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6. SMARTPHONES

LEAPING AND DANCING WITH DIGITALITY: EXPLORING HUMAN-SMARTPHONE-ENTANGLEMENTS IN CLASSROOMS

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Abstract

This chapter explores digitality as part of young people's everyday lives in the Arctic. It is based on two ethnographic studies situated in the political context of the "digital leap", the governmental and curricular emphasis on digitality in education in Finland. With the more formal "digital leap", informal engagements and attachments with digitality intertwine, in which students' own smartphones play an increasingly significant role. The analyses use the notion of entanglement (Barad) to examine how primary school and upper secondary school students emerge in their situated and specific encounters with smartphones in school. The starting points of *things*, *bodies*, *affect*, *time* and *space* open up insights to connectivity between young people's digital activities and global economic networks as well as to the multidirectionality between humans and technologies: while the students access their digital devices, the digitalities also access their users. We suggest that this wilder form of "digital leap" requires reconsidering materiality, affect, and instability of space and time.

This chapter explores children's and young people's engagements and attachments with digitality in Nordic school context. School research (e.g. Simola, 2015) has brought out how classroom practice and routine seems to be surprisingly resistant to change to the extent that to an observer's eyes, much of it looks practically unchanged during decades. However, the fact that smartphones increasingly participate in people's lives might be one factor that triggers profound changes even inside school walls. We suggest that the relations between humans and their constant digital companions, their smartphones, cannot be reduced to instrumental pedagogical relations, and that to examine them, one needs to attend to complexity and open-endedness. Thus, in the following, we are not so much focusing on pedagogies, in how smartphones should be used to enhance learning, rather, we are curious about the material, bodily, temporal and spatial dimensions at play in situations in which children and young people and their digital devices entangle in schools and beyond.

In talking about young people's engagements with smartphones, we will particularly emphasise two aspects: firstly, the affective nature these engagements, or as we like to think about them following Haraway (2003), companionships. The processes in which phones become young people's

companions in everyday life are material, embodied, and deeply intimate. In our empirical examples we discuss for example boredom and addiction in relation to this. Secondly, we emphasise the ‘beyond’ perspective, as we see it crucial to take into account that smartphones are making schools less and less disconnected from everyday life outside schools. There is a multidirectional dynamic in the digital engagements, which means that not only students access their phones, and through their phones global flows and networks, but also the phones access their users. Events, ideas, and provocations from outside the traditional realm of education flow into classrooms via students’ phones. The local understandings of education, and of digitalization and technology as part of it, thus necessarily intersect with larger knowledge networks and affective flows as well as the material chains of production. We ask, what could be seen as distinctively Finnish or Nordic in this case? The hyperconnectedness created through the students’ smartphones necessarily disturbs the spatiality and temporality of schools.

Situated in the above described landscape of new mobilities, capacities and connections, pedagogy is facing new questions. We claim that the answer cannot be found merely from providing young people with technology and suitable learning methods, but an understanding of the everyday complexities of children’s and young people’s very own digital engagements is needed. Furthermore, digitalization of education should be considered as a change that raises ontological questions.

Finnish stories of technology, digitalization and education

In 2018, phones are everywhere in Finnish classrooms. Sometimes they are there as official participants in school tasks. Using phones for school assignments can mean for example finding information for answering questions or videotaping drama tasks on a history lesson. Sometimes the phones are not expected to be openly present, which means that they are hidden in jean pockets or between notebook pages. As soon as the break starts, they pop out from their hiding places, taking a visible role in what happens in the corridors or on the school yard. The formal and informal uses mix and mingle: a school task can intertwine with quick visits to social media applications checking messages or with receiving vibrating youtube posts. Some school-related uses, on the other hand, are situated in social media, such as the shared whatsapp list that is used for communication between the teacher and the students, or for keeping track on homework. For an outside observer it is impossible to say what exactly is going on when children or young people are absorbed in their phones. Nevertheless, phones certainly are there, and based on the intensity, the affective attachment, the time spent on phones, and the range of activities organized anew according to them, it is justified to say that they matter to their young users.

Technology has played a central part in the Finnish project of globalization during the past decades (Ruckenstein, 2010). After the collapse of the Eastern neighbour Soviet Union, and the slowing of forest industry, tech industry and innovations were singled out as something that could lift Finland out of the depression of the 1990s. Much of this had to do with the success of mobile technology, particularly Nokia mobile phones in late 1990s and early 2000s. As a marker of Finnish identity and inventiveness, technology in a short time took its place in the national mythology beside the more traditional ones such as honesty, quietness, guts, heavy drinking or nature. The fact that industrialization had taken place in Finland quite late, only in the beginning of the 20th century, meant that Finland could not rely on its long industrial history. This specific “ahistorical” understanding of technology gave a possibility of starting anew and embracing new developing technologies without the weight of the past, (Kokkinen, 2011.)

