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Entangled Devices

An ethnographic study of students, mobile phones and capitalism

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Graffiti wall at Laukontori, Tampere, November 2018

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Abstract

This ethnographic research looks at the ways in which mobile phones are present in the school life of upper-secondary school students. The research analyses the affects phones have on the spatiality and power relation of school. The research has been undertaken as part of *Textmöten* research project and draws from ethnographic data produced in two Finnish upper-secondary schools during 2015-2016. The research consists of three peer-reviewed articles and a 94-page summary.

The three articles of the dissertation examine the connections of school and mobile phones from different perspectives. The first article analyses the historically ambivalent relationship between school and technology, including the fact that technology in school seldom works in anticipated ways. The difference between many earlier technologies and mobile phones is that this time students are the ones bringing them to school. The second article analyses how phones are present during lessons, how different apps are used and what phones mean to young people. The conclusion is that phones have become a familiar presence during lessons in the research schools. Both the amounts of phone use and the ways the phones are used vary among the students but phones were used significantly throughout the research. In interviews, students emphasized the importance of the phones. They signified independence, adulthood and a space of one's own. On the other hand, students mentioned the occasionally laborious nature of phones which had to do with a constant stream of messages and notifications. The third article focuses on one particular lesson in order to examine the multi-faceted character of phones and the connections they enable. Phones foster new agencies and bring opportunities for re-evaluating school spaces and power relations. However, at the same time they offer commercial actors a way into the classroom and give them a foothold in school.

The research engages Gilles Deleuze and Félix Guattari's concept of *assemblage* to analyse the social and political connections of technology. Mobile phones are approached as part of a wider context. The research takes advantage of the concepts of platform capitalism and digital labour. Contemporary mobile devices are used mainly through platforms owned by global corporations such as Google, Facebook, Microsoft or Apple. Platforms connect individual user activity onto a database controlled by the platform owner. As data is today a pivotal economic factor, enterprises seek to collect as much data as possible. Schools are some of

the most interesting sites for data extraction for technology companies. This is why we are seeing so many actively seeking to enter school spaces in which the presence of commercial actors has so far been tightly controlled. The research asks: are large technology companies quietly gaining a foothold in school spaces through mobile phones without a political debate on the issue?

Keywords: school, technology, phones, mobile devices, capitalism, assemblage, platform capitalism, digitalisation

Antti Paakkari

Mitä puhelimet koulussa tekevät?

Etnografinen tutkimus oppilaiden, mobiililaitteiden ja kapitalismin yhteenkietoutumista

Tiivistelmä

Tämä väitöskirja tarkastelee puhelinten läsnäoloa lukiolaisten kouluarjessa. Tutkimuksessa analysoidaan, miten puhelimet muuttavat luokkahuoneen tilaa ja valtasuhteita sekä koulun yhteyksiä talouteen. Väitöskirja on tehty osana *Textmöten*-tutkimusprojektia ja pohjautuu kahdessa suomalaisessa lukiossa vuosina 2015–2016 tuotettuun etnografiseen aineistoon. Tutkimus koostuu kolmesta vertaisarvioidusta artikkelista ja 94-sivuisesta yhteenveto-osasta.

Väitöskirjan kolme artikkelia tarkastelevat koulun ja kännyköiden yhteyksiä eri näkökulmista. Ensimmäinen artikkeli tutkii teknologian ja koulun historiallisesti ristiriitaista suhdetta ja sitä, ettei teknologia useinkaan toimi koulussa odotetulla tavalla. Monista aiemmista teknologioista kännykät eroavat siinä, että oppilaat tuovat ne kouluun itse. Väitöskirjan toinen osatutkimus tarkastelee puhelinten läsnäoloa oppitunneilla, eri sovellusten käyttöä ja laitteiden merkitystä nuorille. Se toteaa, että puhelinten läsnäolo on tutkimuskouluissa vakiintunut osaksi oppituntien kulkua. Niin puhelinten käytön määrä kuin käyttötavatkin vaihtelevat oppilaiden kesken, mutta tutkimuksessa puhelimet olivat käytössä merkittävän osan oppitunneista. Haastatteluissa oppilaat korostivat puhelinten tärkeyttä ja ne edustivat itsenäisyyttä, aikuisuutta sekä omaa tilaa. Toisaalta mainittiin käytön ajoittainen työläys joka liittyi jatkuvaan viesti- ja ilmoitusvirtaan. Kolmannessa artikkelissa pohditaan puhelinten ja muiden digitaalisten laitteiden moniulotteisuutta ja niiden avaamia kytkentöjä tarkastelemalla yhtä oppituntia. Samalla kun kännyköiden kautta rakentuu uusia toimijuuksia ja mahdollisuuksia kyseenalaistaa koulun tilaa ja valtasuhteita, markkinatoimijat pääsevät luokkahuoneeseen ja saavat puhelinten kautta jalansijaa koulussa.

Tutkimus soveltaa Gilles Deleuzen ja Félix Guattarin kehittämää *sommitelman* käsitettä ja tarkastelee sen avulla teknologian yhteiskunnallisia kytkentöjä. Kännyköitä lähestytään osana laajempaa kokonaisuutta. Erityisesti tutkimuksessa kiinnitetään huomiota alustakapitalismin ja digitaalisen työn käsitteisiin. Laitteiden käyttö tapahtuu nykyään pääosin Googlen, Facebookin, Microsoftin tai Applen kaltaisten suuryritysten omistamilla alustoilla, joilla yksittäisen käyttäjän toiminta liitetään osaksi yrityksen hallussa olevaa tietokantaa. Koska data on tänä päivänä keskeinen kilpailuetu, yritykset pyrkivät hankkimaan sitä mahdollisimman paljon. Koulu on yrityksille eräs kiinnostavimmista datan keruun paikoista ja

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Avainsanat: koulu, teknologia, puhelimet, mobiililaitteet, kapitalismi, sommitelma, alustakapitalismi, digitalisaatio

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1 Introduction

The entangled histories of school and technology stretch back a long way. In essence, they are filled with conflicts: with stories of high expectations and surprising failures. Mobile phones have been studied for nearly 30 years. Today, research on mobile phones focuses on for example didactic solutions and digital learning, the psychological and neurological effects of phone use, and the social and societal effects of phones. A particular turn took place around 2012 as mobile internet became widely available. This changes the role of phones in school significantly.

This research suggests a different focus. I argue that mobile phones must be researched as part of wider, entangled contexts. Furthermore, it could even be said that phones question the very idea of context: as capitalism expands to cover all grounds of life and all parts of the globe, mobile technologies operate by surpassing contexts, embracing de-contextualisation. Contexts dissolve and blend into each other. This is why mobile phones in school bring so many other elements into play. This research is built on the notion that phone use does not take place in a vacuum. In fact, extensive focus on individual phone use may conceal the fact that individuality is built in relation to society, economy and environment. This is also what this research suggests: while talking about schools, young people and technology, we should also talk about things and actors complexly entangled with them. These are things such as history, politics, economy, enterprises, capitalism, childhood, youth, learning and power.

This is a story of entanglements, as stories of contemporary worlds often are. In this story, the central elements are schools, mobile phones, young people, capitalism, children's agencies, the roles of technologies in contemporary economies, and power apparatuses. By mapping out the ways in which mobile phones figure in school lives of 16-18-year old upper secondary school students in two Finnish towns, I examine the connected lives many of us are living.

Phones are there in the classrooms, in schools, in corridors and bags, in pockets. They have slipped in to the lives of young people quite seamlessly and the schools often do not mind. The ideas of the digi-leap, digitalization of learning and digital natives are welcomed as belonging to the world of a new generation. What interests me, and what is less accounted for in research and popular understandings, is what else comes along with the phones. As technologies they come with baggage, with existing and potential entanglements. In school this takes place within the societal institution of the school that has its particular traditions and settled ways. Thus, this is a story of unfoldings in this particular setting, connecting new things to each other.

As the ways of generating economic profit change, the society is restructured. Factories move around the globe and disappear from the parts of the world where this story takes place. In the place of run-down city neighborhoods flourish new restaurants, work spaces and coffee houses. These serve as vehicles for a new kind of a platform capitalism where products are not only things but moods, ideas, images and trends. These are things that people generate and publish voluntarily and willingly, without always getting paid. Digital platforms provide means for appropriation and help to capture the value that is produced. On students' phones, these platforms have also entered the school.

While not the focus of the story, the provocative question of why tech does not work in school can set the story of this research in motion. Changes in capitalism and modes of production are reflected in the technologies and tools we use. In a Foucauldian sense they are also entangled with varying techniques of power. As school operates in conjunction with both the capitalist economy and techniques of power, the aforementioned changes manifest as conflicts between schools and technology. Techniques of power that operate according to the logic Deleuze describes as control clash and overlap with traditional disciplinary power mechanisms of schooling. Similarly, Fordist modes of capitalist production clash with post-Fordist, such as digital labour and platform capitalism. Therefore, the conflict between school and technology puts in play also the conflicts between different techniques of power and the conflicts between different modes of production. As this research looks at singular events taking place in school and its everyday intersections with technology, it situates them in the wider contexts of capitalist production and power techniques.

Research journey

Empirically this study is based on a three-year ethnographic research in two Finnish upper secondary schools, during 2014-2016. The data production has been carried out as part of a research project that enquired into the use of mobile devices in upper secondary schools. The project gathered researchers with various interests. Some focused on interactions and the changing ways of reading and writing, others on the wider implications of mobile devices in schools. My approach has been guided by an interest in how capitalism affects and frames the lives of those living in 2010s Scandinavian societies. This interest leads me to look at things like power mechanisms, agencies, or routes of economic value formation. In my view, what starts out as something seemingly small-scale and micro-level (students using mobile phones in school) has an intricate and nowadays practically immediate connection to large-scale global phenomena (such as inequality, Anthropocene or the accumulation of wealth). Some of these connections have existed for a long time, some have emerged only recently. In my view research in our everyday lives has both a chance and an obligation to engage with this interconnectedness. The

observations I present here will, in the tradition of qualitative and ethnographic research, be particular and non-generalizable.

The way in which this research is conducted and how the story is told begins from the insights of Anna Tsing (2015) as present in her book *Mushroom at the end of the world*. Tsing interrogates the complex ways of intertwined existence on our planet today. Starting from matsutake mushrooms which flourish in indeterminate places around the globe, she builds an analysis of ecosystems damaged by capitalism and multispecies interdependence. The mushrooms bring together industrial forestry, pickers, wholesalers, outlaws, culinarians, cooks, mycologists and border patrols. The process unfolds in patches, as “a mosaic of open-ended assemblages of entangled ways of life, with each further opening into a mosaic of temporal rhythms and spatial arcs.” (Tsing 2015, 4.) This is how Tsing brings together the various phenomena and looks at the way in which they co-exist and constitute each other. Tsing’s approach has inspired me to look at mobile technologies in school in a similar manner. These entanglements are how phenomena unfold. Entanglements are those in which questions lead to more questions and each established connection opens up new ones. As researchers we must be faithful to these connections.

In order to accomplish the Tsing-inspired task of mapping connections between school, labour, capitalism, technology and power, I use a post-structuralist theoretical approach inspired by Michel Foucault, Gilles Deleuze and Félix Guattari. Through an ethnographic methodological lens, I show how what takes place in the classroom is connected to the changes in the modes of production and capital accumulation. In *Mushroom at the end of the world*, Tsing asks how it is possible to study capitalism today – and proposes the following answer:

“[...] by combining close attention to the world, in all its precarity, with questions about how wealth is amassed. How might capitalism look without assuming progress? It might look patchy: *the concentration of wealth is possible because value produced in unplanned patches is appropriated for capital*”. (Tsing 2015, 5. Italics in original.)

Tsing’s approach leads me to look at childhood as an arena where new connections between children and economy are being crafted. In this respect, this study is a story of new areas of life becoming sources of capital accumulation and profit generation. Taking inspiration from Eetu Viren’s and Jussi Vähämäki’s writing on urban economies, I find traces of an emerging form of production some have called *digital labour*. It centers around a re-arrangement of traditional roles of worker and employer in the internet where an increasing amount of productive labour is carried out voluntarily, as Tiziana Terranova (2004) says. Companies seek to build platforms where people can express themselves, build social networks and provide content. The actual content providing is something the users

do voluntarily and for free. The idea of value production where the actual producers are not compensated may appear against our traditional ideas but is actually a persisting facet of capitalism that is constantly negotiating its relationship with what is, in one way or another, on the outskirts and in the peripheries, be it reproductive labour and care (Federici 2014) or non-human production (Tsing 2015).

This brings up the position of the school. It has always had a relationship to productive labour, but traditionally as a place where future labour force is prepared, educated, sorted and selected (Simola 2015). Actual productive labour has not taken place in school. I situate the change that is taking place into the context of post-Fordist capitalist production which has witnessed the proliferation of modes of potentially productive labour. As I will later discuss, labour can today take place almost anywhere and in almost any form. I suggest some of it takes place in school classrooms, in the form of mobile phone use. However, not all mobile phone use is labour – it is also an important social activity where young people build relationships and counter-publics, negotiate with power mechanisms and build agency

1.1 Research questions

My research aim is to approach mobile phone use in school as focal point in which students, technologies and capitalism come together. To this end, I have produced video ethnographic data of students using their phones in school, both during lessons and recesses. In unravelling the knots of this entanglement (Tsing 2015), I am guided by the following research questions:

Question 1: Situating mobile phones into the context of cognitive capitalism, I ask how their presence in school affects the relationships between school and work? This question is answered in articles 1 and 2.

Question 2: Using the concept of digital labour, I ask how mobile phone use in classroom changes the conception of school as a public space. This question is answered primarily in article 2.

Question 3: With the help of Deleuze's concepts of de/re-territorialisation, I ask how mobile phones challenge the prevailing territorialities in a classroom. This question is answered in article 3.

1.2 Analysing contemporary capitalism through assemblages

“There is no difference between what a book talks about and how it is made.”
(Deleuze & Guattari 1987, 4)

The concept of *assemblage* is central to this research. Initially I encountered it in Gilles Deleuze & Félix Guattari’s *Thousand Plateaus* in which they introduce assemblages and their rhizomatic connections as modes of organization that exceed hierarchical and stable arrangements necessary for the disciplinary power Foucault describes. Seeing phenomena as assemblages runs parallel with what Deleuze suggests in his essay *On the post-scripts to the societies of control* (Deleuze 1992). In it, Deleuze analyzes new forms of power that no longer have need for the fixed logics of disciplinary power. Foucault also discusses this shift in his Collège de France lectures of 1977-1978, *Securite, territoire, population*. Many of the elements that Deleuze discusses under the concept of control are also taken up by Foucault who approaches them through techniques of security.

Assemblages are ways of understanding the world and how things organize in it. Deleuze and Guattari introduce assemblages as alternatives to seeing entities as individual and unchanging. Instead of *being* they emphasize *becoming* which takes place in assemblages as entities join others and form composites that are more than the sum of their parts. As Nick Lee writes, Deleuze and Guattari seek to “persuade us to stop asking questions about fixed human nature, to stop seeing life in terms of completion” (2001, 114). Assemblages can be thought of as lines that swirl together for a while and, depending of their degree of consistency, break apart to form other assemblages. As Lee writes, this view “gives us a picture of human life, whether adult or child, as an involvement in multiple becomings” (Lee 2001, 115). Assemblages are not human-centric and Deleuze and Guattari emphasize the fact that humans have always entered into complicated assemblages with non-human actors. Their often-quoted example is the assemblage of human and horse which changes the role of both, giving them new capabilities and duties. When a third element such as a plough joins this assemblage, it has further consequences such as the birth of modern agriculture (Deleuze & Guattari 1987).

The word assemblage is Brian Massumi’s English translation for the French word *agencement* Deleuze and Guattari use in *Thousand Plateaus*. There is an important aspect in the original term that is slightly lost in translation. As Puar (2011) and Wise (2005) point out, *agencement* refers to the coming together of heterogenous elements, not to the result of this coming together. An assemblage is not static but the process of things coming together. In some readings assemblages carry a reference to still life, objects brought together but remaining static. *Agencement* however differs from this in two aspects: firstly, things have not been brought together by an author, an artist or any given subject; and secondly, things

do not remain still. Assemblages are speeds and flows. Entangled in them are contradictory forces pulling in different directions.

Deleuze and Guattari write that we do not know what an assemblage is until we find out what it does (Deleuze & Guattari 1987, 257). In other words, assemblages have no fixed essence and can be known only through their operations. Tsing (2015, 23) defines assemblages as open-ended gatherings that drag political economy inside them and “cannot hide from capital and the state; they are sites for watching how political economy works”. This means above all that economy cannot be separated from the society and examined as a disconnected phenomenon. It is in this vein that I propose that mobile phone use in school should not only be approached as such: it drags other things with it and cannot be separated from them. Only after following the movements within these assemblages can we approximate their effects.

J. Macgregor Wise points to the concept’s possibilities in studying technologies. Wise lays out three possible ways of looking at mobile phones: firstly, seeing humans and phones as separate entities and studying either technological developments or their effects on humans; secondly, seeing technologies as contextual or embedded, in which case the focus is on the embedded practices of using phones and there is no phone use outside of a context; and thirdly, seeing connections between humans and technologies as *articulations* that connect like trailers of a truck (Hall 1986). In the third instance, none of the articulated is a primary subject as each influences the others. And, as Jennifer Slack points out, “the unities forged and broken in this expanded universe are not simply physical objects, such as trucks, but complex connections of elements that are themselves articulations.” (Slack 1989, 331). The central idea is that connections cannot be ‘dis-embedded’ as the idea of embedded practices could suggest. Technologies are not only used in context but are constituted in it (Wise 2005).

