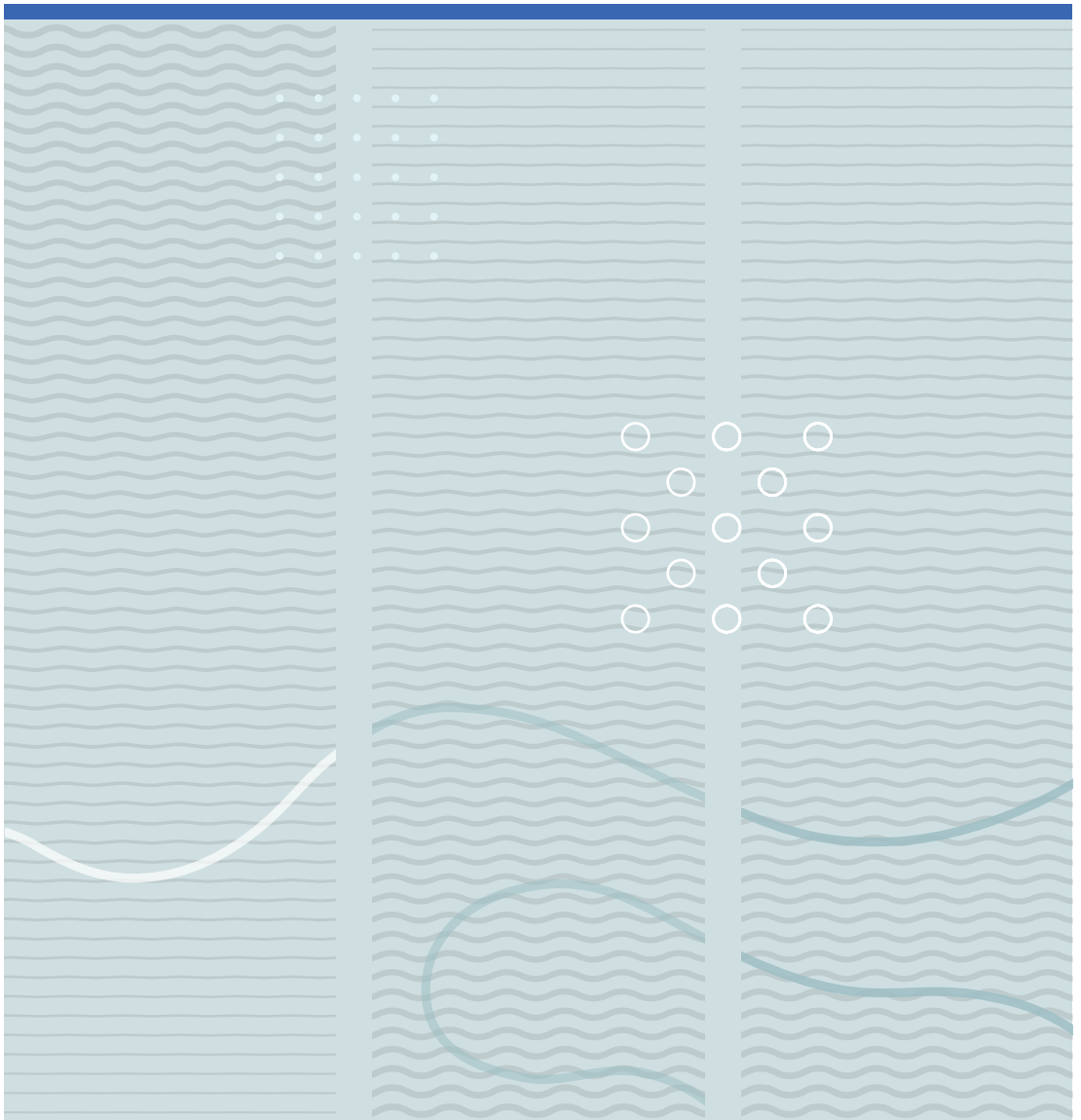Liv Gardsjord Lofthus

Digital literacies as social practices: students, technology and research methods

Liv Gardsjord Lofthus

Digital literacies as social practices: students, technology and research methods

A PhD dissertation in
Pedagogical Resources and Learning Processes in Kindergarten and School

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Når det nærmer seg slutten av arbeidet med denne avhandlingen blir det tydelig at det som tidvis har føltes som et ensomt arbeid, har hatt mange som har bidratt på sitt vis som fortjener en takk. Årene som stipendiat har vært svært lærerike. Tidvis har jeg vært bevisst på at det er lærerikt, tidvis har jeg blitt klar over læringen i etterkant. Så jeg regner med å fortsette å oppdage ting jeg har lært. Det har vært spennende. Spennende å forske og utforske, og å ha en mulighet til å fordype meg. Det har vært krevende. Krevende å fokusere forskningen, krevende å gjennomføre, og krevende å beholde troen på at jeg kan gjennomføre. Uten faglig støtte, mental støtte, fellesskap og veiledning fra kollegaer, veileder, venner og familie hadde det ikke latt seg gjennomføre.

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Porsgrunn 14.10.2021 Liv Gardsjord Lofthus

ABSTRACT

This article-based thesis explores students' digital literacies both in and outside of the classroom. Digital literacies are more than digital skills, and here understood as social practices that consists of students, technology and research methods. The study seeks to illuminate digital literacies as social practices that vary in different contexts. The research that has been carried out was done in two separate field studies, one at an outdoor museum and one in the classroom to investigate *students' digital literacies in social studies.* The students in focus all owned mobile digital devices that they used for schoolwork. To illuminate different aspects of the main investigation theme, four empirical studies are used, resulting in four articles. Article #1 focuses on the researcher's role in data generation, and how this affects the social practices in focus, and the empirical data-material. Article #2 investigates students' digital literacies when doing groupwork in the classroom with tablets. Article #3 seeks to illuminate how the usage of action cameras to get insight into the students' digital literacies might affect the social practices in different ways. The study looks at how research cameras are both a part of the technology and the research methods that make out the social practices. Finally, article #4 examines how, when and for what the students use the different digital tools available to them, and when they seek information elsewhere. The findings from this thesis show how the students' digital literacies are highly context reliant. Understanding digital literacies as social practices consisting of actions, interactions, affordances, agencies, humans and technologies, is a way of recognizing that human-technology interaction is much more than digital skills.

Keywords: digital literacies, social practice, agency, affordance, methodology.

LIST OF PAPERS

Article 1

Lofthus, L. (2017). Bruk av teori for økt refleksivitet i praksis. Praksisarkitektur som rammeverk for å belyse forskerens plass i datagenereringen. In L. Frers, K. Hognestad, & M. Boe (Eds.), *Metode mellom forskning og læring: Refleksjon i praksis* (Chapter 7, pp. 35–55). Oslo, Norway: Cappelen Damm Akademisk.

Article 2

Lofthus, L., & Silseth, K. (2019). Students Choosing Digital Sources: Studying Students' Information Literacy in Group Work with Tablets. *E-Learning and Digital Media*, *16*(4) 284–300. doi:10.1177/2042753019835882

Article 3

Lofthus, L., & Frers, L. (2021) In Press. Action Camera: First-Person Perspective or Hybrid in Motion? *Visual Studies*.

Article 4

Lofthus, L. Digital Literacies in Social Studies'. (work in progress)

LIST OF PAPERS

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CHAPTER 1: INTRODUCTION

The aim of this study is to examine digital literacies as social practices in different contexts. The contexts in focus are two different fields of study: one conducted in an outdoor museum and the other in a classroom. The common components in the two fields of study are that the school subject is social studies, and the students are in grade 9 and learn in technology-rich environments.

This study comprises four articles, adding to this extended abstract. The articles are presented in chronological order. The extended abstract is used to juxtapose, discuss, and relate the articles to each other. It is also used to add critical reflection and documentation of the research process as a whole and to discuss the process of becoming a researcher instead of just focusing on the results of the process. Throughout the study, I strive to balance rigorous and significant academic contributions to the field with earnest and honest access to my self-reflections about subjective values, biases, uncertainties, and challenges concerning the researcher's role and research methods.

As it comes to an end, the project is not the same as it initially was. Based on trial and error with the research questions, research methods, analysis, theoretical focus, and maturing as a researcher, both the focus and lenses for looking at the data have changed. These changes are discernible in the articles and discussed in detail in this extended abstract.

As a museum teacher, I am familiar with the type of teaching performed in outdoor environments, with groups of students visiting the outdoor museum for an excursion. With this personal history, I was initially interested in studying students at a museum and how they used digital tools in that environment. The first dataset was mainly generated in a day at the museum. The students were given the task of producing a digital story by the researcher. In hindsight, this task created unclear roles of teacher/researcher, and the assignment could thus be considered a limitation or obstacle in my research process. However, I later came to see these features as one of the study's strengths because they forced me to reflect upon my choices in several respects. The second dataset was generated for two weeks in the classroom, during which the students' assignments were given to them by their teacher.

Regarding my research content, illuminating digital literacies as social practices, I investigated students' learning processes with digital tools in two different contexts, both relevant to the school subject area of social studies—the classroom and an outdoor museum. The students in the two settings were equipped with digital tools. The focus was mainly on the use of digital tools, such as tablets and smartphones.

I chose to generate data using action cameras that can enable me to understand both the interactions among students in a group and what is happening on the students' screens. Choosing this method proved to be both productive and demanding, which made the research methodology and methods another main research interest, both in their own right and in generating data about digital literacies in a self-reflexive manner. I placed my research in the educational research field, but my focus was not primarily on learning, teaching, or pedagogy. Rather, it focused on the social and practical interplay in contexts where digital tools are commonly used as learning resources. Such interplay can have implications for how we can understand and foster educational activities.

As shown in Figure 1, I consider the method to be a part of the social practice that constitutes the students' digital literacies because the action cameras worn by the students become a part of what they interact with. This study thus encompasses two articles concerning the usage of action cameras and the researcher's role in them.

1.1 Background

As a part of the information society, I am interested in how digitalization affects us and how we affect digitalization. Digital literacies and digital skills are making their way into many aspects of society and our lives.

Research focusing on students' digital literacies from the students' perspective is important. It enables us to better understand how these digital devices affect students, their social interactions, and their learning processes. Through understanding their digital choices and how these choices are a part of their digital literacies, one can elucidate how to become digitally literate. Moreover, understanding students' digital behavior in educational settings allows digital instruction to be supported or modified according to how well it promotes learning and student interactions. My findings indicate that the most effective way to comprehend students' digital literacies is to clarify and define how digital literacies happen. Then, based on that understanding, discuss how they should be taught.

The focus of this research is on digital literacies rather than digital skills. In international literature, digital literacy is a widely used term without one unanimous definition. The term will be thoroughly discussed in Chapter 2. Belshaw (2012) stated that digital literacy comprises cultural, cognitive, constructive, communicative, confident, creative, critical, and civic literacies. According to Hague and Payton (2010), the same terms comprise cultural and social understanding, creativity, critical thinking and evaluation,

collaboration, finding and selecting information, effective communication, e-safety, and functional skills. This parallels Lankshear and Knobel's (2006) study, which underlined that digital literacies do involve elements of skills but that these skills differ in different social practices and the culture and that taking heed of social elements is important for gaining a deeper understanding of digital literacies.

The Norwegian Directorate for Education and Training´s concept of digital skills covers most of these points included in the definitions, but it lacks the explicit cultural and social aspects that the above-mentioned definitions include. For this reason, I observed that using the term digital skills limits our understanding of the effects that digital tools have in students interactions. Digital literacies in plural form are common in the literature, and this also covers the broader approach to the field that I seek to incorporate. Therefore, *digital literacies* are the term I use in this study.

1.2 Research Questions

To study students' digital literacies in social studies, it is important to study students in action and understand their spoken and unspoken knowledge, actions displayed when they jointly relate to one another, and the digital artefacts they use. This was done through video observations, recordings, and interviews. This study also contributes empirical data to research on students in action utilizing various digital tools. This study method is explorative and descriptive; this approach was chosen because I wanted to study what the students were actually doing with and around the digital tools in the given settings.

The main research questions are as follows:

- RQ1: In terms of social practices, how do digital literacies play out in social studies?
- RQ2: How do students relate to each other and to digital tools in different contexts in social studies?

In addition to these content-related research questions, there are two research questions related to methodology:

- RQ3: What are the limitations and advantages of using action cameras to gain insight into students' digital literacies?
- RQ4: How does the researcher's openness to the generated data affect the outcome?

