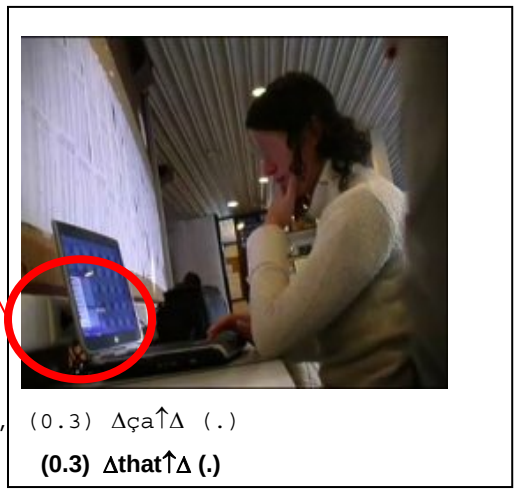


Extract 2. No wireless network has been detected

By her interjectional phrase "**Δoh sugar::↑Δ**" (line 1), the actor *Ji* characterises the fact that a problem has occurred. This interjection shows a double orientation to the sequential environment of the activity. It is both 'context-shaped' (the interjection is produced in relation to the message that has just appeared on the screen) and 'context-renewing', being given that this same action is part of the current sequential environment in sight of, and for the next action (Wilson, 1991). Following this interjection, her question refers to elements which have appeared on the screen: the words "arrêté". After this question, there is *Ji*'s activity on the computer where she starts her software application, which lasts 8 seconds. She answers herself "**oh but? it doesn't want to**" and asks another question. Whereas in the first question, *Ji* was talking to herself, this second question (line 5-7) is addressed to *Bg*. *Bg* is not only the ethnographer, *Ji* orients to *Bg* as being a resource for the activity and therefore a legitimate participant to the active accomplishment of the task at hand. In her turn, "**did he only do that↑ the other day. (-) >or did he do? another thi:ng.<**" (extract 2 – lines 5 to 7), *Ji* is referring to her current activity on the computer and the results of it by using the

deictic pronoun "**that↑**", while, by referring to "**the other day.**", makes *Bg* understand that the question is addressed to him, as it mobilises his previous experience. Previously, she had designated the absent student whose connection *Bg* had observed as "**he**" (lines 5-6) and the computer as "**it**" (line 4). In French, the same pronoun is used for animate and inanimate: the pronoun "il" ("y" when truncated). By using this pronoun, *Ji* personalises the artefact in the interaction (Suchman, 1987) and gives the laptop an orientation of its own. *Bg* asks for a confirmation of the meaning (line 8) by expanding *Ji*'s question and *Ji* answers positively. *Bg*'s category evolves from being a hearer of *Ji's* activity to an active speaker, as the activity becomes more and more conversational (Schegloff, 1996). After this inserted sequence, *Bg* answers the previous turn and verbally gives *Ji* the instructions to follow "**no you must search for the network? first.**".

After the conversational sequence (line 5 to 11) where *Ji* was looking at *Bg*, the talk-in-interaction which follows, far from being *topic talk* (Sacks, 1992) has a more practical goal to which both participants orient themselves, as they turn towards the screen: that of succeeding in connecting the laptop to the Wi-Fi network. By the demonstrative pronoun "**that↑**" that she uses twice (extract 3 – lines 13 and 14), *Ji* deictically refers to a window that has appeared on the screen.



12	Ji	(0.3) euh::,	(0.3) Δça↑Δ (.)
		(0.3) uhm::,	**(0.3) Δthat↑Δ (.)**
13		>eh oui? c'est ça↑<	
		>oh yes? that's it↑<	
14	Bg	ouais?	
		yeah?	

Extract 3. A window appears on the screen

After her hesitation, she is still unable to name the object of her turn, and finally utters "**that↑**". Without seeing the video of the screen or as a simple overhearer of this conversation, one would be incapable of understanding the object of "**that↑**"; here *Bg* does (extract 3 – line 14). The sense of this deictic is clear for both participants, who are engaged in this situated activity and are looking at the same screen. The participants make use of all the resources at hand: the talk between the co-interactants, the on-screen text (error messages or instructions) that they read, the keyboard and trackpad that *Ji* manipulates all mutually inform each other within a single coherent activity (Goodwin, 1994). The interactants use an interactive construction of turns at talk to achieve courses of collaborative action, which is composed of both talk-in-interaction and gestures. The hesitation in *Ji*'s turn "**(0.3) uhm::, (0.3) ∆that↑∆**" is a form of delaying the utterance deictic as the object she is referring to has not become part of the scene yet (Licoppe & Relieu, 2005; Mondada, 2006). Another evidence of their common orientation is *Bg*'s confirmation "**yeah?**" (line 15) after the adjency pair of *Ji*'s question and answer: they are aligned on the same issue and the same task.