As Wise (2005, 84) writes, approaching technologies through assemblages leads us to ask questions like “How has the mobile phone been articulated to particular populations (youth, businesses)? How does the mobile phone articulate to discourses and policies of neoliberalism (stressing individual self-expression)?” Wise suggests that we could perhaps look at mobile phones through the lens of the regime of mobile privatizations. In Raymond Williams’ (1975) analysis, television connected with a societal assemblage that emphasized the private sphere of home. Wise suggests looking at mobile phones through an assemblage “that emphasizes mobility, autonomy, privatization, and individual empowerment through neoliberalism” (2005, 85).

“And so we are not just dealing with an assemblage, but a regime of assemblages, which, in the case of the new form of mobile privatization, includes not only the mobile phone but also the array of self-service or self-check assemblages and many others. But each assemblage is entered into locally: I pick up the mobile phone and flip it open; my body changes

speed, path and consistency; I enter into an assemblage of language, a collective assemblage of enunciation [...] which makes some statements possible and others not.” (Wise 2005, 85-86.)

This research focuses on student-mobile phone-classroom assemblage as an example of intersecting assemblages that can be found in school. I have read phone use in classrooms as an assemblage that mobilizes educational planners, political interest groups, technology advocates, children, teachers, advertisers, marketers, product planners, parents, coderchildren, capitalism, agency, affects, power mechanisms, school curriculums all at once. These enter into multiple assemblages (such as phone manufacturing-capital investments-mineral mining; school privatization-digitalization-platform capitalism). In article 3, while looking at one student using Tumblr on their phone during a lesson, the concept of assemblage helped me to bring together the elements present in the encounter.

I used Deleuze & Guattari’s concepts of de-/and re-territorialisation to look at the movements between assemblages. Phones enter classrooms as assemblages and also create opportunities for deterritorialisation onto other assemblages. In Deleuze & Guattari’s thinking, a deterritorialisation is followed by a reterritorialization. As Viren & Vähämäki (2011, 54) write: “The condition for the expansion and reproduction of the relationship of capital is a constant shifting of boundaries, a continuous deterritorialisation, while the reproduction of capital a societal power relation requires control of free movement, in other words reterritorialization.”

What the assemblage brings is a way to look at heterogenous elements or lines entangled in a situation without assigning a predetermined hierarchy on them. Several lines of deterritorialisation open up in an assemblage then connect with reterritorialisations onto other assemblages.

1.3 Digital labour and platform capitalism

Two further concepts are central to the analysis of capitalism taking place in this thesis. Firstly, this research is situated in what Srnicek (2017) calls *platform capitalism*. This refers to companies that produce network platforms on which user activity takes place. Typically, these companies have few employees but occupy a significant sector of stock market value and profit generation. The platform model has gained traction especially after internet use has moved to mobile devices, with the biggest currently being advertising platforms the likes of Google and Facebook. In addition to advertising platforms, Srnicek lists cloud platforms (Amazon Web Services, Google, Apple, Microsoft); industrial platforms (Siemens, General Electric); product platforms (Spotify, Pandora) and lean platforms (Uber, Airbnb). In platform capitalism user activity takes place on a proprietary platform which means that the platform owner has considerable control over what users can do and that everything they do leaves a data trace. Compared to earlier

forms of capitalism, the companies now have huge amounts of data on their customers. It is this data that has lately become a major source of added value.

After 1990s the changes in capitalism have been approached through many concepts: cognitive capitalism, knowledge capitalism, the attention economy, the sharing economy, the gig economy or the surveillance economy. For the purposes of analysing phone use in school I have turned to Srnicek's notion of platform capitalism which he defines especially through the emergence of a new kind of a raw material: data. (Srnicek 2017, 39). "Simply put, we should consider *data* to be the raw material that must be extracted, and the *activities* of users to be the natural source of this raw material. Just like oil, data are a material to be extracted, refined, and used in a variety of ways. [...] Data have come to serve a number of key capitalist functions: they educate and give competitive advantage to algorithms; they enable the coordination and outsourcing of workers; they allow for the optimisation and flexibility of productive processes; they make possible the transformation of low-margin goods into high-margin services; and data analysis is itself generative of data, in a virtuous cycle." (Srnicek 2017, 40-42).

In other words, in platform capitalism user activity is a source of data which in itself can be used for profit generation. This can happen via advertising as with Google or Facebook, or more indirectly, helping to create new products or enabling the flexibilization of the labor force. The traditional model in which a company sells a product to the consumers does not apply to platforms because the owners of the platforms continue to benefit from user activity on the platform long after the user has purchased the product. The importance of the data gathered through the platform can be seen in the fact that companies commonly offer some of their platforms for free, as is the case with social media platforms (Facebook, Instagram) or some Google services (Gmail), to name a few.

This research uses the concept of platform capitalism to analyse the relationship between mobile devices and young people. The fact that students' phone use in school generates data for commercial platforms raises interesting questions which I will tackle later (in chapter 3.5.). This is also where the concept of *digital labour* comes in. It refers to the value producing activity users engage in while operating in internet. I use the distinction Fuchs and Sevignani (2013) make between digital work (the activity taking place) and digital labour (its valorized part). The question of whether phone use is labour is indeed complex, but in the context of this thesis the following points must be considered. Firstly, user activity clearly produces value for enterprises. It is therefore a value-producing activity – though not labour in the traditional sense since it clearly is not exchanged for a wage. We must then ask whether user activity on mobile devices and social media qualifies as labour at all. One argument is that only the companies who create algorithms and maintain the platforms engage in labour and are duly compensated. The users make a fair exchange where they are given a free platform and in return hand over

their user data. This raises two questions: is user activity voluntary, and how laborious is it? In the light of current research, the answer to the first question is negative as while technically possible, opting out of social media and other platforms is often socially difficult and carries a social cost. Therefore, while not mandatory, it is not completely voluntary either. Regarding the second question, research suggests that users are increasingly seeing mobile device and social media use as quite laborious and time-consuming.

In conclusion, I believe that there are grounds to consider phone use as digital labour. It is certainly a very specific form of labour which is closely connected to platform capitalism. However, the fact alone that this kind of labour is constantly taking place in classrooms makes it both unprecedented and worth detailed study. As the traditional notions of wage, labour or necessary labour time are missing, I will later (chapter 3.6.) suggest analyzing digital labour through Deleuze and Guattari's concept of assemblage.

1.4 Notes on the researcher in the assemblage

A focus on assemblages also entails a re-positioning of the researcher. The research itself constitutes an assemblage in which the histories and connections of the researcher play a part. This particular research and the questions I raise have a connection to my background. In order to situate myself I want to briefly focus on the ways in which this project was born. Though one of my first academic efforts was a small research paper me and my friend Kari wrote together on mobile phone related news coverage, mobile devices have not been especially significant in my life. Coincidentally, it is not through them but through the idea of independent school work that I entered into this research.

After studying sociology and literature I worked as a Finnish teacher in secondary and upper secondary schools. There Foucault's research on techniques of power lead me to look at school as a site of specific power relations (Ball 2013; Ojakangas 1998). Initially I wanted to research power relations in school and the production of an entrepreneurial subjectivity (Mononen-Batista Costa & Brunila 2016). Guided by Foucault, I hypothesized that subjectifying practices are dispersed throughout the whole institutional fabric, instead of being localized inside any given subject or learning content. This made it difficult to know where to start. Eventually the interest in power relations and subjectification would lead me towards Deleuze and capitalism. I went searching for students' independent work as I figured it would be a skill that would have to be emphasized as working life was rapidly changing and the ability to guide oneself was becoming central. However, what I ran into was the prevalence of phones and their significance especially as a site for students' own time and individual work.

As I was approaching school as a part of societal power structures, in other words as a place tasked with creating, preparing and choosing future work force

for the benefit of an industrial capitalist society, I became intensely interested in the matrix of power relations playing out in the micro-level of everyday school life. For Foucault, power does not operate through grand gestures. Power relations play out in everyday interactions and are present in the technologies we use. New communication technologies entering the classroom affect the power relations and processes of subjectivation: the technologies we use also produce and subjectify us, we become subjects with and through technologies. Looking deeper into phone use, it seemed they had a potential for questioning the power relations inside school, the relations between school and its outside, and also the relations between school and labour. Phone use both brought young people to an area that was outside school control and where things like digital labour took place; and brought something foreign inside the school which as a disciplinary institution had been so strict about its own boundaries. Here it was faced with something it clearly could not control but perhaps it also did not fully wish to do so – after all we were dealing with a central part of future labour skills the school was meant to pass on.

2 Mobile phones and the technologisation of school

In order to look at the role of mobile devices in school, we must first go back a few steps and ask questions about both the histories of technology and school in Finland. This chapter begins with a brief look at the history of mobile technologies and earlier research on them and an exploration on the various themes that have recently been engaged in research. This helps to situate my work in the context of contemporary research. From here, I move to look at the specific intersections of technology and school which, as we can later see, have a special relationship.

Prelude: School as a technology

Technology is experienced in an assemblage. It cannot be separated from its connections. Borrowing a notion from Vinciane Despret (2012), we could say that we approach technology as humans-with-technology (Tammi 2019, Hohti & Tammi 2019, Rautio 2017, Haraway 2016). Technology proposes things to those who engage with it, guiding their actions, movements and connections. In fact, school is also a particular kind of technology as sociology of education has shown. In the works of Simola (2015), Rinne et al (1984) or Ball (2013) we can see the ways in which schooling connects with societal structures, the needs of the labour market and local histories. From a technological point of view, school groups children according to their age and home address, guides their movements and body postures through architecture and furniture design (Burke & Grosvenor 2008), suggests certain acceptable modes of interaction ("raise hand to speak") and distinguishes them from the unacceptable ("leave class if bored") through a system of rewards, punishments and repetitions. Eventually it produces a sorting of students, graded according to their compatibility with school hardware and ideology, and given certificates with varying power of purchase in the outside world. From the point of view of mobile technologies, many of their operating protocols address the same issues in a different manner. They too connect with the needs of the labour market and capitalist production, arrange users and grant turns of interaction. They too suggest movements and postures though in a different manner informed by the movements of close acquaintances, advertising or fastest routes with least traffic.

Through this thought experiment we can approach the curious historical fact that schools and technologies have been, throughout the decades, considered a good match for each other. As researchers have documented time and time again, however, these unions have not turned out as they were meant to be (Cuban 2001; Selwyn 2011). Typical issues include: a technology is supposed to transform

school and gets widely adopted, but hardly anything changes (blackboard); a technology is considered a good match for school but its use is plagued by minor technical difficulties which considerably harm its everyday usefulness (tv and video); a technology has the potential to radically transform learning, however its everyday use is reduced to online quizzes and classroom votes (tablets); a technology is available to almost everyone and is said to make learning more efficient, but ends up being mostly used for leisure activities (mobile phone).

In the following, I take a look at the troubled history of school and technology. I propose that, as Hannu Simola (Simola et al 2017) suggests, the endurance and stability of school is often underestimated. There exists a fundamental disconnection between the well laid-out plans of the school developers and technology advocates and the everyday reality of the school that has been constructed through more than a hundred years of tradition and repetition.

2.1 How technology works in schools ... and how this goes against official expectations

Neil Selwyn (2011) suggests that one of the reasons for why technology and school have been considered such a good match lies in seeing schooling as the dispersion of knowledge. Many events in the history of technological development have shared this aim: the printing press, radio, television, photocopiers all made spreading information easier and were seen as things that would help school towards its natural goals. However, as previous research has shown, the relationship between school and technology has been complex (Selwyn 2011; Cuban 2001). Technological innovations are seen as a natural fit for school and brought in with the intention of solving pedagogical and educational issues. Within this framework, technologies are presented as apolitical and interest-free solutions that can help schools out of deadlocks caused by societal problems such as inequality (Brunila 2009). However, a relevant question is whether technologies have ever entered the school in the form that was imagined; and how often they actually have the intended consequences (Selwyn 2011).

Depending on the viewpoint, the effect technology has on school can be positive or negative. Technology can be something that saves the school or its final downfall. This dilemma is again apparent today as digital technologies are presented as tools for solving schools' current problems. At the same time, technologies can also be seen as the culprit behind worsening reading skills (Selwyn 2011). In the history of schooling, many technological inventions have been seen as fundamentally transforming the whole institution, starting from the blackboard. In 1841, the introduction of the blackboard into the classrooms was seen as a threshold moment for schools (Selwyn 2011). A familiar loop of hype, hope and disappointment has followed the 20th century's pivotal technologies like the movie, radio, television or computers (Cuban 2001).

Increasing digitalisation and the growing presence of various digital technologies in everyday school life has been seen widely in the European context (Bradbury 2018; Thompson & Sellar 2018). In Finland, adoption of digital technologies is presented as a key to maintaining the PISA success the education system has enjoyed in the last decade. Digitalisation is described in terms befitting a force of nature, as something that is inevitable and nearly impossible to resist (Saari & Sääntti 2017). This, as Greenfield (2017) remarks, is often a feature of technological discussion: any conversation about the futures we seek are reframed as choices between varying levels of technological development.

A typical conflict appears between technology how technology should be used and how it actually is used (Paakkari 2015). Often research has pointed to the unwillingness of students in adopting new technologies. In this sense mobile phones could perhaps be different: student adoption is not an issue in their case. There might still be other limits, for example the perceived uses teachers and students have for the phones. Or, as Jabari Mahiri (2011, quoted in Selwyn 2011, 24) puts it, if we cannot find a place for digital media in school, they will take the place of school entirely. Technology seems to act as a catalyst that brings up central themes about schooling. Supporting technology adoption with the argument of it producing better learning forces us to ask what we mean by learning and how do we define the purpose of the school. If learning is only the simple distribution of knowledge, technologies may well be a key point but in that case the internet would also present the biggest change in learning that has ever taken place and few seem to agree on this.

2.2 Hidden curriculum and the role of technology in school today

Technology in school is often positioned on a no man's land between inadequate attempts at making learning technology part of students' and teachers' everyday practice, and the distracting use of students' own technologies. Talking about technology leads us to other questions, such as what do we consider by learning? In the following, I break down some of the impasses of tech speech in school context by using the concept of hidden curriculum as a heuristic device. Repositioning the question of what we actually learn in school makes it possible to also reconsider the role of the phones in school.

Theorists of *hidden curriculum* propose that in order to understand school it has to be approached as part of the society. As Jackson (1990) points out, first and foremost schools seem to teach patience, waiting and an artificial periodization of time. These things that cannot be found in the curriculum but which nevertheless form the basis of everyday routines and practices are called the hidden curriculum. In this line of thought, school teaches through its power mechanisms and the ways in which it organizes student lives. As Rinne (1986) writes, schools operate

through the idea of implied individualism, creating the illusion that people operating in schools are free to study, teach and perform other actions without the interference of class, gender, ethnicity or sexuality. Hidden curriculum hints that it would be mistaken to think that school somehow fails to achieve the official goals assigned to it in the curriculum. As Antikainen, Rinne & Koski (2006, 229) write, “the purpose of the school institution might not necessarily be to make people creative and independent or to develop each personality in complex ways, but to instead guide and force students into the societal hierarchies of the divisions of power and labour”. In the everyday life of schools, societal structures that reach far beyond the school are constantly in play (Broady 1986; Willis 1978). From this perspective the use of technology gains new steam. The presence of digital devices in classrooms may teach us many things even if their ‘educational’ benefit is under debate.

A recent discussion in a large Finnish newspaper (Malmberg 2018; Saavalainen 2018) probed the advantages and disadvantages of digitalization in school. This brought out a number of interesting insights, the most prominent being that digitalization was detrimental to learning outcomes. Two important questions must be asked: what is the digitalization discussed here and how are learning outcomes defined? Simply changing these two variables has a great impact on the results. Regarding the first question, during my research it has seemed that digitalization takes many forms in school, the two main ones being the government-led top-down digitalization and the mostly student-initiated bringing of own devices into school (sometimes called BYOD). These two have very different consequences. The increasing reliance on BYOD may potentially entwine students’ lives ever more closely with capitalist value production. For me, digitalization and the entangling of students’ personal lives, user identities and data into global financial digital economy companies are two different things altogether. The former does not necessarily demand the latter, only if we so decide.

Regarding the second point, the question of learning outcomes is long-debated. For a sociologist, one of the most important questions is: what do we mean by learning? Often the focus is on formal learning contents. However, as we have seen, the theory of hidden curriculum suggests otherwise. If we adopt this approach we must also look at the question of what we learn in a different manner: from the perspective of hidden curriculum, what digitalization teaches us is an ever-growing intimacy with corporate actors; increasing difficulty to shield our personal data and identity, and an incentive to share our actions to others in the net.

Lately we have seen the multiplication of actors on the educational field. In Finland schooling has traditionally been considered something that the public sector takes care of and private actors have not been favorably looked upon (Simola, Kauko, Varjo, Kalalahti & Sahlström 2017). The rapid technologisation of recent years has brought many global enterprises to this field, such as Microsoft, Apple

or Google. In addition to these companies building computers, tablets and mobile phones that students and teachers use, they also directly offer study materials or evaluation tools for the schools. In collaboration with university researchers, Microsoft has published a tool helping teachers to evaluate their teaching (Microsoft 2017). From 2016 to 2018, a university teacher training field school carried the title of an Apple Distinguished School for its innovative use of technology (UEF 2016). Therefore any discussion on educational spaces must today account for the increasing number of technological actors. With these technologies the Finnish school space is being increasingly divided into blocks governed by different enterprises and the influence of companies like Microsoft or Google is growing. With the discussion on digitalisation being mostly concerned on the advancement of the 'digital leap', these phenomena have not yet been widely discussed on the level of education policy.

