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Laptops in an educational practice: Promoting the personal learning situation

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ABSTRACT

In this article an ethnographical study of laptops' activities during lectures in a university milieu is analyzed as different kinds of involvements. Through interviews and observations we have focused on how these involvements influence the laptops' alignment towards the educational practice. The analysis shows the importance of separating the educational practice and the personal learning situation. Studying students' learning intentions, rather than certain laptop related activities, we get a deeper understanding of the role the laptop can take during learning activities. Five general characteristics of laptoping are found. Negotiating the laptops' different roles in the educational practice opens up for an understanding of the students personal learning situation as being more than just listening to a lecturer. Additionally, competent integration of digital tools into the learning situation extends the dimensions of the lecture beyond the lecturing hours and personal note taking. Such knowledge is vital for creating foundations for digital competency in a digitized society.

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1. Introduction

According to the European commission it is clear that digital competencies play an increasing role in the way people learn and that ICT (Information and Communication Technology) is an important asset for nurturing creativity and innovation (European Commission, 2008). What we want to address is a discussion related to the *change in the educational practices* that is a result of an increased use of one ICT, the laptop, in schools and universities.

The increased use of laptops in schools and universities has not passed unnoticed. On the contrary, during the past years an intense debate has grown with arguments for or against the use of laptops (and other mobile technologies) in the educational practice (Fisher, Keenan, & Butler, 2004; Fried, 2008; Gardner, 2004; Graham, 2001; Kotz & Essien, 2002; McVay, Snyder, & Graetz, 2005; Young, 2006). However, in discussions about laptop use in classrooms, debaters and practitioners tend to be polarized into an either or position. The Chronicle of Higher Education (Young, 2006), reports that some lecturers welcome the laptop, some ban it, while others allow the laptop as such but close down the network and the Internet access in the classroom. But few report on what measures have been taken, if any to integrate the laptop into the lecture. There are several studies reporting on how laptops interfere with learning in the classroom, how the laptop user use the screen as an interaction shield, how it becomes a focal point, a distraction for other students without a laptop (Fried, 2008; McVay et al., 2005; Prescod & Dong, 2006; Newman & Smith, 2006). However, it could be argued that these arguments treat and compare the learning situation as it was before the laptop was introduced. In most of these cases there has been no or little effort to adopt, or rather, design the didactical practice to take advantage of the new technology. Another striking theme in this literature is the insecurity and uncertainty about the role of the laptop, expressed by both lecturers and student. Neither lecturers nor students seem to have a view on what is appropriate laptop behavior during a lecture, thus they are unsure what actually constitutes competent laptoping during a lecture. By referring to the student and a laptop as laptoping and associated activities as laptoping we want to stress the mediation between actor and technology. It is not enough to analyze the agency (the power to act and have effect) of the human – in this case the student. It is the conjunction of a student and a laptop in action that has effects for learning, and it is therefore necessary to take the unity of human and the mobile computer, the laptoping, as the departing analytical unit for developing an understanding of the role of ICT for learning. With competent laptoping we thus refer to, for example, what is efficient laptoping, what is social accepted laptoping and what are suitable services to support

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this laptoping in a specific lecture situation. This connects to the wider frame of reference offered by the European Parliament when stating key competences for a lifelong learning. One such competence is digital competence:

Digital competence requires a sound understanding and knowledge of the nature, role and opportunities of IST in everyday contexts: in personal and social life as well as at work (Official Journal of the European Union, 2006, p. 16).

As a consequence of this we argue that it is more to the laptop than to forbid. What is at stake is also a sound understanding of the technology-augmented situation, the technology itself and *the expected outcome and opportunities of such a situation, such as acquired digital competencies*. As expressed by Young who quotes a teacher at the Loyola Marymount University who argue for the necessity that teachers adapt their practice to the lecture situation: “*The laptop isn’t the problem, it’s teachers who refuse to engage students well enough and who don’t set proper boundaries as to what is and isn’t acceptable behavior in their classroom*” (Young (2006, p. 27).

To nuance this debate about the pros and cons of mobile technology in educational practices this paper argue that laptoping is a complex and multi-dimensional practice in itself that must be explored in *order to understand the alignment between laptoping and the educational practice*. Laptop-focus during a lecture cannot be assumed to be good or bad for the students’ personal learning experience. It has to be explored if and in what situations it is supporting or distracting from learning. The question, whether the laptop is a support for or a threat against the educational practice, is not a simple question of either or. The research question is consequently: *What characterizes laptoping within an educational practice, such as a lecture, from a student perspective?*