As many national imaginaries, Finnishness has been built from an assemblage of miscellaneous elements that have their provenance in unexpected places. The technological narrative can extend

simultaneously to the future and to the past (Kuisma, 2013): it can signify present success as well as the recognition of past Finnish achievements and inventions. Like many of the things considered typically Finnish, however, mobile technologies are not the sole property of Finnish people and the above sketched narrative of technology is not unproblematic. While technology is seen as one of the means to taking global lead, the global origins of the technologies themselves remain hidden. A non-critical approach to technology and a certain techno-optimism (see Berglund, 2010) are sometimes seen almost as a national duty. In addition to this, the notion of technology as “ours”, makes it difficult to discern its connections to politics.

Education can be seen as another Finnish success story. The comprehensive elementary school system created in the 1970’s to guarantee free and equal basic education for everyone has become famous due to international comparisons. The Finnish success in OECD’s Programme for International Student Assessment (PISA) (see, e.g. OECD, 2010) reinforced the reputation of Finland as the model country of education. The stunning success measured in the early assessments, however, did not last, and along with decreasing results, space for fears of Finnish education looking backwards was made (Saari & Sääntti, 2017). At the time that this chapter is being written, a new government policy has announced a “digital leap”, a strong emphasis on technological skills in basic education (Saari & Sääntti, 2017). The new core curriculum of basic education defines that digitality – some kind of use of digital devices or platforms at the minimum level – should be included in the teaching of all the school subjects. It can be said that technology is employed as means to construct successful Finnishness once again - this time to reoccupy the global leading position in the field of education.

The “digital leap” policy requires all the schools to guarantee access for the students to up-to-date technological devices. Importantly, however, some municipalities are not as fast in making their “leap” as others. In reality, pedagogies increasingly lean on students’ own devices, typically, smartphones, as it is common that almost all the students carry their own smartphones at school. The use of students’ own devices for school tasks, the Bring Your Own Device (BYOD) approach, has been identified as one of the fastest growing educational trends in Nordic countries (Johnson et al., 2015). At the moment, Finnish children typically are bought their first mobile phones when they start their school, at the age of 6-7 years. Among 8-year-olds, the percentage of smartphone owners is 88 (DNA koululaistutkimus, 2017).

In this chapter, we go to classrooms to observe what the above described national narratives and policies look like from the level of children and young people. Our ethnographic studies in the contexts of basic education and upper secondary school enable examining the material, embodied and affective detail of “digital leap”. In trying to reach the thick texture and the messiness of everyday life, we do not center one single branch of digital communication, such as social media discussions or information retrieval for school tasks, because the functions of the phone are layered and they relate to each other and to other actions in school in nonlinear and complex ways. Indeed, it would be simplified to differentiate between real and virtual life, or “screen time”, as these increasingly exist in a mixture, following a logic of “both and”. One example of the complex issue of having phones in the classrooms is that even if the phones are closed, the virtual and digital elements continue to intervene because all the students’ networks continue to leave messages and affordances and to participate in what happens seemingly “outside” these technologies.

Entanglement - a material and relational approach

For our study, the starting point is the realization that children’s mobile phone use is characterized through complexity, change, flow, affect and mess (Law & Mol, 2002) and that it is thoroughly materialcultural by nature. Digital engagements are never only digital, and they cannot be embraced

through a reductive lens of information retrieval, for example. *While students have access to phones, the phones also have access to their users.* Digitality both participates in constituting social and material life, and is itself constituted in relation to events and beings. Thanks to the multidirectional complexity of these dynamics, what happens around children and digitalities is always partly unpredictable. But not entirely, as algorithms, platforms and mobile “ecosystems” are dominantly shaped in ways that serve the interests of prominent tech companies such as Google, Facebook or Apple (Pasquinelli, 2009). Again, following the logic of *both and*, what from the point of view of a young person is random and playful pastime use of for example game applications, can and will from the point of view of tech corporations be actualized as commercial benefit. Thus, even if we approach the landscape of human-technology entanglements as open-ended, we need to account for the non-innocent work of power relations within the relationality at hand.

Theoretically, to embrace the above described complexity, we need a material and relational ontology. Instead of focusing on individual children, their learning or social interaction, we examine the combinations and gatherings of heterogeneous elements in everyday digital encounters that take place in classrooms. We use the concept *entanglement* by feminist social science scholar and nuclear physicist Karen Barad (2007; 2012) to illuminate the open and co-constitutive dynamics within the assemblages of children, their phones, and more. Thus, we take neither children nor their devices nor pedagogical practices as given and existing a priori, but foreground the ways in which these emerge from and as parts of the unique combinations that take place in classrooms (see also Prout, 2005). Barad’s agential realist ontology is based on her notion of *intra-activity*, an inherent interaction which constitutes all entities in interdependent relations:

Existence is not an individual affair. Individuals do not pre-exist their interactions; rather, individuals emerge through and as part of their entangled intra-relating. (Barad, 2007, ix).