In the same way that she shows the different procedures and their mutual engagement in the attempt of connection, *Ji* shows their failure too. She reads the message aloud ("**no wireless network has been detect- detected↑ within reach↑**" - line 17 and 18) – which *Bg* could have read on the screen, by himself, without the need of the utterance. *Ji* confirms the failure through the second pair part, her answer "**∆no,∆**" (line 21). In this connection activity, *Bg*'s category in action evolves progressively from ethnographer to active participant in the connection activity. It is clear that *Bg*'s Membership Categorisation is not defined *a priori* and once and for all by the ethnographic observation context. Rather, his category becomes relevant in the course of the dynamic activity, as the participants themselves negotiate the relevance and orient to either category. The relevance of "being more than just the ethnographer" becomes essential for the development of the activity. *Bg* becomes an active member, the flexible cooperative modalities linked to the participants' co-presence give some kind of robustness to the collaborative team's work, thanks to different types of informal help, that, for example, experts can bring to lay persons (Grosjean, 2005). This is the nature of the help that *Bg* is giving *Ji* through their *talk as work* (Whalen & Zimmerman, 2005), and more particularly his explicit instructions (line 10) or questions (line 20). As he engages more and more in the activity as a participant, *Bg*'s contributions guide the activity and guide the course of the action. After a four-second

pause in the talk-in-interaction, *Ji* produces, with a continuative tone, the last turn of the extract "**refresh? ∇the list? may be,∇**" (extract 2 – line 23). We notice a lower volume at the end of her utterance, as she suggests a possible action to remedy the failure.

2.3. A Gap between Online and Offline Experience

The interactants make a second attempt to connect the laptop to the wireless Internet network in the next extract transcribed below. Unlike the previous attempt, where the difficulty was centred around the state of being "online or offline", that is part of the "embodied" virtual space, it seems that, as the activity develops, the problem is extending to the real world. Wireless networking technologies are perhaps especially interesting due to their combination of tangible and intangible elements (Dourish and al., 2004). Caught up in the everyday usage of an Internet-connected computer, and using the possibilities of ubiquitous computing in a transparent way, the users sometimes forget this *sine qua non* state of connection. Since the wireless networks' interfaces offer the same properties and usage characteristics as wired ones, *Bg* tends to get confused in this extract.

But before coming to this issue, we will take a close look at the modality of the interaction between *Ji* and *Bg* in order to analyse the mutual and aligned sharing of information in the accomplishing of the activity. What contextual information does each participant effectively contribute to their accomplishment of the cooperative activities?

1		(0.4)
2	Ji	Δça? peut ête. que là↑ dfaçon?Δ
		Δit? can only be here↑ nyway?Δ
3	Bg	ou:[ais,
		ye: [ah,
4	Ji	[>afficher? [toutes les&
		[>display? [all the&
5	Bg	[Δouais, ouaisΔ on&
		[Δyeah, yeahΔ we're&
6	Ji	&connections que t'as fait.<
		&connections that you've done.<
7	Bg	&va faire ça? >afficher toutes les
		&going to do that? >display all the
8		connections::< (.) hhh euh:: hmmm::
		connections::< (.) hhh uhm:: hmmm::

Extract 4. Information sharing during the second attempt of connection

This is the first time overlapping occurs in the collaborative talk-in-interaction between *Ji* and *Bg*. These overlaps can be characterised as "supportive and cooperative interruptions" (Lerner, 2002), where the interactants collaboratively produce Turn Constructional Units (TCU) (Sacks, Schegloff, & Jefferson, 1974). The overlapping begins at *Bg*'s appreciative response (*ibidem*) at line 3, which displays *Bg*'s understanding of the deictic pronouns "**Δit?**" and "**here**" at line 2. *Ji*'s turn (extract 4 – line 4) overlaps *Bg*'s (line 3), which is in turn overlapped at line 5. These distinct forms of participation reveal their common orientation to the screen activity and the on-screen displays. *Bg*'s overlap of *Ji*'s turn, which has just begun and where the TCU has not yet been uttered, displays his understanding of the situation. Both participants have access to the screen resources and understand, at the same time, which procedures need to be accomplished, as they share the same "collaborative floor" (Lerner, 2002). Their overlaps show that they both acknowledge what's going on in terms of action and sequences of actions. *Bg* does not wait for the end of *Ji*'s utterance before starting to treat it: he follows the emergence progressively (Goodwin, M.H., 1980; Goodwin, C. & Goodwin, M.H., 1987). *Bg* pays attention not only to the talk itself but also to the surrounding environment (Goodwin, C. & Goodwin, M.H., 1996). The environment contains the relevant elements for the task in hand, and more particularly the relevant informational elements necessary for decision making.