The empirical focus of this paper is students’ everyday use of laptops in a Swedish IT-university milieu. The university educates in information technology related programs and courses, and has incorporated laptop use as a natural part of the learning habitat. During four years (2003 to present) the first author has conducted ethnographical fieldwork, including participant as well as non-participant observations and interviews among students performing everyday activities at the department. The main focus has been on the laptopers everyday life at the university. The first author has followed them during situations such as lectures, group work, lunch etc. in order to study the use related to different situations. Our delimitation in this article is *the lecture*, and this we refer to as an educational practice, a practice with a great deal of historical heritage as well as other expectations from students as well as lecturers. We argue that this more or less institutionalized practice may be seen as separate from the individual students’ learning situation, during a lecture. While the lecture as such, and its related activities, is shared among lecturers and students, there is always an individual learning situation for each student. This situation is affected by the use of laptops. It is developed differently in various situations depending on the role the laptop may take during a certain activity. The laptop, with its different applications and possibilities, its mobile character and of being connected to the Internet through wireless networks, can create a multitude of learning situations for each individual student. In this paper we analyze how this can be understood as different forms of involvement in relation to different learning situations. Thus, this article does not deal with the actual learning outcome or long term consequences of the additional cognitive load that the laptop may introduce onto the student. It is what the student say and do and its relationship towards the content of a certain lecture that is in focus.

The next section gives an overview of related research within the field of laptop use and learning environments. This is followed by the theoretical framework that will guide our view of the relationship between the students involvement and the educational practice. A section on methodology follows, introducing the ethnographical fieldwork and how the study was conducted. The Results are organized around different kinds of involvement, where each section describes a transcript from the fieldwork and puts it into context. In the Discussion the transcripts are related to the concept of alignment in order to understand the complexity of how involvements are aligned in educational practices.

2. Related research

The first attempts from universities to provide laptops to students may be traced back to 1988 at Drew University (Gardner, 2004). The research within this area has primarily focused on three aspects: (i) the administration and organization of introducing laptops ranging from how to handle finances the importance of use policy’s (e.g. Elliott & Hall, 2002; Gardner, 2004; Kalbert & Rosner, 2003), (ii) if and how the laptop increase the students learning (e.g. Fried, 2008; McVay et al., 2005; Prescod & Dong, 2006) and (iii) the actual use practice of the laptops and effects on the university practice (e.g. Barak, Lipson, & Lerman, 2006; Fisher et al., 2004; Fried, 2008; Kotz & Essien, 2002; Thomas & Nishida, 1998), to mention a few. Despite the long tradition, only a few articles provide insights into the everyday use and effects of laptops, since quite many articles focus on the perceived usefulness of laptops investigated through surveys or other primarily quantitative representations (Demb, Erickson, & Hawkins-Wilding, 2004; Fisher et al., 2004; Kotz & Essien, 2002; Prescod & Dong, 2006; Wolff, 2006).

Findings relating to laptop use in the classroom suggests that students do appreciate the laptop and find it useful, especially for taking notes and undisturbing communication with class-mates. The student also has to take more responsibility of her own learning, even in class. The teacher giving a lecture i.e. “The sage on the stage” becomes even more questionable with laptop equipped students (Thomas & Nishida, 1998). Moreover, the laptop attracts attention in several ways: flashing battery indicators, fans, the vertical alignment of the screen (compared to paper-notebooks), pop-up windows, chat-messages etc. (Fried, 2008; Thomas & Nishida, 1998). After studying lectures where no integration or consideration of the laptops had been made, Fried (2008) suggests that, if the teacher does not integrate the laptops into the lecture, it is better to forbid the laptops since they will disturb more than they will enhance the students grades. The following quote “*Recently there has been a call for . . . research done in “real classes” and those not specifically tailored to laptop use. . .*” suggests that there is a need for further discussions on which role the laptop is to play (Fried, 2008. p. 3).

The discussion about the laptops’ role relates to Elliott and Hall (2002) who provides a set of seven guidelines – or challenges – that have emerged when integrating laptops into the classroom. Especially two of the guidelines relates to this work: 1. Knowing when and how to use the laptop in the classroom and 4. Managing a more interactive classroom which allows students direct access to the instructor, other students and external resources. Thus, they suggest it is the availability of other students and external resources such as the web related services that may lead to inappropriate use, or to quote Elliot & Hall “*In-class activities must be monitored closely to ensure students stay on task when using the laptop during class time*” (Elliott & Hall, 2002, p. 64). As the final sentence of Fried (2008, p. 7) suggests: “*I believe*

students, faculty, and administrators need to find ways to promote the appropriate use of laptops while simultaneously reducing the negative impacts of inappropriate use”.

It is however unclear what Elliott and Hall (2002) and Fried (2008) consider to be appropriate and inappropriate use respectively. Is it taking the eyes from the lecturer, taking and sharing notes, or checking for additional material on Wikipedia? The discussion around inappropriateness reveals a view of the student and the lecture as an arena primarily for teacher monologs where students should pay attention, rather than an arena for a more complex learning agenda where the boundaries between the classroom activities and the learning situation can be blurred. There is a need for research to separate the means from the end, to separate an activity from its content, thus to distinguish between surfing Wikipedia for entertaining movie clips or for lecture-related pages. If recent research has judged the media, the activity and the focus on the laptop as such as inappropriate, this study looks at the students' purpose of a certain activity – how they are involved – and asks how it may contribute to the students learning.