The intra-active nature of events brings into picture a vibrant ontology, in which also temporal and spatial dimensions are embraced. According to Barad, space and time are not neutral, stable, and separate from humans but also part of how human and non-human beings entangle and become. She continues:

Which is not to say that emergence happens once and for all, as an event or as a process that takes place according to some external measure of space and of time, but rather that time and space, like matter and meaning, come into existence, are iteratively reconfigured through each intra-action, thereby making it impossible to differentiate in any absolute sense between creation and renewal, beginning and returning, continuity and discontinuity, here and there, past and future. (Barad, 2007, ix).

Empirically, we draw on two ongoing studies. The first study focuses on children and their own smartphones on a 5th grade classroom among 11-12-year-olds. The broad research question “What comes to matter for the children in their digital assemblages?” is connected with an aim of developing nomadic participatory approaches that would be able to follow children to virtual and real-life environments in a flexible manner. The empirical materials for this study were produced jointly by Riikka and Katariina, and they consist of a range of co-produced observations, visual materials, virtual and real-life encounters and conversations. The second study has been conducted by Antti as a part of larger research project, a video ethnography in Finnish high schools among 16-17-year-olds over a period of three years, focusing on smartphones in classrooms and their connection to the re-configuring of power and spatial relations. The empirical setting for that study can be seen as especially ambitious: in addition to researcher-produced video materials there is a focus group of

seven students whose mobile phone contents have been captured simultaneously with the real-life interactions taking place (Paakkari & Rautio, 2018). Thus, through this data it is possible at least partially to approach the enigma of what kinds of connections and worlds there are behind the minimalist scene of a young person staring at their phone and touching the screen with their fingers.

In what follows, we follow and join the children and young people with their phones within selected empirical events. Our two different studies are situated in different contexts and age groups, however, there are also contact points and similarities. For developing the idea of human-smart phone-entanglements, we have chosen the shared starting points of *things*, *bodies*, *affect*, *time* and *space*, which will eventually be considered more broadly in terms of entanglement and connectivity to society and global economic networks. Employing what can be termed post-qualitative methodology (St. Pierre, 2011), we will include “zoomings” into cases drawn from our empirical materials, which are meant to serve as provocations for further thinking. Our approach can also be defined *nomadic* (Deleuze & Guattari, 1987; e.g. Braidotti, 2002) in that it foregrounds movement and refuses closure and linearity in order to be able to constantly ask “What else?” (Hohti, 2016). The theoretical notion of entanglement helps us to disturb the educational gaze which traditionally foregrounds human individuals and agency, and to move towards a more open-ended notion of relationality. This examination is ready to follow strange and inexplicable things and to also challenge the boundaries of rationality, which can be seen at the center of the anthropocentric discourse of education.

Things

Phones are everywhere in classrooms. And consequently, with the current types of smartphones, mobile internet connections follow people as a rule. Networked existence can mean that the boundaries for mobility and access may seem almost non-existent as soon as phones are opened or even near the body. A 13-year-old formulated this networked existence simply by saying that without a smartphone (and access to internet) you are as good as a “not living person”. In classroom life, the dimensions, directions and intensities of this mobility are difficult to grasp, because social media contents, material elements and affordances from the environment, social interaction in real-life, virtual activities such as vlogging and games mix and mingle in fractions of a second. Furthermore, what makes analyses of seemingly unrestricted mobility within digital engagements so challenging, is that the boundaries for this mobility exist in multi-layered forms (Haider, 2017).

The change in mobility and boundaries described above has been taking place in ways that are only partly official, visible, and intentional. To make sense of this process, we now pause for a while to consider the materiality, the “thingness” of the smartphone. Going through our empirical materials we have no problem in detecting a lot of phones, but even so, we can be certain that there is a much bigger amount of phones present. The currently trendy phones are slim, and they are easily hidden between notebooks, in school bags or in clothes. Along with the more and more easy-to-carry or wearable technologies, digital devices become almost like body parts, which are as obviously used as hands or eyes. Schools, however, are places in which pedagogies often close out the possibility of having the phone exposed. The use of students’ own smartphones is only at certain times allowed as part of the official school, while these engagements often remain in the margins and go unnoticed in classrooms:

The teacher has instructed all the pupils to put their mobile phones away. After a while I still see several phones. One phone is lurking between the pages of the notebook. A girl has got slim white jeans with a slim pocket to put her slim white phone in. This girl takes the phone out of the pocket every now and then for a quick look: out from the pocket, and back to the pocket, out and in. She is a video blogger, I have been told, and on one lesson, when the topic

is future dreams, she says she wants to move to Los Angeles to become a famous blogger.
(Observational fieldnotes, 5th grade)

Heather Horst (2016) has written about the intimacy of digital mobility, which is tangible in our empirical materials. Bodily existence with a phone is a very personalized and customized experience. It is in the subtle and close looks and faces that are made. It is a certain repertoire of gestures that follow the phones, the phone-specific ways of bending necks and directing eyes. With the phones, even certain types of clothing follow: a teenager got new jeans which he liked, but they were left unused until the parents discovered where the problem lied. The pocket was too short for a phone to fit comfortably in. After the pocket was sewn bigger with an extra piece of textile, these jeans started to be worn again.