9	Bg	•hhh (0.3) hhh Δtu connaisΔ le:
		•hhh (0.3) hhh Δdo you knowΔ the:
10		euh le site de la fac↑, >eh beh non
		uhm the university's website↑, >eh no
11		on peut pas y aller< tant qu'on est
		we can't go there< as long as we're not
12		connecté,=
		connected,=
		#((dismay hand gesture))
13	Ji	=eh #ou:ais,
		=oh #ye:ah,
14	Bg	(0.2) euh::, (0.5)
		(0.2) uhm::, (0.5)
15		∇conne::xion?∇ quand tu >quand
		∇conne::ction?∇ when you >when
16		tu es?< quand tu es? à ta cité euh
		you're?< when you're? at your student's uh
17		universitaire↑ tu fais comment.=

residences↑ how do you do it.=

18 Ji =moi c'est là↑ >mais c'est parce
=for me it's here↑ >but it's be-

19 que< c'est branché↑
-cause< it's plugged in↑

20 (.)

21 Ji [>parce que là il est pas branché<]
[>cause here it is not plugged in<]

22 Bg [∇ah oui::∇]
[∇oh yes::∇]

23 (.)

24 Bg là c'est branché↑ directement
there it's plugged in↑ directly

25 Δavec un [câble↑Δ=
Δwith a [cable↑Δ=

((Ji's head nod))

26 Ji [hum:
[hum:

27 Bg =tu fais pas wifi. tda↑ (--) euh::
=you don't use wifi. tda↑ (--) uh::

28 hum::et? si tu fais? rechercher::?,
uhm::and? if you do? search::?,

29 créer-? ∇non pas créer une
create-? ∇no not create a

30 nouvelle connexion:?, ∇ (0.2) euh::
new connection:?, ∇ (0.2) uhm::

31 (0.2)∇tda euh∇
(0.2)∇tda uhm∇

32 Ji Δet? C'est quoi?Δ qui nous
Δand? what is it?Δ that

33 bloque::↑ euh
blocks:: us↑ uhm

34 Bg ∇∇je me souviens plus comment y

∇∇i don't remember how we
35 faut faire∇∇
must do∇∇

Extract 5. the multimodal interaction between *Ji* and *Bg*

In lines 9 and 10, *Bg* asks her interlocutress if she knows the university's website, "**∆do you know∆ the: uhm the university's website↑,**". Considering this question in the context of the activity, this pre-sequence allows an 'opening' on the projected activity. *Ji* as well as the analysts are able to understand that *Bg* is referring to the instructions concerning the connection instruction that are available on the website. The speaker *Bg* seems to orient to the fact that it is difficult to reconcile a manifestation of being "offline" (the laptop not being connected yet) with an "online" experience (visiting the university's website). Without the instructions to help them in their attempt, they cannot connect the laptop and since the laptop is not connected, they are unable to obtain these instructions. *Bg* himself realises the paradox: after having uttered the question, he produces an explicit explanation (extract 5 – lines 10 to 12). By her verbal confirmation, accompanied by the left hand gesture at line 13, *Ji* makes visible that she has seen the absurdity too. This visible and recognised contradiction, to which they orient themselves, points to the role of the Internet as a medium for a communicative and informative artefact. But one of the main characteristics of this artefact, as we have seen in this extract, remains embodiedly virtual and cannot be accessed until a connection is established and gives the Internet its full capabilities.

By elaborating on this issue, which is the difference between a "traditional", or at least usual, cabled connection and a wireless one, *Ji* and *Bg* makes the characteristics of the wireless network relevant for the current activity. This specificity of the Wi-Fi connection, as opposed to a cabled one, is made relevant in the practical development of the activity: it is more difficult to connect to the wireless network. These connection procedures constitute, in the initial steps of the connection activity, a problem for the participants themselves, because there are more actions to accomplish and these procedures are still unknown to *Ji*, who is in the process of learning them. At line 18, *Ji* verbally refers to her usual manipulation and orients herself to the difference between her usual routine procedures and the present procedures needed to obtain a wireless connection that she is experiencing for the first time in this open space. At lines 17 and 18, *Ji* and *Bg*'s respective turns follow each other rapidly, without any interruption. In coordination with her utterance, *Ji* produces a pointing gesture with her right hand (line

18), before the lexical component to which the gesture is affiliated (Schegloff, 1984). This gesture is used to show to *Bg* the window that has just popped up on the screen. The cabled connection parameters, which have previously been saved in the operating system, are written in this window. *Ji* refers to the distributed resource (Hutchins, 1995; Conein & Jacopin, 1993) concerning the computerized artefact in order to answer the question. In general, the computerized artefact which helps the users plays the role of a cognitive tool, that is usually non intrusive and which remains under the control of the human operator (Salembier & Pavard, 2003).