3. Theory

In order to actually understand the alignment between the laptop and the educational practice, and its role in the social interaction, we use a framework developed by Ervin Goffman. It is used as an analytical lens to conceptualize the empirical material from a social interactional perspective. Here Goffman's classic conceptualization of *involvement* is used to investigate how the students divide their attention between different activities competing for attention. Goffman's notes on unfocused interaction and especially the framework on involvement have notably been used within sociology and Discourse Analysis (DA) (Jones & Rodney, 2004; Stéphane Tonnelat, 2007; Williams, 2007; Tholander, 2003). Also, some of these studies are directed towards educational settings or IT (Christine Rosen, 2004; Jones, 2004; Tholander, 2003; Wasson, 2006; Williams, 2007), which made it possible to transfer them methodologically to our empirical setting.

In his much referenced work on unfocused interaction Goffman introduces the notion of involvement to differentiate between the different engagements within a situation. As noted by Jones (2004) it helps to separate the figure from the ground, to separate different activities and their relationship towards, in this case, the lecture. Goffman names the center of a situation's engagement in an activity the *dominant involvement*. This is the kind of involvement that deals with what type of activity that by convention is considered to be the core activity by the present people in a particular situation (Goffman, 1963). Thus, the convention is the norm, practice or custom associated with a given situation historically and culturally developed by the present people. The notion of involvement can therefore be loosely tied to Symbolic Interactionism's concept “Definition of the Situation” (Charon, 2007; Thomas, 1923) which refers to how a person constantly strives to define the situation she is into be able to act accordingly.

The dominant involvement is distinguished from the *subordinate involvements*. The latter refers to a situation to which an individual is dividing his or her attention for a short while (Stéphane Tonnelat, 2007). Since this study takes place at a university it is convenient to take an example from a similar setting in order to exemplify what is meant by involvements and especially dominant involvements. Imagine a lecture, the lecturer is standing in front of the class giving his talk about a certain subject, what is commonly referred to as the Sage on the Stage. The lecture itself is here the dominant involvement. With this follows expectations on the student to pay attention, listen and occasionally ask questions. Under normal conditions in the Swedish university practice, it is not accepted to sleep, read a newspaper or have too intense communication with the other students, during such a classic lecture (for different cultural expectations related to sleep, see Williams, 2007). Of course, numerous variants of lectures exists, but going back to the Introduction and the “either or debate”, or the quote about the “real classes” it seems that it is the classic lecture that is in focus (Fried, 2008 p. 3).

While concentrating on the lecture, a student may still be able to draw doodles in a notebook without being regarded as somebody who is not focused on the lecture. She will also, from time-to-time direct her attention towards other activities, taking notes or checking her calendar, for instance. Such activities are considered to be *subordinate involvements* (Christine Rosen, 2004; Tholander, 2003; Wasson, 2006). According to Goffman, subordinate involvements are characterized by activities that are carried out in a muted fashion and only for so long her complete attention is not required for the dominant involvement. The definition of dominant and subordinate involvement and the relationship between them, are always dependent on an understanding of the circumstances and will differ between various contexts. Both also have a direct temporal relationship as they may differ from moment to moment.

During normal conditions the situations dominant involvement is also equal to what Goffman calls the individual's *main involvement* (Wasson, 2006; Williams, 2007). The main involvement is the involvement that the individual is focusing most of her attention on, which typically is the dominant involvement of the situation. However Goffman also discuss *sub involvements as a threat* to the individual's focus on the dominant involvement. Thus, there is always a risk of turning the sub involvement into the individuals main involvement, which is then detached from the dominant involvement.

A subordinate involvement can therefore take the form of a main involvement for that person (or group of persons) and will compete with the dominant involvement. From the teacher's point of view that is exactly what happens when the student's focus on their laptops during a lecture, as expressed in the introduction. According to Goffman it is therefore understandable that sub involvements are seen as *threats* to the dominant involvement.

The article will thus analyze these different forms of involvement from the perspective of *how the laptop align with the educational practice*. By introducing alignment we emphasize on how laptop activities are dividing a student's focus between more or less lecture related activities. As we will see it is not the case that the laptop either supports learning or disturbs it, it may support learning at different levels.