It must be noted that the technologisation of education takes place on many fronts and is not a monolith. The task for research is to account for the diverse ways in which the processes unfold. In the Finnish case, three main approaches should be pointed out. The first approach is the top-heavy approach Microsoft has chosen where it co-operates with the administration and the schools and seeks to drive programs that introduce AI or AR into schools. Microsoft has also targeted teachers and schools with platforms that promise more efficient administration and course planning. Of individual companies, it probably has the longest history and closest collaboration with Finnish educational authorities. The second approach is a grassroots-level integration of technologies into classrooms. The most obvious example of this is Google and the ways in which its platforms and apps such as Google Classroom, Google Drive, Gmail and Google Docs have been taken into everyday use in many classrooms. While Google also co-operates with schools and educational authorities, its success builds largely on the fact that its apps are familiar and already present on student devices. Google offers tools that are considered relatively safe and easy to use and since finding better alternatives often demands time and effort, this is seen as a good compromise. The third approach can be seen in the large number of small private enterprises seeking to enter the market. They offer promises of more efficient learning, making teachers' lives easier or bringing publicity to the efforts of Finnish teachers. The field of new entrepreneurs is still fragmented and it is difficult to predict their success. (Selwyn 2016).

At the moment, much depends on political decisions and whether society decides to interfere in the marketization of schools in a more determined way. All three groups offer a challenging but extremely interesting field for research. Because of the relative local autonomy of educational authorities (Varjo & Kalalahti 2019), municipalities have contacts with different enterprises and through different channels. Some of the information falls under market confidentiality and is

not available for researchers. Contacts between administration and market operators – be it on an individual school, municipal or national level – emerge through personal connections and are hard to trace in a systematic manner. Some interesting research is already taking place (Seppänen, Lempinen, Nivanaho, Kiesi & Thrupp in process; Mertala 2017) but more is needed.

What we can learn from hidden curriculum is that significant things are taking place even when plans are ostensibly failing. In order to thoroughly analyse the role of technologies in school we must look both at the everyday practices in which they become part of school and the long-term plans and aspirations of technologizing education. In analysing technologies in school through the lens of hidden curriculum, a good starting point is looking at technologies as actors with its specific intentions. They are not neutral and outside of societal relations, power relations and political aspirations. As they gain an increasingly stable foothold in schools, it is all the more important to ask what they are doing and whose goals they are advancing.

It is worth considering the idea of hidden curriculum together with the idea of *contaminations* that Tsing (2015) uses to highlight the entangled character of contemporary capitalism (see also Paakkari & Rautio 2018). Both concepts emphasize that technical issues are never just that. The ways in which things are problematized and technologies brought in as solutions to these problems have both intended and unintended consequences. Both can change school greatly. Where hidden curriculum puts more emphasis on the intended but unsaid consequences, contaminations focus on the unintended. As a tool for analysis, I will return to the concept in chapter 3.6.

Interlude: Mobile phones and nation-building

In the Finnish imaginary, mobile phones arrived at the scene towards the end of the 1980s. A particularly iconic image was the leader of the Soviet Union, Michael Gorbachev, being handed a Nokia phone on his visit to Finland. At the end of the 1980s the emergence of the phones coincided with an economic boom and they became associated with yuppies, young and rich, openly capitalist and entrepreneurial types. Still, mobile phones were regarded as something of a curiosity and very few people used them. I remember my uncle having one and the excitement of seeing him get into his car at the summer house and drive a few hundred meters up the hill to reach a spot where he could find a signal and request a call from the operator. During the 1990s phones became smaller and cheaper and by the mid-1990s were no longer a curiosity. This was also when first research on mobile phones started coming out. Seeing an adult with a phone became more common but they were still a rarity for young people. Mobile phones were used for serious stuff, for conveying important messages through speech. In addition to phone call functions, they typically had a small screen, one or two games, and the possibility

of sending SMS text messages. However, SMSs were expensive and the amount you sent each month had to be carefully monitored. I got my first phone in 1997. It was my dad's old Nokia 2110 with a small screen and a pull-out antenna. I was 20, and it was an important marker of adulthood.

By the beginning of the 21st century mobile technologies had established themselves as a research topic. In the Finnish society phones were a signal of something bigger and at the center of the project of globalization (Ruckenstein 2010). Nokia was an old Finnish company that expanded into mobile technologies (Kuisma 2010). This foray into a new technology during the 1980s gave it a head start when the phone sector really started taking off, also coinciding with Finnish economy trying to deal with the collapse of the Soviet Union and the following recession. Unexpectedly, mobile phones emerged as an area where a Finnish company was one of the biggest in the world. From the end of the 1990s until its sale to Microsoft in 2014, Nokia was a key factor in all discussions on mobile technologies and their consequences in Finland. When talking about phones, you were also talking about Nokia. And when talking about Nokia, you were talking about the country's biggest tax payer and the company Finns were known for and proud around the world. This was perhaps why the discussion on technology was mostly neutral or positive. Eeva Berglund has called Finland a curiously technophile country (Berglund 2007, cited in Ruckenstein 2010). One of the reasons may be that during the last two or three decades a large part of the discussions around technology were tied to Nokia, a company that had lifted Finland from the depression and paved an innovative future that promised something else than a continued dependence on the mutual trade between Finland and Soviet Union. Later, the company returned to the ground as its inability to listen to critical voices eventually caused stagnation and over-confidence that opened the way for competitors like Apple or Samsung. (Vuori & Nguyen Huy 2018; Doz & Wilson 2017.)

The story of technology as the unifier and economic savior of a small country searching for its place between East and West was culturally pervasive. Technology did play a central, while perhaps not exceptional, role in the Finnish self-imagery after the 1990s (see Kuisma 2010). Many small countries have built up their self-image through technological advancement. In Finland, this narrative helped to gloss over many of the inequalities that formed the backbone of the IT industry. As Marja Vehviläinen (2009; Vehviläinen & Brunila 2007) shows, from early on the story of technology in Finland was built on a gendered narrative where almost all the important actors were men. They held the vast majority of ICT jobs and dominated ICT imagery.

2.3 Mobile generations, changing socialities and societies

The beginnings of sociological mobile phone research are in the early 1990s and therefore coincide with the era when technology industry was replacing forestry

as the driver of Finnish economy. Phones were regarded as intriguing new technical artefacts that entered Finnish everyday lives with surprising ease. One of the first sociological endeavors was a 1993 article by Roos entitled “300 000 yuppies? Mobile telephones in Finland” (Roos 1993). Reading these early texts now suggests a curiosity in which the phones also have a larger role to play. During the 1990s, asking questions about mobile technologies is asking “what will life be like in this new technologically oriented Finland?” Phones are symbols of a new, more open and connected existence, coinciding temporally with Finland actively positioning itself as a European country, becoming a member of the European Union and moving away from its long-standing connections with former Soviet Union.

From the very beginning, it was presumed that mobile communications had a profound effect on sociality. The ways in which mobile phones changed social interactions was a reoccurring theme in research. Consequently, this meant that research took place in settings where many people were present. Places that were urban or had young people in them became favored research locations. Though phones were initially a thing for adults, one of the focus points of early research was their roles in the lives of young people. Mobile technologies seemed to carry a transformative potential that bought along a new way of life. Mobile phones were not a neutral addition to existing lifestyles but something that ushered in a new era and had potential for building new subjectivities. This called for new concepts, sometimes even a re-definition of what the human species, as Kasesniemi (2003, 41) suggested: “Mobile phone generation, mobile teens, the mobile generation, or even *Homo Mobilis*, the moving and communicating human”. Phones had the paradoxical twin characteristic of being both something that intuitively slotted into people’s lives and something that carried a potential for radically transforming them. Throughout the years – these tensions are still visible almost 30 years later – phones have been seen as both intuitively easy to use and carrying the potential to disrupting our everyday ways of being.

Young people growing up in a changing technological landscape were the ones to feel its effects first-hand. This seemed to make them ideal research participants providing a lens through which adults could see themselves. The question of “what is technology doing to us?” was easiest to answer by looking young people’s lives growing up with the same technologies. Another common approach in early phone research focused on the public use of phones that questioned prevailing norms of public and private. Phones were considered a nuisance because they enabled people to publicly talk about private matters (Mäenpää 2005). In Finland, where people were typically granted a lot of personal space in everyday interaction, this was almost scandalous. Tram etiquette was the subject of an intense debate: where trams used to be places for silent reflection, they were suddenly full of people sharing private matters over the phone. For many years using phones in public betrayed a lack of manners (Kopomaa 2000). Phones also had other effects on public life. As Kopomaa (2000) and Mäenpää (2005) write, phones changed

sociality and the experience of urban spatiality. Kopomaa entitled his 2000 book *The city in your pocket*, referring to social relations being reachable by the phone. This idea also shows an interesting definition of urban space as something that is not merely physical but an entanglement of social relations, psychological affects and physical structures. Mäenpää wrote about new spatialities that emerged as phones gave a possibility for a situationist-inspired *derivée*. You did not have to plan routes in advance but only trust that the phone and its contacts would take you to where you wanted to go. The phones were making spaces more immediate and unpredictable.

Traditional critiques had suggested that technologies disrupt the connection between humans and their surroundings, separating them from social contexts. This atomizing effect was seen already with portable music players. However, as Callon and Law (2004) pointed out, technologies also connected users to other spaces and the network-like connections music created (Mäenpää 2005). Listening to music was not a passive act but active creation of new spaces. In a similar vein, phones were sometimes seen as threats to urban space since they untied users from traditional sociality. There were also other concerns: phones over-emphasizing individuality; causing addiction and a compulsive need to talk; leading people to interact with machines instead of living beings; and making people incapable of living in quiet harmony with themselves (Mäenpää 2005). However, interviewing phone users and observing the role of phones in urban environments, Mäenpää noticed that instead of separating and atomizing phones seemed to connect users intimately to urban spaces. Phones were used to contact the people physically closest to you, they were instruments for coordinating movement in urban spaces and for facilitating unexpected encounters (Mäenpää 2005). Face-to-face contacts did not seem to disappear but to proliferate. Life events took place with the people one wanted to share them with, and phones intensified the feeling of life as something that was lived together with others (Mäenpää 2005).

In *Mobile messages: Young people and a new communications culture*, a 1997-1999 research project on how young people use mobile phones Kasesniemi et al (2003) were surprised by school attitudes towards technology: from early on, Finnish schools seemed to have a reasonably positive attitude towards phones. This follows from several factors: from the emphasis on young people's relative autonomy compared to many countries and the role of phones as devices of this autonomy; and on the other hand, the relatively positive attitudes towards technology and especially mobile phones as 'Finnish innovations'. The young people of late 1990s are already labeled a "mobile phone generation". As new consumer technology inventions were introduced in quick succession, the generation gap also signaled a technology gap – each new generation grew up with technologies that were foreign to the previous generation.

Phones mattered both as physical objects and as containers of a social value. Kasesniemi points out how the outward appearance of the phone was very significant in early 2000s. Students had multiple covers on their phones so they could change the look daily, and many also hand-painted the covers. Then, on the other hand:

“Knowing the price of the model is not enough to pin down the phone’s social value. On the contrary, the value would seem to be increasingly defined by the content of the mobile – its mind and soul, so to speak. A large selection of interesting text messages, hundreds of names and numbers stored in the memory and a unique text displayed on the screen add to the social value of the handset.” (Kasesniemi 2003, 47).

Today the outward appearance of the phones seems less significant, though some of the students in our research did change their phone covers or add small chains or pearls to their phones. Lately, the phones have largely begun to resemble one another. They are all thin rectangle-shaped objects that are mostly display on the other side and have a camera lens on the other. Content-wise, the possibility of storing your user profile in cloud and activating it on another phone in just a few minutes has perhaps decreased the individuality of the phones as objects. If you lose or break the particular device you are using, it is easy to activate the same content on another device. In this sense the social value of the device is still very important, but the connection between the social value and a particular physical object has loosened. Even the best and most expensive phone can be replaced with a similar object without losing the social value associated with the content in the phone.

In Finland, mobile phones emerged in a particular intersection that combined local and historical peculiarities, making them part of a Finnish nation-building process. Phones were symbols of more than just progress and communication: they signaled being in the frontline of technological development, modernization, becoming a part of the West and finding a new national identity. Added to this was the paradoxical nature of communication in a famously reserved and quiet Finnish culture, as if people finally wanted to speak out but did not really know how. Mobile phones emerged as a national project which still seemed possible in the beginning of the 1990s. Their brief history also shows how local stories gradually become global and their entanglements impossible to control. The fate of Nokia corporation is symptomatic in this regard: it emerged and flourished as a Finnish enterprise but eventually failed, was sold off and disappeared as a brand. In recent years the construction of Nokia has restarted, but now its entanglements are much more visible, making it consequently harder to regard it as a nation-building exercise. The name Nokia is owned by a company that sells it off to another company that makes builds phones in China. Even the Nokia brand of today is a testament to the entangled character of mobile devices of today.

An interesting question is how Nokia's position in the Finnish society was reflected in the research. As mentioned, many of the research projects on mobile devices took advantage of enterprise co-operation and Nokia was a common partner (Finnable 2020). It is worth asking how research has taken part in the Finnish nation-building project. When the phone acts as a symbol of a more open and connected existence, there is a danger that critical research can be marginalized. The search for new forms of sociality and urban living is perhaps more appreciated by funders than the uncovering of political or economic aspects of phone manufacturing and usage. In this sense the withdrawal of Nokia as a powerful corporate force in the Finnish society may lend researchers more room to tell other kinds of stories.

2.4 Current themes in phone research

As the novelty of mobile communications has worn off, studies have focused on more specific topics. There is no longer a single mobile communications technology and research has tended to focus on technologies in various contexts. Critical voices have gained prominence especially during the last decade of mobile communications research. If the early critique sometimes tended towards a conservative agenda, lately sociological critique has focused on technologies and their wider societal effects – the origins, ideologies, material resources behind the technical devices. A more psychological line of inquiry has also emerged and focused on the unwanted effects technologies have on their users.

Phones, safe spaces and counterpublics

The empowering aspects of mobile communications have been an interesting area of research and many have looked at the role of technologies in building communities and civil movements on grass-roots level. Mobile technologies are entwined with so many contemporary human activities that it is difficult to name an area with no connection to them. Intersecting with criticisms towards mobile technologies, anthropologists and feminist technology researchers have shown that phones may have groundbreaking effects for their users. In their research on an Indian slum, Tacchi and Chandola (2015) show how women used phones in a way that enabled them to escape the control of their families or repressive gendered practices. Mobile phones and social media can help users to build safe spaces and counterpublics, and have been important for feminist, LGBT and queer communities (Kanai 2017; Renninger 2015; Rentschler & Thrift 2015). Sometimes creating space for these counterpublics requires special effort, as technologies reflect the values and privileges of their creators – who still today are largely affluent white men (Paakkari & Rautio 2018; Greenfield 2017; Crawford 2016; Vehviläinen 2009). Users experience this through norms and limitations preventing

self-expression. In these situations, many find creative ways of circumventing the limitations posed by technology. Kanai (2016) examines how users engage and reframe offensive imagery by editing and circulating images. Hart (2015) looks at how young people find spaces for intimacy online, creating spaces for the parts of young people's lives that adults wish to keep hidden. Maloney, Roberts and Caruso look at how masculinities are performed and constructed in online gaming (Maloney, Roberts & Caruso 2017). Mobile technologies may also help in creating spaces where things like the society's gaze and norms towards bodies may be discussed and challenged (Fardouly, Willburger & Vartanian 2018). Locatelli (2017) shows how users subvert normative online community rules through carefully considered practices. Through a postcolonial lens, Amit S. Rai (2012) approaches phones as an element "in a series of struggles over the force, sense, and value of forms of domesticity, ethnicity, religion, age, media consumption, money, reputation, status, motherhood, work, migrancy, and translation." (Rai 2012, 5) Rai shows how phones may provide possibilities for the subaltern and overturn the relations of dominant communication.

In school, mobile technologies may help to challenge prevailing power structures. Leigh Kelly (2018) looks at the ways in which black girls develop counterpublics and strategies for critical resistance through Snapchat and Twitter. Mobile technologies may give young people a chance to question the discourses and practices dominant in their school life. Aaen and Dalsgaard (2016) look at how Facebook groups may function as a third space, between the public classroom and private personal space, in which to discuss issues that would otherwise be hard to bring up (Aaen & Dalsgaard 2016). Kupiainen (2013, 37) writes about how young people's use of their own media makes physical school boundaries permeable and creates new unofficial school spaces. While in the traditional sense of learning new technologies have remained relatively unused, Kupiainen notes the significance of them creating an unofficial space that teachers have only limited control over (2011, 40; see also Richardson 2014). Kupiainen also looks at the idea of *digital natives* that was introduced by Mark Prensky (2001). The idea held that children who grow up with mobile technologies also learn to use them almost automatically. This idea has been subject to many criticisms – one of which is that technologies are always entangled with structures of the society and form of power (Deleuze 1990). To just leave them as they are only serves to cement the power structures already in place. As Kupiainen (2013) points out, this has occasionally become an issue in schools since teachers were liable think that students learned to use new technologies and contents by default and there would be no need to teach them. Often teachers also lacked the necessary skills since technological knowledges expired so rapidly.