The intimate relation of the students with their phones suggests that when talking about the “bring your own device” pedagogies, the fact that a phone is one’s own makes a difference. In a conversation, the students on the 5th grade talked about phones as their “best friends”, or as their “soulmates”. The upper secondary school students emphasised in an interview the aspects of freedom, independence and adulthood that are connected with the phone, after so many years of having limitations on their phone use. One student shared their feeling that intervening in their phone use felt like “my freedom was being taken away”. They also spoke of phones as “little moments of relaxation”, as there are many subjects during the day and not all can be equally interesting - while simultaneously questioning if the things they commonly did on their phones (“looking at loads of news for example”) really were that relaxing. Sometimes the attachment acquired a layer of irony. One of the students answered a question on how their life would be different without a smartphone by laughing and saying: “Well then I couldn’t sit and check out all those youtube videos here”.

The phones’ significance for the young manifests materially. There is a range of colourful covers, stickers and gadgets meant for decorating the phones - indeed, some phones in the 5th class looked like cartoon characters with their long ears or big blinking eyes. Jane Bennett, in her *Vibrant Matter* (2010, 9), evokes the idea of flattened ontology and “thing-power”, which comes easily to mind when looking at how smartphones frequently occupy a central place in social situations among the young, and how they organize anew the surrounding things and bodies. If we “flatten” the hierarchy of the materialities of school, and give attention to the more neglected things that participate in classroom life, alternative forces compared to the official school become visible. Glowing in the dark, literally alive with different kinds of sounds, vibrations, alarms and calls, the phone can be seen as operating as an agentic and powerful actor in the classroom.

Our automatized gaze of educational professionals usually hurries to explain events in terms of human individuals and social interaction. Focusing on “thingness”, considering phones as material beings among other types of beings, is a way of disrupting the central place of human beings and looking more carefully at the materiality of education. Matter is, nevertheless, never simply general matter: speaking about matter, one speaks at once about relationality, about a multitude of interlocking forces (see Coole & Frost, 2010). According to Donna Haraway’s notion of *companion species* (Haraway, 2016), humans and technologies have got their shared and connected histories. To center the “thingness” of smartphones makes space for discovering the phones as “objects of knowledge” (see also Millei et al., this volume) in the sense that we not only know the phones as objects, but that these objects also know and have histories and biographies of their own. Our thing-approach makes it possible to ask - instead of the more usual question, how do/should children use smart technologies in classrooms - *how do smartphones use kids?* The shared biographies between phones and their users are not fixed but they remain materially open-ended, which means that also unpredictable consequences can come into existence.

One way of approaching material relationality is to map various actors and agents that (even temporarily) come together in an object. The smartphone, having entered digital education and taken a role as means for Finland's "digital leap", carries traces of various actors that have come together to produce it, such as the programmers and the multinational corporations. Some of these actors contrast strikingly the circumstances in which the Finnish children, embedded in Nordic well-being, go to school: the underpaid factory workers, the deserted country villages of China, the child labourers in mines of Congo or Rwanda digging for cobalt and tantalum (Fuchs, 2014). The "thingness" of smartphones is rendered as something inherently heterogeneous and beyond Finnish. Sebastian Abrahamsson and his colleagues (2015) have examined the case of omega-3 fatty acid, following the often unequal and purposefully hidden relations behind the production of this health product in favour of health-conscious people. Similar to the fatty acid products, the smartphones are as if reflecting surfaces that send back all the critical questions related to the chains of production that produce them.¹ Abrahamsson and his colleagues (2015) see it important, instead of sharing Bennett's enthusiasm about the liveliness of matter itself, to examine the complexities, frictions and intractabilities of "matter in relation".

Bodies

I join the 5th graders and their teacher for a picnic. The place outside the school is nice with sunshine, old trees and fields of grass. Two of the students, whom I have seen taking dance moves every now and then during normal school days, have prepared a dance performance. The music, "Me myself and I", is easily found in Spotify. A portable loudspeaker is connected to the phone laying on the ground. Other children move towards the phone, gathering around it and sit down on the grass to see the performance. One of the students, however, remains a bit further away by the trees with his phone in his hand, surfing in social media, it seems. A classmate videotapes the dance. I'm thinking that some of the photos are probably instantly shared in Snapchat as parts of the children's "My stories". I am told that the girls have learnt the dance from YouTube, where children share their dances in an application called Musical. I also videotape the dance with my phone to show it later in a conference. After the performance has ended, when some have started a football game, I notice a group of children staying among the trees and making their own dances and taking photos and videos. (Observational field notes, 5th grade).

For us, from a relational and material perspective, the school picnic is an affective assemblage, in which the agencies are neither situated in individuals nor in things, but in combinations and gatherings which are digitally entangled. Smartphones and their accompanying internet connections become parts of bodily experiences and capacities. This connectivity is not only present here and now, but it deals with a bigger timespan, encompassing the personal histories of individual children: it is through a longer participation in the net-based community of Musical application users that this particular moving, dancing and watching combination becomes possible.