The figures show the central aspects of this study and how it is understood. This is relevant in this figure and in all the following figures in this extended abstract.
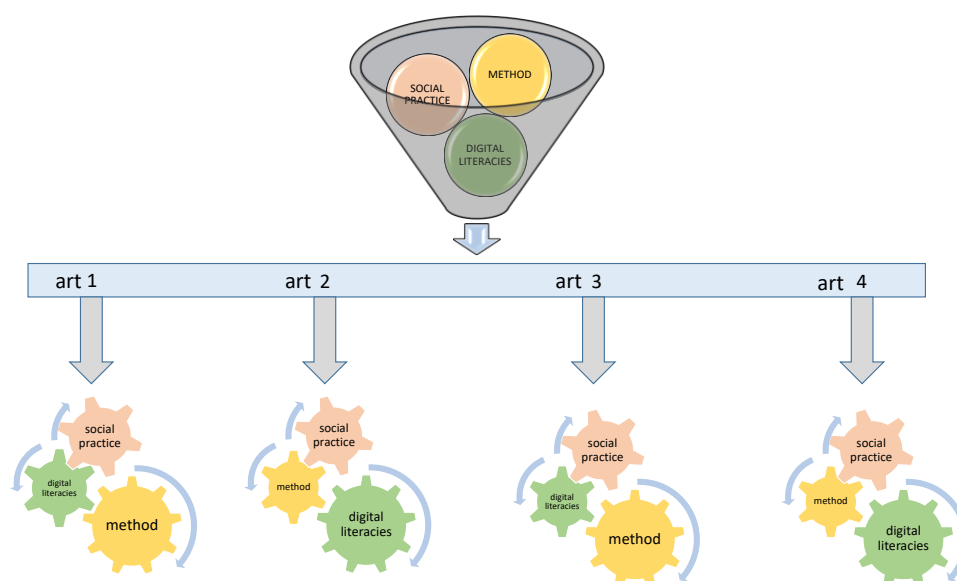
Figure 1. From initial research questions to objectives in each article

Figure 1 illustrates how the three terms: digital literacies, social practice, and method, also seen in Figure 2, derive from the initial research questions concerning social practices, method, and digital literacies. The funnel illustrates how these components are forced together and present in all four articles in varying degrees. The cogwheels show this. All the elements are strongly connected, but the focus of each study varies. The numbers leading to the cogwheels refer to the chronological numbering of the articles. The new arrangements of the components following the funnel and the cogwheels show the transition from the initial open approach to the research questions in each article.

In my efforts to answer the research questions, the different articles clarified the different aspects of the main questions. Therefore, the articles are presented here in chronological order, as follows:

- Article 1: Bruk av teori for økt refleksivitet i praksis. Praksisarkitektur som rammeverk for å belyse forskerens plass i datagenereringen.

  A self-reflective book chapter about the research process,
Article 1 discussed how empirical data focusing on digital literacies can be generated and some problems the researcher might encounter. This article clarifies the 4th of the main research questions.
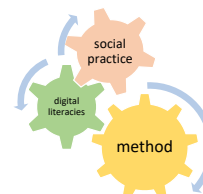
- Article 2: Students Choosing Digital Sources: Studying Students' Information Literacy in Group Work with Tablets.

This article is an empirical study from the classroom, addressing the following research question: How can mobile digital tools be used as learning resources in social studies education? The focus was on answering three questions related to this issue: How do students negotiate the meaning of the use of various available sources on a tablet when working on a school project? How does a tablet as an artifact and learning resource fit into a social learning situation? How does the work done on a tablet contain elements of formal and informal learning? This article examines the main research questions concerning content relations.
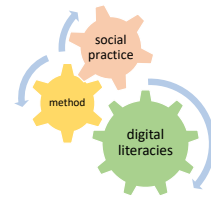
- Article 3: Action Camera: First-Person Perspective or Hybrid in Motion?

Article 3 focuses on using action cameras to gather information about what is occurring on the students' screens and how they interact. This seemed to be a good way to gather video data from several groups without interference from the researcher. In retrospect, however, it was not as straightforward as initially thought. In this article, the focus was to understand the multiple ways in which the camera, the person wearing it, co-present others, the researcher, and the making of the recording as a process figured into the data production. This article discussed the limitations and advantages of using action cameras to study students' digital literacies.
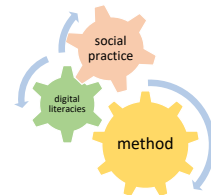
- Article 4: Digital Literacies in Social Studies

Article 4 is based on an empirical study from the outdoor museum, and it illuminated the main research question by focusing on two related questions: Which tools do the students use at different times, and what are the reasons for their choices? How are these choices a part of digital literacies and the digital?
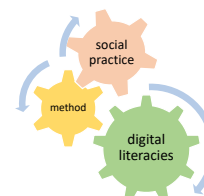
This article examines the main research questions concerning content relations.

The four articles have different main focuses, but these different focuses are all a part of what establishes the overall social practices that occur, where students' interactions with each other and their digital tools and the researcher and the chosen research methods discern the context.

The articles are integrated by highlighting different practice architectures in distinct contexts, the relevant methodological issues, and how they become part of the practice architectures. The integration of the four articles is thoroughly discussed in Chapter 4 of the extended abstract.

Figure 2 illustrates how the articles focused on different aspects of the topic and how these elements made up a whole. Combining and bringing these aspects together added more value to this extended abstract than to the sum of the articles. It integrated the main components of this study to show their interdependencies, which had to be separated and kept out of each article scope.
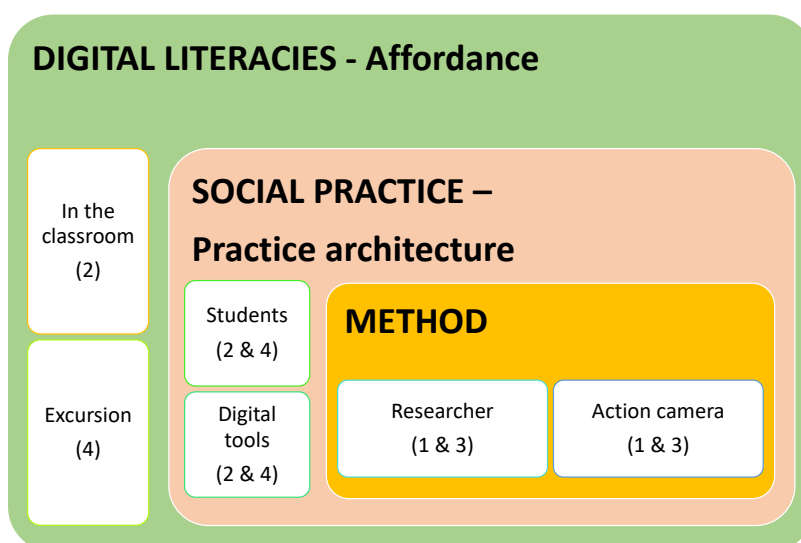
Figure 2. The articles in this research project addressed various aspects that together makes up a whole.

The figure shows how the articles addressed the aspects of the research project. In addition, the relationship between the focuses is shown in the figure, which indicates that digital literacies are the focus area that frames the whole. To explain and describe digital literacies in different contexts, I examined digital literacies as not static but rather changes according to—and because of—the components of the practice. This is shown in Articles 2 and 4, where the most important elements in the practices in focus are the students and the digital tools used. Theory on social practices is a narrower frame to understanding digital literacies, and how I understand and use the term will be discussed in Chapter 2.When I was working with the datasets and gaining a deeper understanding of what I consider important in social practice, it became clear that the chosen research methods and methodology are part of what delineates social practice, which is the main part of the digital literacies I was interested in investigating more closely. Throughout the project, data generation, analyzes, the researchers' role, and the methods chosen for generating data have become important elements, not only as a means for gathering the data but also as a strong premise for the social practices that occur. The focus on both digital literacies and methods is bound by social practice, practice architecture, and affordances.

1.3 Method and Analysis

As mentioned before and will be discussed more in-depth later, the data generated for this study occurred in two different contexts, with two different groups of students. The first field study was undertaken during an excursion to an outdoor museum. This part of the study was conducted as a design-based study, and the data generated here are video recordings of group work, my observations as a participant-observer, and interviews conducted in pairs at the school a week after the excursion. The interviews were only relevant as supplementary data in the analysis in the fourth article and did not contribute to the core aspects of this study. The second field study was conducted during two project-based learning settings in a classroom that I accompanied over two periods of one week each. The data generated here is of a more ethnographic quality and comprises classroom video recordings, group work recordings, participant observations, and informal conversations.

The analysing process, discussed in more detail in Chapter 3, started ongoing since the research project was planned and conducted. The videos from the group work were transcribed, and I used interaction analytic approaches to better understand the video-recorded interactions. The analysis and the theory in focus had mutual effects. Theoretical perspectives are discussed in Chapter 2. To analyze and illustrate the data in the articles, I used Laurier's (2014) method of creating graphic transcripts. This is a valuable way to better clarify the data material, and it is used as an important analytical approach in its own right when working with the data material.

1.4 Theoretical and Methodological Approaches

To study the students' digital behavior in different learning environments, both indoors and outdoors in groups, sociocultural views on learning were used in this study (Vygotsky, 1978), which also explained the phenomena I studied. The phenomena are students learning in groups and utilising digital tools. The sociocultural view on learning is not a general frame for the study but clarifies how social interaction and digital tools affect learning. Part of the student's tacit knowledge in this area can also be discovered through the social approach to learning and a sociocultural approach to studying the learning that occurs. I chose the discussion and focus based on digital literacy studies (Gilster, 1997; Lankshear & Knobel, 2006; Meyers et al., 2013; Sefton-Green et al., 2009). This is discussed in Chapter 2. To study the students' digital literacies, I used the term *affordance*, coined by Gibson (1986),

frequently used in related research on using different tools in social practices (Greeno, 1994; McGrenere & Ho, 2000; Norman, 1999). This was a way to better understand how the cultural tools—here, technological tools—affected the social interactions by looking at the students' abilities to perceive the different affordances that are available when using these tools. These different affordances are physically present in the environment and are located in the informational and social context. Affordances provided by the content of the digital tools are also situated in the digital context. I argue that all these types of affordances play a role in students' digital literacies. I found it significant to consider that students' ability to perceive affordances lies in their tacit knowledge (Polanyi, 1983). Thus, tacit knowledge is discussed as one conceptual entrance to the data material in Chapter 2. When studying the students' interactions and talk during the interaction, dialogism (Linell, 2001) provides a basis for understanding the social practices of digital literacies. I used practice theory to describe social interactions in the learning context with digital tools in technology-rich environments. Throughout this study, the theoretical perspectives and approaches changed, mainly expanding to include the perspectives I added during the process to understand, explain, and address new insights gained.

1.5 Structure

This study comprises two parts. The first part is the extended abstract, a text that summarizes and discusses the articles and their work. The second part comprises four articles. In the extended abstract, I explain the work that has been done and reveal the connections among the articles and how they explain the overall problem and research questions. I elaborate on how I methodologically approached the field, the theory, and the thematic whole. Previous research and the results are presented. The discussion in this extended abstract deepens the articles' argumentation and binds them together, adding value to the articles and establishing the study as a whole.

The first chapter of the extended abstract provided a brief introduction and described the goals and research questions. In Chapter 2, I will clearly explain digital literacies and how this is theorised in the literature. Subsequently, a thorough explanation of how I understand the term practice will be given by looking closer at practice architecture, dialogism, affordance, and tacit knowledge. In Chapter 2.3, I will take an analytical approach to select existing empirical research concerning how students choose different digital sources in social studies and what types of digital tools they use when. Chapter 3 presents the methodology and

methodological considerations and justifications and describes and reflects how the data generation and research process occurred. I also expound on the analytical tools and processes that I used to examine the data. Chapter 4 summarizes the articles, and the results are discussed following my contribution to the research field and the practice field. Finally, I discuss how this study and its results can provide a background for further research topics.

CHAPTER 2: APPROACHES AND TERMS

In the first part of this chapter, I will present and discuss the term digital literacies, where I follow up by discussing other important terms and approaches related to this study.

Chapter 2.2 thoroughly clarifies my understanding of the somewhat vague term, social practice. This demonstrates the connections between the terms used in the articles to analyze and explain the empirical material on the one hand and the main term in this study, digital literacies, on the other hand.

Following the discussion on digital literacies and the theorization of social practices, Chapter 2.3 discusses research related to the specific social practices in focus; students choosing digital sources and the practices of youngsters selecting specific digital tools.

Given the relatively wide range of research in these areas and the narrower area of interest of this study, a systematic review of literacy and digital literacies in education is beyond the aims and scope of this study. However, these vital concepts and how they have been defined and perceived are touched upon throughout the extended abstract, particularly in Chapter 2.1.