On the other hand, a prevalent area of research has been technology as a didactic solution and as a way of fostering learning improvement. Learning Bridges-project (Kumpulainen et al 2010) is one example that has worked on extending

learning environments beyond traditional school boundaries. Lipponen, Rajala and Hilppö (2014) have written interestingly on the possibilities of enhancing and experimenting with school spatialities and temporalities. For teachers, these create new opportunities for building agencies and inventing with Freirean and other critical pedagogies (Paakkari 2011b; Paakkari 2015b).

Mobile technologies, surveillance and big data

As many researchers emphasise, the contexts and platforms in and through which we engage with technology happens matter a great deal. Often the situation is skewed from the beginning as it is mostly western affluent men that are in charge of creating the infrastructures (Vehviläinen 2009). Tacchi, Kitner & Crawford (2012) emphasize that mobile technologies are always part of a context, and things like labour relations, kinships and gendered practices can make an enormous difference in how they are used. Technologies should not be looked as singular catalysts but as parts of a larger network. The potential hazards of always-online mobile communication have really come into focus after 2015. As Facebook has stumbled from one privacy scandal to another, the questions concerning privacy and other shortcomings are being addressed to the whole industry.

One area of focus has been the collection and tracking of user data. Mobile technologies make it possible to track user locations and turn the resulting data into profit. Often there is no meaningful way to opt out of location tracking. Even as apps are now required to ask for permissions for data gathering, they may not function properly if the permission is withheld. Or, as documented in several cases, the app may say that it only gathers information to increase its functionality and to enable better recommendations with location tracking, but leave out the fact that it also sells the information it has gathered. (Valentino-DeVries et al 2018.) In school context, the surveillance aspect has been discussed in relation to the increased datafication of education. (Lupton & Williamson 2017; Selwyn 2015; Roberts-Holmes 2015.) As more and more data about student and teacher performance is constructed, many have questioned the presumptions behind these data-collection models and their long-term consequences. Bradbury (2018) shows how increased data gathering produces ‘data doubles’ of students, classifying them as fitting to the norm or as deviating from it. Thompson and Sellar (2018) suggest that data-driven schooling is oriented toward conformity and has trouble with the parts of learning usually considered most important: creativity and the renegotiation of established norms. Scholars have also addressed the vast amounts of digital testing and evaluation proliferating on the field of schooling. As Thompson (2016) argues, testing and evaluation performed through big data and adaptive tests are actively producing subjectivities on the field of education.

The psychological discussion on the dangers of screen time has gained a lot publicity. This strand of technology critique takes issue with the psychological

effects of digitalisation. It suggests that phone use has a detrimental effect on our ability to concentrate on things; staring at bright screens may damage vision in the long run and cause sleeplessness in the short run. Phone notifications interrupt our workflow constantly and cause loss of effective labour time. (Huotilainen & Moisala 2018; Moisala et al 2016) Many critical points have also been raised in relation to parenting: phones may distance parents from their babies – there was even a campaign by the city of Helsinki in 2016 showing predatory birds snatching a baby while the mother was looking at her phone¹ – and parents and teenagers from each other as both use their phones instead of interacting. Media focus has increasingly turned into the ways in which mobile technologies are making our lives more difficult, shortening our attention spans and leading to socially harmful phenomena. As Mark O’Connell (2018) hints in a *New Yorker* article entitled ‘The deliberate awfulness of social media’, the experience of using social media is all the more often like his experience of Twitter, “a relentless confirmation that everything is both as awful as possible and somehow getting worse”.

During its 30-year history research on mobile technologies has grown to a full paradigm spanning many different approaches. This research is situated towards the sociological end of the scale: as a part of asking how contemporary mobile technologies affect the school and the lives of young people. From here, we can start to unwrap the theoretical background of the research.

¹ <https://yle.fi/uutiset/3-9297180>

3 Power, capitalism and assemblages

This chapter outlines the theoretical background of my research, presented in the form of a double movement. The first movement discusses Foucault's concept of subjectifying, productive power and the shift from disciplinary power to what Foucault calls dispositifs of security and what Deleuze later calls control. The second movement, partly overlapping and corresponding with the first, is a transition from Fordist to post-Fordist capitalism and the production of value through crowdsourcing and digital labour. While these two movements do not erase earlier forms of power and value production, they signal the emergence of a new ground that can be sensed precisely where this research is situated. The use of mobile technology in school animates a whole assemblage of actors and interests and in which the processes of power, agency, exploitation, resistance and desire are constantly expanding and leaking in all directions. In order to engage with these phenomena, I employ Deleuze & Guattari's concept of assemblage laid out in chapter 1.

3.1 Productive power and human nature

Possibly the single thing Michel Foucault is best known by are his theories of power as productive and creative, as not only something that restricts but as something that shapes and molds us. In Foucault's thinking, there is nothing outside of power relations and we always exist in a network of varying power relations. This leads to the idea that power is not right or wrong, only dangerous, something whose lines and movements must be followed and accounted for (Foucault 1984/2001b). Likewise, there is always room for resistance which is indelibly intertwined with power (Foucault 1982/2001b). When I first started reading Foucault's work, I found the idea of productive power difficult to understand. What did it even mean? Perhaps, I thought, it meant that power doesn't only forbid but also encourages you to do something. Unfortunately, this did nothing to help me understand the significance of the idea. Later I came to think that Foucault refers to things that take place before a 'conscious level', before the subject – things that produce that very subject which then desires and does things. I came to think that there is no common ground, no single point from which history could be evaluated or even understood because subjectivities (in other words *we*) are different in different times. Even the very level on which we live, perceive, experience and think is produced historically and transversed by power relations. Madness, death, freedom, and desire all mean completely different things in different times.

Only when these conditions are produced, can things 'get started'. Large changes lean on small changes. Micro and macro relations of power, micro- and

macropolitics. For example, the organisation of power relations in families and the division between productive and reproductive labour is a cornerstone of the Fordist mode of production and Fordist capitalism hinges on it (Lazzarato 2006). The nuclear family and Fordist factory work are two sides of the same coin and one does not work without the other. For me this has meant most of all that if we change one, we also change the other – changes in the little things, the ways of producing subjectivities, change the whole system.

In Foucault's thought I found the idea that human nature as such, or subjectivities, are produced by concrete practices and techniques. They do not fall from the sky. Different times and regimes subjectify in different ways and the ideas, truths and knowledges we encounter in various times are fundamentally different. This is one of the key points in Foucault's early work as a historian of ideas, as evidenced for example in *Les mots et les choses* (Foucault 1966; Paakkari 2011). In this sense there is a connection from Foucault to Nietzsche and Marx. Nietzsche's genealogy (Nietzsche 1996) aims at a re-evaluation of all values, with Nietzsche tracing the origin of our thought and the reasons why we have come to accept the truths we have. (Foucault 1971/2001a) And on the other hand, Marx shows how people are produced by the circumstances they encounter. In *Capital*, on the chapter on "The so-called original accumulation", Marx shows how the worker who is able and willing to sell their labour on the labour market does not exist naturally. They must first be produced into the world by violent means, by the appropriation of land and taking away of their livelihood which means that they have nothing else to sell except for their 'free' labour power". (Marx 1887; Viren & Vähämäki 2011, 33.)

"As a subject, the worker does not exist naturally. The worker does not fall from a tree but has to be produced as a coagulation or an intersection of societal relations." (Viren & Vähämäki 2011, 33.)

As Viren and Vähämäki write, in the core of capitalism lies the production of subjectivities. Foucault and Marx both show this in their research. Power is not outside the subjects but producing them, bringing them into being.

As Foucault's work shows, the forms of organizing power are of primary importance and always connected to wider societal structures. In a 1972 interview, discussing the formation of a people's jury with Maoist Pierre Victor, Foucault strongly opposes the idea that the left could establish progressive tribunals to further good things, and that the power previously held by the bourgeoisie could be better used. As Victor says "if a stick is bent, it should be twisted to the opposite direction to make it right", Foucault responds that it would be better to just break the stick. Both in practice and in theory Foucault kept reminding that the way in which things are arranged on a micro-level leads to how they are arranged on a macro-level. Practices of power are born on a micro-level and it is there that they can and must be changed. (Foucault 1972/2001a; Eribon 1993.)

3.2 Discipline, security, control

For me, sociology of education has always seemed like a fertile ground for Foucauldian thought. Education and schooling deal with the use of power: institutions and highly organized ways of using and distributing power in the society. In the core of education and schooling lies also the reproduction of labour force (Selwyn, Nemorin, Bulfin & Johnson 2017). Foucault sees school as a disciplinary power institution and Foucault places it on the same continuum with mass institutions such as military, barracks, hospitals, madhouses and of course prisons. All these rely on the same basic disciplinary techniques of power that Foucault analyses in detail in *Discipline and Punish*. However, it has long been evident that school cannot only be approached as a disciplinary institution. On the last pages of *Discipline and Punish* Foucault writes about “the distant roar of battle” (Foucault 1995, 308) referring to emerging new forms of power. Two years later, in his lectures at the Collège de France under the title *Security, Territory, Population*, Foucault goes into more detail analyzing the techniques of power operating under what he calls the logic of *security*.

In Foucault’s example of town planning, disciplinary power works by constituting “an empty, closed space within which artificial multiplicities are to be constructed and organized”, according to the principles of hierarchy and power relations. (Foucault 2007, 17). It works through surveillance and correction (Foucault 2007, 5) It is an intimate surveillance of details since details are the way power can grasp a body (Foucault 1995; Paakkari 2015). A disciplinary city plan aims at separating people to their specified areas and creating strict rules for their actions and movements. However, in these lectures Foucault is after a more flexible form of power that he defines as the logic of security. It takes the already existing as a starting point, observing the flows of people and things and then planning the city around them in a way that seeks to minimize detrimental actions and maximize beneficial ones. There is no sudden moment of punishment but a gradual modulation of the details of life in such a way as to produce the best combined effect for the society. What Foucault is after is a form of power that focuses on potentials and possibilities of acts, not the acts themselves. (Vähämäki 2006a).

Some years later, Gilles Deleuze approaches the same phenomena in *Postscript on the societies of control*, writing about control societies and control power (Deleuze 1992). Analysing everyday school life in relation to economy and society, it quickly became apparent to me that these analyses captured something essential. Instead of strict punishments and disciplinary rules I had grown up under in the 1980s, the question was more of filling up individual portfolios and learning to manage complex entities not dissimilar to project management. The skills required in labour markets were different, sure, and power mechanisms in the institutions also seemed different.

Above, I have approached school with the concepts of productive power and subjectification. This has led to the change in techniques of power and movement

from disciplinary to control power. In the end of this chapter we will return to this in order to find possible tools for analyzing it. Before this however, it is necessary to look at the shift from Fordist to post-Fordist capitalism in order to fully situate the school in relation to contemporary techniques of production.

3.3 Journeys in 20th century capitalism: from Fordism to post-Fordism

During the 1960s and 1970s two overlapping events changed the way in which humans produce things: firstly, workers were becoming increasingly disillusioned about factory work and its rigid rhythms and contents. The idea of large-scale factory production, as formulated in the taylorist doctrine of production developed by Frederic W. Taylor (1913), was to produce uniform things in large quantities. This was done by determining what the market needed and how it could be most efficiently produced. The production process was then divided into small segments that each worker would perform, often standing by an assembly line. The work that was performed here was extremely repetitive, often physically exhausting and almost categorically non-creative. As Jussi Vähämäki (2009) points out, there is a whole cultural form around this type of work, for example some Bruce Springsteen songs from the early 1980s capture the affects of factory work.

Early in the morning factory whistle blows
Man rises from bed and puts on his clothes
Man takes his lunch, walks out in the morning light
It's the working, the working, just the working life

Through the mansions of fear, through the mansions of pain
I see my daddy walking through them factory gates in the rain
Factory takes his hearing, factory gives him life
The working, the working, just the working life

End of the day, factory whistle cries
Men walk through these gates with death in their eyes
And you just better believe, boy, somebody's gonna get hurt tonight
It's the working, the working, just the working life
Cause it's the working, the working, just the working life

In the above lyric of *The Factory*, Springsteen captures a part of the affectual landscape of Fordist production: frustration, rage, despair, and violence. The day begins early, the work in the 'mansions of fear and pain' is characterized by monotony and physical duress which 'takes his hearing'. For the narrator, the alienation is visible in the eyes of the workers who walk out of the factory at the

end of the day, and results later in the threat of physical violence. ‘Somebody’s gonna get hurt tonight.’ While the imagery of Fordist production is dominated by men, it was actually an assemblage that brought together mostly white men doing factory work, women doing unpaid reproductive work at homes, children raised in the disciplinary nuclear family, colonized subaltern populations living in relative poverty and providing the material background for western industrial production. As it begins to disassemble, we see the renegotiation of all these parts (Viren 2018).

On the other hand, as Nick Lee describes, the Fordist model required large investments and long-term planning which also meant that it brought along fairly secure jobs and stable conditions of employment (Lee 2001, 11). This so-called Fordist compromise also gave the workers a possibility of benefiting from rising standards of living. As Lee Points out, when the Fordist compromise was working, conditions of employment were stable even if they were been less than pleasant. There are many descriptions of the tediousness and monotony of Fordist labour, such as the ones presented by Nanni Balestrini (2016) or Kristin Ross (1995). As long as Fordist production was profitable, some of the benefits trickled down to the working class. On the other hand, the Fordist assemblage largely confined women to reproductive labour at home. As Lee points out, in Fordism the adulthood was mostly reserved for men. While they got to enjoy the relative stability offered by the production regime, women were tasked with providing the stability, taking care of home and children and attending to the emotional needs of others. Fordist production also sought to eliminate certain troublesome aspects of the labour force through the process of deskilling (Srnicek 2017): with standardized factory production there was no more need for individual skill or mastery. The virtuosity of a skilled professional was unnecessary which also meant that capitalists were no longer reliant on individual master workers who could be late, drunk or troublesome.

During the 1960s and 1970s, a gradual shift towards a post-Fordist model of production took place. The shift was driven by two main reasons: firstly, workers wanting to escape the tedium of factory work; and secondly, capitalist production needed to counter the decreasing rate of growth with a new regime of production. The problems of Fordist capitalism were numerous. The alienation Marx described was born from the fact that workers could not experience themselves as parts of the work process and had to hand the control of their bodies to someone else. The highly gendered division of labour allocated different tasks to women and men, putting the men to paid labour and leaving unpaid reproductive labour to women who then became financially dependent on men. Silvia Federici (2014) shows how the unpaid labour of women – even if there are vast differences inside the category of women, depending on socio-economic factors and ethnicity, among other things – constituted one of the reservoirs of unpaid work that capitalism has been taking advantage throughout the centuries. Towards the end

of the 20th century also the division of labour starts slowly fragmenting. Housework and care work get recognized and compensated as proper work and not just hidden as the invisible reproductive basis making other types of work and existence possible (Federici 2014).

Together with the progressive climate of the after war generations of the 1960s, more and more people started asking why things should be like this: why should I leave myself at the factory gates? People started demanding for a right to express themselves at work. Work should be viewed as an extension of the self, which in relation to factory work was a preposterous idea. This led to a slow expansion of the category of work: suddenly economic surplus value could be gleaned from a plethora of places and not only factories' and assembly lines.

Work as the expression of inner self

In *The fragment on machines* Marx (1986) introduces the idea of *general intellect* and knowledge becoming the main productive force (Vähämäki 2006b). The idea of cognitive capitalism originates from here (Moulier Boutang 2007; Viren 2018). It was developed especially by theorists of post-fordist production especially in the autonomist Italian tradition who started using Marx's idea as a starting point for analysing the changes in capitalism in the later half of the 20th century. In their analysis work escapes the limits of the workplace as general intellect, the ability to learn, use language and co-operate become means of production. As Vähämäki writes, "general intellect is the general ability to think and communicate, the ability to be human" (Vähämäki 2006, 24). As a consequence, the entirety of life-time becomes a time of production. The whole life is potentially productive. In the fragment Marx writes that the worker "steps to the production process instead of being its chief actor" (Marx 1986, 178). As Vähämäki suggests, this describes the worker as an organizer or an editor who brings together different parts and controls the production through their personality. From here stems a contradiction between old and new work: when work was only alienation, it was a relief to get off; but when work becomes self-expression, life without work seems empty and meaningless (Vähämäki 2006b). There is suddenly more at stake in work. Because many jobs require engaging your persona, workers may regard their jobs as the most important areas of their lives and as ways of expressing their inner selves (Vähämäki 2003). Correspondingly, being away from work or unemployed will stop one from expressing their true persona. However, it is good to keep in mind that these changes are not universal but situated in a particular historical context. They apply mainly to the predominantly white middle- and upper middle class European and North American labour market.

The emerging communicative and co-operative work is at odds with fordist structures. Disciplinary structures with their closed spaces are ill-suited for communicative co-operation (Vähämäki 2003). However much of the work starts

to involve communication: capabilities required in contemporary work are those of organizing and combining varying and possibly contradictory contents (Vähämäki 2003). There is also a contradiction between large enterprises and mass-production versus small companies and their flexibility. Small enterprises emerge as profitable and possibly advantageous compared to large corporations with their scale benefits. While small enterprises can only produce small quantities they can be quick to react and innovative. Their different ways of organizing and networking suddenly seem beneficial (Vähämäki 2006a).