The notion of entanglement allows insight into the idea of "childhoods as emergent" (see Prout, 2005; Ruckenstein, 2010): the specificity of how these bodies emerge in various ways, from specific combinations of technologies, environment, culture, and histories. The combinations are open and thus create unpredictability in terms of what can take place. The delightful "dance" of agencies on the school picnic points at affect as part of how certain actions, bodily moves, cultural phenomena and ideas gather and flow. The dynamic of this situation differs strikingly from the instrumental view

¹ We are grateful for Michael Gallagher for raising this point.

of a human intentional individual using technology in order to achieve pre-set goals, say, learning goals, which can be seen as the prevailing official discourse of use of technologies in schools.

When the 5th graders were asked if they were ready for an experiment of spending some time without their smart phones, the answer was hesitant: How could we wake up in the morning for school for the first thing? How do we then keep track of what is going on in social life, how to listen to music and how orientate when going to new places? How to remember *anything* in the first place?

The joke going around some time ago, about a group of surgeons that were the first in the world to successfully separate a phone from the hand of a teenager, has a serious part in it. The concept of “the cyborg” was used already in the 80’s by Donna Haraway (1986) to make space for recognising the part of various nonhuman beings, things and technologies as the companions for humans in life and history. Deborah Lupton (2016) takes up the Harawayan concept of “companion species” (Haraway, e.g. 2016) to think about not only digital technologies but also about the vast amounts of digital data that is generated by and for humans, in order to discuss the ways in which data is already living a life of its own, entangling with and affecting human lives in turn. The phones as parts of young people’s memory and existence, are sets of relations and thus they, too, can be thought of living lives of their own partly separately from their users. In the very near future, if not right now, there will be a need for educators to grapple with further human-technological entanglements and phenomena like Augmented Reality, implanted technology, and biometric sensors. These all will affect on how we understand school, even if the notions of what school is and what it should be have been surprisingly resistant in the face of technological developments (Selwyn, 2011; Simola, 2015). In that situation, what can be considered local, Arctic, Nordic or Finnish, will be an interesting question.

We brought up above how the phones could be seen as bodily and spatial extensions of the young (Ruckenstein, 2013), or as companion species (Haraway 2016). Indeed, in a talk some children called their phones “soulmates” and saw them equal to their memory. They maintained that losing their phones would mean losing their personal histories and social lives.

The phone policy is changing in the 5th class during the next term. After threatening to do it a few times, the teacher collects the phones in the beginning of the lesson in a box in order to help the pupils to focus in the lesson. Strangely, she tells me, the kids do not resist, rather there is the feeling of gratitude and relief when she does it. (Observational fieldnotes, 5th grade)

The students’ reactions to the phones being banned made us thoughtful. How to make sense of the surprising air of relief when their phones were taken away for the lessons? A material and relational ontology opens up the field of cause and effect so that also ruptures, disconnections, and nonlinear and unruly forms of logic can be taken into account. Barad (2011) speaks about nontraditional causality, which can also be termed “queer causality”, because it operates within relationality and indeterminacy. The human-smartphone-entanglement is open and affected by connections to tech companies, applications, and temporal and spatial circumstances. The relations created between content and device producers and their young users then are far from equal and loaded with commercial interests. To borrow from Natascha Dow Schüll (2014), we could even talk about “addiction by design”.

When the children are relieved to take a pause from co-existing with their digital companions, it is perhaps because the addictive and desired potentials nested in this entanglement can at the same time be tiring and “too much” - too much for the school classroom and the young to handle. Even when acknowledging the creative potentials and the mobility achieved in schools, whether in terms of a more official “digital leap” or more informal “dance” of agencies, we have to remain conscious about the power imbalances at play in these affective engagements. From a relational material viewpoint,

addiction, which is most often situated in human individuals as a personal psychological problem, can be investigated as a non-individual and material phenomenon that is born and purposefully nurtured *in-between* the young people and their smart phones.

Affect

Affects flow through and intertwined with human bodies and their smartphones in school, transgressing categories and spatial and temporal boundaries. Rather than investigating the young human bodies of our study as clearly bounded and stable, we want to attend to bodies as entangled, that is, bodies that always “extend and connect to other bodies, human and non-human, to practices, techniques, technologies and objects which produce different kinds of bodies and different ways, arguably, of enacting what it means to be human” (Blackman 2012, x). The concept of affect offers a way to analyse both the embodied and immaterial dimensions of human- digitality – encounters, as well as a way to articulate for these processes avoiding dichotomies (body/mind, for example). Arising always in the midst of “in-between-ness”, affects describe states of relation, even if sometimes momentary, as well as the passages of forces or intensities. Seigworth and Gregg (2010, 2) say that at once intimate and impersonal, affects mark belonging: the ways in which bodies belong to encounters, but also the ways in which world belongs to a body’s encounters.