The following figure 3 shows how the Chapter is structured with social practices being the part of digital literacies in focus, and the specific practices being choosing digital sources and different tools in different contexts.
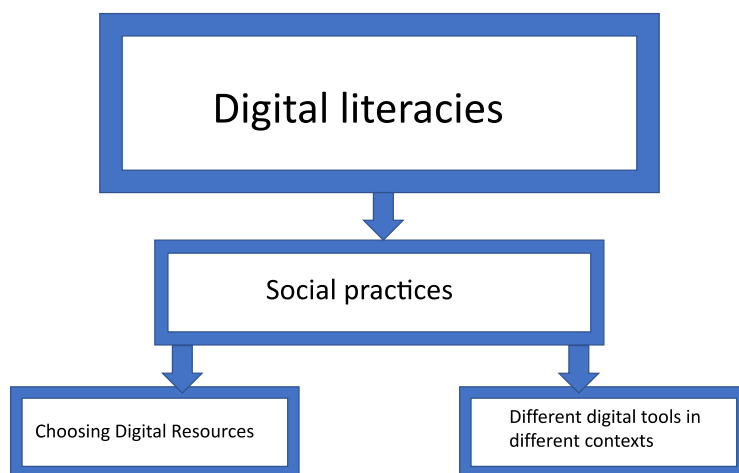
Figure 3. The structurization of chapter 2.

2.1 Digital Literacies

In its original sense, literacy means the ability to read and produce text and was earlier seen as something highly individual and cognitive—a skill that was not reliant on context. Later studies have considered literacy as something more than skills, and what is called New Literacy Studies takes the sociocultural view of literacy and emphasizes how literacy is always historically, socially, and culturally situated (Jewitt, 2008; Barton, 2007; Barton & Hamilton, 1998; Gee, 2001). Literacy is part of social practices. According to Barton and Hamilton (1998)*, literacy is essentially social, and it is located in the interactions between people* (p. 3). As Gilster (as cited in Pool, 1997, p. 6) put it, digital literacy involves "mastering ideas, not keystrokes". Different from digital literacies, competence is the classification of it as something people have (or do not have) rather than something they do. The doing depends not only on cognition but also on cultural, language, and discursive differences. Gee (2010, p. 17) explained the social practices that happen in the activity of literacy as involving *ways of talking and listening, acting and interacting, thinking and believing, and feeling and valuing.*

In his earlier work from 1989, Gee argued that discourse is a more inclusive term than literacy; he defined discourse as using words, sounds, images, etc. in a socially recognized way. Discourse is also a way of behaving, interacting, valuing, thinking, and believing. Based on this definition of discourse, Lankshear and Knobel (2008) defined literacy as "socially recognized ways of communicating as members of discourses" and (Knoble & Lankshear, 2006) as everyday practices both in and outside the classroom.

Following this social aspect, I want to attend to authors who extend the notion of the social and what it contains. According to Bhatt and MacKenzie (2019), social practices are also mediated by material artifacts and networks. Latour (2005) underlined the importance of our understanding of nonhuman actors in this dynamic literacy and the importance of these actors to our understanding of the social practices that comprise digital literacy. Thus, digital literacy involves the constantly changing practices through which people make traceable meanings using digital technologies (Gillen & Barton, 2010). All these practices are located in systems in which human and non-human agents, inside and outside school, strongly influence literacy events in the classroom space and the social actors' agency (Cannon, Potter, & Burn, 2018).

Focusing on a more specific relevant aspect of digital literacies, Barton and Hamilton (1998) also made an important contribution to the conceptualization of literacies as

social practices, advancing a social practice perspective of literacies that examined how digital literacies are affected by the settings, contexts, and people that are interacting around the digital actions that occur. Being digitally literate has to do with knowing when to use or not to use specific digital tools, even in technology-rich environments. Digital literacy also comprises knowing how to act in different types of media-rich surroundings. This is relevant for this study, as the practice perspective has become my major theoretical approach.

Media educators, such as Buckingham (2007), Jenkins (2007), and Lankshear and Knobel (2008), claimed a more humanistic, non-functional definition of digital literacy. According to Pietraß (2009), identity building is considered one of the most important characteristics of digital literacy. This wider discourse-oriented understanding of literacies is relevant for this study, as I examine how students interact and use digital tools in digitally rich environments.

As literacy, and here digital literacy, depends on listening, acting, interacting, and thinking within the human agents as social actors and part of a discourse, in addition to artifacts as non-human agents and networks, which are ever changing, it can never be static. The needs of a situation are in flux, and when the needs change, the digital literacy needed for that situation changes accordingly. According to Martin (2006),

> "Maintenance of digital literacy is . . . ongoing; it is necessary to return repeatedly to the well of digital competence (whose contents are themselves changing as technology evolves) to acquire the competence needed to succeed in the life-situation, whether it be learning, work or leisure." (p. 156)

Martin's (2006) definition supports the notion of digital literacies as a social practice, following technical skills, and illustrates that understanding the skills is important to understanding social practice.

As digital literacy is neither closed nor self-explanatory (Lankshear & Knobel, 2015), it is difficult to operationalize digital literacy in a predefined way, even in a more regulated setting such as the school. This is also one of the main reasons empirical research, such as this study, particularly helps to illuminate and gain a broader understanding of how digital literacies are operationalized within different school settings, groups, and individuals.

As seen, the definition of the term *digital literacies* is not straightforward, and there is no universal agreement on it. Digital literacies are practices rather than skills and practices that change. As Stewart and Hedberg (2011) stated, schools should use tools in the classroom that can help them adapt to the different practices that are in motion and in which the students

are participating. I would emphasize that, from my viewpoint, the tools in the classroom constitute one part of the practice, and the practices in motion cannot be seen as digital practice without the specific tools. Thus, the social context of usage needs to be considered (Ryberg & Georgsen, 2010). As Belshaw (2012) illustrated, and as I have emphasized above, digital literacies are not only contextual but always socially negotiated. Understanding literacy can involve understanding how people make perceive information from resources in the environment and how they communicate using different means. In this way, literacy changes over time due to changes in the cultural tools we have available (Erstad, 2015).

As argued, digital literacy is not straightforward; it is a broad term comprising many skills and competencies. It has been claimed that it comprises multiple literacies rather than just one (Knobel & Lankshear, 2006). The *digital* part of the term is often used to denote the technological aspect, which gives opportunities to create, process, and use digital media. It describes the technological processes that develop these opportunities and services to recreate information through digital media. The rapid changes occurring in technology and new digital media represent the digital part of the concept, where content is always changing. *Competence* (understood here as part of digital literacy) comprises both skills and knowledge; it is also ever-changing regarding which skills should be mastered and which knowledge should be gained to achieve them. For these reasons, digital competence (as a part of digital literacy) is integral to the society in which it is a part and can never be understood in a vacuum (Dons, 2006). Trying to agree on one detailed definition can be problematic, as both digital and social interactions in the context and discourses are ever-changing. For this reason, and because it changes constantly, it is better to use a range of different digital *literacies* rather than a specific digital literacy. In digital literacies, there are different literacies concerning different tools and contexts. Various literacies associated with the use of digital tools have been defined, such as information literacy (Eisenberg et al., 2004), computer literacy (Tobin, 1983), media literacy (Buckingham, 2007), and digital literacy (Gilster, 1997). Again, as Lankshear and Knobel (2015) stated, digital literacy is a composite of digital literacies. Drotner and Erstad (2014) stated that media literacy and digital literacy evolved from different traditions, where media literacy is closely linked to media studies and digital literacy more to informatics and technology. To broaden the understanding of digital literacy, I used the plural form and understood both media literacy and digital literacy as part of digital literacies; in these contexts, I focused on digital media. However, as Drotner (2018) stated, the focus on particular media at various time points raises the risk of over-interpreting certain

features. I studied particular media at a specific point in time in a certain context. I acknowledge that media literacy is much more complex than this. I still find the understanding of media literacy useful to bring to my understanding of digital literacies.

Buckingham (2006) established a framework for media literacy comprising four essential components to follow up on the more specific notion of media literacy. Although this can be said to be a narrower conceptualization than digital literacies per se, looking more closely at these components in this specific type of literacy, the framework can be used for more specific literacies, such as gaming or web literacy, giving a broader understanding of digital literacies as a whole. The first component is *representation*, understood as the ability to see whose understanding of the world is heard and whose is not. Part of this relates to understanding authority, reliability, and bias. The second component is *language*, which is the ability to recognize the language used in specific and varied communication settings. The third is *production*, which is the ability to reflect on who engages in communication and why it occurs. The last component Buckingham (2006) defines is *the audience*, which is the agents' ability to understand and be aware of their position. These may not be all components of digital literacies. However, I still find it relevant to consider them when trying to understand digital literacies as a whole. This endeavor is relevant to this study because the students who are the subjects of my research show digital skills connected with different media.

I understand digital literacy to incorporate multiple literacies that are dynamic and context-sensitive practices. *Nevertheless, digital literacies* remain used here as the overall term. Studying digital literacy may represent Meno's paradox: On the one hand, if I do not know what it is, how can I study it? On the other hand, what is there to study if I already know what it is? Here, the topic is partly known and partly unknown. In this thesis, I seek to examine how digital literacies can occur in different learning contexts in social studies. The aim was not to see if the students made good or bad choices or if the choices were what the teacher predicted or thought would have given the best learning outcome. Instead, the aim is to take an explorative look at what students are doing in given settings and contexts and to analyze what happens descriptively.

In sum, before I briefly turn to the criticisms of the concept, the understanding of digital literacies is grounded on the notion that it is contextual and dynamic, and the aim of this study is to illuminate what it can be in the different contexts I have been studying.

One of the possible critiques directed toward this view of digital literacies is that there are no clear limits of literacy—more or less, anything goes. This lack of clear boundaries makes it difficult to interpret and evaluate literacy practices. Another critique is that many of the empirical studies conducted with a new literacy studies approach are limited to the local, and researchers should also consider external social factors beyond the community that affect the practices exhibited (Street, 2003).

Many studies on digital literacies have focused on meaning making (Knobel & Lankshear, 2006; Furberg & Ludvigsen, 2008; Furberg & Arnseth, 2009; Sanberg & Silseth, 2021; Erstad et al., 2009), or how the students make meaning of what is taking place in the action and interactions in focus. My research operates on a different analytical level, where I focus on the activities that I observe rather than understanding inner or cognitive processes of meaning making. As exhibited in this study, this type of descriptive research is important for studying everyday practices in action to gain a greater and more nuanced understanding of digital literacies.

In the following section of this Chapter, I will closely examine the theoretical perspectives that make up my understanding of digital literacies as social practices. Following Figure 2 in Chapter 1, which displays the various aspects addressed by the articles, the theoretical concept of digital literacies is discussed in Chapter 2.1. As shown in Figure 1, the method is an important part of social practices. This is discussed again in Chapter 3, but both narratives in this study—the processual and the academic—are theorized, and as a part of the social practices in focus, the method figures into the discussions in this chapter. As seen, digital literacy can be understood as a specific form of social practice (Gee et al., 1996; Lankshear & Knobel, 2008).

2.2 Social Practices

Practice is a widely used term in social research, and as Blikstad-Balas (2014) discussed, it is a rather vague term with no one clear definition. That is not to say that it is a term that should not be used, but it underlines the importance of defining what the researcher understands with practice. For this reason, I will discuss different uses and contextualization of the term practice in the following sections. This has been necessary to answer the research questions, as I seek to examine the social practices that play out, and where the researcher and action cameras constitute part of the practices.
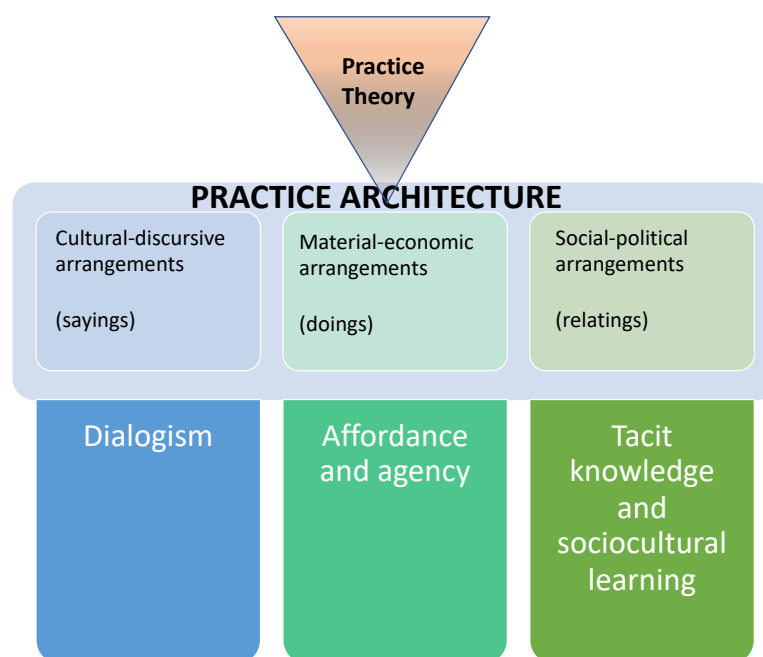
Figure 4. Theoretical terms used to expand and deepen the understanding of the components of practice architecture

Figure 4 displays how I use practice theory and related concepts in this thesis. In the work with practice theories, some terms have been particularly helpful to gain a more nuanced picture of the different components that make up practice architecture and thus the architecture of the digital literacies. These will be treated in more detail in the following, and I will start with a discussion of practice theory as a general approach before I look at the following concepts that are relevant in the way I analyze social practices. Studying practice architecture with its components of sayings, doings, and relatings (Kemmis et al., 2014) has become an increasingly established approach in the field of education. To expand and deepen the understanding of these components of practice architecture, I employ the following terms: *Dialogism* relates to the understanding of sayings, focusing on actions and interactions in their

specific context as important parts of discourses (Linell, 2001). The terms *affordance* and *agency* are distributed phenomena that have been used in the understanding of doings. These terms have been employed to interpret and understand the students' actions and their relation to the digital tools. The term *tacit knowledge*, and more narrowly, the way the term connects to a *sociocultural view on learning*, has been used to elaborate on the understanding of relatings. Using the sociocultural view of learning as a framework to understand relatings is a way to try to understand the often subjective and personal aspects of participating in social practices. To a great extent, how students relate to one another in the given contexts is based on tacit knowledge that appears in the processes of reaching shared understandings, practical agreements about what to do, and social solidarities (Kemmis et al., 2014). It is useful to see the parts that make up practice architecture (sayings, doings, relatings), dialogism, agency, and affordance and tacit knowledge and sociocultural learning power in light of each other, as they are closely interconnected but still focus on different parts of the practice. They are intertwined, and the understanding of one is highly dependent on the others. This is illustrated in Figure 4, which serves as the reader's guide to the present chapter.