Ji relies on the knowledge shared by *Bg* and herself in the course of the interactional activity: she makes the situation explicit when answering *Bg*'s question about her usual procedures of connection (extract 5 – line 17). As the activity unfolds, *Ji* mobilises her knowledge of "what she usually does" as a resource for the current action, as the on-screen text becomes relevant. After uttering her answer, she continues to manipulate her laptop: she keeps on looking at the screen while she activates her mouse cursor. At line 26, her answer **"[hum:"**, which overlaps *Bg*'s turn, is accompanied by a head nod (Goodwin, M.H., 1980; Goodwin, C., 1987). The head nod becomes a pertinent resource, which is available and made visible within the activity (Goodwin, 1981), placing, for the analysis, the indexical proprieties of the practical action on the foreground. Some studies (Heath, 2002; Goodwin, 1981) have legitimated the gaze and vocal elements as essential vehicles for the production of actions and social activities in the socialisation process. In this particular collaborative interaction, which occurs in a public place, and where the co-present participants are seated side by side and orienting themselves to the same on-screen activity, the production of a gestural manifestation, coupled to the verbal **"[hum:"**, appears to be the appropriate action for the current activity. Usually the speakers use the visual channel to encourage the partner in producing a gaze readjustment or a series of head nods showing their engagement in the current activity (Heath, 1989).

We have just seen that the technical object "a cable" served as a medium for *Ji*'s connection to the Internet: without its functionality and the appropriate parameters, the usual home connection is not made possible. In the next step of connection, we will examine further the characteristics of Wi-Fi network, which is essentially virtual. Therefore, within the network-covered space, the interactants are engaged in the accomplishment of a new and different procedure, in order to have access, first to the Internet, and finally to the shared workspace.

2.4. Connection Button's Affordance

In the following extract, the users familiarize themselves with the virtual workspace after accomplishing the prior actions needed for connection, which have to be learned, through successive compulsory steps. In this extract, the co-participants finally succeed: the laptop accepts the wireless connection. It is possible to question here the particular hybrid nature of the open space, where the university's Wi-Fi space merges with a public place. One must remember that *Ji* and *Bg* find themselves in an open and public corridor, where different categories of university members constantly pass along. The notice board which they are facing is consulted by two students, *Pm* and *RI,* who want to know about the list of the appointees for the exam. The two girls are discussing and are engaged in their own activities. They are standing next to *Ji* and *Bg* at the very moment they get connected to the Internet. Thus, students surfing on the Internet from their laptop and students consulting the notice board, passing by or anyone having a drink meet in this same space while they are engaged in quite different forms of activities. For example, *Ji* and *Bg* (try to) use the Wi-Fi network available within the public space, while the two students reading information on the notice board do not orient themselves to the possibilities of the Wi-Fi network at all. Yet, the four of them find themselves in the same restricted area, engaged in activities that are expected to happen there, and rub shoulders without treating the other persons' activities as disturbing. As their activities and topic talk skirt without merging, their separate conversations have been transcribed in parallel columns while preserving the temporality: *Ji* and *Bg*'s conversation on the left and *Pm* and *RI*'s talk on the right. We can therefore observe that the organisation of the wireless network functions *within* a public space, as well as it is made available *for* the public space. This feature of the open space is directly linked to the mobility associated to it, where Internet users are nomads and can appropriate all kinds of places (including public places) if they are Wi-Fi zones.

1		(0.4)
2	Ji	>et dans l'aide< de ce truc? y::=
		>and in the help menu< of this thing?
		there's::=
3	Bg	=<et pourquoi? y:, y met activé,>
		=<and why? he:, does he put activated,>
4		(0.5)

5 Pm ça↑ c'est tous les noms? de tous
this↑ that's all the names? of all

6 les délégués. (0.3) t'as vu: Δon
the delegates. (0.3) did you see: Δwe

7 commence par le a↑Δ hihi hhh
start by the a↑Δ hihi hhh

8 £y doit être là bas↑£
£he must be there↑£

9 Rl moi? ∇j'en ai rien à fou:tre du a.∇
me? ∇i don't give a damn about the a.∇

10 (6.0)

11 Bg les boutons sans fil, situés
the wireless button, situated

12 sur l'ordinateur? (.) °qu'est? ce
on the computer? (.) °what?

13 que c'est que ça,°
is that,°

14 (8.0)

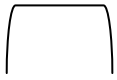
15 Pm ∇regarde.∇ (0.3) £y a tout ça:?
∇look.∇ (0.3) £there's all that:?

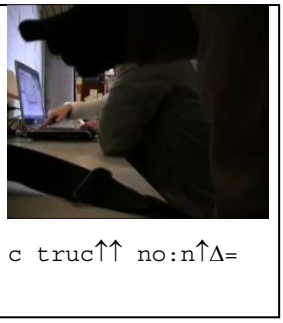
16 comme djouba£ [(inaudible)&
like djouba£ [(inaudible)&