4. Methodology

This study applies ethnographic methods, i.e. an ethnographic perspective on the empirical material (Anderson, 1997; Clifford & Marcus, 1986; Forsythe, 1999; Van Maanen, 1988). The research has been ongoing during four years, studying laptop use among students at an IT-university. The presented excerpts are taken from the first author's written field notes and interviews with students. The ethnography was conducted from five main perspectives: (i) through interviews with the students; (ii) covert observations in the open shared areas at the university; (iii) as a teacher conducting lectures and seminars; (iv) as an observer during lectures held by others; (v) and through two

workshops testing the findings. The teaching experience consisted of lecturing over a ten-week period for three consecutive years. This course gave a good opportunity to get a close view of the students' group work but was also complemented with covert observations of other teacher's lectures. While the teacher perspective is interesting and important, this article focuses on the students' learning situation. 16 persons have been interviewed within a total of 10 interviews at the IT-university, (seven female students and nine male). Out of these, two were group interviews. The interviews were semi-structured, open ended and in-depth (McCracken, 1989). Being semi-structured the interviews were more like a conversation or dialog than an question–answer interview, as suggested by Patton (1990). Below follows examples of questions asked during the interviews:

- What is it like to have the laptop during lectures?
- What role does the laptop play for you during a lecture?
- In what ways do you communicate within the class?
- Do you use Instant Messaging and who are on your contact list?
- What type of information do the messages sent during lectures contain?
- Did you take notes during lectures before you started to bring the laptop?
- What does it mean for you to be in a lecture with laptops all around?

Besides the observations accounted for above, at least ten weeks per year during the four years of study have been spent at the university, resulting in approximately 1200 h of observation. These observations have been done in the open shared café-like areas as well as in classrooms and group rooms.

4.1. Analytical strategy

The analytical work was done in five steps. The first step involved the choice of empirical setting, methodology and data material collection through interviews and observations and the accompanied transcription.

The second step involved selecting the framework of Involvement. The framework was seen as appropriate due to its focus on situated interaction which is also central in the empirical material. But the most important reason to choose the framework was its focus on individual's synchronous ongoing interactions in a particular situation. Thus, it is not the students' test results or the laptops role from an organizational perspective that is of interest.

The third step involved selection of suitable empirical material. The research described in the Section 2 puts much emphasis on the lecture. Because the lecture create quite clear delimiter in time and space it was determined a suitable situation for analysis even though the empirical material reaches beyond this. The three criteria's used to select and analyze the material was:

- The interaction should occur during a lecture.
- It should include interaction with the laptop as well as with the lecturer, other students and other artifacts such as newspapers and note books.
- It was considered important to note the lecturers and other students reactions towards notable activities.

The fourth step was to discern different kinds of involvements in the material, e.g. dominant involvement and different alignments of the interactions, and to try to distinguish and understand how aligned versus unaligned activities affected the learning situation. This basic categorization worked as a point of departure for further analytical work. These criteria were followed in order to analyze the empirical material:

- What constitutes the dominant involvement in the studied setting?
- How do the present persons acknowledge this involvement?
- What are the accepted activities within this dominant involvement?
- What other activities are observable without direct connection to the dominant involvement?

In the fifth and final step we combined the findings from the related research and the theory based empirical analysis and found five areas, five characteristics of laptoping supported either by the alignment framework and empirical material or by related research and the empirical material. These five characteristics are presented in the Section 6.

5. Results

The result section is structured around the two overarching involvements, the dominant and the subordinate. Each involvement is represented by a group of related observations that deal with each involvement's alignment and serve as base for further discussion. Under each involvement, interview quotes and observational excerpts are presented together with a short analysis. These excerpts from observations and interviews give examples of a typical alignments and as such representing the larger body of observations gathered over four years.

5.1. The studied setting

The milieu of the IT-university is open and café-like with small tables and chairs, water and coffee machines. The open areas are next to group rooms and more traditional classrooms. Lunchrooms, coffee machines, printers and the open areas are shared between staff and the students. All the students at the university are encouraged to use a laptop for conducting their studies, and most students have a laptop. The laptops are equipped with wireless LAN capabilities. The wireless network is available on all four floors of the building. Only a small minority of the students – and some specialized courses – uses computer labs. Instead, the students collaborate in the café-like milieu,

much like in [Picture 1](#). During lectures most of the students put their laptop on the desk in front of them ready to use. Sometimes the lectures are designed to let the laptop play an active role based on a pedagogical goal, but more often it is left to the student to invent an appropriate use of the laptop during a lecture (see [Picture 2](#)).

In general the students use their computer for all sorts of activities, also after school hours. This opens up for use in other settings than the university, most obviously in the students' home. The avid use of computers in class is something that some lecturers find threatening and frustrating, while some considers it a resource in their lectures.

5.2. The dominant involvement

The dominant involvement treats what the student and teachers regard as appropriate behavior in a given situations, in this case, the lecture. The most obvious main involvement in the lecture situation, as also expressed by the students, is simply to listen to what the lecturer is lecturing about, asking questions and taking notes on paper, as expressed in this excerpt below taken from a group interview with three females in their mid twenties.

Interviewer: What is it like to have the laptop during lectures?

P2: There is a rather big risk that you do something else then listening to the lecturer, that's obvious.

P3: But I think that's good, because if you, if you don't have to, well if you listen you do that because you need to even if you have a laptop or not, and if you don't want to listen, you don't have to, nobody will notice and you don't have to be bored. . .

P1: I'm listening most of the time, I feel that if I take the time to go here and if its not totally meaningless, it can be a bit boring at times, but most often there is a point, so I want to listen.