In Europe, the turning point between Fordism and post-Fordism can be situated between 1970-1974 (Peltokoski 2006). From the point of view of labour, it was the birth of a new subjectivity and its refusal of the disciplinary fordist production. From the point of view of the capital, it was a question of answering the crisis of mass production made apparent by oil crisis (Marazzi 2006). As the idea of *just in time* -production – in which the markets can no longer be assumed to demand whatever the supply happens to be, but production is more of a reaction to the demand, which consequently means also that long-term work contracts and job stability become rare since the thing you are presently doing may not be in market demand tomorrow (Marazzi 2006) – is introduced, work slowly ceases to be stable continuum and turns into a series of individual performances that can be purchased from separate suppliers. In this sense, post-fordism signifies the era of non-permanent labour: as Berardi says, labour power is no longer purchased as whole personas but as fragmentary labour acts that network capitalism arranges into complete units (Peltokoski 2006).

Hardt and Negri write about how production becomes situated in a new place, a “non-place”, since as general intellect is situated wherever in the society, wherever people communicate or form communities. Relationships of care, reproduction, love, voluntary work, hobbies become sites where value is produced since they are the sites where personalities are produced and expressed (Peltokoski 2006). As the sphere of work grows to potentially cover all fields of life, it also reaches out to areas that used to be outside of work, private. Old distinctions between life in public and life in private (Arendt 1998) get shaken. As Eeva Jokinen (2006) says, family, home and home melt into each other and intertwine. Often this mixing is not without problems and resembles a slightly too runny marbled Bundt cake, as Jokinen writes. Work and care run everywhere, get mixed in each other and turn life into something that occasionally seems too liquid.

3.4 School and the reproduction of labour

School has an intricate connection both with power mechanisms and production regimes. School education in Fordist welfare states can be understood as part of an arrangement aimed at guaranteeing education to the entire population on the condition that it results in sufficiently able and productive labour force (Selwyn

et al 2017). The basic functions of Nordic welfare state compulsory education which Rinne, Kivinen & Kivirauma (1984) have analysed, exemplify this pact with the reproduction of labour. The school prepares young people for future work, gives them competences that are deemed necessary, sorts out the students with respect to their capabilities, and gives parents an opportunity to work while their children are in school.

The relation between school and labour reaches to the everyday organization of school life. Hosio-Paloposki (2006) shows how school curriculums in the late 1940s and 1950s were influenced by the aspirations of revitalising Finnish industry according to the principles of Fordist and Taylorist management doctrines. The school was supposed to raise students to survive in the adult world and therefore curriculum designers had to pay close attention to how adult world actually functioned. The parallels between factory organisation and school have been probed by many. Rinne & Salmi (1998) write about how children are transferred from one grade to the next as on an assembly line and how, as in mass production, order and discipline are given the highest importance. In relation to capitalist economy, the school's mission is divide, select and sort the students to different positions of social hierarchy. The principles of Fordist management were particularly evident on the level of the hidden curriculum where they are brought to life through the ideals of punctuality, obedience and monotony. To achieve maximum efficiency and productivity for the society as a whole, the society had to be thoroughly organised along the principles of Fordist and Taylorist doctrines. Education became one of the central fields for this organisation to be laid out and deployed.

Post-Fordist school and education

Schooling changes in conjunction with the changes in means of production. Selwyn et al (2017) show how contentious and contested this relationship has been through the years. According to Hosio-Paloposki (2006), Finnish school and curriculum design has been trying to address the question of post-Fordism since the 1990s. In school, the seeds of this new regime of production emerge from several directions. The rise of entrepreneurial education teaches students to view their lives as projects, develop capabilities that are in demand, and see themselves in relation to the needs of the labour markets (Mononen-Batista Costa & Brunila 2016). The skills of managing connections between fragmented parts of labour become central parts in the toolbox of a post-Fordist worker (Laalo, Kinnari & Silvennoinen 2019).

In education, new targets are personal evolution and the life as a whole. Education becomes a question of developing general readiness instead of learning specific professions (Vähämäki 2003). It is important to foster lifelong learning and create the right kinds of attitudes (Kinnari & Silvennoinen 2015). Resilience,

the ability to recover from setbacks and be flexible, must be also nurtured. Through these techniques individuals are made subjects of their own lives, responsible and accountable for their actions and life choices. A thorough analysis of these techniques has been undertaken under the concepts of therapisation and psy-disciplines, ethos of vulnerability and self-governance (Bendix Petersen & Millei 2016; Brunila 2011; 2012; Brunila et al. 2018; Saari & Harni 2016).

Post-Fordist capitalism that increasingly takes advantage of mechanisms of control power seeks to move responsibility onto individuals. In the last decades this has resulted in the formation of an entrepreneurial subject, a *homo economicus* that seeks to maintain their life with the same meticulous care as an enterprise – rationally calculating the pros and cons of each relationship and action (Brown 2015). As he analyzes the birth of this *homo economicus* in his lectures on the birth of biopolitics, Foucault (2010) emphasizes two points. Firstly that the idea of rational choice has never been particularly suitable for describing human action, and secondly that this does not really matter since as Viren (2018) points out, classical political economy has never sought to analyse the world as it is. Its theories of supply and demand do not so much describe economic systems such as they operate but create a normative model according to which society should be organised.

3.5 The inclusion of childhood and youth into production

In modern Western thought, the relationship between childhood and economic activity has been problematic. As Ruckenstein (2013) says, children are often considered economically useless. Ariès (1962) and others have shown how the childhood we currently know has been constructed in Western modernity and how starkly it differs from how young people lived in the 15th century. As childhood has been positioned outside production, youth has become a transitional phase where citizens are made and economic subjectivities constructed (Mertanen et al. in press; Kurki et al 2017; Brunila & Rynnänen 2016). Childhood as a space of limited mobility and agency has been discussed widely (Paakkari 2015; Ariès 1962; Ruckenstein 2013; Salo 2010; Strandell 2012; Hohti & Karlsson 2013). As children get older, these limitations are gradually loosened, with 14-year-olds being able to take jobs that do not harm their ability to go to school and 15-year olds being able to work if they have finished secondary school.

The line between children and youth and economic activity is not clear-cut. Ruckenstein (2013; 2015) shows how children turn to commercial toys and games in order to develop agencies that may not be otherwise available in the restricted space of childhood. This has not gone unnoticed from commercial enterprises who actively target children as consumers – directly and through parents. There is no easy line between inside and outside or wanted and unwanted participation: even if we disagree with excessive consumerisation of childhoods, commercial actors

are often the ones taking children and young people most seriously. Behind the success of many child-targeted products is their ability to tap into the life-worlds and desires of children. As Ruckenstein shows, this does not come about by chance but is meticulously undertaken through child-targeted consumer surveys and market research. Even if adults dismiss the desires of children, capitalism takes them seriously as customers. The ways in which childhood and youth figure in the assemblages of global capitalism are also one of the terrains where new trends emerge. Young people re-interpret prevailing imagery, sometimes giving rise to trends. As Viren & Vähämäki (2011, 33) write, “the value of capital today increases only with action that is not wholly under the logic of capitalist added-value.” Though smartphone use is certainly not completely outside the capitalist logic, young people are regarded as one potential target group capable of reinventing meanings and creating unexpected openings. Being popular with young people carries a special significance which applications like Snapchat and Tiktok have taken advantage of. Even if young people may have less money to spend, popularity among them is a sign of a particular cultural capital (Ruckenstein 2011).

What children and young people share is that they both spend large portions of their days in schools. Traditionally, the relationship between schools and labour market has been a preparatory one. From a marxist perspective, society tasks school with the preparation, evaluation and sorting of future labour force. However, actual labour does not take place in school and in this sense its function is reproductive. (Antikainen, Rinne & Koski 2006.) This is also reflected in the fact that campaigns against child-labour were central driving forces behind the creation of Nordic comprehensive school system.

A comprehensive renegotiation of this arrangement is now taking place. The model of an unfinished and in process youth leading to a stable adulthood is giving way to a more fluid understanding of life where both young people and adults remain unfinished and changing (Lee 2001). As the promises of adulthood (stable identity, permanent job or guaranteed income) disappear and the possibilities to economic activity (for example through Youtube, Instagram or TikTok) increase, retaining youth as a zone outside labour is a tough ask. Young people today have many ways of engaging with the labour market besides taking a job. For this research, two are especially interesting. Firstly, young people engage in various kinds of digital labour through their device and social media use, mostly unpaid but sometimes also paid. Secondly, as sources of data, young and old users are just as valuable to platform capitalist enterprises.

Digital labour and platform capitalism in the classroom

As laid out in the introduction, this study grounds the connection of mobile devices, school and capitalism around the notions of platform capitalism and digital

labour. Digital labour is taken to mean all the diverse activities taking place on the device that end up generating economic value. In article 2 I (together with Pauliina Rautio and Verner Valasmo) looked at students using mobile phones in classroom through the concept of digital labour. In the data, the amount of phone use varied between students but was always significant. The students had slightly different ways of using phones but messaging apps like Snapchat and Whatsapp proved the most popular. Also popular were social media apps like Instagram or Facebook. Besides these the students used browsers, games and Youtube. Only a small fraction of the use was directly school-related, consisting of the official school app Wilma, dictionaries and calendars. As we find in the article, it is difficult and perhaps unhelpful to classify a specific percentage of phone use as digital labour. The ways in which enterprises generate profit from user activity vary considerably. For the purposes of this study, the sheer potentiality of phone use to become profit generating is more important than the exact amounts of digital labour undertaken in classrooms.

From its early days, producing internet content has carried the contradiction of being often voluntary but still extremely labour-intensive. Tiziana Terranova (2004) examines the time-consuming world of updating sites, uploading images, writing comments and editing pictures. Users are sometimes willing to do this for free since the benefits of belonging to a community or interacting with friends outweigh the laborious nature of internet sociality. Some have also argued that companies compensate users by providing platforms free-of-charge (Jenkins, Ito & boyd 2016). However, many are asking whether the trade-off is still fair as companies are making vast profits based on user-generated content and still failing to protect user-privacy, as numerous Facebook scandals after 2015 have showed. Christian Fuchs (2014) defines the time spent on digital platforms as unpaid work time and builds a case for saying that the companies exploit users' digital labour. Furthermore, as Fisher's (2015) study of a class action suit against Facebook's sponsored stories shows, users are increasingly seeing economic connections in their online activity.

While digital labour refers to the actual labour users are performing while using devices, the notion of platform capitalism points to the broader economic context under which current mobile device use is situated. As mentioned in the introduction, the notion comes from Nick Srnicek (2017). The presence of digital platforms in the classroom has grown dramatically during the last few years. The most obvious example is Google, whose word processing app is being used widely by teachers and students. Google's email, calendar and translator apps are likewise very popular and used by students and teachers on a daily basis. The simple fact that most phone owners have these apps and know how to use them is a major factor behind their popularity. While some schools and teachers have sought open-source alternatives it is increasingly hard to compete against giant companies in a monopoly position. The learning curve for the apps is small and therefore they are

hoped to be less distracting in classrooms. But while the apps may offer ease of use, their introduction into the daily school life turns classrooms into convenient data mining facilities for Google (Singer 2017).

Google is by no means the only platform capitalist player in the school. Microsoft, Apple and education enterprises such as Pearson are also actively offering their products and marketing them as tools for learning. In late 2019, one Apple executive courted controversy by stating that he does not believe students with “cheap notebooks” will succeed (Vincent 2019). While the executive later tried to clarify his comments saying he believes every child has a chance to succeed, the episode offered a window into how high the stakes are for these companies. While the children doubtless have a chance to succeed, those platform capitalist companies that are left out of the classroom may find it harder to do so. As Srnicek (2017) shows, data has become such an important vehicle in platform capitalism that companies simply cannot afford to pass by potential sources of data. This is why so many of the large enterprises of digital capitalism are seeking to enter the school (Selwyn 2016).

3.6 Analysing contemporary capitalism through assemblages

“For every complex problem there is an answer that is clear, simple, and wrong.” (H. L. Mencken)

In this chapter I have laid out a double movement of changing power mechanisms and value production regimes. As phone use in school engages several things at once, I suggest analysing it through Deleuze & Guattari’s concept of assemblage. In this research, it has functioned both as a theoretical and a methodological tool. This emphasises how the two cannot be separated from each other as the theoretical apparatus strongly guides how data is read and therefore also constitutes the analysis.

A typical situation for this research is one where a student is sitting in the classroom and attending a lesson. While the lesson takes place, several things happen simultaneously: attending the lesson, participating in the teaching, engaging in digital labour through a mobile phone, keeping in touch with friends, building relationships and producing data for platform capitalist enterprises. In order to account for this multitude of overlapping events, I have turned to the notion of assemblage. Approached through categories like school, education or work, it is difficult to grasp the facets of what is taking place. The students are engaging in digital labour in the classroom but *also* participating in the teaching. How can many things be taking place at the same time? Clearly these traditional categories

have lost their ability to contain activities. However, while the situation is complicated it does not follow that we could not say anything about it or that it would be useless to analyse it.

Assemblages are composed of various elements that pull in different directions. This may help in analysing situations that would be contradictory to traditional categories. The elements in an assemblage are not locked in place and have no pre-given substance. As Deleuze and Guattari say, an assemblage may be known only through its operations (1987). In other words, what matters in an assemblage are the relations between parts, not the parts in themselves. An assemblage approach does not presume that because of what things were at one stage, they would forever remain the same. A student may engage in digital labour in the classroom while studying but this does not mean they would have to be categorized either solely as a student or as a part of the labour force. In my understanding, using an assemblage approach entails paying attention to the flows and movements in the assemblage. Contradictory elements come together in assemblages as they contain both flows of capital and flows of agency. Situations that both allow for an expansion of agency and function as means of appropriation need to be analysed with tools that respect their complexity. Otherwise we have to resort to simple categories like good or bad, either denouncing the event or approving it without reserve. This would mean saying that phone use in school is either a bad or a good thing. Both answers are too easy. In reality, mobile technologies give rise to situations that both contain seeds of agency and function as means of appropriation. In Deleuze and Guattari's terms the assemblage involves lines of deterritorialisation, with some of them turning into reterritorialisation and ending up captured in mechanisms of power (Deleuze & Guattari 1987, Deleuze 1994b). The task of the analysis is to follow movements in the assemblage and differentiate between the forces and vectors in it. In my reading, an assemblage allows for seeing events both as parts of a whole, paying attention to their societal connections, and as immanent in the way that does not presume the current situation to remain forever the same.

In *Friction: An ethnography of global connection* (2005) Tsing describes stories told by different participants of a successful environmental campaign. To her it seems that participants describing the same events are speaking of completely separate things – so different are their perspectives. However, this has not stopped the campaign in focus. Instead the diversity has become its strength, providing potential to engage actors with varying goals and agendas. This research, approaching the intersection of technologies, education, capitalism and young people, turns to a similar conclusion. To bear witness to the events we must accept their messiness and unresolved character and work from it. Attempts at simplicity only add to the messiness (Law 2004). Tsing's ethnography of global connections focuses on areas of "awkward engagement, where words mean something different across a divide even as people agree to speak" (2005, xi). In my research,

technology in school is a site for these awkward encounters. It brings together educational planners, political interest groups, technology advocates, children, teachers, advertisers, marketers, product planners, parents and coders. They gather round a seemingly shared object with different interests. There is no single truth of technology in education but a frictional web of interests, an assemblage.

Assemblage and agency

”Agency can be strange, twisted, caught up in things, passive, or exhausted. Not the way we like to think about it. Not usually a simple projection toward a future. [...] It’s caught up in things. Circuits, bodies, moves, connections. It takes unpredictable and counterintuitive forms.” (Stewart 2007, 86)

It is important to remember that in the assemblages we have analysed, we can find not only exploitation but also agency. As Lee (2001) puts it, agency emerges in assemblages. Agency is not something that an individual could possess but comes into being in-between as human and non-human actors extend toward each other and create new connections. Agency is not permanent or fixed but constantly on the move and changing. As Pauliina Rautio writes (2013), we become existing in combinations with others, with non-human and human things and beings. In connecting with others, we enhance our capabilities and can reach new agencies. According to Deleuze’s reading of Spinoza (Deleuze 1988), a body’s power lies in its ability to be affected by others, by forces outside of itself. Agency does not reside in any particular individual but between them. While criticizing the idea of individual agency, Elina Paju (2013) proposes working with agency as something that takes place between things, as relational (see also Niemi 2015). As my research interrogates the question of what happens between phones, their users, and school, I have found such views helpful.

Therefore, we should not ask what a particular person can do. We should ask what they can do-with, what are the possibilities a given situation creates? As Rautio puts it: what are the things that students want to connect with in order to become existing? What are the models of co-existing that we create? Considering this research: what are the assemblages we connect with and what kinds of agencies do they foster?

On the other hand, in their article *Living with Omega-3*, Abrahamson, Bertoni, Mol and Ibáñez Martín (2015) ask how far it is wise to extend the concept of agency. Regarding mobile technologies I tend to agree with their argument. Instead of seeing independent operators we should see students and phones as elements in the chain of being-with-agency. Students-with-phones have different agencies than students without. Phones extend and complicate the entanglements of agency. Often mobile technologies are seen as something that enhance students’

agencies (boyd 2014). While my starting point was an interest in how mobile technologies affect agencies in school, this line of inquiry leads us multiple and conflicting agencies, revealing an assemblage of actors with conflicting agendas. Young peoples' agency and mobile technologies cannot be approached separately and instead we must consider what are the agencies on the move in for example a "student-smartphone" -assemblage? This leads us a rhizomatic ensemble of interests that are by no means apolitical. To me it seems that students' agencies become something we cannot really reach as such – what we can work with is this ensemble. To follow it is also to account for the agential movements in it.