17 Rl [ΔΔhi hmm↑↑ hmmΔΔ

18 Pm &(inaudible)

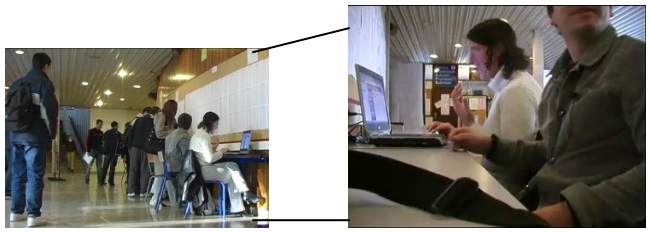
Physical affordance of the button





19 Ji &Δah bé↑ c'est c truc↑↑ no:n↑Δ=

		&Δoh but↑ it's this thing↑↑ no:↑Δ=
20	Bg	=ah bé voilà↑ [hrrr
		=oh that's it↑ [hrrr
21	Ji	[hrrr↑ hhh
22		ΔΔheuheuheuheu[heuheuheu↑↑ΔΔ&
23	Bg	hhh [Δmerci? Δ (-)&
		hhh [Δthanks? Δ (-)&
24	Ji	&hhh hrrr ah? putain::↑ heuheuheu
		&hhh hrrr oh? shit::↑ heuheuheu
25	Bg	& merci? jiji?
		& thanks? jiji?
26	Ji	[heu hhh £j'm'étais toujours
		[uhm hhh £i had always
27	Bg	[et voilà
		[and here you go
28	Ji	demandé ce que c'était ce bouton£
		wondered what this switch was for
29		heuheu
30		(.)((physical contact between Rl and Bg. Bg looks at her and moves his chair))
31	Bg	par?don
		so?rry



Extract 6: the connection to the university's Wi-Fi network mixes up with the public space

Since the public areas, which are Wi-Fi zones, have evolved and have been adjusted and furnished in order to meet the new needs and use of space, it is also interesting to question the way in which different types of activities are accomplished. Behind *Ji* and *Bg* (who are sitting side-by-side facing the laptop), there is a corridor, which is an open public space that students and administrative staff constantly pass through. The wall in front of them serves as a notice board, where students can obtain information, like the two girls we will see later who consult the list of the appointees for an exam. A coffee machine and a drinks machine are also available in the entrance hall. The two campuses that we have observed are public places. We observed that they are shared

spaces as well as workplaces of a particular nature: the students are engaged in personal work tasks, sometimes in collaboration with other students, or in leisure activities. This connection activity therefore occurs in a place that can be categorised as "public", where particular types of interaction are also produced. But beyond what "appears to be" at the same time a work and leisure area, how, precisely, do these places progressively emerge as an exclusive context of interaction, giving rise to verbal exchanges and practices that may be characteristic of a Wi-Fi zone on the campus?

At line 5, *Pm* is addressing Rl. The two speaker pairs *Ji-Bg* and *Pm-Rl* are in such close proximity that the conversation between *Pm* and *Rl* is audible on the video recording. The conversation between *Pm* and *Rl* is available for analysis because of the *continuing state of incipient talk* (Schegloff and Sacks, 1973) between *Ji* and *Bg.* These gaps of silence (as from line 4) are not occasions to close the conversation, but a silence set by the contingencies and constraints of the screen activity in which they are primarily engaged. As a result, the collaborative talk-in-interaction is suspended when they are accomplishing some individual tasks, like reading. Moreover, we can even interpret these silences as uninterrupted action. In these different extracts, the talk-in-interaction has a collaborative goal. Most of the time, *Ji* and *Bg* share information and try to find a solution when there is difficulty in accomplishing the activity.[3]

In the same way, the *body torque* allows us to structure and make sense of the two parallel conversations in context. The bodily orientations of the respective groups (see images at line 4) inform us about their relationships and the nature of their activity. Therefore, an utterance or a bodily movement has to be analysed in relation to the local context of its production in order to grasp its full meaning; all the more in such environments where different types of activities occur in the same place. While the first group sitting at the table is engaged in their main activity of obtaining a wireless laptop connection to the Internet, the second group beside them, who are standing up and moving slightly, are looking for names of students on the posted lists. *Ji* does not orient to the potential "disturbance" (she continues to face her laptop) and despite the corporal proximity and the parallel conversations, she continues to explore the configuration of her laptop, with *Bg*'s help. *Ji* does not seem to consider the girls' conversation as a nuisance because there are no contextual features of privacy

[3] Therefore, this empirical analysis of action is not only confined to the analysis of interpersonal communication (Conein, 1990: 103).

relative to a workplace as such. It is worth noting that *Bg* and *Ji* are simultaneously in two places (Schegloff, 2002): the real physical environment, the entrance hall, and also the more "embodied virtual space" (*ibidem)* where they are trying to connect the laptop to the Wi-Fi network. The main characteristic of this place is that activities which traditionally take place on desktop computers via wired Internet connections, which are placed in computer labs or libraries at the university, are transferred to open places where the Wi-Fi network can be picked up. They are hybrid places where heterogeneous activities can, and are carried out as seen here. As a result, *Ji* and *Bg*'s activities on the laptop can, of course, be analysed from a generic Human-Computer Interaction, where, once the users obtain an Internet connection, the procedures do not really differ whether the users are mobile or not. However, in sequences like here, where students using their laptop are close to others who are engaged in completely different activities, the relevance of the specificity of using a Wi-Fi network from a laptop on the university premises emerges in and through the activity, and is analysable through the talk-in-interaction.