The borders of “real-life” and virtual life are fluid and blurred for example in the case of digital messaging:

Sitting in class I notice one of the students making faces at their phone. The student gazes longingly upwards with a contemplative look on their face. Then, in an instant, the face returns as it were, and moments later they repeat the gesture. When I ask about this later, it turns out that lately their friend group has been composing or imitating emojis with their faces, and the situation I observed was that particular student taking a couple of attempts at the expression and then checking the result on their phone. (Observational fieldnotes, upper secondary school)

In his book *Virality*, Tony D. Sampson (2012) suggests contagion theory and virality as fruitful models to examining the exercising forces of relation on the social field and (p. 3). He shows how a prediscursive flow of contagious affects, feelings, and emotions is intimately interwoven with discourse within all kinds of social assemblages, ranging from “terror contagion” to the “virality of love” (Sampson, 2012, p. 127). We find the concept of contagion useful for thinking about the ways in which media-influenced themes materialize and circulate within and across the fabric of everyday life in the school and how they affect “bodily capacities, atmospheres, feeling-tones” (Seigworth & Gregg 2010, 2). One such theme is audible in the following event:

Students are sitting in the corridor and one of them is playing a word puzzle game on their smartphone. The word she is searching for has a mustached man and a spider as a hint, and she asks the others for ideas. Somebody starts humming the melody of an old Spider-Man theme song, “Spider-Man, Spider-Man, friendly neighbourhood Spider-Man”. Still, this doesn’t seem to be the correct answer. The student switches to a photo-blog app and continues talking with the others. While browsing through pictures she sometimes shows the screen to the others so they can react to the images. Multiple topics that seemingly have no connection - Lion King, drag queens, One Direction, Kim Kardashian, cocoa cookies - overlap in the discussion, many of them seemingly coming from the student’s phone. Somebody hums Spider-Man. We never find out what the correct answer to the word puzzle is, since it was not

Spider-Man. The melody however seems to persist. Later in the day, as the students are leaving for home, we still hear somebody humming Spider-Man. (Observational fieldnotes, upper secondary school)

When somebody hummed the Spider-Man tune for the first time, it clearly had the affective capacity to become called upon again and again. The tune persisted, rendering irrelevant the fact that it was not really the correct answer for the question. In our studies we observed many kinds of similar *autotelic* practices (see Rautio, 2013) - engagements without an obvious goal or rationale - entangling with mobile technologies and related to their affectual intensities.

When observing how both young and adult bodies become attached to digital devices and applications, and are attracted into ever new modes of communication, ready to dramatically change their everyday lives according to their “smart” companions, the affective quality of these processes is obvious. These forces and intensities are, nevertheless, not innocent and should not be examined only as a rosy potential. Technology companies are able to connect with users’ affective engagements (Fuchs, 2014) and autotelic habits, actively producing technologies and devices that offer themselves to these kinds of practices. The affective flows connected to young people’s smartphone use can be purposefully nurtured and turned into profit. While talking about some techno-human entanglements as delightful and dancing, there are also more cynical, harmful and dangerous agencies at play. In addition to addiction, the children and young people of our study spoke about the more negative feelings of frustration, tiredness, or “getting stuck”. Some of the students brought up the juxtaposition of extensive use of digital devices and keeping up health and good condition.

The affectivity and embodiment of digital engagements are thus at the core of why critical analyses are needed. Following the example of Abrahamsson and his colleagues (2015), it is crucial not to only realize the networked existence of schools as parts of capitalist economy, but also to scrutinize the character and quality of the relations at hand. In addition to traditional, instrumental pedagogical views, we suggest examining how these relations are operating beyond the rationalist notions of human agency, also in the respect of how hard they are to resist. While there are critics who believe that the “flat” material relationality undermines the possibilities of critical analyses of ideologies (for discussions, see Blackman 2012, ix; Gunnarsson & Hohti, 2018), our viewpoint is that centering materiality and relationality can enable a different, perhaps more nuanced critical examination of complex relations of power and affect. An example can be found in studies on hate speech which confirm that conversations can get heated partly due to how media (social media platforms and their technical applications) themselves facilitate and generate conflicts and contrasting aspects (Horsti & Nikunen, 2013). A new kind of criticality could participate in redefining the place of humans and the boundaries between human and non-human while attending to the ways in which devices such as smartphones join everyday lives.

Time and space

The current school practice and architecture in Finland still carry traces from the era of industrialization, the time of the emergence of the modern school institution. Life in schools is arranged according to strict “time-space-paths” (Gordon, Holland & Lahelma, 2000), which organize specific actions along specific times and spaces and nowhere and no time else. Usually, within these temporal and spatial arrangements, there are neither times nor spaces reserved for smartphone use. In our studies, we observed the phones being taken out from the pockets in ‘non-times’: between-times, transitions from one activity to another, when the bell rings and the break starts, on the way from one classroom to another. Similarly, a complicated spatiality emerges in connection with the smart phones. There is rarely a place pointed for the children to look at their phones in the current Finnish

school architectures, which means that phones, these power-things, often move people to strange places, or “non-places”. The kids find a place to look at their phones sitting on stairs or in the tight spaces under them, in transitory places such as corridors, hidden corners, or coat racks. These kinds of spaces have not been fully programmed for educational use (see also Augé, 2009), they are physically and semantically empty. Bodies often gather around the phones tightly, as the current types of phones have been planned mainly for individual use. The bodies touch each other, eyes pointed at the small screen. At these moments, the bodies become specific phone-bodies with specific phone-talk and phone-laughter.