Below, practice theory is discussed in general before practice architecture is elucidated. The terms that are used to give additional meaning to sayings, doings, and relatings—dialogism, agency, and affordance, and the sociocultural view on learning and tacit knowledge—are discussed. When introducing the different terms, short explanations are given as to why the terms are relevant as theoretical concepts before going further into the content of the terms.

2.2.1 Practice Theory

This section covers the terms *practice* and practice theory as ways of understanding human interaction. This is done through Schatzki's (1996) and Reckwitz's (2002) theories, as these views complement each other, and using both views expands the understanding of the concept and its content. Following this, practice architecture is discussed; practice architecture has been used to structure and make sense of the practices studied, looking through the lens of *sayings*, *doings,* and *relatings*.

Practice theory is a sociological theory that allows for the analysis of human action and social order. It offers a perspective to understand people's ordinary actions in a given practice, and this is key to understanding and explaining social phenomena. A practice comprises means and competencies and offers a language for reflection and a perspective for understanding. Using practice theory to make sense of the digital literacies that arise and are

embedded in the interactions between students and digital tools in given contexts, it is possible to gain a language for reflection. An introduction to defining the term social practice is as follows. The social practice comprises "socially structured, and socially structuring, patterns, and resources that form the core of everyday life activity . . . [that is,] ways of understanding and doing things in the world" (Thorne, 2013, p. 193). Practice theories have become an alternative way of understanding the social world that differs from social theories that view action as rooted either in individual or collective norms and values (Reckwitz, 2002; Schatzki, 1996). According to Reckwitz, there are three ways of explaining action and social order, one of which is practice theory. The other two are the purpose-oriented theory of action, which has an individual purpose, and norm-oriented theory of action, which focuses on collective norms and values. However, Reckwitz (2002) also stated that these two ways of understanding action and social order dismiss the tacit part of knowledge, and this is problematic because tacit knowledge enables a symbolic organization of the reality of which we are a part.

Practices are ways of organizing ordinary actions that put people in places and positions. Reckwitz (2002) stated that "a practice is a routinized way in which bodies are moved, objects are handled, subjects are treated, things are described, and the world is understood" (p. 250). Like most actions, practices are performed as part of conventional ways of doing things. Even if the participants in a practice are not aware that their actions are a part of a practice, when these ordinary activities become identifiable regimes of activity, they are called "practices." This is closely related to Gee's definition of social practices, defined in Chapter 2.1 as "digital literacies," activities involving *ways of talking and listening, acting, and interacting, thinking, and believing, and feeling and valuing (*Gee 2010, p. 17).

Practices are performances that repeatedly happen, in a routinized way, among the participants in given contexts, such as using specific digital tools in a specific context with a certain social interaction. Some practices last for a long time, whereas others last for a shorter period. Because they are culturally conditioned and understood by the participants in a particular practice, it may sound like anything can be a practice. This is not the case. To be a practice, something must be structured with a pattern (Thorne, 2013). When the practice is put into play, it stabilizes and changes at the same time. As practice theory can give access to a language for reflecting, analyzing the empirical data, and assessing what makes out the students' digital literacies through its lens, it facilitates defining, changing, or enhancing the practices.

Reckwitz (2002) set the following components as part of routinized behavior at the core of a practice. First, the *body* and its activities and actions form one component. The body is not only an instrument for the agent(s) but also knows how to perform routinized actions, such as handling objects. Second, the *mind* and mental activities have different know-hows because some specific mental activities are part of different practices. Third, *things* and their use as social practices often comprise both agents (body and mind) and objects in a routinized relationship. Fourth, *discourse* comprises bodily patterns, routinized mental activities, motivations, and objects. Fifth, in the *structure/process*, social fields are structured by routines, and to some extent, the social order is social reproduction. Finally, *cultural knowledge* is a way of understanding and giving meaning to objects and humans. All the mentioned components are what make a social practice (Reckwitz, 2002). I understand Reckwitz's different components to elaborate on the sayings and doings that Schatzki (1996) identified as making up practices. Reckwitz (2002) also underlined that "the practice should be understandable to the agent or the agents who are the carriers, and also to the potential observer (at least within the same culture)" (p. 250).

Schatzki (1996) proposed two different practices as conceptual aids: dispersed and integrative practices. *Dispersed practices* are overarching parts of social actions, such as following rules, explaining, and questioning (Schatzki, 1996). *Integrative practices* occur in special spheres of human interaction (Schatzki, 1996). The practices in this research project are integrative because they all include one special object or tool in the school project at hand. They are also the type of integrative practice that an excursion in social studies creates. The same is true when studying group work in the classroom. As the methodology, the researcher and the camera have become such prominent parts of the social practices that I consider the methodology another component of an integrated practice. One could argue that these are different dispersed practices together, creating an integrated practice. Schatzki specified that dispersed practices might change when they meet other dispersed practices within an integrative practice. I believe that this describes the practices I have observed. There are different traits of the practices that have dispersive traits and others that have integrated traits. These limits are difficult to set, but they are important to distinguish in a research project. They are also closely related to the question of whether practices are dispersive or integrative.

Like all humans, all the students in this study participated in different practices simultaneously. Within Reckwitz's (2002) approach to practice theory, the different components that make up the practices are useful to consider. The integrative perspective on

practice theory clearly shows the practice's complexity, and, as Schatzki (1996) clarified, the agent is at the center and is the carrier of the practice. In addition to Reckwitz's components, Schatzki's method of dividing integrated and dispersive practices is applied when interpreting the empirical data.

2.2.2 Practice Architecture

The concept of practice architecture was adopted to analyze the data and as a language to elaborate on practice theory, because I found the three-fold approach, including sayings, doings, and relatings, suitable for a descriptive analysis of the digital literacies in focus. Below, I clarify how separating practices inside a practice architecture framework is especially well suited to this study.

According to Kemmins et al. (2013), practices can be seen in "sayings" and "doings," which represent a way of understanding the bodily, mental, and routine elements that happen and constitute a certain practice, including "relatings" that occupy the social dimension. These aspects can be described as follows:

1. *Sayings*: These are cultural discursive arrangements that exist in the dimension of semantic space and enable and constrain how we can express ourselves in the social medium of language (and symbols).
2. *Doings*: These are material economic arrangements that exist in the dimension of physical space–time and that enable and constrain how we can do things in the medium of work and activity.
3. *Relatings*: These are social-political arrangements that exist in the dimension of social space, and they enable and constrain how we can connect with and contest one another in the social medium of power and solidarity. Relatings can involve reaching shared understandings, practical agreements about what to do, and social solidarities (Kemmis et al., 2014).

In the articles in this study, both affordance and practice architecture were used to understand the practices in focus. This is similar to Reckwitz's (2002) body, mind, and thing, but it was difficult to see the students' cultural knowledge and their practical know-how in the data material because this is tacit rather than explicit knowledge. In a broader understanding of practices, Reckwitz's additional components of a practice mentioned above—knowledge, discourse, structure, and agent—are useful for understanding the complexity of the data and

reflecting on how much tacit knowledge is a part of the practices. This is also what makes grasping the notion of digital literacies a complex undertaking.

2.2.3 Parts of Practices

In this section, the terms mentioned at the beginning of this chapter—dialogism, agency, and affordance, along with tacit knowledge and the sociocultural view on learning—are discussed. I also examine how these terms fit with the different elements of practice architecture, as delineated above, as a way of understanding digital literacies as social practices. This is a way of extending, elaborating, and, to some degree, modifying the different parts of practice architecture and making it more relevant to this study. These terms are helpful in understanding and describing the empirical data material. As shown in Figure 4, sayings, doings, and relatings make up a whole, as do dialogism, agency, affordance, and tacit knowledge; therefore, it is not productive to put them into completely separate boxes. For structure in the reading and thought process, the different terms are first discussed separately and attached in a one-to-one relation to sayings, doings, and relatings. This simplification is nuanced later in the chapter.

2.2.3.1 Dialogism

When generating the empirical data, the groups of students were observed, and an empirical analysis of their spoken and unspoken interactions was conducted during and after transcribing the data material and studying their face-to-face interactions. The communication, in a broad understanding of the term, and the conversations that occur were the basis for analysis. The interaction among students and their interaction with the tools, such as tablets, smartphones, and action cameras as available cultural tools, was analyzed, and using Linell's (2001) approach to dialogism to gain insight into the dialogs and communication, dialogism is both interactional and contextual. Dialogism is mainly related to sayings here. As I will discuss below, this simplifies both Linell's term *dialogism* and Kemmis et al.'s term *sayings*, but it is used as the first proxy for understanding the data material.

In dialogism, conversation is much more than the linguistic traits of language; it includes other social aspects occurring within the conversation. Dialogism comprises both cognition and communication, and it is a situation where individuals are in dialogue with other human agents and the context, in this case, the digital tools. Linell (2001) stated that

conversations are seen as a social situation and an organization of social actions. According to Linell (2001), there must be some degree of coordination and mutuality for communication to happen, and as it is highly contextual, the organization of social action and its discourse are specific to each situation. Here, I see parallels to Reckwitz's (2002) components intertwined to do a practice. Dialogism stresses that the relevant contexts and activities are not only situational but also sociocultural. The sociocultural view on learning is discussed later in this chapter.

The analysis of dialogue has its background in Garfinkel's ethnomethodology, where the aim of the research is to look more closely at how people make sense of the world and the methods they use to establish social order (vom Lehn, 2014). Ethnomethodology is the research of everyday practices, and it fits well with the theory of social practices and practice architecture. To closely examine the activities and interactions occurring among students, students and the physical spaces, and students and artifacts, as parts of digital literacies, I started from an ethnomethodological perspective on interaction (Garfinkel, 1984; vom Lehn, 2014). A perspective inspired by this, but not following a strict understanding of ethnomethodology, was used to examine how the students in this project solved everyday activities both in the classroom and outside of it, and the methods they used to approach the task, the artifacts, their fellow students, and their surroundings. The methods they chose and developed when interacting with digital tools, both individually and in collaboration with others in the group, were studied. In practice, this data generation was based on participatory observation. Through ethnomethodology, one can study how phenomena, such as perception, interpretation, and definitions, are created in action and how people relate to each other in daily settings (vom Lehn, 2014). Part of what is the focus in this study is tacit knowledge, taken-for-granted actions, and students' interactions. These ways of carrying out conversations are the methods that people employ as members of society when they conduct their social lives (Linell, 2001; vom Lehn, 2014). The social practices as parts of digital literacies in this study comprised actions and interactions that the students were familiar with. Thus, ethnomethodology is a useful methodological and theoretical lens, and it fits well with dialogism, given that the dialogue in focus comprises much more than the spoken word alone. Rather, it comprised the context and the digital tools, both cameras and tablets/smartphones, all of which made up the actions, interactions, and dialogues. In the construction and process of structuring conversations, the individual actors have both a background and a focus that gives them the tools to take the initiative and respond in the conversation. The students acting

in the conversations that were observed were familiar with their settings, which made this awareness explicit.

When studying the dialogues and conversations in detail and making sense of the students' individual agency, their agreements and sometimes conflicting interests became visible. These aspects were revealed through the communication, action, and interaction taking place in a specific context known to the actors. This context and social arrangement, or sequentially organized communication, was a joint construction in which all the students were involved, even if it contained vagueness and openness, misunderstandings, and sharedness.