The long pauses (six seconds at line 6, and eight seconds at line 14) in between their different utterances show *Ji* and *Bg*'s orientation to their engagement in the current activity. *Bg* finds information in the help menu provided by the computer's operating system, "**the wireless button, situated on the computer?**" (extract 6 – lines 11 and 12). This distributed information concerning the computerized artefact allows them to find the solution to the network connection problem. But before it becomes a solution, the button must first be located on the laptop. Until a *double coordination* (Norman, 1991) has been accomplished by *Ji* and *Bg* between the written instruction and the task environment, the spatial information is not relevant (Conein, 2006). *Ji* accomplishes a pointing gesture (Goodwin, 1981; Schegloff, 1984) with her right hand towards an integrated button on her computer, simultaneously to her turn "**&∆oh but↑ it's this thing↑↑ no:↑∆=**" and presses the button (extract 6 – line 19). *Bg*'s turn "**=oh that's it↑ [hrrr**" quickly follows *Ji*'s without any break and confirms the success of *Ji*'s gestural action. Therefore, it seems that the action models the object "button" that is manipulated and is at the same time modelled by it. By coordinating their action with the relevant information and artefacts, the two co-participants have successfully co-operatively completed this new step in the connection procedure. From the point of view of the interaction, the extract cannot be reduced to simple conversational interaction, since it presents itself as a scene of three-party joint attention: *Ji* and *Bg* orient themselves to the button which becomes the common object of focus (Conein, 2006). The laptop is

now finally connected to the university's Wi-Fi network. It is only when they have reached their goal of connecting the laptop that *Bg* orients himself to the presence of the two girls and realises that his chair could possibly be preventing them from accessing the notice board. Until then, *Ji* and *Bg* were engaged in a single activity, reading the instructions on the screen and looking for solutions. They were concentrating on the task at hand and probably had their awareness (Schmidt, 2002) about the surrounding environment reduced. The fact is that it is only when they are connected that *Bg* moves his chair, looks at the girls and says "**so?rry**".

The computerized artefact – informational and communicative – needed to be configured first before they could access the Internet: the activation of the Wi-Fi Card was crucial in accessing wireless Internet. We have observed the first steps of this procedure. Now that they have Internet access, the two interactants intend to accomplish different pedagogical activities using the Wi-Fi network.

2.5. Restricted Intranet and Internet Access

The fourth and last step in the proceedings of the first connection is the one that we have identified as the authorisation to access the university's server. Access to the faculty's pedagogical intranet requires a personalized identification number. *Ji* needs to enter the information relative to her user account which appears on her student card. The identification stage is, therefore, a determining one in the intranet access procedure, since the university's server only allows access to the students who are registered at the university. The identification number only allows access to the Wi-Fi network if the student's card is valid for the current academic year.

The student's card is therefore an official document, which allows the student to be identified, for all possible activities related to the university, including access to its restricted network. The card is a paper support where the identification number is written down, and kept by the student. In this respect, it is a cognitive artefact (Norman, 1991), where information is saved. We will, therefore, examine the role of this paper document in the digital collaborative activity between *Ji* and *Bg*, which becomes especially relevant because at first *Ji* does not use her student card. She types her university mail address and the connection fails.

1	Ji	>et c'est normal qu'il mette↑<
		>and is it normal that it takes↑<
2		trois plombes? ∇comme ça? ∇

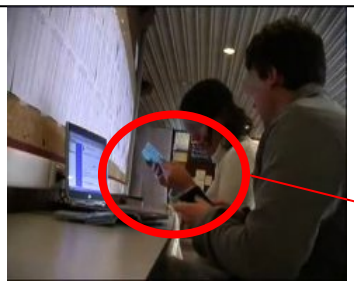
		three hours? ∇like this? ∇
3		(0.2)
4	Bg	qu'est ce qui y a marqué sur
		what is there written on
5		l'autre fenê:tre?
		the other wi:ndow?
6		(2.0)
7	Bg	euh::: ∇ah nan∇ (.) là↑ faut que
		uhm::: ∇oh no∇ (.) there↑ you need
8		tu? recommences.
		to? start again.
9	Ji	ah bé min::ce↑ (.)Δ c'était pas
		oh da::mn↑ (.)Δ it wasn't
10		ça↑ que vous aviez tapé↑Δ
		that↑ that you had typed↑Δ
11		l'aute jour::↑ parce que mon
		the other day::↑ because my
12		courri[e::l euh c'est pas
		mai[::l uhm that's not
13	Bg	[Δmais je j'ai pas rgardé↑Δ]
		[Δbut i i didn't have a look↑Δ]
14	Ji	marqué là d']dessu:s
		on] i:t written
15		(.)