In this excerpt we interpret the students talk around "listening to the lecturer" as a way to express what one ought to do during a lecture, i.e. listening to the lecturer is part of the dominant involvement. P1 states that one attends a lecture in order to listen and P3 states she thinks it is all right to deviate from the involvement if the lecture is "boring" and the laptop offers possibilities for the student to "stay out of boredom". Still, by referring to the situation in this way she expresses a view of this kind of laptop use as conflicting with a "proper" understanding of what constitutes a dominant involvement during a lecture.

In another interview a student argues that the laptop has become like a second self. The effect of losing the possibility to interact with the laptop is like loosing a bit of oneself:

R1: It's a bit awkward, you've become used to check things, to write a lot of things down, it has become the normal situation, you expect it to be there.



Picture 1. Students while doing group work.



Picture 2. Students and teachers during a lecture.

Taking this account into consideration there is reason to believe that what is accepted behavior during a lecture is about to change. What he refers to is not only the laptop as a tool to write things down during a lecture but also the laptop as something that is available during groupwork at home as well as during lectures. From his perspective, it is not the laptops existence that is disturbing, it is its non-existence, when it's not available.

From the students perspective the use of laptops may be aligned with the dominant involvement, i.e. increase the value of the lecture from a learning perspective but there is always a risk of being drawn into cyberspace. If viewed critically and based on what the students say, one may argue that the dominant involvements relation to laptoping is pragmatic, thus, it is not accepted to use the laptop if it disturbs the lecturer, and the student should stay out of the browser if they can not control themselves, but it may be approved if the student is bored and is already familiar with the subject at hand.

5.3. Subordinate involvements

A subordinate involvement during a lecture is an activity that draws attention from the dominant involvement, even tiny amounts of attention, for a short period of time, as defined in this study. With this view subordinate involvements may be everything from taking notes, surfing the web to ask another student a question.

Many situations were documented when students were taking notes on their laptop. This also included visiting remote services for individual use such as Wikipedia for additional material on the lecture subject. Here Wikipedia was used as a way to get additional information to contextualize what was said during lectures. Another approach was to utilize the web, and Wikipedia in particular, to be able to inform the discussion in the classroom and to ask knowledgeable questions. The reason for this sometimes seemed to be based on an honest interest in the topic, and sometimes as an expression of a will to "sound smart" or to test the lecturer. It has also been expressed by the students that when they browse the web for content relating to the lecture, the intention is not to read it during the lecture but to bookmark it for later reference. As we see in the quote below from an interview with a student, note taking was an important aspect of bringing the laptop to class:

Before I took notes with paper and pen, I wrote down all sorts of things. Later at home I thought it would be neat to have those notes digitally. Since then I have written my notes in Word. As soon as they say something of interest, I write it down, and it's searchable. And [it's good] that you can communicate it with others in the classroom, and to ask about things you don't understand or didn't hear. You don't have to ask aloud and in that way act rude towards the lecturer.

While first having taken notes with paper and pen this student experienced a qualitative enhancement when moving over to a digital environment on his laptop. The laptop became a resource used to capture thoughts and ideas, to inform oneself and not to disturb the lecture. Activities on the laptop support both immediate needs and creates opportunities for future use of the information created during class. Digital data cannot only be stored, it can also be shared, communicated, and recontextualized. Thus, they may also be shared directly during the lecture between students, i.e. they may support local interaction within the present group. In the quote below, from an interview with a group of six students, similar aspects are expressed:

Anna: Sometimes we have exchanged illustrations or drawings of what have been written on the whiteboard, drawing takes time, I know it was a drawing that Christoffer made the other day, and then I sent a message over ICQ, if I could have it.

Lisa: That's what we talked about before, about glancing at the others screens!

Anna: Then, great I got the drawing, I don't have to do it my self.

Laptop use during lectures creates a practice Lisa adequately names *glancing*. Glancing has equivalence in the analogue world. Sneak peeking on a nearby sitting student's notes has several implications for learning. It is a way to easily gather notes if one is lacking concentration. But it can also be seen as a way to make sense of what is going on: if the others are taking similar notes I can't be wrong. Glancing with a laptop makes it possible to elaborate on this practice, which Anna realizes when she refers the situation where Christoffer made a quick drawing.

Laptop supported communication between students may happen both during lectures and group work, most often through Instant Messaging (IM). The communication may be with a student in the same classroom or with students outside of the local university context in remote communication. The presented excerpts below are characterized by communication between students regarding matters relating to the educational practice.

During a rather informal lecture, with only five students, where we [first author] talked about systems development methods, one of the students said he had a friend who used "something called scum, or something". The first author encouraged him to immediately send an e-mail to this friend and ask him what he thought about it. This friend, who was working at an international game developer in UK, responded just before the end of the lecture with a short text about his thoughts on Scrum and a link to Wikipedia.