In the empirical material produced in upper secondary school, thanks to the simultaneous display of conventional video ethnographic material and the students’ mirrored phones, we observe conflicting spaces interweaving in a banal and everyday school scene.

We look at the videotaped scene, two students sitting on a bench of a corridor, chatting and peacefully doing something on their phones, killing time, it seems. One of the students is playing a mobile game. The small screen at the corner of the video displays the game, in which the player takes the role of an assassin, standing on a rooftop and looking down at a city filled with people. The player’s mission is to pick out and take aim at selected targets, and proceed to shoot them. The victims’ heads are blown apart on the screen. “Mission accomplished”. We feel as if having had a chance to visit a space not intended for us. (Observational fieldnotes, upper secondary school)

The school space is dramatically transformed and renegotiated when connected with the game space. In addition to spatial extensions, smartphones and their social media applications serve also as *temporal* extensions. In our study the 5th grade class, as already quite usual throughout the country, had established a shared whatsapp message group. The group was active also outside school time, sometimes extending the formal school to homes, as happened when a student had forgotten a book at school or had been absent and needed to know homework. Nevertheless, the group was also a place to discuss more informal matters. Even if the teacher was on a trip and physically away, they were able to control and comment on what had happened in whatsapp during their absence. The spatiality of school was extended to homes, too, as the parents could be easily contacted during the school days to negotiate all kinds of matters, for example in situations in which a student suddenly turned ill.

The temporal and spatial extensions described above intervene in social life, too. We have realised that there is never a certainty about what is “alone” or what is “together” based on simply observing students standing alone on the schoolyard or sitting side by side, each one active on their individual phones. Through their smartphones, they were potentially connected to invisible company: networks, communities, audiences, memories, and more. The timespaces that they occupy are ambiguous, separate and yet connected. To turn the entanglement around, the phones can also affect the spatiality of everyday life through the very assumption of connectedness, as pointed out by Amit S. Rai (2012). He has examined women in Mumbai who gain access to places they would not otherwise go thanks to the mobile phones they carry with them. At times, similarly, a phone can provide the student with access to company, while it also may enable solitude, as standing physically alone becomes less stigmatized. With a phone you can go to places you would otherwise not go, and with the phone you are potentially constantly connected.

Linnea Bodén (2015) has activated the notion of entanglement in examining how digitality complicates the stable and taken for granted notions of absence and presence. She shows how these phenomena can be seen as complex and specific to each entanglement and constituted partly by a digital absence register software. Malou Juelskjaer (2013) examines spatiality and temporality as constituting forces in the production of gendered subjectivities. She suggests that Barad’s (2007) concepts *entanglement* and *spacetime* can put time and space into “analytical motion”

(Juelskjaer 2013). Entanglement challenges some basic ideas underpinning traditional notions of education and childhood, namely that children travel through (linear) time, are situated in (stable) spaces and use material/technological tools as the means to acquire skills.

Returning to the example of the school picnic, activating Barad's concept of entanglement, we can see a specific spatiality and temporality emerging with the smartphones, in which the moving and singing bodies of the children are involved, or in fact, co-constituted in a specific way. The analysis highlights the specificity of situations and contexts, and the fact that time and space are not background factors but active participants in emerging assemblages. As Bodén (2015) has suggested, objects and digital technologies, as parts of specific entanglements, can be seen as participating in re-organizing practices, times and spaces in schools, whereby specific and unique times and humans emerge.

The relational and material approach to digitalized classrooms entails that with the students' smartphones having entered classrooms, and the intensification of networked connectedness of school life, there is an urgent need for education to employ more refined notions to account for the instabilities of space and time. This is hardly happening now, as in Finland, instead of the relative autonomy of highly educated teachers, demands for more centralized governance and measurable and comparable assessment for students are getting louder (Saari & Sääntti, 2017). The shift to test culture is possible only through clear-cut understandings of efficacy and progress, whereby simplified linear notions of time, progression and learning are reinforced (see Myers, 2014).

Finally: Negotiations, dancing and leaping

In this chapter, we have been looking at how children and young people engage with their own smartphones in schools. Phones have rapidly occupied a visible role in Finnish educational environments alongside with the official policy of "digital leap" promoted by the government. The engagements of the kids with their phones take place partly in the margins, yet they change a lot: for example, they connect Finnish schools to global digital economy and participate in the production of vast amounts of digital data. We explored the human-smartphone-encounters of classrooms from material, bodily, affective, temporal and spatial starting points. Smartphones participate in educational practices in all these dimensions complicating the role of school in children's lives and the role of children's lives as parts of school. We used Barad's (2007) concept of entanglement to attend to the complex ways in which humans and technologies co-evolve and co-constitute each other in a material and relational dynamic.