4 How to research mobile phone use?

In this chapter I take a look at the methodological choices behind my research. As the phenomenon is spread across several areas, my analytical approach has focused on dealing with this complexity. The core of my data consists of video ethnographic material on upper secondary school students' life and phone use in school. In the following, I bring together methodological considerations from my data production phase with thoughts on research methodologies and ethnography in particular.

The ethnographic data of the research was produced with the aim of gaining knowledge on the everyday school life of the student participants. Data production took place in two Finnish upper-secondary schools, one in a small town in central Finland and the other in the Helsinki metropolitan area. Altogether seven students took part in the research as focus students whose school days and phone use were followed in total for 18 days during the years 2015-2016. The produced video ethnographic data consists of 113 hours of classroom recordings from 15 different taught subjects, and 18 hours of recess recordings. Two researchers accompanied each student, one following them with a video camera and the other mirroring their smartphone screen with a laptop. The focus students had a phone application allowing them to project their screen content to us during the school day. The application was student-controlled, offering them the possibility of turning the mirroring on and off whenever they wished. As researchers, this extraordinary access gave us a chance to visit the events unfolding on a smartphone during a school day.

In addition to this data, we also interviewed the students participating in the research several times and produced observational notes while in school. As the interviews were conducted in the middle of the ethnographic process and we were already familiar with the students, they could be called ethnographic interviews. As Niemi (2015) writes, these are defined by a common sensibility to the field both the interviewer and the interviewee share, making it easier to return to things that have troubled either one in the everyday school life. Additionally, in my first article, I used ethnographic data that had been produced earlier in 2013 during a research project called *Språkmöten* which was a sibling project for *Textmöten*. Both were constructed with the requirements of conversation analysis in mind and it was precisely during data production for *Språkmöten* that we realised how difficult it was to grasp what was happening with phones in classrooms. In my first article I also analysed certain key government documents. However, the bulk of my data is ethnographic.

While planning *Textmöten* in 2014, we pondered on how to get to analyse the role of mobile devices in everyday school and classroom interaction. Based on

earlier projects, it seemed that phone use could not really be approached with existing methods. Video recordings of the classroom showed students using their phones but gave no indication as to what they were actually doing and how the interaction was structured. The project was developed from a conversation analytic starting point and it was important to be able to closely analyse textual structures in phone communication. Phones were a constant presence but we had no idea what happened during the moments they moved in and out of the classroom interaction. Phone use in school was often a consequence of an event: a message could arrive or something could happen in the classroom suggesting using the phone. Naturally, boredom and the feeling that nothing interesting was happening could lead to the phones coming out. The research apparatus was constructed with these moments in mind. It was important to be able to see how patterns of interaction came to being and what were the events that lead to phone use. Brought together these things led us to produce student-controlled video recordings but in such a way that it retained a semi-objective and naturalist view. In other words, the students could share their screens with us but had little choice to experiment with framing, angles or editing – all that was transmitted to us was a screen capture video.

The research apparatus was constructed by myself, Fritjof Sahlström and Verneri Valasmo. We went through many iterations in trying to develop a working solution and ended up with a setup that consisted of students and their phones; video cameras in the classroom; laptops in the corridor; Wi-Fi modems; mirroring applications; and researchers using the laptops. At the time of the research, all of the students had either a phone with either Android or iOS operating system. With Android phones, we used a free screen casting application Mirror Beta², developed by a company called ClockworkMod. On iOS (iPhones) we used the screen casting feature Airplay that was built into the phone's operating system. We used a Wi-Fi modem to create a network into the school for the student and the researcher could connect into. The researcher then logged on to the network and the student could cast their screen content onto the researcher's computer where it was then recorded as a screen capture video. Simultaneously as one researcher was outside the classroom using the laptop, another was inside filming the student with a conventional video ethnographic approach. After the field phase, these two recordings were combined into a single video showing the student with the phone screen image popping up on the screen whenever the phone was in use.

Our research assemblage included more technological parts than customary in ethnographic research. In its eventual form the data was constructed of a classroom video camera recording overlaid with a feed showing the phone screen of

² The name of the app has since changed. In December 2018 it was available on Google Play store under the name of Screen Recording and Mirror <https://play.google.com/store/apps/details?id=com.koushikdutta.mirror&hl=en>

an individual student. The technology-heavy setup meant that data production required the careful co-operation of video cameras, microphone transmitters, microphone headpieces, microphone connecting cables, batteries, memory cards, mobile phones, screen mirroring applications, laptops, power adapters, extension cords, Wi-Fi-modems, video editing software and portable hard drives – naming only the non-human participants. Most of the data was prepared to its final form by myself and Verner Valasmo. During the research we had difficulties with almost every element mentioned above and were often perplexed by the complexity of the process. Innumerable things went wrong, leaving us constantly having to improvise. While we have tried to interfere with the data as little as possible, the sheer complexity of the at-least-15-element setup serves to deconstruct the idea of the data existing independently somewhere, waiting for the researchers to collect it.

From an ethical standpoint it was paramount that students were always in control over their phone content. The screen casting solutions were operated by the student, who pressed a button on the screen in order to start or end screen sharing. The fact that students had to activate the mirroring application manually did however result in numerous technical issues that could be caused by the software malfunctioning, the Wi-Fi disappearing or the laptop software not functioning as intended. In the end, we produced data showing video image of school life with student phone use also visible in the pictures, with the important distinction that the videos only show the moments that the students wanted to share with us by having the screen mirroring activated. It is important to keep in mind that the data is a product of this apparatus and not objective description of what happens in the classroom on the students' phones.

There is no obvious one way of researching young people using their phones in school. Digital ethnography operates in a landscape that is constantly changing and as Selwyn et al (2017) write, we should stay inventive and open as researchers. There is the danger that the “once innovative and insightful techniques now come across as decidedly tired ways of engaging with digital contexts and digital issues” (Selwyn et al 2017, 155). Interesting and relevant research on mobile phones could have been done in many ways: mapping the traces produced by digital data, doing collaborative video tours and also using traditional interviews to bring out student perspectives on digital devices could all have produced interesting data (Selwyn et al 2017). How we ended up doing the research in precisely the way we did had a lot to do with earlier experiences of the members of the research team.

4.1 Ethnography in digitalized school spaces

Citing Delamont and Atkinson (1995, 15), Gordon, Holland and Lahelma (2001, 2) write that they take ethnography in education as “research on and in educational

institutions based on participant observation and/or permanent recordings of everyday life in naturally occurring settings.” Ethnography takes place “on the level of the micro politics of the educational institution” (Gordon, Holland & Lahelma 2001, 13). On this level, as Ulla-Maija Salo (1999, 52) writes: “Something is always happening in the classroom. The action is episodic and discontinuous – talking, counting, confusion, success, questions, laughter, teaching, pencil sharpening. Still one can sense that something is continuously evolving.”

Mobile technologies become part of the everyday school hustle and change the spatial orders of the school. The classroom has been a place with limited possibilities of communication with the outside, a traditional example of a disciplinary organization of power, as Foucault (1995) suggests. However, as we saw countless times during our research, smartphones make it easy to communicate outside the classroom at almost any time. With these possibilities of transgressing the classroom walls, new entanglements with economies, power relations and societal questions appear. In lining out a research approach for digital ethnography, Sarah Pink et al (2016) draw attention to the following five points. Firstly, there are many ways of doing the research and often the infrastructure has a pivotal effect in how the research turns out. This should also be acknowledged in writing. Secondly, digitality as such is not placed in the center of the research: what is important are the entanglements and connections it makes possible. Thirdly, it is important to approach all phases of the research openly without seeking to lock things in place in advance. Fourthly, one must be reflexive in acknowledging the encounters that resulted in the knowledge produced. Fifthly, one should foster an experimental attitude towards producing data and communicating the results.

Digital ethnography often deals with technologies that foster strong emotional attachments. The interconnectedness and attachment of humans and their machines is further cultivated by the design of the technologies seeking to make them inseparable parts of our daily lives (Pink et al. 2016.) Technical artefacts can act as extensions of the self, something through which a person is constructed, as Lally (2002) shows. Phones are good examples of this: the young people we met during the research were well aware of the phone they were using and what kind of a person it projected. Companies also design their products with this explicitly in mind which can be seen in their advertising. As phones have lately converged towards each other technically, the defining factor in choosing a particular device may be the lifestyle and the brand values it tries to associate with. (Pink et al. 2016; Lally 2002.) Phones, and technological objects in general, also have a symbolic role in the constitution of social relationships, for example as objects that parents use to symbolize adulthood for their children. In Horst’s (2015) study children viewed their computers specifically as symbols of adulthood. Children’s access to technologies may represent “the first steps in a longer trajectory of a relationship with technology” (Pink 2016, 137).

4.2 On doing video ethnography

I made the choice of using video ethnography to make sense of the classroom life and its entangled digital connections. Sometimes this seemed to work, at others I felt a danger of losing the complexity I was after. One of the justifications for the use of video recordings is that they ‘capture the situation as it happens’. Whereas the ethnographer may be tired, distracted or simply focusing elsewhere, the video apparatus sees what is happening and records it thus making it also possible to later return to the data with a different focus. In spite of this, in their article on classroom ethnography Maclure, Holmes, MacRae & Jones (2010) describe a familiar situation where participants of a video ethnographic study have difficulty in recognizing themselves and their activities on the screen once shown the video material. There is a sense of something missing. Once seen on video, everyday activities seem almost banal. In a school setting, what the videos are for example clearly missing, is the children’s power to irritate or frustrate adults. (Maclure et al 2010, 545.) They also have remarkably little power to disturb normalized readings of teachers or teaching. In Maclure et al’s words what is lacking is *affect*. Videos show classroom activities largely deprived of their affectual intensities. As Maclure et al’s aim was to disturb the researchers themselves and to put on hold their habitual circles of interpretation, they were stunned by the fact that the videos they produced seemed to be jointly culpable in creating a system that freezes children in their places. Their research got me asking: how to create videos that could map movements; that could account for the physical and affectual movements taking place during a lesson; that could be truthful to the movements that point away and outside from the classroom?

During my research, I have noticed that video data often gets treated as evidence. As de Freitas (2015) writes, it gives the illusion of saying something real. One way of disrupting realist readings of data can be the use of editing, visual effects or alternative visualisations that interrupt the temptation of treating video images as linear reproductions of something that took place (see de Freitas 2015, 326). These kinds of visualisations also raise the question of what can we actually see in the video and what is it witness to? What is the event the video has captured and where in time is it situated? If we take Deleuze’s concept of event seriously, it seems evident that it cannot be re-produced or re-presented again and again unproblematically. The event is singular and refuses to be replicated. (Beck & Gleyzon 2016.)

Approaching video data in this way, instead of seeing the video as container-of-truths that can be viewed over and over, it might be interesting to aim at producing similar effects. It is hard to escape the feeling that we lose the singularity of (classroom) events in their video reproduction. What we are left with is what Maclure et al. (2010, 543) describe as a “mundane realism”. As video research has tried to preserve its neutral gaze in the face of artistic approaches and tried not

to become cinematic, it is in danger of losing its capability to make us stop and question ourselves and our habitual readings of situations.

Video method closes. It presents classrooms as enclosures, inhabited by stock figures ('the Teacher', 'the Child') who, despite being played by real people, become drained of singularity. Under the basilisk stare of the fixed camera, people become invisible. (Maclure et al. 2010, 546)

What Maclure et al. argue is that video recordings made with a typical hands-off approach lose their capacity to "animate the viewer – to spark new thoughts, sensations or reflections" (2010, 546). It is interesting that while Maclure et al. write that when showing the videos to others they were met with the same lethargy and difficulty in engaging with the material. Somehow this seldom happened with our video material. The reactions it sparked were inevitably those of excitement, curiosity and amazement – "How could there be all these things going on in the classroom, we had no idea!" Looking back, it was perhaps an effect of escaping the enclosure of the classroom that suddenly brought familiar scenes into life. Everybody knew these things were taking place but could not find a way to reach them, and suddenly phones made it possible.

This leaves me with the question: what is it that gets caught on video? This is increasingly topical since as our technical capabilities expand, complex attempts are being made in order to capture classroom events in full. This can be seen as a typical example of solving a problem by throwing more technology at it (Greenfield 2017). Perhaps it also speaks of the different ways of perceiving what the 'important' things taking place in a classroom are. Do we focus on the visible actions or the affectual intensities they contain? Are we searching for something that can be reached without the immediate presence of a researching subject or is the knowledge we are after only produced in a relation? These questions are entangled in the choice of methodology and the ways we talk about it. The technological tugs and pulls also affect the research situation in other ways. The complex apparatus escape the control of the researchers: so much data is produced, so many viewpoints captured that it is practically impossible to even know all the data one has produced. The significance of technology affects the research process in important ways. On the one hand, it serves to further displace the idea of a sovereign researcher subject controlling each element of the research apparatus – which I obviously see as a good thing. On the other hand, the technologies of this displacement do not appear out of nowhere but are constructed by people and carry ideologies and structures may or may not be compatible with the broader research approach. Päivi Jokinen shows this in her article about the experiences of researching with a 360 degree classroom camera tasked with 'seeing everything' in the classroom. (Jokinen & Nordstrom forthcoming).

It is hard to escape the feeling that technologies – in this case videos – are tasked with filling out the gaps or imperfections of human knowledge and perception. As if somewhere behind the horizon an apparatus capable of seeing everything would be waiting. But again, what would this ‘everything’ include? The physical events of the classroom may well be mapped more revealingly or the physiological and even emotional states of the students followed through sensors surveying heart rates and neurotransmitters. It is hard to see where the growth of technological complexity will end. What is missing, however, is the researching subject and the thoroughly subjective and affective nature of ethnographic research. Ethnography takes place *in relation* and is contextual and personal. I see ethnographical notes as an attempt to produce what happened between me and the field in a given moment. The situatedness of ethnographic knowledge should not be seen as a failure but as one of its greatest strengths. At its best, ethnographic knowledge can be something that is *both insightful and not universal*. A local, situated knowledge, among others. One of the benefits of working with video materials is that they demand a lot of work in order to come to existence. The illusion (and occasional hope) of data existing somewhere without the need for my intervention is well and truly shattered as one has to go through countless hours of editing, cropping and focusing.

4.3 Ethics

Researching phone use enters a very personal life domain. From the beginning of the project it seemed that it was impossible to carry out the research from afar and that we would inevitably encounter some private elements of students’ lives. Initially we experimented with alternative ways of actualising the research: it was possible, for instance, to approach classroom life video ethnographically without following students’ phones closely. However, this gave us very little insight into phones and made conversation analytical approaches nearly impossible (see article 2). Another option was generating ethnographic data through participant observation without video equipment. This was useful and became part of our data production but again gave us reasonably little detailed material on things like the micro-level interaction patterns. We considered asking the students to record their daily phone use and presenting us with the pieces they wanted to share. This turned out to be very difficult because of the limited storage capacity of the phones. The method also seemed laborious for the students. Therefore, in the end, we carried out the research in the way described above, recognizing that we were moving on an ethically challenging ground and would have to take this into account throughout.

It was important that the students were old enough to decide themselves whether they wanted to participate in the research. Because of this, all the participants were at least 16 years old. (National Advisory Board on Research Ethics

2009.) We also felt it was important that the students would be well informed of the research before deciding to participate. We visited the schools, introduced our research and gave the students some weeks to consider whether they wanted to participate. In the first school, located in central Finland in a small town, we had over 15 volunteers and selected four at random. In the second school, situated in the Helsinki metropolitan area, we had four volunteers and selected them all. We had to limit the number of participants due to technical limitations, for example the difficulty and time required in switching the equipment from one student to the next and verifying software and hardware compatibilities. With the eight volunteers we went through the research procedures and produced some test data. At this stage one of the students changed their mind about participating. Despite our efforts in being clear about the proceedings, they had not realised that their screen contents would be recorded during the research and decided to back off. As we at the same time noticed that we would end up producing very large amounts of data, we decided to carry out the research with seven students.

The field phase took place during three years between 2015-2017. We visited the schools on week-long data production periods during the students' first, second and third years of upper secondary school. On each visit we interviewed the students and discussed their feelings about participating in the research and whether they would like to adjust the research procedures in some way. In this way we tried to lessen the possibility of anyone feeling uncomfortable about the way in which they took part in the research.

In the research team we discussed about how to make sure that the people taking part in the research would be favourable to it during the whole three-year period. Clearly, there could be no way of making sure the students would always be excited about taking part, and as the research took place over a long period of time, it did not seem right to pressure anyone to participate unwillingly. We tried to always discuss with the students during the field phases and if someone seemed less willing to take part, we would film them less. This enabled us to produce at least some data with all of the students on each visit and on the other hand, from an ethnographic perspective it was not important to have exactly the same amount of data from each participant. In summary, we recognized the ethical challenges present in the research. We sought to take them into account by informing the participants about the nature of the research; by repeatedly discussing the progress of the research and their feelings about it with them; and by giving them as much say into the production and use of the data as we felt possible.

Looking back at some ethical considerations

While I sought to plan the research with the best of my knowledge there are some considerations that could be developed further in the future. The research process could be collaborative and it would be good to be able to accommodate ideas from

the students in the planning of the data production. I would have liked to bring out students' voices and opinions in a stronger manner. While we did discuss the research and its progress with the students regularly, it was sometimes difficult for me to perceive how they really felt about its ethical positioning and how easy it was to express discontent after first agreeing to participate. We tried to listen carefully to the students and if they wanted to participate less one week, we would always agree.