Extract 7. 'what the interactants see is what the interactants get'

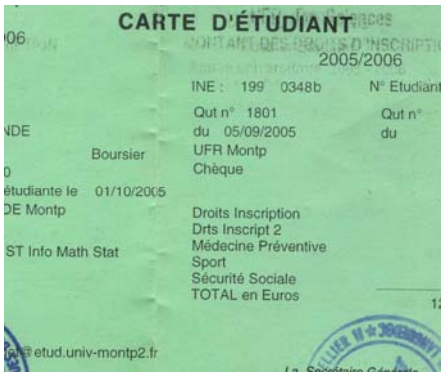
At lines 1 and 2, *Ji* examines the situation and verbally remarks that there is another problem by her question. She compares the situation with the normal (fast) connection time that she expects. Collaboratively, *Bg* accesses the laptop's interface and looks for an explanation (extract 7 – lines 4 and 5), and expects to find a message in the form of a window.

After this temporary failure, the action accomplished by the user *Ji* combines an understanding of the information she reads on the screen and an identification of the relevant data available on her student card. At line 7, *Bg* tells *Ji* that she needs to start again. By asking *Bg* whether the situation is normal or not, she attributes a form of expertise to *Bg,* who gathers information for the diagnostic before producing a prescription "**you need to? start again.**" (extract 7 – lines 7 and 8). The task of obtaining a connection is co-constructed by *Bg* and *Ji* in the progress of the interaction. The connection activity is accomplished by using *Bg*'s knowledge, which is called upon

during the accomplishment of the activity. Both interactants are able to evaluate the situation in real time by reading the computer's response, that is, accessing to the intranet has failed because *Ji* has not entered the appropriate login details. What the interactants see on the screen is what the interactants get: the effect of the rapid incremental reversible operations on the object of interest is immediately visible (Shneiderman, 1997). Sequentially, the successive turns of *Bg* (extract 7 – line 7-8, 13) and *Ji* (extract 7 – line 9-14) are the consequences of the error message that appears on the screen. In order to correct the data, this time, instead of entering her university's email address as login, *Ji* takes her student card, on which her student's identification number is written.

1	Bg	il a: utilisé:: les- il a
		he ha:s used:: the- he has
2		utilisé::↑
		used::↑
		
3	Ji	ah si. Δah:? c'estΔ avec que::
		oh yes. Δoh:? it'sΔ with only::
4		euh maju::scule↑
		uhm capital:: letter↑
5	Bg	il a utilisé? ça:: là.
		he used? that:: here.
6		(0.2)
7	Ji	>non mais en fait?,< y faut une
		>no but in fact?,< you need a
8		majuscule:: ∇pour l'écrire∇
		capital letter:: ∇to write it∇
9		(29.0)
		((Bg points the on-screen text with his left hand))
10	Bg	non: c'est mar:?qué (.) euh nnn
		no: it's wri:?tten (.) uhm nnn
11	Ji	[en minuscule↑ et sans la clef
		[in small letter↑ and without the key
12	Bg	[en minuscule (.) et sans la clef,

Student's card



		[in small letter (.) and without the key,
13	Ji	ah↑ min:ce euh::::↑↑
		oh↑ su:gar uhm::::↑↑
14		(27.0)((typing her identification number))
15	Ji	ça fait dix? ça↑
		does it make ten? this↑
16		(6.0)
17	Bg	voilà.
		here you go.
18	Ji	ouais:::↑↑
		yeah:::↑↑

Extract 8. access authorization to university's server

Using the document containing the data is locally relevant for the two interactants. The inscriptions do not identify the student by name, but provide a different form of information, which is not readily accessible. Instead of a name or an email address, the student card gives a code that has to be deciphered according to the instructions given on the graphic user interface in an adequate and acceptable fashion. Then, the student has to enter the number according to the the instructions on the screen.

In this extract, the card serves as a tool to create the connection, and becomes a cognitive artefact to complement the computer screen's interface (Hollan, 2000). Both the student card and the information appearing on the screen are used to correct the login, allowing successful access to the university's intranet. During subsequent connection attempts, the card will certainly continue to be used as a cognitive artefact, as a memory aid (Norman, 1991). This use of the artefact reflects its situated and embodied character in the context of action and use, as the actions are distributed in time, and between persons who accomplish the activity. Thus, the cognition is "distributed" (Hutchins, 1995) between the student *Ji* and the object "the student card" as a physical element of her environment which helps her in successfully obtaining a connection.

> *"The term 'distributed cognition', for instance, is increasingly used to demarcate a concern with (socially) shared representations and the co-ordination of action by individuals in organizational environments"* (Heath et al., 2000: 306).

When accessing the server, some information which is available on the university's home page appears on *Ji*'s laptop screen. *Ji* follows the instructions exactly. Therefore, the computer, in turn, becomes an informational artefact, which displays information that becomes an available resource for the participants in action. At lines 11 and 12, *Ji* and *Bg* simultaneously utter what they synchronously read: "[en minuscule↑ et sans la clef", which is the message displayed on the screen. In the setting of an observation of how usages are constructed, the interface creates a distribution of the shared resources between the user and the information displayed on the screen. The interface as a cognitive artefact presents informational proprieties. It is, thus, possible to observe a shared contextual representation between the interactants *Ji* and *Bg* (extract 8 – lines 11 and 12). The overlapping of the two utterances demonstrates the interactants' common and simultaneous orientation to the displayed information relevant for the completion of this situated activity.