Ethnomethodology involves the methods of interaction people employ, comprising the rules and methods they follow in interaction with others. This is a form of tacit knowledge that can be difficult for researchers to spot. It can also be difficult for agents or actors to explicitly be aware of these social methods or rules even if they implicitly know how to follow them. One way to make the rules and methods easier to see can involve using one of Garfinkel's research methods called the "breaching experiment." This is a way of acting out of the ordinary, or the specific social norm, in a small way and understanding the structure of everyday activities to see how they are both created and maintained (Garfinkel, 1984). In this project, the use of action cameras turned out to be a breaching experiment where I could see how the students reacted to something unexpected. This was not intended, but the camera's presence or my presence through the cameras clarified the students' rules and methods, as they all commented on the usage of the cameras and tried not to comment on the usage of the cameras. This explained not only how the students acted around the cameras but also how they acted and interacted around the other digital tools.

2.2.3.2 Affordance

The first observations showed that the devices were highly important; thus, it appeared useful to look to a concept that highlighted and framed the devices in a way that would fit well with the general approach of this study. I found this to be the case with the concept of affordance. As the digital tools and the students were part of different practices in different contexts as something that makes out the digital literacies, it became clear by studying the data that what the digital tools afforded different students varied greatly. Through video data of interaction and conversations and interviews, conversations, and observation, I sought to understand what the digital tools afforded students in different practices, which is becoming a part of what constituted the practices in focus. The different affordances were constituted by,

and a part of, the social and collective processes, and they were not brought forth by autonomous individuals alone. In a social process, students' knowledge and the affordances they receive from tools and practices are understood as something that are recreated, reproduced, renegotiated, reconceptualized, and recontextualized (Linell, 2001). In the analytical work, the concept of affordance was employed both when observing the students and their mobile digital tools and when studying the students' interactions with the action camera, as documented in all four articles. This was a useful analytical tool to gain access to what makes out digital literacies in the given contexts.

The theory of affordances stems from Gibson's (1986) ecological approach to visual perception. In this view of perception and action, the focus is on the interaction between agents and the environment. According to Gibson, perception comprises not only how we construct the environment but also the physical and mental processes that inform the agent's activity. Thus, affordance can be understood as what the environment affords the perceiver. However, affordance also includes what the perceiver sees that the environment has to offer. This means that both the environment and the perceiver define affordance. This concept has been used in the study of human–computer interaction, and according to Norman (1999), affordance includes the perceiver's earlier experiences, former knowledge, and culture. This parallels the sociocultural view on learning, where former knowledge and culture play an important part in the learning process; however, like Gibson (1986), Norman focused on the individual (Kaptelinin & Nardi, 2006; McGrenere & Ho, 2000).

From a sociocultural perspective, Greeno (1994) used the concepts of affordance, agents, and abilities to analyze activity. In contrast to Gibson (1986), who focused on the individual, Greeno focused on interactive processes in which agents cooperate with other agents and the environment or the physical systems with which they interact. This interactive view of perception was applied when group work was investigated, especially because the activity occurring relies on the interaction between affordances and abilities. The conversation activity, among other things, comprises the agent's ability to speak and perceive the language. The affordance is different for distinct agents depending on the agent's ability to perceive it, and it can also "be understood as conditions in the environment for constraints to which the agent is attuned" (Greeno, 1994, p. 336). Whereas affordance refers to what it is about the environment that contributes to the interaction, ability refers to what it is about the agent that contributes to the interaction. Greeno underlined that the affordance of the environment

depends on both the abilities and the constraints that the agent recognizes. According to Greeno, people have different abilities to gather information in their activities.

Contexts outside school have been referred to as informal learning (Livingstone, 1999), authentic learning (Petraglia, 1998), located learning (Lave, 1998), and unintentional learning (Dreier, 2003). In addition, learning trajectories can be defined as different forms of learning in different contexts and social practices. The paths are not static; rather, they are constantly changing as we take part in different practices. This means that the paths are formed in social settings, but at the same time, they are individual. All learning pathways cross different contexts, and knowledge is not something that lies there waiting for us to learn; rather, it is formed while we learn (Dreier, 2003; Stray & Wittek, 2014). This is an informative way of studying how digital tools can be used as learning resources because these are tools that students use in several settings in life. The use of digital tools generates many learning trajectories—some intended, others more random, and therefor affords different things to different agents, or perceivers, which was one analytic focus in this study.

This is the case both when studying the camera and method and when using tablets and smartphones. All students can perceive affordances. Affordance was chosen as a theoretical concept to examine the data because the individuals in the group and how they each reasoned for their choices were observed. Affordance is a lens that makes opportunities and constraints visible when making such choices. This is in turn a part of digital literacies.

2.2.3.2 Agency

The theory and understanding of the terms *agent* and *agency* fits well together with affordances to elaborate on the doings in practice architectural framework, and to further digital literacies as social practices, as I understand human agents to be the one's perceiving and exploiting the affordances.

In sociology, the discussion on structure and agency is ongoing. Where does a structure end, and where does the individual's capacity to make free choices start? At its core, I understand this to prolong the philosophical question of essence or existence. I will not go further into this discussion other than recognizing that although people are defined and shaped by social structures, they inhabit an ability to make decisions and express them in behavior. This is what I understand to be people's agency, the capacity, and ability to make free choices and act on them. Whoever has agency is an agent in that given situation. I do not linger on where the line should be drawn between structure and agency but keep the pair in mind.

Emirbayer and Mische (1998) conceptualized human agency as follows:

"The capacity of socially embedded actors to appropriate, reproduce, and, potentially, to innovate upon the received cultural categories and conditions of action following their personal and collective ideals, interests, and commitments."
(Emirbayer & Mische, 1998, p. 970)

I find this nuanced and complex understanding of the term useful when trying to make sense of the students' actions, as I keep in mind that what I see is the present, but the student's agency also comprises the past and the future, to which I do not have access. Of course, this does not signify an inability to make sense of what is happening in the present, but it does underline the limitations of such observations.

The students' agency or the way they make choices plays an important role in the interactions in focus in this study. Another question that arose during the project was whether the agency was only located within humans or distributed between humans and non-humans (i.e., the technology). Agency can be located in both agents and artifacts (Lund et al., 2019). This is also the case in Reckwitz's (2016) theory of social practices, where objects are "things to be handled and constitutive elements of forms of behaviour" (p. 253). Human agency highly depends on context, and digital literacies depend on human agency. What is conceptualized as digital literacies is based on the actors' distinct agency in the given situation, and this depends on the agents' orientation to the past, future, and present. Practice theory also parallels the understanding of the interconnectedness between structure and agency, which is negotiated in social practices for practice theory.

Within the two different situations and contexts in focus, the term *transformative agency* explains how agency changes (Lund et al., 2019), as the students consider the digital resources based on what seems relevant and how the students can perceive the digital resource's affordances. The transformative agency is an agency that changes according to the situation, and in the situations in this study, this is linked to the use of different digital sources and digital tools. These transformative agencies are seen in the different situations in which the students connect their situation and the sources they have at hand. When analyzing the interaction among students and students and between students and artifacts, examining the students' agencies is a way of understanding these interactions. The agencies are transformed throughout the situations, and transformative agency is a dimension of students' digital literacies.

In their study on students solving a problem in a science class, Lund et al. (2019) stated that "An early indication of agency is when students start considering resources, given or actively sought, analogue or digital, in order to break out of or transform" (Lund et al. 2019, p. 55). This transformation occurs when students find new resources to help them solve tasks. This is highly relevant as a focus in all four articles that make up this study, whether the focus is on digital resources in the shape of online information videos, different digital tools, or digital action cameras. Focusing on and analyzing the interaction between students and students on the one hand and between students and artifacts on the other hand by looking at students' agency is a way of understanding these interactions.

2.2.3.2 Tacit Knowledge and the Sociocultural View on Learning

The term "tacit knowledge" was initially introduced by Polanyi (1983). Throughout this study, this complemented my understanding of dialogism, human agency, and affordance. I understand knowledge about how to interact with others and digital tools in different contexts to be a type of tacit knowledge, and thus a way to elaborate on relatings within the practice architecture framework. Such knowledge is not verbalized, and thus it can be easier to grasp when using video of the students' actions and interactions to study this more closely. As Kemmis et al. (2014) stated, relatings within practice architecture refer to the process of reaching shared understandings, practical agreements about what to do, and social solidarities. Within these shared understandings and practical agreements about what to do is where I see what I define as the students' tacit knowledge in the data material.

Polanyi's (1983) point of departure in addressing tacit knowledge is that we know more than we can say. The earlier prevailing concept of knowledge held (among other things) is that, to know something, one must be able to clearly express what one knows. According to this concept, knowledge must be articulable, abstract, and, as such, valid in every situation, regardless of context. Tacit knowledge, however, is knowledge that is not or cannot be articulated.

Tacit knowledge can be divided into two types: the knowledge we have that we take for granted and thus forget to articulate, and the knowledge we cannot articulate (Polanyi, 1983). Winch (2010) elaborated on the concept of tacit knowledge by characterizing some different forms of it. Some forms of knowledge can be possessed without people being aware of them, and some are performed without people being aware that they are performing them. For some forms of knowledge, people may know that they possess the knowledge, but they

are still incapable of explaining how they know what they can do (Winch, 2010). I understand this to cover tacit knowledge. I find these distinctions relevant to my research design and choice of research methods because the students possess knowledge, they are not aware of and cannot explain. Tacit knowledge is a multifaceted form of knowledge. It will be challenging to articulate and be aware of the tacit knowledge people possess in many cases. It can be said that experiences are gradually shaped into knowledge, similar to the way actions can solidify into practice with routine, as Reckwitz (2002) proposed. This view of knowledge is useful for my research because I see the students' interactions with and around digital tools as a form of tacit knowledge. They are aware of how to interact with and use the tools in a purposeful way. They know more about their use than they can explain. One may well imagine that knowledge gained by verbalizing it can be more easily articulated than knowledge derived from trial and error, where the knowledge of how to use digital tools would, to a large extent, fall into the latter category. In other words, people do not know what to do until they have done it. This is relevant when discussing digital literacies.

Tacit knowledge has a dimension related to culture and subjects, and Polanyi (1983) thought that knowledge is socially and culturally oriented. This was relevant in my research because the students seemed to know digital literacy as a social practice in which they participated.

Polanyi (1983) stated that *knowledge* is socially and culturally oriented, and in his sociocultural theories on learning, Vygotsky stated that *learning* is both socially and culturally oriented (Vygotsky, 1978). Vygotsky thought that learning does not depend on the level of development where the learner is; rather, learning drives development forward. In this study, Vygotsky's sociocultural learning theories were used as an approach to the processes in focus. Here, there are clear parallels to Polanyi's concept of tacit knowledge. Polanyi and Vygotsky both thought that learning and knowledge are not formed in a vacuum. Learning and knowledge formation occur in interaction with others and with cultural tools, which happens in the culture and history of which we are a part. Thus, these processes are both socially oriented and conditioned.

Vygotsky (1978) wrote about learning, whereas Polanyi (1983) wrote about knowledge. Learning and acquiring knowledge can be said to be similar activities. In his sociocultural approach to learning, Vygotsky also believed that learning is contextualized. I use these terms in this thesis as I understand the student's way of acting and interacting is something that they have learned, and has become a part of their tacit knowledge. Learning is

historical in the way that historical contributors are involved and create common cultural references. Vygotsky thought that all learning or higher mental processes have two planes. First, it has a social plane, where one learns through social interaction with others. Second, and afterward, mental processes move onto an individual plane (Vygotsky, 1978).

An important element in the sociocultural theory of education is the use of tools in learning processes. An activity can be mediated using a tool designed to perform that activity. By learning how to use the tool, one also acquires the activity for which the tool is intended; thus, the tool communicates activity. Vygotsky viewed language as the most important tool (Vygotsky, 1978; Wittek, 2012). Language was an important element in my research for understanding the students' interactions, but the entity I focused on was the digital tool and its uses. From a sociocultural perspective, learning can be viewed as the negotiation of knowledge and participation in social practices (Wenger, 1998). Learning is seen as occurring both within groups and on an individual level, and these two levels of learning are entangled in the learning processes (Greeno, 1998; Sfard, 1998). Moreover, the basic unit of analysis in Vygotsky's (1978) theory is mediated action or action operating through mediational means, such as language. Following mediation and integrating the tools used in the activities, I find it best not to think of the bodily and mental processes and the mediating tools as two distinct parts of human activities. Instead, they are part of human activities that make up social practices. This parallels Reckwitz's (2002) practice theory.