What made the students volunteer was something I still don't exactly know. They certainly had their own agendas but we perhaps did not discuss them extensively enough. Participating in a study changes one's position as a student. It could bring additional inconvenience as we occasionally asked the students to come to school early in order to set up the microphones and cameras. Sometimes it meant taking a break from the regular day. One thing the students strongly emphasized was the importance of the phones for themselves and their negative attitudes towards phone bans. For the students, participating in a study was possibly seen as a way of bringing more attention to how meaningful the phones were. We were surprised at how much interest the research generated in the first school where a half of the students volunteered to participate. This was possibly to do with the fact that the teachers were positive towards the research and as the school was located in a smaller community, researchers were not seen as often there. In the second school researchers were a common sight and neither the students nor the teachers seemed to pay extra attention to us. Most of the participants could be labelled either technology-positive or successful in school. All of the participants were white or passed as white. We did not enquire about their social class and background. Six of the students spoke Swedish as their first language, one spoke Finnish. Everybody was fluent in Swedish and the research took place in Swedish-speaking schools. Swedish is not my native language and while I became more fluent in it during the process, this could sometimes be seen as awkwardness in the interviews.

Both the students and the teachers were interested in the findings of the research although there was generally more interest in the first school. After we had completed the data production we returned to both schools to present our initial findings. This was also done to facilitate discussion on mobile device use in school. We presented our findings in an assembly where the whole school was present. These served as starting points for a discussion where students and teachers could raise issues. Although we only saw what took place in the assembly, the discussions likely continued afterwards. As a general observation it seemed that the students were not surprised about the findings but the teachers seemed to have a quite limited understanding of how phones actually are used during schooldays. Many expressed surprise about the amount of screen time in classrooms. With this in mind we focused especially on showing the richness and variety digital devices bring to students' everyday interactions.

Working with under-aged informants

We wanted to enquire into the aspects of phone use precisely in the context of school and the lives of young people. Along with this came the challenge of all the participants being – at least at some stage of the research – under the age of 18. One of the reasons for choosing to do research in upper secondary school instead of lower secondary school was that the students would be over the age of 16. As per the instructions of the National Advisory Board on Research Ethics (2009), young people of at least 15 years of age can take part in a research on their own consent. With this in mind we decided to ask permission for the research from the students themselves. This emphasized the fact that we considered the young people to be the experts with regards to their phone and social media use and wanted to respect their right to take control of the digital spaces they engaged with (see Tani 2014). The caretakers were informed of the research, but the actual permission was asked from the students themselves.

Later this has raised questions. During the writing process of an article for an international journal the reviewers raised the point that researching the phone use of underaged students seemed unethical to them. The question was resolved with reference to the recommendations of the National Advisory Board on Research Ethics (2009). On the other hand, the students themselves, school staff and parents have been satisfied with the research. Due to the young age of the students we have wanted to be in contact with them throughout the research and at each step make sure that they consider what we are doing appropriate. We have sought to give the young people opportunity to influence the carrying out of the research and change the research practices they have not agreed with.

Anonymity in digital ethnography

Our aim was to give the participants as much power as possible over how data based on their lives was deployed. At the same time, as researchers, we did want to preserve the possibility to analyse the data in the ways we found most interesting. We came up with a proposition that whenever image data is shown or published somewhere, we ask the students in the data whether they are ok with the showing of the publishing of that data. This is a common procedure in video ethnographic research. In a sense we asked for consent twice, once at the beginning of the research and then more specifically on each analysed segment.

What makes phone data so interesting is the balancing between private and public. On the one hand we are dealing with extremely private content, as we can each probably think of with regards to our own phones. On the other hand, a large part of produced content may however be public. Instagram posts, Facebook updates, and so on, are often public at least to some extent. By now many users have also grown tired of constant reports on how companies providing services take

advantage of user information. Since 2015, there have been numerous reports of suspect user data sharing, with Facebook being the worst offender. With this in mind, we wanted to maintain an obvious boundary between public and private in the data production: whenever students turned on screen sharing on their phones, the phone use became (at least potentially) public and this was shown by a watermark-like icon on the screen which could not be hidden. Correspondingly, when the icon was not present, the user could be sure that their use was as private as usually. An additional layer is provided by technological developments which may in the future enable advanced image searches or facial recognition. How to protect the anonymity of the participants? In the project we sought to do this by using drawings made by hand on the basis of video images or concealing parts of the image with blurring effects and masks. This ensured that publications would not show recognizable images. (Juvonen, Tanner, Olin-Scheller, Tainio & Slotte 2019; Sahlström, Tanner & Valasmo 2019.)

4.4 Ethnography at large

A clear definition of ethnography as a methodological tool is hard to pin down. As Anna-Maija Niemi (2015, 22) suggests, central ideas in ethnographic research are the researcher's reflexive stance, and sensitivity both towards the data and the power relations of the research contexts. In this sense, ethnographic work entails a willingness to constantly turn back to the research process and rethink its elements. Although my research has been ethnographic in many ways, for me this has perhaps been the clearest marker of an ethnographic approach.

As Niemi discusses, many facets of ethnographic sensibility have lately been questioned. The idea of a clearly defined 'field' has been criticized. On the one hand, the field is not something that exists separately from the researcher: their actions help to construct and maintain the field as such (Ikävalko & Kurki 2014; St. Pierre (2008), Niemi 2015); on the other, the field of research is not necessarily a specific physical place (Niemi 2015). The phenomenon of young people using smartphones in school does not exist as an objective entity. During this research project I have produced and constructed it as the assemblage that I then researched, as I will later demonstrate. Other choices could have been made and other assemblages put together. Karen Barad's notion of an *agential cut* helps to clarify this. She emphasizes that research phenomena are not passively waiting for scientists to inquire into them, but that every research creates the phenomena it is researching. While this idea may be commonplace in qualitative studies, Barad shows how it takes place everywhere, from physics to queer studies. (Barad 2003.)

In their 2016 book on Digital Ethnography, Sarah Pink et al write that in their view, "ethnography is not a very meaningful practice by itself; it is only useful when engaged through a particular disciplinary or interdisciplinary paradigm and

used in relation to other practices and ideas within a research process” (2016, 2). They use Karen O’Reilly’s definition of ethnography as “iterative-inductive research (that evolves in design through the study), drawing on a family of methods ... that acknowledges the role of theory as well as the researcher’s own role and that views humans as part object / part subject” (O’Reilly 2005, 3; cited in Pink et al 2016, 3). Pink et al go on to write:

“O’Reilly’s definition is useful because it remains open to the relationship between ethnography and theory without insisting that a particular disciplinary theory needs to be used in dialogue with ethnographic materials. To engage in a particular approach to ethnography, we need to have a theory of the world that we live in. The ways in which we theorise the world as scholars, working in or across academic disciplines, impacts on our practice as individual (or team-working) ethnographers in particular ways”. (Pink et al 2016, 3).

As discussed in the earlier sections of this book, for me this theory has centered on contemporary capitalism and the changing definitions of labour. While researching mobile phone use in school I am also asking questions about how lives inside and outside of school are entangled? Are work and education separate activities and what happens when school becomes a place where directly productive economic activity takes place? Tsing (2015, 66) gives a guideline: “to understand capitalism we need an ethnographic eye to see the economic diversity through which accumulation is possible”. In doing ethnography in these emerging educational spaces, we can benefit from approaches recognizing that, as Haraway (2016) writes, things are even more connected than we would like. Sensivity to the interconnectedness of things also means giving up on a fixed conception of research space because it is constantly changing. Some of this is due to digital technologies that become parts of educational spaces. However, I feel that ethnography is well positioned in this situation as it has always been a negotiation about space. Seen from this angle, digital technologies are not radically changing everything, but only a part of a new chapter in the process of spatial negotiation and re-configuration that has always been at the core of ethnography.

Encounters with post-qualitative research

In 2001, Gordon, Holland and Lahelma wrote that “the impact of postmodernism and post-structuralism has not been great in the field of educational research” (2001, 19). Since that, it has had considerable impact and has really come to the fore after 2010. Many Finnish researchers have sought to move ethnography to a post-structuralist direction (Guttorm 2014, Hohti 2016, Paju 2013), often with emphasis on new materialist, post-humanist or post-qualitative approaches. One of the central ideas behind these moves has been the understanding of ethnographic

accounts as something other than realist narratives of things that objectively took place (Gordon, Holland & Lahelma 2001). Working with ethnographic notes as ‘merely text’ has enabled a more experimental approach.

As Niemi (2015) points out, realist traditions still influence ethnographic research. The feeling of not being able to capture what really happened on the field is testament to this. Elisabeth Adams St. Pierre says that we remain rooted in the traditions we have grown up in and need to be ready to re-work and question them. In St. Pierre’s view, many of the emergent possibilities of post-structuralist research are lost when it institutionalizes. There is a danger of forgetting that we made it up at one point. As she puts it in an interview:

Qualitative methodology was invented in the 1970s and 1980s as a critique of positivist social science but we have structured, formalized and normalized it so that most studies look the same. The ‘process’ is the same: identify a research question, design a study, interview, observe, analyze data, and write it up. We can just drop a researcher down into a pre-given process and they know what to do, and we can pretty much predict what will come out. In this way, qualitative methodology has become predictive, like positivist social science.” (Guttorm & Hohti & Paakkari 2015, 16)

St. Pierre shows how qualitative research was created in dialogue with concepts of positivist epistemologies and remains in certain points a prisoner of them: many ethnographers feel the pinch of having to prove the reliability of a result while simultaneously questioning the entire concept of reliability; or having to discuss validity, or data gathering, or objectivity, while at the same time trying to move away from them. As Riikka Hohti (2016, 42) writes on the ambiguities of data: “When the researcher leaves the field, she has something called data with her: field notes, scribbled in her notebook or materialized in pictures or saved as bits on a memory card. These days it all ends up on computer files. There it is, waiting.” The question “What is data?” still remains hard to answer. In St. Pierre’s view, much of qualitative research is still caught in the positivist terminologies created by completely different research traditions and carrying view wholly different views of the world. This leads her to calling for post-qualitative research, a complete reconsidering of the concepts and epistemologies we want to work with (Guttorm, Hohti & Paakkari 2015). What St. Pierre is calling for is a foundation of epistemology and ontology and the slow construction of methodological tools on top of that. In this sense she even questions the meaningfulness of teaching methodology to her students – simply encouraging them to read and develop their own methodologies in dialog with the questions and theories that interest and trouble them. (Guttorm et al. 2015). Also, she suggests that changing our minds is harder than we think, and that it is hard to escape the methodological foundations we have grown up in, even if they no longer serve us well. St. Pierre encourages

us to be ready to change our minds, to sometimes admit defeat and start over. “I think the mark of excellent scholarship is changing our minds and being willing to do that.” (Guttorm et al. 2015, 16).

Behind the new post-qualitative approaches is an important question concerning the world and the knowledge we produce. In post-structuralist research the idea of research as something that not only describes but produces worlds is nowadays a commonplace. (Law 2004, 5) As we take it as a starting point, the next question concerns the character of the worlds we are producing – who populates them, how are they constructed? In research and in writing, we construct “possible images of the world”, as Law (2004, 6) says. As we can never know the world in all its complexity, spaces or images for the unknown are also needed. In this way “this new work”, as St. Pierre calls it (Guttorm et al. 2015), opens up possibilities of being and makes way for something we do not yet know. It gives us a possibility to look at new phenomena through with new concepts, as Jokinen, Hohti and Räsänen (forthcoming) do with minor affects, Hohti and Tammi (2019) with multispecies childhoods, Bodén (2016) with intra-action, and Rautio and Jokinen (2016) with more-than-human worlds.

Ethnography as a feminist methodology

My ethnographic interest builds on the power of ordinariness. As Kathleen Stewart (2007) shows in *Ordinary Affects*, the ordinary has an affective power that can pierce our existence, our settled or stratified ways of being. Traces of this potentiality are always present if seldom actualized. They help us to see the extra-ordinary in everyday. Life is lived “confused, but attuned” (Stewart 2007, 10), and when something breaks in the ordinariness, it is “as if everyone was just waiting for something like this to happen” (Stewart 2007, 11). It is tempting to think of still life, of a moment captured or frozen for analysis. But life is fleeting, escaping, always on the move and never stopping long enough for the observer to get an objective grasp. (Stewart 2007, 53). Ethnography is an attempt at living with the chaos, of going with the flow of ordinary events.

Félix Guattari develops the idea of *micro-politics* in several essays during the 1970s and 1980s. (Guattari 2009a; 2009b). Guattari, along with Deleuze and Foucault, seeks to question the origin and center of important societal changes and shifts. Do they happen at a large-scale institutional level and then trickle down to the lives and everyday practices, or is it the other way around? (Guattari 2009a; Foucault 1979/2001b.) These writers strongly take the side of everyday phenomena. Similarly, Foucault focuses his inquiries on micro-political phenomena which then are shown to connect with larger-scale structures. The events are not ‘cases’ that exemplify a larger structure, but singular instances, happenings or unfoldings that both have a connection with structures and exceed them. In my view, ethnography is situated on the level of events. Instead of looking at structures, it seeks

events. It seeks out the unusual in everyday. The forces, vectors, lines of flight, and ordinary things that go on as they always do. As Tuula Gordon, Janet Holland, Elina Lahelma and Tarja Tolonen (2005) write, ethnography often focuses on what seems ordinary, what demands no explanation.

Feminist ethnography in particular has been interested in the messy stuff of everyday life. For a long time, this was also the part of life reserved for women. Reproduction of life fell outside the prestigious arenas of decision-making, politics, war, common good, or labour. Men were the ones who carried out their lives in the sphere of ‘the general’, or who in the words of Hannah Arendt, lived a *vita activa*, a life capable of political action. For Arendt, the things that had to do with mere everyday existence were not something that could even be discussed on the political stage. This cast women and those doing reproductive work to the sidelines while the political arena and agency in general was reserved for those focusing on the general, not the particular. (Arendt 1998.) Sometimes this was also the case in Marxist research where labour was seen as exclusively something that took place outside of home (Federici 2014). The labour force consisted of men and reproduction was just a necessary addition, not labour in itself. Through the work of Silvia Federici and many others, reproductive labour is only now becoming recognized as a central mode of labour.

Focusing on reproductive work is not only significant for Marxist research. It is a part of a shift that questions where important things actually take place, where power is situated and how it is distributed, and whose lives matter and whose do not. Engaging in ethnographic research is a political move. It is turning the gaze towards that which was not considered important, that which was mundane and commonplace. To paraphrase Marx (1887) from the chapter on The Buying and selling of labour-power in *Capital*, it is to take leave from the surface where everything takes place in view of all, and enter into the hidden abode of production.³ This is where things are entangled and messy, constantly turning into each other. Ethnography is being part of this messy everyday, in the middle of things. And as Deleuze & Guattari write, the beginning and the end are not interesting – the middle is where we always are: “the middle is by no means an average; on the contrary, it is where things pick up speed.” (Deleuze & Guattari 1987, 25).

³ “Accompanied by Mr. Moneybags and by the possessor of labour-power, we therefore take leave for a time of this noisy sphere, where everything takes place on the surface and in view of all men, and follow them into the hidden abode of production, on whose threshold there stares us in the face “No admittance except on business.” Here we shall see, not only how capital produces, but how capital is produced.” (Marx, *Capital I*, p. 123)

5 Articles

5.1 School and smartphones. Cognitive capitalism in the classroom [Original title: Koulu ja kännykät. Tietokapitalismi luokkahuoneessa]

Article 1 takes a general look at mobile phones in classrooms. It starts from the observation that the union of technology and school has often been problematic. However, it is still often loaded with expectations and technology is considered a good match for school. An inquiry into current official documents suggests that increased digitalization is seen as a necessary condition for keeping Finnish education on the forefront of pedagogical success. However, the documents observed point to an obstacle: technology is not used enough in schools. There seems to be a contradiction between students being confident in their ICT skills and students using their own devices a lot and the continued lack of efficient pedagogical ICT use. The article suggests that through students' own mobile phones technology has entered the school but in ways that are considered inappropriate.

Where Marx saw a direct correlation between the societal organization and the technologies it produces, Deleuze suggests that technologies should be seen as a part of a societal assemblage and must not be looked at alone. We should always consider what specific machines are doing in our specific society. Following this guideline, the article sets out to investigate the logic of technologies in cognitive capitalism. Berardi suggests that mobile phones act as the assembly line of cognitive capitalism, helping to join fragmentary pieces of labour together. Pasquinelli points out the significance of big data as raw material for value production in cognitive capitalism. This enables us to situate mobile phones as machinery of cognitive capitalism, both helping to create big data and making possible the everyday organization of fragmentary cognitive labour.

Viren & Vähämäki analyze a new form of entrepreneurship that seeks to harvest added value from the spontaneous activity of people. This is contrasted with a traditional model of the entrepreneur creating value through investment. Together with Moulier Boutang, Viren and Vähämäki suggest that contemporary capitalism operates through platforms that collect and take advantage of user activity. This can be seen for example in the logic of social media corporations or Google. The article connects this with Ruckenstein's discussion on prosumerism which also addresses the changing roles of producers and consumers. Ruckenstein points out that technology developers are deeply interested in the desires of their users and go to great lengths in trying to provide content that they find interesting. At the same time, they acknowledge that something in user activity always escapes them.

The article ends by concluding that we should consider mobile devices in school in the context of cognitive capitalism and its value production. This would involve moving away from discussing whether there is enough technology in school, and instead analyzing it in precisely what it does. This also means taking seriously the new agencies and possibilities that technologies create for users and the ways in which users find ways of advancing their own ends even on tightly controlled platforms.