Moreover, the handling of, and the interaction with, the interface allow a look into the participants' specific orientation to the activity. *Ji* at first tries to enter her password using capital letters, before starting again using lower-case letters. The identification, accomplished by the users themselves, of what is the correct login and password, is a situated activity (Suchman, 1987), closely linked to a specific context and usage framework. The interactants' orientation in the learning process is dynamic and develops progressively as the interaction unfolds.

We have closely observed that once the connection steps are accomplished and the restriction overcome, it is possible for the students to obtain an Internet connection from almost anywhere on the campus. In order to connect, they rely on certain pieces of information spatially oriented towards the accomplishment of the task: the information concerning the connection procedures are directly available on the university's website and the student's card contains the necessary identification number. Therefore, the space and spatial arrangements in the participants' immediate environment (technological space of the laptop and the entrance hall as a public space) influences the action and at the same time is influenced by it. This contextual configuration of the space and distributed cognition is closely linked to the technology usage.

3. Conclusion

With the arrival of Wi-Fi network on the premises of the campuses of Montpellier, new digital environments have been created through users' appropriation of the space, their attempts in connecting to and using the wireless network, like *Ji* whose connection steps we have described. These places were traditionally practical spaces where social interaction took place or where people passed by. With the coming of the wireless network and the furnishing of this crossing and notice area, heterogeneous activities started to take place within the same space, rendering the term "place of study" difficult to define: pedagogical and digital activities move from the library or computer lab to this public open space. Therefore, like in any public space, the activities of different groups of people co-occur without merging, and mobile wireless Internet activities occur alongside others. In the light of the temporally unfolding activities we have described, and the characteristics which have emerged empirically through the accomplishment of the specific steps of connection, we propose the term of *Ambient Internet Space*.

Thus, the *Ambient Internet Space* is more than simply a wireless network covered area or a public and open space. The two students *Pm* and *Rl* find themselves in the same place as *Ji* and *Bg,* but as opposed to them, *Pm* and *Rl* are neither engaged in computer activities nor even orienting to the possibilities of using the Wi-Fi network. The *Ambient Internet Space* emerges from the moment laptop users orient to the possibility of accessing the internet and accomplish connection activities until the identification requirements are met and the Wi-Fi network is accessed and used. However, from the description of *Ji*'s successive steps in connecting and the issues that were raised during the activity, we notice that even though *Ji* is accustomed to using her laptop and a cabled connexion, she does not orient to the wireless connection procedures as being straightforward.

The personal computer is widely and commonly considered as a valuable piece of technology for people and purposes. As technological and communicative infrastructures, computers and wireless networks should ideally be "invisible" (Norman, 1998) or "transparent" (Ishii, 2004). Empirically, through video ethnography, we have seen that the use of the Wi-Fi network, which is new to her, is far from being transparent for *Ji*. At home, her routine accomplishment of connecting her laptop is naturally integrated in her daily activities, and is as transparent to her as "plugging in and using my hairdryer". Unlike a simple and non-problematic home connection, her

failures and successive attempts to obtain a connection are central to the activity, and constitute the core of our analysis. Far from being "invisible" for the user, the activity of connection necessitates full attention and involvement in this specific task, and precise interpersonal coordination concerning the use of artefacts. It involves the users' reading of the computer responses in the form of error messages, the interpretation of information contained in artefacts, like the student card, and situating this information in the spatial environment of action (finding and pressing the button) in order to accomplish the required connection steps.

Therefore, studying the role and the place of the artefacts in the interaction as they fit into the structure of the connection activity within this newly-created hybrid space, the *Ambient Internet Space,* necessarily goes along with the study of the situated talk-in-interaction as they are engaged in the activity. It constitutes the main data for analysing the participants' orientation to the artefacts or to the coordination of action, even in a multimodal analysis of interaction. That is why we chose an *in situ* approach, where activities are examined *in situ*, as they unfold in the *hic* and *nunc* of the interaction, through the close analysis of the participants' conversations, actions and the distribution of their activity with the environment.

4. Transcript Symbols

Data were transcribed according to conventions developed mainly by Gail Jefferson and commonly used in conversation analysis.

[	overlapping talk
=	Latching
(.)	micro pause
(8.0)	Pause
:	extension of the sound or the syllable it follows
.	stopping fall in tone
,	continuing intonation
?	rising inflection
Mine	Emphasis
°uh°	quieter fragment than its surrounding talk
.hh	Aspiration
Hh	out breath

&	a continuation of a same turn after overlapping talk
><	quicker than surrounding talk
↑	mark an overall rise in pitch across a phrase
∆	rise in volume
∇	lower volume
£	laughing tone in the voice
hrr heu	laugh transcript

Figure 2. The table of transcript symbols

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