Students are attuned to specific ways of carrying out activities, and they have to learn how to use cultural tools and the mediational means made available to them in these activities through guidance and scaffolding (Collins et al., 1989; Rogoff, 1990). In the sociocultural tradition, there has been an interest in how technology can support students' learning (Hmelo-Silver et al., 2007; Roschelle et al., 2010). According to Koole (2009), mobile learning occurs at the intersection between the technical tools, social practice, and the persons' (in this case, the students') learning with the tools. Learning is considered to be situated, facilitated, and developed through social interactions and interpersonal conversations and mediated through tools. Thus, digital tools as cultural tools are both physical objects and providers of numerous information sources as discussed in articles 2 and 4.

In handling digital tools, I imagined that the students would not necessarily have so much explicit knowledge of how these tools are used to solve a task in social studies. Nevertheless, I assumed that they could reach a result through social interaction and the knowledge they possessed from other learning situations. Thus, a significant amount of tacit

knowledge would be displayed through their use and interactions, both in the social environment and using digital tools. However, how this was done in practice would be defined and redefined in interactions with others while learning occurred (Wittek, 2012, 2014).

In any situation, the framework for interaction is part of the students' learning (Wittek, 2012, 2014). In this study, digital tools were used on the students' premises, which were mainly defined by the school, for solving a given task. Thus, to some degree, the learning situations were familiar. Furthermore, the students worked in groups with known artifacts, the digital tools. In contrast, the activities and the situations were somewhat unclear, and the students had to make sense of this among themselves. This constituted a less familiar situation in both subprojects that were completed.

In both field studies projects, the students were asked to solve a given task in a way they considered adequate through special artifacts, that is, with the digital tools. This could be experienced as a challenging task. Nevertheless, it was important to avoid too much facilitation because it was the students' approach to the challenge I wanted to observe, not my approach. Vygotsky (1978) specified that what one should examine or learn about must not be divided into too small elements. Here, one can draw parallels to what Polanyi (1983) called the functional structure of tacit knowledge. He described this as the way we focus from smaller units to what these individual units make up together (Polanyi, 1983).

When we see the big picture, it can be difficult to define the units that compose the whole. This is true in many forms of learning. If one is to define everything one does, it can be difficult to do anything. For example, in students handling digital tools, it can be difficult to define all the choices and ways to proceed with what they are going to do. As mentioned above, Polanyi (1983) thought that neither knowledge that we can verbalize nor tacit knowledge exists alone; rather, both are part of new knowledge recognition. Polanyi's concept of "emergence" was used to understand the data and this development and the new knowledge that arises in the field between tacit knowledge and knowledge that can be put into words (Polanyi, 1983). This addresses the innovation that occurs when two qualitatively different phenomena in a knowledge process create something new. An example of Polanyi's emergence found in Vygotsky's theories is how Vygotsky believed that the interaction between language and thought worked (Vygotsky, 1978).

Language and thought are two qualitatively different elements in the process of forming knowledge. Through a dynamic process in which both elements come into play, new

skills are created by the learner. Thus, it is both in the interaction and the confrontation between the two elements that learners achieve development on a higher mental level. As Polanyi (1983) specified, this newly acquired knowledge is both focal and tacit. It can be said here that there are similarities between knowledge that can be verbalized and tacit knowledge and between language and thought. In the theory of practice architecture, this could be placed in the overlapping area between doings and relatings. Thus, both Polanyi and Vygotsky (1978) thought that knowledge contains components of different forms—focal and tacit, language and thought, rational and implicit, and practical and intellectual. They both had a dynamic view of the development of knowledge in which the dynamics between different forms of knowledge create new knowledge. Tacit knowledge can gradually become focal, and practical knowledge can become intellectual. In this study, I tried to make practical knowledge intellectual by observing and engaging the students to practice the practical and tacit knowledge they possessed.

2.3 Practices in Focus

In Section 2.2, I have defined my understanding of the term social practice by using the term practice architecture and further described what I understand about sayings, doings, and relatings. This has been done to add content to my understanding and positioning in seeing digital literacies as different social practices. This relates the terms used in the articles to the main term in this study, digital literacies. Then, in Chapter 2.3, I look to selected research on the specific practices of choosing digital resources and different digital tools in different contexts. The first part (2.3.1) looks at practices that are similar to the social practice of evaluating digital sources that has been examined in article 2. The second part (2.3.1) looks at how youngsters choose different digital tools in different situations, similar to the social practices studied in article 4.

2.3.1 Choosing Digital Resources

In this study, I examined practices in which digital resources play an essential role in the interactions between students. I focused on practices in which students choose digital sources or tools and how such choices are made. In the following, I will consider research on students' evaluation of information as a part of digital literacies and place this study within the field.

First, the evaluation of sources, in this case, digital sources, can be defined as "the stage of the information-seeking process when an information seeker decides to use (or not use) a piece of information she or he has found" (Gasser et al., **2012**, p. 58).

In a formal learning context, such as the classroom, evaluating sources is, to some extent, the responsibility of teachers. This is somewhat complex for online information. Research shows that the way young people evaluate online information is not always optimal (Livingstone et al., 2005). Thus, it is important to understand how the evaluation of sources is conducted (Macedo-Rouet et al., 2019).

In their study, Metzger et al. (2015) examined the factors that affect young people's (aged 11–18) information evaluation practices, using a hypothetical deductive method. They found that some important factors affecting their practices are differences in cognitive dispositions and the extent to which they had formal training in evaluating sources. Their study indicated that the different agents have different areas of focus. They conclude that research gives reasons to be skeptical of young people's evaluation abilities (Metzger et al. 2015, p. 340). Their research showed that there is no one way that young people evaluate the immeasurable amount of information available online. Many seem to know which criteria they should use when evaluating sources, but several studies show that the criteria students actually use when searching are not the same as those they stated important when asked (Walraven et al., 2009). The same was seen in research done by Macedo-Rouet et al. (2019). They found that when asking young people (12–16 years old) to rate digital sources, what they observed of evaluation was different, not as systematically done as they stated in the interviews. These studies show that how students evaluate their evaluation strategies and what they actually do might differ. This is supported by studies that found that students who said they would base evaluations on source information rarely did so when observed in real time (Hargittai et al., 2010). Students frequently ignored source information (Bartlett & Miller, 2011; Barzilai & Zohar, 2012), focusing instead on the relevance of the information provided (Walraven et al., 2009) and basing their conclusions on a website's surface-level features (Coiro et al., 2015; McGrew, 2020). In their review article, Bråtenet al. (2018) found that one reason for not evaluating digital sources the way they knew they should, could be the lack of encouragement from teachers.

What is actually being evaluated in the selection process is not easy to grasp. Walraven et al. (2009) showed that the students based much of their evaluation on intuition. Where their intuition takes them differs, and research shows that students' reasoning within

these practices is often shallow. Students often use superficial cues when choosing digital sources (Macedo-Rouet et al., 2019). The focus on superficial cues parallels studies that have shown that Wikipedia is considered a good source, as it is easy to understand (Blikstad-Balas & Hvistendahl, 2013). When studying how seventh graders evaluate websites' sources, Coiro et al. (2015) found that students focus more on the relevance of the content than on reliability and that their evaluation is often superficial and vague. A study conducted by Metzger et al. (2010) found that the evaluation of digital sources is often done in a heuristic manner rather than systematic. Through data analyzes of group interventions in which students discussed their online information-seeking behavior in groups, they found that the participants used five heuristics to evaluate sources. These were reputation, endorsement, consistency, expectancy violation, and persuasive intent. They argued that this shows that a common strategy used when evaluating information online is to "minimize cognitive effort and mitigate time pressures through the use of heuristics" (Metzger et al., 2010, p. 434). They also argued that identifying these heuristics was an important step in developing explanations of information evaluation behavior online.

Together, the selected articles show that young people evaluate sources depending on former knowledge about how to evaluate and greatly on intuition and heuristics. This is the strategy used even for young people who are aware of the evaluation criteria they should be using. Many of these studies thus show that young people evaluate and choose digital sources based on vague and often superficial criteria.

Much of the cited literature is based on surveys and quasi-experimental data (Metzger et al., 2010). Many of the studies on adolescents' use of evaluation criteria have examined how a set of given criteria is being used and how these different criteria are being evaluated (Macedo-Rouet et al., 2019). This is different from research in which the students evaluate without being instructed and without specific criteria to evaluate. Research focusing on this issue shows that teachers are an important factor in guiding students in their source evaluation in learning contexts, but students might evaluate differently when they are not teacher-led. This might also be one reason for questioning the results from researcher-led interventions (Bråten et al., 2018).

As digital literacies are studied as social practices in this study, and evaluating sources is also a social practice, it was important for me to study groups since they reason together for their choices. In this study, the students were not explicitly asked to evaluate sources. Instead, evaluation processes emerged as they worked in groups, persuading each group to agree with

their reasoning for choosing sources. By using an action camera, I could access what emerged as their heuristic rather than a systematic evaluation of sources (Metzger et al., 2010). To further understand the students' interactions and selections and use of resources in groups, I considered practice theory as a theoretical framework, as discussed above.

2.3.2 Different digital tools in different contexts

In this part of the analytic review, I will be closer to the specific practice studied in Article 4, where the focus is on how and why students use different digital tools for different purposes and when they choose not to use digital tools. I will first consider research on mobile learning to understand the why and how for mobile devices and further scrutinize studies that examine what types of tools are used for what.

Mobile learning involves learning with mobile tools, such as smartphones and tablets. The focus is on tool mobility, and the term suggests that learning can occur anywhere at any time (Crompton, 2013). This is supposed to make learning easy, accessible, and interactive (Burden & Maher, 2014; Kukulska-Hulme & Traxler, 2019). It also focuses on how learning occurs in different contexts and across contexts; it occurs both in leisure time and in school and is both formal and informal (Traxler, 2016). Moreover, the formal learning that happens at school can be linked to the informal learning that occurs during the students' leisure time (Kukulska-Hulme et al., 2009). When in school, the students can also be connected to other social spaces, and the schools also influence the social spaces outside the schools (Sahlström et al., 2019). Mobile learning also provides good opportunities for learning both inside and outside the classroom (Kukulska-Hulme & Traxler, 2019), and it might enable connections between different physical learning environments (Stewart & Hedberg, 2011).

Much of the research done on the usage of mobile digital tools in school contexts has focused on what teachers and students should be doing in the classroom or what the technology offers in terms of opportunities. Yet, there is a lack of research on what people are actually doing with the technology (Cerratto et al., 2018). Traxler and Kukulska-Hulme (2016, 2019) argued that the next generation of mobile learning is becoming more context-aware. Context-aware mobile learning uses personal technologies about the place, the history, and the learners' relationships with other people and objects.

While the smaller screens of phones and tablets may promote more individualized uses, one of the consequences of mobile devices in the classroom is personalizing the student's participation (Sahlström et al., 2019). These devices are also relatively easy to show

to and share with others, and research on mobile learning and the usage of different mobile tools shows that different tools have different affordances for different people and refer to how technology affords.

Dinsmore's (2019) study focused on smartphones' affordances in the classroom for teachers and students. They considered earlier research on how teachers and students can have different views on technology, where teachers frame digital technology instrumentally as a tool with proper and improper uses while students view the same technology as providing access to shared social spaces (Boyd, 2012; Fisk, 2016). Dinsmore´s study (2019) showed that while the features of mobile smartphones encourage contextual mobility, the teachers asked the students not to take advantage of this mobility but rather to use it in a way that was proper for the context of school. Bringing a personal device to the classroom crosses a boundary, as it is not part of the school (Gilje, 2019). An Australian study by Selwyn et al. (2017) shows how personal digital devices, such as smartphones, tablets, and laptops, enabled leisure practices during school. The study was conducted as ethnographic research, comprising observations and interviews at three schools with students from 11–18 years of age. The study showed that the structures of the school also shape the usage of a personal device in school. It shows that the students still use their devices in the same way as outside the school context in ways that do not disturb the classroom context. This is relevant for my research as it focuses on the extent to which the school's equipment becomes the students' and how it affords different things for the agents according to context. In their study of Finnish and Swedish upper secondary schools, Juvonen et al. (2019) studied the role that laptops and smartphones play in the process of being "stuck" or becoming "unstuck" when working with text planning. In their data, they found that students turned to their digital tools when they did not get the desired response to their social initiatives from peers. They found that smartphones can hinder and facilitate students' concentration on learning tasks (Juvonen et al., 2019).

Ott et al. (2018) used the notion of infrastructure as an analytical tool to understand the conflicts around mobile phones in school. The study was built on a survey of over 200 students from a Swedish upper secondary school; it was then used as a guide for selecting the sample for four focus group interviews. In this article, the researchers discussed the social and technological dimensions of students' use of mobile phones. Ott et al. (2018) pinpointed that students sometimes used their phones for schoolwork, but they viewed mobile phones as personal. Thus, when using their phones at school, they merged with the infrastructure at school and adapted their regular use of mobile phones to the norms of school practice. At the

same time, the use of mobile phones in school opened a boundary space between schoolwork and leisure activities.