In this situation the lecturer and the student brought the laptop into the discourse of the lecture by acknowledging the student and the laptop as a hybrid (i.e. the laptop and the functionality of the IM software) and using this hybrid to network and gain knowledge of the subject matter in question. Hence, the dominant involvement, is in this situation renegotiated between the students and the lecturer. The student also went outside of the immediate situation and communicated remotely in order enhance the educational practice.

The observation below addresses a similar point:

A guest lecturer from an IT-consultancy is giving a presentation on how to create and show a relation between the interaction design and the business effect through various activities and documents. Afterwards a student said that this was the most interesting guest lecture so far and the class seemed very pleased. Still it was obvious that some of the students focused on the screen rather than following what was said. A few minutes after the lecture, when some of the students were asked questions about this particular event, they explained what was going on, on the screens. When the guest lecturer talked about her company and the customer where the screen shots from the current example came from, some of the students, still interested in what was said, surfed to these actual sites. One of the students also looked up what wikipedia.org had to say on some of the topics that came up during the lecture (Personas). She then sent the URL of the Wikipedia page to three other students, her project members, in the classroom through her instant messenger.

An important point here is how several flows of information converge to one focal point addressing what is going on in the classroom and relates to what the lecturer says. This behavior has been observed on many occasions. When asked about it, the students often point out the importance of finding the material on the web while they have the lecture subject in their mind. One perspective is the possibility to backtrack activities using url-history, bookmarks, IM-history etc. for later use and be able to relate it back to the actual context of the lecture. As a consequence of this the lecturers sometimes expressed uncertainty about the students laptop activity. In the normal situation the lecturer can not know if the students lapping are targeted towards the dominant involvement or not, since the content of their screens is not available to the lecturer.

5.4. The threat of the subordinate involvement

When the subordinate involvement takes over and becomes the main involvement for a particular student, the dominating involvement and the main involvement is no longer equal, for that particular student, if they ever were. The student has turned, either inwards to the realms of daydreaming or, as in the following examples, into the laptop and its tempting services. A subordinate involvement is always threatening the focus on the dominating activity (Goffman, 1963). Both YouTube and Wikipedia may draw the students attention away from the lecture to such an extent that they loose connection, which have had this effect for some students:

P1: Then, it's so hard, it disturbs, I directly loose focus if I start surfing or does something else, then I'm gone, I have to watch myself.

Something else might be Instant Messaging since it is quite often used during class for different reasons and often the students comment upon this *spreading effect*. Using the laptop to create social awareness within the group does not necessarily have to interfere with the educational practice. Even if communication may concern things like the color of the lecturer's shoes or a very amusing web site that is popular at the moment, it could be argued that this communication supports the students as a community, but more from a social perspective than pedagogical. Thus, the communication supports community strength rather than the educational practice, as in the quote below, from a group interview with four persons where the students discuss a previous communication during a lecture:

R4: Absolutely, an example of this happened at a lecture we had a couple of weeks ago. It was so boring, and then there were this new game, something with penguins'. At the end of the lecture the whole class was playing. One started and. . .

R3: Except Mario who was watching Jack Ass instead.

R4: If you got an ICQ-message and the lecture was boring, you followed the link that was often present in the message. And then you look around yourself and see that everyone is surfing.

The communication through ICQ went from being a temporary subordinate involvement into a main involvement without connection to the lecture. This may be a result of several activities, such as informal communication (whispering), glancing at others screens and through the use of instant messaging technologies.

6. Discussion

In the introduction, we argued for the importance of developing a nuanced view of how to understand the laptop in use – lapping – during lectures. Laptop use tend to be ubiquitous and therefore it becomes difficult to separate “bad use” from “good use” in relation to the educational practice, as it is traditionally understood. In order to develop an analysis of different kinds of laptop use, we took a starting point in Goffman's reasoning on different types of involvements. What we saw was a number of different uses of the laptop, depending on the situation and the user. In the proceeding discussion we will analyze these different forms of involvement from the perspective of *how the lapper align with the educational practice*. With alignment we focus on how laptop activities are dividing a student's focus between different more or less lecture related activities. As we will see it is not the case that the laptop either supports learning or disturbs it, it may support learning at different levels.

6.1. Alignment

In this section we will describe different subordinate involvements to nuance the role of mobile technology in this practice. Each involvement will be analyzed by how it aligns to the lecture by its means or goals and its relation the dominant involvement. By doing this we try to achieve a way to distinguish between different involvements without judging if they are appropriate or not (compare the discussion in Fried, 2008; McVay et al., 2005; Young, 2006).

While the different forms of involvements show the use complexity it also shows how the alignment between the lapper and the educational practice varies between what the student is currently doing with the laptop and what is expected from a student during a lecture. By using the notion of alignment we want to show how subordinate involvements at times are not related to the lecture i.e. not aligned to the dominant involvement, and at times are aligned with learning, since the activities still relates to acquiring new knowledge about the subject matter. Some students express themselves regarding the lecture, from our perspective, in a quite narrow way. For them, as seen in the result section, it is about listening to the lecture and to ask and answer questions. The students activities are thus limited to taking notes about the lecture and other minor activities since, as they say, they are afraid of loosing focus of the lecture and disturb it.