To end this chapter, we would like to zoom in into the everyday negotiations around the use of digital devices and the amount of effort needed to govern and regulate the temporal and spatial tensions emerging in connection with them.

At the time of writing this chapter, Antti comes to one of our meetings with an anecdote from home. His 7-year-old son is starting to explore digital worlds through his dad's phone, which at the moment offers one single game, Dancing Line. The child-parent-policy has been to have 40 minutes of screen time on weekdays, and 60 minutes during the weekends, with the child having a choice whether to use the time with a game or by watching a TV program. Antti tells us about the feelings of frustration, disappointment and anger that frequently follow the daily game time. (The actual expression often heard is "OK, so now you got me killed!" when Antti intervenes and tells that the game time is finished.) The reason for the child's frustration either lies in the fact that the screen time ends, or he is disappointed for having spent all the time in the game and thus not seeing a favourite TV program. Despite the latter, he doesn't want to

stop playing when the game is in progress. Antti, a researcher of smartphones, is contradicted about this. He remembers how joyful it was to have a chance to play games in his own childhood, but worries about his child's ability to resist the addictive forces designed into the game. Is there any other way to intervene than the authoritative command from the parent's side? This story, nevertheless, ended in at least a temporary compromise, as the child came up with a suggestion of having the screen time split in two, so that he could still play daily but also use the other half for watching his favorite programs.

Nick Lee, in his *Childhood and Society* (2001), situates child-adult-relations in the landscape of postmodern uncertainty, which concerns areas such as work life, family structures, or nation-state borders. According to him, these changes also complicate the generational relation, as an incomplete "becoming" state of existence for both children and adults is replacing earlier, more categorically defined notions of generational difference. For us, it seems that one consequence of digitalisation is the new kinds of negotiations needed between the educators and young phone users. In these negotiations, the adult-child-relations can easily get polarized in the vein shown above, and simplified notions of both adult and child, and digital activity are being reinforced. One dimension of this simplification is reflected in the persistent use of the notion of "screen time". These discussions get polarized also in terms of either positioning children and young people as vulnerable or at risk, or then as unproblematic "digital natives". Similarly as in the anecdote above, the parents attending the 5th grade parents' meeting were tired of being the police monitoring their children's screen time, but had no relevant alternative in sight.

This chapter has highlighted the need of complexity-sensitive conceptual understanding when approaching young people's digital use. One of the central skills in future will be the ability to balance between more stable and more specific temporalities, and to understand the layered and multiple places and spaces and blurring identities that become available with digitality. Reclaiming an illusory independent human agency does not seem like a relevant alternative because, echoing Karen Barad, there never was such a thing as independent human agency in the first place. We suggest that these phenomena should be recognized as co-achievements between human and non-human companions. There are seldom "either-or"s but mostly "both-and"s here. By using the concept of entanglement we hope to have shown that it is possible to discuss the complex detail of digital lives of the young beyond the binary ends of digi-positivity or digi-criticality. Yet, we maintain that even as entangled and co-evolving, digitalized childhoods as well as adulthoods have to be scrutinized in terms of their character and quality, ultimately in regard with quality of everyday life.

In our exploration into how digitality, education and young peoples' lives connect, we have found the centrality of affect. It is through affect that the engagements with digital devices acquire their life-changing intensity. The emotional relation of the young with their phones, their 'soulmates', can mean that it becomes more and more difficult to launch alternatives for the easy and addictive digital engagements. These affective intensities do not simply emerge from nowhere, but they are partly result of meticulous market research and corporate strategy, with the software and hardware companies aiming to maximize the time their users spend engaged in their products. Nevertheless, the young are not to be seen as mere victims, because within the material relationality, ruptures and openings always exist, offering shifting positions in power and generating other kinds of non-individualistic affects than addiction only. Whether as dance partners or things to take a leap with, smartphones as educational companions are always partly unpredictable.

In their analysis of the "digital leap" in Finnish educational policy documents, Saari and Sääntti (2017) speculate that the Finnish PISA success could as well be due to the relatively slow digitalisation of pedagogies. Based on our material and relational exploration, technology, which in the Finnish national rhetoric is seen almost as part of our arctic national identity and now seen as the primary

means of rescuing our educational system from staying behind, is rendered thoroughly global, from the material resources used for manufacturing phones to the global enterprises behind the applications. The Finnish discussion has however circled around assuring local industrial competitiveness, and the ideas of progress and development have been equated to technological advancements (Greenfield, 2017). For us, the existence of students' own smartphones in classrooms means that a more informal, perhaps wilder form of digitalisation is already going on in classrooms. There are no reasons to believe that the role of students' own phones in education will not be but strengthening in the Global North. Currently, however, big part of these digital engagements goes unnoticed and is left in the category of accident or chaos from the perspective of conventional school pedagogy. We observe this category being filled with more and more engaging content that matters. In order not to make an empty leap, the digital companionship and attachment between young students and their smartphones should be considered at an ontological level.

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