In a study, Edgerly et al. examined how American youth (12–17) learned to consume news, focusing specifically on the devices (television, computers, tablets, and mobile phones) they employ when consuming news. The focus of the study was on what they learned about news consumption from their parents, how this had changed with all the digital devices available, and with media use being much more individualized, as children and parents use these devices and consume media behind closed doors and not in shared public spaces, in a shift toward what Livingstone (2007) called the privatized "bedroom culture." In their research, they stated that news consumption might be less visible via mobile devices, as this makes youth media consumption individualized. With the "bedroom culture" made possible with these devices, Patterson (2015) argued that the home has become a less influential place for learning new media habits. Instead, they see other influences, such as schools and peers, as more influential (Lee et al., 2013). Edgerly et al. (2017) found that the school curriculum and peers play a significant role above parental factors regarding media consumption. This is relevant in my research, as it shows how digital tool affordances are something we are socialized into perceiving.

The selected articles show that what the different digital tools afford the different agents is highly contextual, and they are taught and learned through interactions with others, adding to functional aspects of use. This is relevant in this study, where I, in the fourth article of the study, focused on when they use the different tools and for what. For example, the smartphone is personal both as it is their personal device and because of the small screen, whereas the tablet is the school's device and, therefore, affords something else although it also enables some personal use. This is part of what discerns the social practice in focus.

2.4 Summary

In this chapter, I placed this study in what is the overarching term in this thesis: digital literacies. This is also illustrated in Figure 2. I understand digital literacies as social practices and use practice architecture as a frame to deeply understand the empirical data.

My encounter with the empirical world quickly demonstrated that human action and interaction are so complex that the sayings, doings, and relatings used by Kemmis et al. (2014) needed further explanations. Therefore, I examined these dimensions using dialogism, agency, affordance, and the sociocultural view of learning and tacit knowledge. In this study,

social practices are understood as activities mediated by digital technology. The activities are also seen as cultural and specific ways in which the technologies at hand are used. The activities occur in a social and historical context that gives meaning and direction to the activities. I do not understand the relationships I have drawn out between sayings and dialogism, doings, and agency and affordance, and relatings and tacit knowledge and sociocultural views on learning as synonymous. Rather, this is a simplification I employed to understand the data material. As seen throughout this chapter, dialogism is both what is said and what is done in interactions. What is said and done is highly reliant on human agency and how it is seen through affordance. I understand affordance as something that is made visible by the actors or agents and their agency, where many agencies meet in a myriad of agencies and generate tacit knowledge. The students' tacit knowledge is made visible through their dialogues and the silent interactions that comprise actions and relations, which can be seen as dialogism when considered together. Knowledge and learning are viewed here through the agents' dialogues and actions. I see tacit knowledge as what Pickering (1993) called a "dance of agency," where the agent's knowledge also comprises which agencies are at play in different situations. The complexity and overlaps are illustrated in Figure 5.
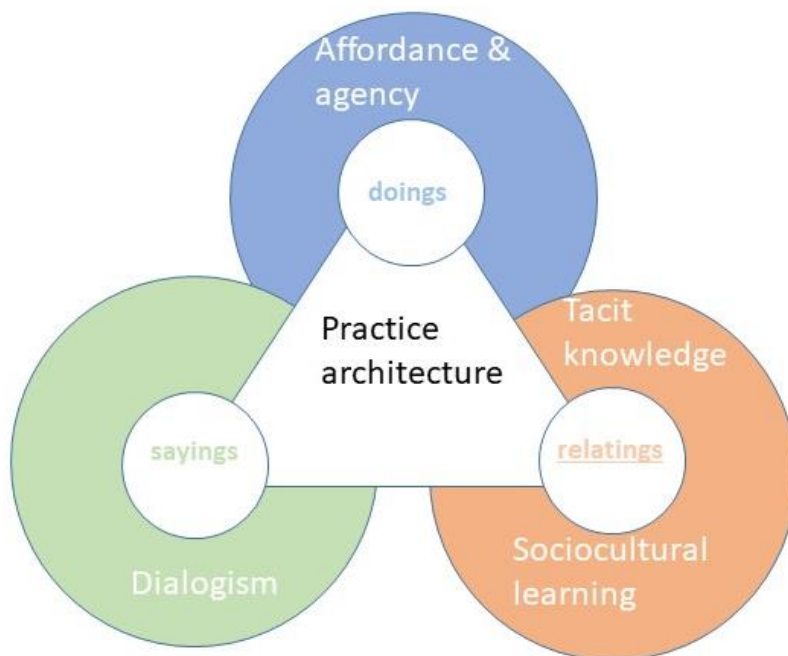
Figure 5. How practice architecture relates to affordance, agency, dialogism, tacit knowledge, and sociocultural learning

As Kemmis et al. (2014) stated, with my additions in square brackets:

"we are both the products and the producer of language [dialogism], both the products and the producer of work and activity [affordance, agency], and both the products and producer of power [in relation to sociocultural learning and tacit knowledge]" (Kemmis et al., 2014, p. 6).

As shown in Figure 5, these elements cannot be separated from one another. When elaborating on practice architecture using dialogism, affordance, and agency and sociocultural learning and tacit knowledge, it is possible to gain a better understanding of the practices in focus, as I tried to show in the articles in this study, and as I will further elaborate on in Chapter 4 of the extended abstract.

In Chapter 2.3, I closely examined the specific types of social practices related to my study.

CHAPTER 3: FIELDWORK PREPARATION AND IMPLEMENTATION

In Chapter 2, I considered digital literacies as social practices focusing on some specific practices. As already mentioned, I found the researcher and the method to be an important part of the social practices in focus. Therefore, this chapter is both a descriptive methods chapter, and it also has a part where the usage of the action camera is thoroughly discussed as a way of learning about practice and part of a practice.

The chapter starts by presenting descriptions of how the fieldwork was performed and how the data was generated, analyzed, and presented. Building on Articles 1 and 3, this chapter also includes further considerations of how the methods were suitable for this study, including a section on how they are related to the methods used in other studies in a similar field. How the methods chosen affect the practices that play out is discussed throughout the chapter. As the fieldwork was performed in two different parts, I also discussed their differences and similarities. Then, the two fieldwork processes are separately discussed, where they differ. In those cases where the methodology in the two fieldworks is the same, they are discussed simultaneously. The content in this chapter seeks to address some criteria that Tracy (2010) defined as the "big tent" criteria for qualitative research: worthy topic, rich rigor, sincerity, credibility, resonance, significant contribution, ethics, and meaningful coherence. This helps meet the other aims of this chapter, such as achieving sincerity through transparency about methods and credibility through providing concrete details from the fieldwork.

The chapter starts by introducing the research field, how the participants were chosen, and what the settings and contexts looked like. This also includes how and why two different student groups were studied. Following this, the methods used are discussed and situated regarding the existing research. When focusing on the usage of action cameras in this extended abstract, the discussion concentrates on the ethical questions concerning the usage of action cameras. I then discuss the process of analyzing and representing the data material.

3.1 Research Settings: From One Student Group to Another

In this section, the selection of contexts and participants in the process of data generation is considered. Since two different fieldwork projects were conducted, it may seem logical to go through them one by one, but although they were two separate projects, they were not independent concerning the research topic or methods and, to a great extent, they depended on one another regarding the development of the research. Thus, this section is

written following a chronological timeline, which means that it will go back and forth between the two projects.

3.1.1 Background

As mentioned above, my background is as a museum teacher. This is both where my experience lies and where my initial interest began. The point of interest was to examine more closely how middle school students use outdoor museums and how they would implement digital resources when given a task to solve. Within this context, one could envision being highly "analog." When I was choosing participants, the main factor I considered was meeting students in middle school, in a middle sized town, who all were equipped with digital tools that they used for most school subjects. Other criteria used to choose participants were their willingness to be filmed in a nearby outdoor museum and classroom by the researcher.

One way to meet students and schools is through the museum, but as there are always new groups of students visiting, it is easier to make contact through the school than through the museum, and then invite the school class to the museum. Based on this approach, my strategy was to give the students a task from the researcher, the same way a museum teacher would have done. The students were given a task in which they were asked to implement the museum's physical attributes regarding its building stock and the area for the open-air museum. The theme was the Norwegian Constitution and the year 1814. In other words, there was no guided tour under the auspices of the museum. The students' assignment complied with the curriculum and the topics they were working on in social studies, and the teacher approved it. It was also a topic in which the museum could be integrated. It was important that the students and the teacher experienced that this was not taking away much of their time, but instead, it could be a part of what they were already working on.

The reason for focusing on middle school students was the assumption that this group of students has many ways of using digital tools in different contexts because they are used to different devices both in school and at home, using them for work, entertainment, and communication. This is relevant because the focus is on digital literacy as something that is more than simple know-how. Another assumption, and the reason for choosing an outdoor museum for an excursion, was that this context would provide access to a borderland between school and leisure time. This focus was not relevant in the second fieldwork process. This means that the rules for social interaction may differ, and the use of digital tools in different interactions might come into play. The initial idea for the first fieldwork was to investigate

how the students used digital tools, focusing on geographical information systems (GISs). This was important because one aim at this stage of the process was to use digital maps to examine more closely how students orient themselves in the environment when they have digital maps of the area they are in and how they use the maps and why.

3.1.2 First Fieldwork Process

As GIS was initially part of the research focus, the students in the first fieldwork were asked to use and make digital maps. The researcher predesigned the idea for the first fieldwork project to give the students an assignment to use digital tools in different ways—reading/writing, pictures/video, and maps. Their assignment was to create a digital story from the museum with all these elements included in the process. Before the fieldwork, the teacher divided the students into groups. This was done based on the groups they used in the classroom.

In the initial correspondence with the teacher, the project was described, along with the initial thoughts on the study aim. Arrangements were given for the researcher to meet the students once before the project was conducted and to inform them about the research project and the research methods used to generate the empirical data. The excursion at the outdoor museum lasted four hours, with each group having a member who wore an action camera. The video clips' durations varied according to how the camera was employed and turned on or off by the students. The groups were also observed in action by the researcher. As stated, GIS and maps were important parts of the project as planned because the initial thought was that the students would create maps of the area in their digital stories. However, this seemed uncommon to them, and they ended up dropping the map-related task from their final digital story. Thus, the focus on GIS and digital maps fell away because the generated data did not provide relevant information.

One week after the excursion at the museum, a meeting was arranged at the school to examine the digital stories the students had made. Each group was expected to show their digital stories to the rest of the class. However, because of technical problems in the classroom, this did not happen. Thus, the students' assignments seemed no longer a fully valid and important part of the intended research project. GIS and maps were completely taken out of the study. To follow up on the not-executed presentations, semi-structured interviews were conducted in pairs. Half of the groups were interviewed the same day as we went through their digital stories. The other half were interviewed the following day. The interviews were

conducted in a nearby classroom. Again, the teacher matched up the students in pairs, assuming that the two students were compatible. The interviews were all filmed. The reason for not choosing only sound recordings was that I understood the interviews to be social practices, and for this reason, the idea was that video would give more information than sound recordings alone.

After going through the data from the first fieldwork process, I developed the impression that the video data from the action cameras were fragmented and difficult to study. A lot was going on, and the learning context came across as unstructured. The book chapter (Lofthus, 2017) that is a part of this study discusses this more thoroughly, and I use practice architecture as a concept to understand that the researcher's role affects the research field to a great extent. The researcher affects the research field in any fieldwork, not only in fieldwork where the researcher's role is more prominent.

3.1.3 Second Fieldwork Process

In this subsection, a further explanation of why the second fieldwork project was conducted differently from the first is given. The points discussed here are different from those in the previous sub-section because I seek to clarify the choices concerning what was done in the two separate phases, whereas the book chapter that was referred to is a meta-view of choices that affected the data that was generated. There were several reasons why specific aspects were done differently. First, it was expected to be easier and more fruitful to study students in their normal environment, in the classroom. It would be potentially more fruitful because this would be a context in which the students were used to working and had clearer roles. In addition, this approach was expected to generate data that would be easier to study and analyze because the participants would be sitting down in a quieter environment. As discussed above, this made me think that the first fieldwork project was more of a pilot than an actual part of the research project—a pilot that had not worked out well.

I decided that the study would be less of an intervention and more of an observation for the second fieldwork process. Thus, I consulted the case study literature. From Yin's (2012) perspective, a case study comprises the five following components: research questions; hypotheses, if there are any; analysis devices; the logic that binds the data against the hypothesis; and criteria for analyzing the findings. Regarding the preparation for data generation, Yin (2012) considered the pilot project to allow the researcher to refine the data collection plans. Another important reason for going into the classroom was that this seemed

to be the norm when studying students' interactions in class and that this type of data would be easier to analyze and, thus, a safer choice. I thought it would also be better to study them working on an assignment or project given to them by their teacher, not an outsider, because the teacher knows the students and how they are used to working. This seemed important because the aim was to study the students in their normal environment; thus, normal assignments from their regular teacher would give better insight.