6.2. The aligned subordinate involvement

There is an uncertainty among the students about what activities are considered appropriate within a lecture. Still, a number of activities are performed on a regular basis, during lectures that, according to the students, primarily align towards the personal learning situation. Examples of such activities are:

- Surfing Wikis, searching for articles relevant for the actual lecture for later use.
- Sharing URL:s and articles with other students.
- Taking lecture notes.
- Sharing lecture notes and drawings of the white board content between students.
- Asking other students questions regarding the lecture via Instant Messaging.

These activities take away focus from the lecturer but may still support the students own learning situation as presented in the Result section. By actively engaging with the content of the lecture directly, while it happens, the students have a richer set of artifacts to analyze after the lecture. Still, from the lecturers perspective, it may be somewhat disturbing not to know what the activities behind the screens are about. Especially, if there has not been a preceding discussion on the role of the laptop within the classroom. But, according to the last excerpt in the Result section, it is also disturbing for the students to not have the laptop available as they are used to. The students' argument that the laptop may help to stay out of boredom during a bad lecture could be compared to a hostage situation where the laptop comes to rescue.

6.3. *The unaligned subordinate involvement*

Through glancing and Instant Messaging during lectures the students create common activities such as sending amusing videos and giving comments to each other. The purpose is to entertain but it also tightens the bonds between the students. This subordinate involvement is aligned towards community entertainment rather than learning as in the previous example. Through glancing supported by the vertical screens, Instant Messaging and other activities for sharing information and creating shared repertoires of awareness, such patterns spread quickly within the class. We like to call this *the laptops spreading effect*, an effect that may be triggered when a group of laptops are located within a small area and with eye contact.

As said, the laptop can easily make the student loose track of the lecture. As described, such unaligned subordinate involvements during a lecture may be online gaming or surfing news. They are unaligned towards learning, thus they threatens the more or less shared understanding of what is acceptable behavior within the current situation. Instead of an alignment towards learning, such activities are aligned towards entertainment for themselves and for the other present persons.

So contrary to what P3 says in the first series of interview quotes in the Result section, somebody will notice, since the screen is visible to others. The spreading effect and the activity of glancing makes it even more important to discuss what is competent laptoping. What Fried (2008) calls inappropriate use we interpret as unaligned subordinate involvement. She calls for ways to promote appropriate use which we will get back to in the section Characterizing the Laptop.

6.4. *The personal learning situation*

By using the notion of alignment, it becomes evident that there are activities reaching away from what is going on in the lecture room *but still are aligned with the students more personal learning situation*.

As stated by the students, the dominant involvement of a lecture is primarily to listen to the teacher and focus upon the lecturing which also can include asking questions or reflecting upon questions posed by the lecturer. The laptop typically has a passive role or is not used at all. This type of behavior can be understood as acting in line with the dominant involvement, as it does not distract from, question or challenge it but rather strengthen what the situation "is about" according to both teachers and students. But if we look closer at the different activities that we say support the learning situation, the laptop is anything but passive. The notion of involvement has been of importance to separate the individual students learning situation from the other subordinate activities. This is important because it offers a way to understand certain "unfocused" activities as being a part of learning from the students point of view. Unlike some previous studies (Fried, 2008; Young, 2006), we do not necessarily understand such activities as being unaligned with the educational practice. In such an involvement, the laptop takes an important role in order to support the student in sharing and taking notes, searching for documents, chatting about the lecture subject etc. From a teacher perspective it may be frustrating to see the student focusing on the laptop rather than the lecture. But as we have shown it does not necessarily mean that the students are not focused on learning. As expressed in the result-section, the students follow up hunches and associations, which steam from the lecture. This indicates that it becomes easier to form ones own learning situation with the laptop than without (Jones, 2004 shares similar results in computer-mediated communication studies).

The notion of involvement has also contributed to highlight the students constant switch between different subordinate involvements and the dominant involvement. That students multitask while using laptops is not a novel contribution, but to be able to show how the laptop in that way contributes to the individual learning situation, is. Additionally, it is not a specific medium or service that is to blame for unfocused students. On the contrary, every service whether it is the web, Instant Messaging or e-mail, are used both for entertainment and learning-related activities (Fried, 2008; Mangan, 2001). Thus, while the hardware itself with its vertical screen, flashing indicators of various sorts and movement on the screen may disturb (Fried, 2008) the services in themselves may be aligned either way.

Even though this article focus on the lecture and leaves the "before" and "after" the lecture outside the study, it becomes evident that the portability of the laptop affects the use during the lecture. The surfing, messaging and note taking during lectures are activities that primarily support situations that have not yet occurred. As expressed by the students they strive to keep their notes digital and surf during lectures in order to create a digital trace available in forthcoming situations. The learning situation from the students perspective does not end with the lecture, it continues during group work and home work. The laptop may thus act like a glue or medium that ties different learning situations together (Lindroth & Bergquist, 2008).