5.2 Digital labour in school: Smartphones and their consequences in classrooms

Article 2, written together with Pauliina Rautio and Verner Valasmo, approaches phone use in classroom through the concept of digital labour. Looking the cumulative data produced during the Textmöten research project we conclude that phones have a constant presence in classroom. Use varies considerably (e.g. 4%-22% of time) but even at its most minimal point is significant. A major part of youth phone usage takes place in social media and can be approached through the concept of *digital labour*. This means the labour associated with producing content on internet platforms. The article discusses the ways in which many theorists have approached this as unpaid labour and as an example of platform capitalism. Digital labour is associated with a business model that is typical to late capitalist economy where enterprises produce platforms that users themselves fill with content. Companies such as Facebook or Google provide a service but the majority of its content comes from users who do not get paid for their contribution.

In a school classroom this is significant for two central reasons. Firstly, in Finland school has been seen as something that the state takes care of. Enterprise actors have had very limited access to the classroom. This is now changing rapidly as students in a classroom use apps and platforms created by technology companies both in their study tasks (dictionaries, writing platforms) and for their personal life (social media). This raises important questions around the control and ownership of the classroom and the educational setting as a whole. Secondly, school has been situated on the outside of working life. One of the reasons for the creation of the Nordic school model was the abolition of child labour. However, it could now be argued that we are witnessing the return of a peculiar mode of child labor. While students are sitting in the classroom and studying, they are simultaneously engaging in productive economic activity on their phones.

The article shows how a majority of students' phone use takes place on platforms that can potentially turn it into economic profit. Mobile device use carries a duality also for the students: while it is a relaxing moment away from school work, it is sometimes experienced as less than relaxing because of all the notifications and emotionally tasking content it provides. While communicating with friends was clearly the most important factor for phone use, students also had to

learn to negotiate with the commercial aspects of phone use such as the presence of advertisements.

The article concludes by pointing out that internet in itself will not revolutionize the practices of teaching and learning. Technology does not come alone and cannot be analyzed without looking at its connections. The article suggests mapping the actors present in the classroom in order to understand how technology functions there.

5.3 “What is puberty, then?” Smartphones and Tumblr images as de/re-territorialisations in an upper secondary school classroom

Article 3, written together with Pauliina Rautio, focuses on a singular psychology lesson and the ways in which one of the students uses Tumblr photo-blog application to contextualize and challenge discourses on puberty offered by the teacher. We look at how puberty materialises in everyday school life through phone use. This leads us to examine the ways in which phone use matters to the students and channels flows of capitalism in school.

In the article we wanted to map the forces present in the classroom through mobile devices. The approach was motivated by an idea that the devices have an agency of some kind, that they are not merely passive technology objects doing exactly what their designers intended. We presumed that with the phones also new forms of agency enter the classroom, and the devices may act as allies for these new agencies. The article was an attempt to map the elements of this event and see what is going on. We used Deleuze and Guattari’s concepts of de- and re-territorialisation to look at how mobile devices challenge the territorialities in the classroom. For Deleuze and Guattari, the continuous oscillation between de- and re-territorialising forces is a central feature of capitalism. In a classroom situation, we wanted to see where the de-territorialising forces present in mobile phones lead and how they in turn re-territorialise. We also used Tsing’s idea of salvage accumulation in order to approach value production that takes place in atypical places such as school classrooms.

In the analysis, we found three main aspects of de- and re-territorialisation. The first was in relation to the physical space of the classroom. While the lesson was taking place in the snowy early spring landscape of central Finland, the student we observed was looking at images from sunny beaches and tropical lagoons. We looked at how this imagery was constructed as objects of consumption, through an objectifying gaze that presents places as potential vacation destinations. Secondly, we focused on de- and re-territorialisations in relation to the affective space of the classroom. Shared memes de-territorialise the affective intensities of disciplinary school structures such as the need to share the same physical space with a number of arbitrarily chosen classmates or the need to act interested

in teaching and play the role of the 'professional pupil', as Lahelma and Gordon write.

Thirdly, we focused on bodies were de- and re-territorialised in Tumblr images and during the lesson. While during the lesson that focused on puberty and its effects on human bodies the teacher framed puberty as something that prepared bodies for their principal purpose, procreation, the images on the screen presented other ways of using bodies. In them, bodies existed for pleasure, desire and enjoyment. Finally, we looked at the ways in which consumption and cognitive capitalism are entwined in these de- and re-territorialisations and the mobile devices enabling them. The analysis presents an interesting contradiction in the ways phones give young people a possibility to create spaces of their own and question the prevailing power structures of the school, and are simultaneously deeply connected with the logic of value-production in cognitive capitalism.

6 Concluding remarks

”How else can one write but of those things which one doesn’t know, or knows badly? It is precisely there that we imagine having something to say. We write only at the frontiers of our knowledge, at the border which separates our knowledge from our ignorance and transforms the one into the other. Only in this manner are we resolved to write. To satisfy ignorance is to put off writing until tomorrow – or, rather, to make it impossible. (Deleuze 1994a, xxi)

Donna Haraway (2016) writes that in our contemporary worlds one central experience is that things are even more connected than we would like. Sometimes the connectedness may lead to a feeling of over-abundance and the impossibility of taking a stand: things are simply too complicated and there is no easy right answer. This research has presented one approach to the connectedness and complexity of mobile devices in schools. The central finding is that mobile devices cannot be approached separate from the things they are connected to. They are always a multitude, a web of connections, and deserve to be analysed as such. Phones drag along an assemblage of actors, power relations and economic structures and any analysis should account for them.

This research has shown how technology in school points back to the power relations and societal structures behind the technology itself. As Prout argues, “devices and technologies are not inserted into social relations from the outside. They are created and create effects within a particular social and economic context and it is to this whole network of connections that we must look to if we are to grasp the process” (Prout 2004, 125). Technologies are introduced to the schools with a rhetoric of solving educational and pedagogical problems while time and time again it is found that technology alone solves nothing. It carries along an age-old, quasi-religious hope that someone would solve our problems for us. One of the reasons for why technological solutions are so persuasive is that they often demand us to change little in the ways in which we act. This research has sought to follow mobile devices in schools, paying attention to their complex connections. However, as Neil Selwyn writes, it is not enough to recognize the complexity of a phenomenon. The value of a thorough critique lies in “explaining exactly what things are complex; then explaining why these things are complex; and then highlighting important factors of this complexity that usually escape people’s attention but might offer a way forward” (2016, 146-147). Acknowledging the complexity does not mean raising our hands and giving up. There are things we can say and do. This research has shown that mobile devices have become a permanent fixture

in Finnish classrooms. However, the debate over the consequences of this is far from over.

For me, this research has marked a beginning.

6.1 Reflections on methodology

We need innovative methodologies to investigate new technologies in school environments. When video research became possible it presented an innovative opportunity to understand the events of a classroom in more detail. After the introduction of mobile internet a significant part of classroom interaction has shifted onto mobile devices and this needs to be reflected in the research we do. Digital ethnography that enquires into mobile device use faces many challenges such as how to respect the privacy of the users while producing data that gives a comprehensive picture. As Selwyn and others point out, this asks for a willingness to experiment and develop new innovative research methods. The methodology developed in this research, mobile phone screen mirroring combined with video ethnography, offers an interesting new way for a detailed look to how digital devices are present in school. It gives the students control over what material is shared while being relatively easy and straightforward to use and not demanding the students to specifically produce content for the research. It allows for an intricate look into how phones are used in today's classrooms. The approach developed by us has already been used in other projects such as the *Connected Classrooms* project at University of Karlstad, Sweden (Juvonen et al 2019). In the future, it can form a basis for new methods that enquire into the use of digital devices in school.

6.2 Platform capitalism in schools

The results of this research show how mobile devices have become integral parts of classroom life. The presence of mobile devices has tied school and economy together in new ways. The digital labour taking place on the phones produces value outside the classroom and the data students generate in platform capitalism flows back to the companies that own the platforms. As shown in article 2, the large-scale everyday presence of mobile devices in classrooms is rapidly changing the lines of public and private. Education has always had its commercial aspects that can be seen in examples like the textbook industry (Selwyn 2016). However, digital technologies bring some fundamental differences. The presence of private actors has traditionally been heavily regulated in the Finnish school system and the content of textbooks is broadly controlled by the curriculum. With regard to the digital technologies entering school on the ground-level, the public sector holds much less sway over them. Global technology companies have gained a strong foothold in the everyday operation of classrooms. This is often driven by

convenience as there are hardly any alternatives to commercial platforms such as those offered by Google, Microsoft or others. Students write notes and collaborative essays on word processors, teachers share lesson slides on cloud platforms, timetable planning is done on calendars. For companies behind the services this creates a ground-level access to the classroom. It results in a mutual dependency where students and teachers rely on the platforms to supply them with services and the platforms rely on students and teachers to supply them with data.

This happens at a time when global technology companies are actively pursuing a larger role in education. They offer course materials for schools and teachers, give discounts on devices for school use, seek to influence curriculum planning, are involved in private school enterprises, actively recruit people from public school administration and finance various education-related start-ups. Education has long been an important sector for tech companies (Selwyn 2016). In platform capitalism it becomes all the more significant through the sheer importance of data (Srnicek 2017). It would therefore be foolish to think that tech companies would not increase their efforts in entering education.

6.3 The urgent need for discussion on technology in schools

The discussion about the role of technology in schools has been left in the hands of technologists for too long. The pace of technological development has been such that the public sector and the general public have had trouble in keeping up. This may lead us to think that we simply cannot comprehend the possibilities new technologies bring. Perhaps an innovation that can revolutionize our existence is just behind the corner? Neil Selwyn (2016) claims that this optimistic self-confidence has led some tech sector operators to see themselves capable of solving any global or local issue with the help of new technology. Because the promises of technology are often complicated and their accuracy is hard to measure beforehand, discussing them has been difficult. A Silicon Valley slogan “fail fast, fail often” means that inventions need to be brought to market swiftly, letting markets decide on their viability. The fact that most start-ups fail is not seen as a problem since for a thousand failures there may be a new Google. From the tech sector’s viewpoint, it is better to bring technologies to market immediately instead of considering their benefits and disadvantages. This has led to a lack of debate on the effects of technology use, especially in education. In *Is technology good for education* (2016) Selwyn proposes that we re-ignite a public discussion on the benefits and disadvantages of technology in school.

This discussion has to start somewhere. This research is one step towards it. While the public sector ponders on what to do with school technology, IT companies are moving fast into the classrooms.

6.4 Why technology in school should be regulated

In 2020, we must be able to give up on the idea that technology would be self-regulating or would correct its own missteps. Many central Silicon Valley ideologies are turning out to be incompatible with school and education: the emphasis on quick results and demonstrable outcomes; thinking big and acting quickly; the mistrust towards institutions and experts; the ideals of experimenting and failing often (Selwyn 2016).

This research suggests starting from seeing – borrowing Nick Srnicek’s (2017, 3) idea – major tech companies as economic actors within a capitalist mode of production. This means seeing them as actors that have to seek out profits in order to resist competition. As Marx (viite) already shows, in capitalism one can only succeed by capitalism’s rules. No matter how successful a company has been, others are always waiting to take its place as we saw in Nokia’s case. This means that while companies may be interested in social justice and corporate responsibility, this applies only for as long as it does not come in the way of their primary goal, shareholder value. After 2015, with Facebook’s numerous data leak scandals or emerging evidence of Google developing a censored search engine for the Chinese market (Liao 2019; Vincent 2018), we have seen that there is no reason to trust the tech sector to be its own guardian. Silicon Valley capitalism has concretely shown itself to be incapable of being responsible for environmental sustainability or user privacy. While these concerns might be important for the companies in principle, as capitalist actors they have no choice but to obey the laws of capitalism.

These are the companies that we trust with our data, free of compensation. And not only our own data, also that of children and young people. How realistic is it to presume that they would not misuse it at some point, even while they operate within the sphere of western libertaristic capitalism? However, there is no reason to think that the society could have no say in technology use in schools. As Selwyn (2016) reminds, most major technological developments of the last century have been driven or at least supported by the public sector. The foundations of Silicon Valley capitalism were built on government-funded military research (Barbrook & Cameron 1995; Dyson 2012). The application or development of technology has never been left solely to tech companies and our current situation should be no exception. There are many possible avenues for regulation of technology in school. Of late, we have seen proposals that would break up the monopoly position of largest tech companies. An interesting approach, driven by a presidential candidate in the US, is also one that would give users the possession of their own data (Yang 2019). They could then either decide to sell it to the companies for a fee or to refuse to hand it over.

Regarding school, the position of data is most vital. How much data do we allow to the companies in our schools? If the public sector does not react, there is

a danger of the schools turning into publicly funded data mining sites for global tech giants.

6.5 Phone addiction and contemporary capitalism

Lately, in 2016-2019, public discussion on phone use has been dominated by psychological approaches that emphasize the effects of phone use and multi-tasking on our cognitive capabilities. These discussions have been important and one of the central factors behind a shift in public opinion that has turned increasingly critical toward phone use and social media. Some of the main critical points of the screen time debate have been the following: a constant stream of notifications leads to a culture of interruptions where large parts of work time may be taken up by inefficient and superficial reacting to messages and notifications – repeated interruptions damage our ability to properly focus on anything; the constant presence of phones can take away from other social relations such as face-to-face interactions; children have trouble switching off after using phones for extended periods of time; parents have difficulty connecting with children while being constantly barraged by their own phone notifications; and social media leads to a dilution of privacy and does not protect user information with nearly enough care. While many of these issues are absolutely worth considering, the absence of certain themes has been noteworthy. In short, what has been talked about are individuals, their abilities to control their behaviour, the addictiveness of technology – what has not been talked about are things like societal structures, power relations and capitalism.

Many of the debates carry a reminder of early 20th century debates on the effects of big cities and metropolis on human psyche. Some criticized big cities claiming their constant barrage of affects and information would break the bonds of human communities. A contrasting view was offered by Walter Benjamin who wrote about absent-mindedness as a way of sensing the events unfolding in a metropolis. One does not observe everything closely but participates in the stream of events absent-mindedly, being both present and absent. (Benjamin 1989; Viren & Vähämäki 2015.) According to Benjamin, this may give rise to a new culture with new ways of being and sensing. Regardless of whether Benjamin was right or not, it is interesting that he formulates his approach on the basis of changing modes of production. As the nexus of capitalist production was shifting from the countryside to the cities, metropolitan life in the early 20th century was increasingly the life of the proletariat. Judging it inferior to previous modes of life was also an implicit judgement on the life of workers whose existence was deemed inauthentic. Benjamin did not succumb to powerless nostalgia but sought to look for seeds of coming revolutions in the changes of everyday life. In the destruction of traditional ways of being, he saw the emergence of something new which could also be a positive force.

With this in mind, it is worthwhile to stop and look at the reasons behind phone use today. A large part of why we look at our phones constantly, check our emails and try to remain in reach throughout the day has to do with the way labour is organized today. A swift reaction to an email is often expected. Calls are expected to be answered. Some phone apps such as Slack are used explicitly for work coordination and some, such as Whatsapp, Facebook or Instagram, may not be solely for work but nonetheless house important work content. And all this before even considering the enormous difficulty of setting ‘work-related’ things apart from ‘not work-related’ in our lives. As the suggestions of post-Fordist theorists from 20 years ago – everyday life becoming directly productive, or the everyday becoming the site of production – have become true, but as always, in a distorted form, it is commonplace that the contacts created on free time social media later lead to work. In a society that cuts pensions and unemployment benefits while raising the cost of living, it is often simply unwise not to be alert and online. Therefore, *if phone-addiction is not so much a personal deficiency but something implicitly demanded by contemporary capitalism*, approaching it as a personal problem leads to unwanted outcomes.

6.6 Future suggestions

Another interesting aspect deals with phones as actors and the agentic capabilities of mobile devices. As we have written together with Riikka Hohti and Katariina Stenberg, phones matter to young people in intricate ways and have become participants of everyday school life (Hohti, Paakkari & Stenberg 2019). There is also a need for an analysis that takes a detailed look at how mobile devices become part of interaction. Verner Valasmo, Fritjof Sahlström and I have written on how phones enter the interaction frameworks in classrooms and how the details of app design can have far-reaching consequences for the interactions between students, teachers and classrooms (Valasmo, Paakkari & Sahlström in process). Furthermore, the many paradoxes of the digitalisation of education need to be analysed robustly. Together with Anna-Maija Niemi (Paakkari & Niemi in process) we have pointed out how there is a strange discrepancy in how students are encouraged to use their own devices and simultaneously sanctioned for using them. The proliferation of e-books and other digital study materials has taken place with the ostensible goal of providing more individualised study materials, however many of the students still wish for the return of printed books which however are not favoured by the school. While digitalisation is being pushed through on the premise of providing more individualised education, the form of this individualisation seems heavily pre-determined.

Approaches such as these show that there is a strong need for research on education and technology. It also shows that the phenomena in question are seldom simple and one-dimensional. Any research on them must be able to account for

things in their many-sited connectedness. In this project, I hope my research presents a small contribution and a step to a fruitful direction.

This research has started from mobile devices in a school context. The question of what they do in school has led me to investigate the connections between technology, education and flows of capitalism, power relations, and agential possibilities associated with technologies. For the actual process of research, non-individuality and entanglements have been of central importance. As a researcher, I have become a part of an assemblage through which the phenomena in question can be inquired into. However, these research assemblages are also the *loci* in which we write, think and feel. I could not have done this research alone and I would never have wanted to – I would not have encountered these ideas alone, and have never done so. They are situated and created in our encounters, in between things and beings, where things pick up speed.

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