6.5. *Alignment between the laptop and the educational practice*

Students possibilities to escape the lecture by entering a state of "mental absence" was not invented by the advent of laptops during lectures, but it becomes even more obvious when students face the laptop more than the lecturer. Still, as expressed by the students, some

of them acknowledge an increased risk of losing oneself into cyberspace. This echoes the findings presented in the Section 2; those faculties implementing laptop programs also need to establish strategies on how to handle “inappropriate use” (Fried, 2008).

Based on our findings above regarding the causes of unaligned activities we argue that it can not be the lecturers role to act as a police or judge in order to discriminate between so called appropriate and inappropriate laptop use since it is not the service in itself that is the problem, rather what it is used for, its purpose, or in our words its alignment. Instead it becomes important to introduce a strategy to nurture the students own responsibility for their laptop related activities. Without a proper understanding of the pros and cons with laptoping during lectures we cannot expect the students to act competent. But with such a responsibility as seen in the result the students are quite quick to utilize different services from a personal learning perspective. We mention a few like Instant Messenger, Wikis and MS Word. To integrate these services and tools more actively and thus foster a practice where the subordinate involvements are cultivated and enhanced, and thereby aligned towards learning and the dominant involvement, is a topic for future research.

In the strive for a strategy regarding laptoping during lectures it evidently becomes central to focus on and discuss the individual students and lecturers handling of their own learning situation. The empirical experience from a laptop environment and of laptops during lectures, tells us that that the dialog with the students needs to be continuous and that the lecturer has to reflect over not being in focus all of the time even if it may be frustrating not to know what is actually on the students screens. With a strategy in place, the lecturer may feel more secure about the actual content on the screens. Without such a strategy the unaligned activities may attract both the student and lecturers attention and result in a misunderstanding of the laptops potential.

6.6. Characterizing the Lapter

When introducing and accepting laptops into the lecture it is naïve to believe that the educational practice as well as the learning situation will be unaffected. To be able to cope with this change a sound understanding of the role and characteristics of the laptop is important, which also has been the purpose of this paper. Five important characteristics from the discussion is highlighted below:

- *The students responsibility for their learning situation increases*, the lecturers role as a judge of what is appropriate activities and not may be questioned when each student develops their own learning situation. Rather the faculty should design for a learning culture where all the laptop related activities share the goal to enhance students learning. This design process needs to be explicit, spelled out and communicated maybe as a “laptop etiquette” in order to create the “right” mindset for students and educators. In interviews student ask for this type of etiquette.
- *Rudimentary digital skills of social and annotation services* such as turning IM-clients into Do Not Disturb-mode, close the e-mail client and software's with no connection to the lecture may seem trivial but an important part in keeping distraction under control. But more importantly knowledge about how to use wikis, mind mapping software or online forums is becoming part of the digital competence that we expect of students.
- *The learning situation extends beyond the educational practice* where the laptop acts as a glue between the different situations. Activities during a lecture may seem irrelevant for the lecture but may be important for post-lecture activities. Bringing the laptop between situations for an extended period of time increases its potential as an important learning artifact.
- *The lecturer as the main focus of the lecture attracts competition* from other students and various web-resources. But by making use of the competition and integrating it into the lecture opens up, according to our experience, for more engaged and involved students. In order to make this successful it is central to design a learning culture that integrates the lapteres and makes them part of the design process.
- *Physical factors regarding the laptop attracts attention*. The sound from fans, blinking, the vertical alignment of the screen etc. that needs to be addressed from a manufacturer standpoint (Fried, 2008). But it is also an interesting subject to investigate further, how student act in order to minimize the effect in the classroom. While not related to digital competencies from a student perspective it is an interesting and important design question on how to design for minimal disturbance.

Based on this we argue that the laptop should not be treated as either good or bad within a educational practice or even during a lecture. On the contrary, it is rather about what we use it for and our expectations on the situation that determines its effect and if such activities are aligned with the present view of the situation. Such knowledge we view as important parts of a digital competence.

7. Conclusion

This article has dealt with the use of laptop computer in an educational practice and how the discussion about laptops during lectures, in recent studies have focused more on students attitudes towards the laptop rather than studies of actual practice. We set out to nuance the debate by giving empirical examples of use patterns, from lecturers at a Swedish IT-University. By applying Goffman's framework on involvement we have broadened the picture, showing how surfing, chatting and other activities may or may not be aligned to the dominant involvement, depending on the content of interaction. Finally we suggested five general characteristics that are likely to apply to educational practices involving laptops. While these general characteristics of laptoping may emerge in many settings where the laptop is present, each educational practice needs to re-negotiate the main involvement and come to its own conclusion about what is competent laptoping during different stages of a lecture.

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