I thought it would be easier to generate data videotaped in a more structured environment. This was one of the main objections to the video from the outdoor museum. With the students and cameras moving around, there was so much going on that it was hard to follow. In addition, it was challenging to make sense of the different hybrids displayed in the data material, as discussed in Article 3. The boundary between school and leisure that was initially sought became difficult to differentiate and understand, and the focus on map-making and GIS was no longer relevant. Thus, there were seemingly many reasons to abandon the initial project and go into the classroom. I realize that many of these factors created uncertainty in my approach to the project as a researcher regarding the use of this fragmented, unstructured data. I also thought that the data from the first fieldwork were limited because of the methods used and the lack of clarity in the instructions the students received.

The criteria set for the next fieldwork project were again to work with middle school students in a digitally rich learning environment. The school where the second fieldwork process was conducted had established a collaboration with the university. Contacts were made with a social studies teacher at a school where all the students were equipped with tablets. While I had abandoned several other themes, one focus was still clear—the interaction between the students in groups and the students' interaction with their digital tools. The fieldwork period was set to one week, as the students were working on a project that lasted for this length of time. Before the fieldwork, the class and the teacher were visited and observed on two separate occasions, mainly to understand how they used the tablets and to inform the students about the researcher, the project, and the methods used to generate data. Two teacher meetings in which the teachers discussed how to work on the upcoming projects were also organized. The project's focus was environmental issues, and the students were doing different activities at school and home, which led to the students writing different blog posts.

In the last week of the project, the field study was conducted for 15 hours for five days. The generated data were researchers' observations, video from full classroom interactions, conversations with students and teachers, and video from groupwork sessions.

The students were equipped with action cameras, either worn by one student or placed on the table among them. For one week, I also observed the class for a separate project where they were working on geography, using tablets in groups. During that period, observations were made, but video data were not generated. Thus, the data generated here was not thoroughly analyzed but rather used as background information.

3.1.4 Reflection Process

The empirical data from the classroom seemed more structured and less fragmented, and as the researcher, I did not see myself as prominent in this data, in contrast to the data from the museum. This perception changed from a meta-perspective of the work I gained when working on the book chapter. The researcher's role was not as intimidating to me in the classroom because the students followed their teacher's instructions rather than me telling them what to do. My experience was that it was more convenient to work with the classroom data. After the second fieldwork project, I thought that the generated data was easier to study more closely because the context of the study was group work in the classroom, where the students were not moving around. Therefore, the situation and physical space were more limited. The data material from the classroom also seemed more authentic because this was a teacher-initiated learning situation.

Interesting and rich data were also generated from the first fieldwork project at the museum, and this would provide useful information in addition to what was generated in the classroom although it was extremely different. Eventually, rich data were also provided because of the high degree of difference in the settings. These differences seemed difficult to cope with because they made it hard to see the similarities between the different projects. However, going deeper into the literature, as described in Chapter 2 and the data material, the need to find similarities was not as prominent, as the focus on how digital literacies are highly context reliant. With this in mind, I saw these two different settings and projects as strengthening the research rather than weakening it. While the two projects were not meant to be compared, their differences actually substantiated the context-reliant aspect of digital literacies.

The realization emerged that the researcher could not use, analyze, or say anything about the reality she observed and tried to understand and make sense of it by picking and choosing the data that seemed more convenient and available. This means that although the data from the first fieldwork was fragmented and initially difficult to make sense of, they

were very rich, and they could not be deselected only because the second fieldwork data were "cleaner." There were many interesting data from what I then labeled as a pilot project that needed more attention, which would clarify the established research questions: How do ninth graders relate to digital tools in different contexts in social studies? How can this clarify digital skills and digital literacies? How does digital literacies as a social practice play out in social studies?

After generating empirical data from two different learning environments and contexts, both using teaching methods widely employed in social studies, data was available that could provide a rich understanding of digital literacies in social studies. Table 1 shows the commonalities and differences between the two fieldwork processes.

Commonalities	Differences
Grade 9	Three days vs two weeks
Social studies	PC tablet vs iPad
1:1 digital tools	Outdoors vs classroom
Group work	Mobile vs stationary
Action camera	Different groups

Table 1: Commonalities and Differences in the Two Fieldwork Processes

3.2 Design: Evaluation of Methods Used

In this section, I discuss the different research methods used in the two fieldwork processes. To generate empirical data on the subject, I decided to use video for the reasons described above. In this context, I will also discuss how similar studies on literacy and education have used video-based methods. Further, I decided to use action cameras because the research subjects could wear them without the researcher being close by. It could also generate video data in motion. The initial reason for choosing an action camera to generate video data was that action cameras could give the researcher a first-person perspective, offering insight into the world of the research subjects (Lahlou, 2011). At first, this seemed like a good way of gathering data. In Article 3, how this first-person perspective came into play (or not) is discussed based on a detailed examination of the data. The consideration is whether this first-person perspective was a fruitful way of framing the data. When looking at the world through the eyes of another—in this case, a subject–camera hybrid—choices that are made may be difficult for the researcher to account for. The challenge here was that the

so-called first-person perspective suggests access to a subjects' perspective, but the analysis still relies on (re)constructive approaches that share many qualities with other, more established approaches to data analysis.

The main purpose of this project is to find answers to "how" rather than "why" questions. Therefore, it seems clear that the best research design would be similar to what can be called a descriptive case study. The decision to examine educational phenomena in a naturalistic setting, in the classroom, and on an excursion was made via the process described above. Although the results of the two standalone cases cannot be generalized, they stand as examples, and the power of the example should not be underestimated (Flyvbjerg, 2006). This study investigates how two groups and two units used digital tools as a learning resource in two different contexts in social studies education to produce concrete and context-dependent knowledge to see what could be learned about these two cases.

The independent fieldwork projects were designed differently, one conducted as a design-based study and the other as a case study. Table 2 provides an overview of the different types of data material generated in the two fieldwork projects.

Excursion	Classroom
26 students. 10 girls and 16 boys	27 students, 15 girls and 12 boys.
Notes and information from contact with the teacher	Notes and information from contact with the teacher
Observations from visiting the class one day before the excursion where I talked about the project and observed the class	Observations from teachers' meetings
Five hours of observation and video material from five groups from an excursion in an outdoor museum	Notes from talks with the students
Thirteen interviews in pairs gathered over two days after the excursion carried out at the school in a separate classroom	Observation notes from following the class for 15 hours for one week
Fieldnotes	Fieldnotes
Observations	Full class conversations on video

	Video from group work with action cameras
	Observation notes from following the group in one project period over one week
	Conversations with students and teachers

Table 2: Overview of Data Generated in Fieldwork Projects

While the table provides information on the participants' gender, gender, ethnicity, class, and other factors did not become a relevant part of the analysis. This is because the data did not provide indicators that it would be relevant in answering my research questions.

3.2.1 Video

The world told is different from the world shown (Kress, 2003). This and the use of practice theory and Polanyi's understanding of tacit knowledge as a theoretical basis for this study are arguments for choosing a video to generate empirical data. Digital literacies are often studied in a context in which mediated interaction and communication constitute the research focus (Blikstad-Balas & Sørvik, 2015). To capture such interactions, video is widely used in educational research. The reason is that video affords a way of generating, harvesting, and analyzing data, where students are thinking and acting through spoken interaction, gestures, and the use of diverse artifacts.

As documented in the four articles, the video provided good insight into the students' interactions, and to the interviews, and conversations as background information. By using data material generated from video recordings as the basis for the analysis, the data was available for viewing several times. A lot of information was contained in what was unspoken—that is, the students' actions.

Using video to generate data in research allows the recording of activities and actions where they are happening. Video can clarify and give access to interactions that are more difficult to grasp using other methods. According to Jewitt (2012, p. 4), video data is a real-time sequential medium. It can provide a fine-grained multimodal record, and the generated data are durable, malleable, and shareable. Sharing data with other researchers secures more transparency in the research process. Video material preserves actions and interactions for

repeated scrutiny. The video recordings also make talk and interaction between students and the digital tools available for study.

Despite its advantages, video still presents only one perspective on reality, and much is left out. Some questions worth further examination when using video to generate data are where the camera should be placed and what the focus should be. In addition, video cameras are not neutral objects, and it is worth considering how the camera might affect the participants (Heath et al., 2010).

The video data provided much more information about the students' knowledge of learning and interaction than could be articulated. Although there are good reasons for filming, it also has its limitations. It is important to note that when generating data, the data is generated while the researcher and camera present have a limited area of awareness, and this area covers only a small part of what is happening. Before starting the camera, many choices about where and what to focus on have to be made. This is unavoidable and necessary, and it might also give relevant insight into the research process.

One choice that must be made is what type of camera to use. Two of the main types of video tools used in research are a fixed camera placed on a tripod or a handheld camera in a setting where the researcher needs to move with the camera to record actions and activities of interest.

Using a fixed camera angle in a classroom setting is set up according to the focus of interest and can give an overview of the classroom and insight into the class as a whole. This approach was chosen in the second phase of the research to gather background information about the class in focus. The disadvantage of using a fixed camera is the lack of flexibility (Blikstad-Balas & Sørvik, 2015). For this reason, and because the students were highly mobile, it was pointless to use a fixed setup for fieldwork at the museum in the first phase, as it was a large area where different groups were moving around simultaneously. A handheld camera could have been used for the group study, but it was not a good alternative for generating data from several groups with only one researcher. This would have made the recordings somewhat random or up to the researcher's preference, which is one of the main criticisms against using this type of camera in research (Laurier & Philo, 2006).

3.2.2 Action camera

The action camera has been said to offer insight into the world as it appears to the research subject (Lahlou, 2011). It also gives the participants some control over what is being

presented (Kinsley et al., 2016; Blikstad-Balas & Sørvik, 2015). The usage of action cameras in research is discussed in-depth in Article 3 (Lofthus & Frers 2020). Kinsley et al. (2016) used action cameras to understand how students orient themselves in a library by accessing the subjects' viewing angles in this orientation process. Kindt used action cameras in the classroom to understand how the teacher appeared to the student and closely examined collaborative work (Kindt, 2011). Blikstad-Balas and Sørvik (2015) chose to equip a group of students with head-mounted cameras to study literacy in context, as it "takes us closer to the actual reading and writing and records the processes of engaging in different texts" (Blikstad-Balas & Sørvik, 2015, p. 142). This is a relevant aspect for me to choose a similar approach to the actions and interactions, as it records the interactions of a group with digital tools as cultural artifacts that together form the digital literacy practice.

Letting one subject carry or wear the recording equipment is one way to access the details and embodied aspects of the activity (Lahlou 2011). Lahlou (2011) also referred to the manipulation zone (p. 615), which is the area right in front of the subjects that is difficult for others to get access to but is where most of what the subject is doing is happening (Blikstad-Balas & Sørvik, 2015). Using this as a rationale for choosing this type of camera could arguably mean that I chose one student in each group as the main subject of study. However, the generated data also shows the interaction in the group close to the student wearing the camera and thus gives access to these interactions. As mentioned, a video camera is not a neutral tool that does not affect data generation. There are also limitations to the action camera. I agree with Blikstad-Balas and Sørvik (2015), who argued that the action camera is not more intrusive than other cameras, but that it does have ways of affecting the data, as discussed in Article 3, where we look at the different ways the camera affects the interactions (Lofthus & Frers, 2020).

Since this study is situated in a specific field, digital literacies studies, I also want to place myself extensively on how video-based approaches have been used in this field. This also serves to make my contribution to the field more visible.

As mentioned, any type of camera or researchers' presence will affect the process of generating data and the data that will be available. This has been discussed in the first article of this study. One of the main challenges addressed when using video in research is the camera's effect on the subjects in the study, making the empirical data less "untouched" than one perhaps strives for.

Blikstad-Balas (2017) and Heath et al. (2010) agreed that the camera effect or reactivity is there and that it affects the situations being studied. Many researchers have experienced that the effect of the camera also seems to be less evident after the participants become used to the cameras (Aarsand and Forsberg, 2010).

Again, the effect of the camera is, to some extent, present, and rather than trying to remove this effect, it can be useful to see it as a part of the context in focus (Heath et al., 2010). As Goldman (2006) stated, «It seems obvious but necessary to state that we should not decide to not use video because our actions might be affected by the presence of the camera, but rather to accept the performative actions we demonstrate whenever we are being observed" (p. 5). Blikstad-Balas (2017) also stated that video recordings provide a chance to investigate the effect of the camera on the subjects. This was done by Aarsand & Forsberg (2010), and the effect of the action camera and what it clarifies has been investigated in the 3rd article in this study (Lofthus & Frers, 2020). In the article, we saw, contrary to the studies showing that the camera effect became less evident, that the students took the camera they were wearing or that someone in the group was wearing as a part of their interaction. It could be that, in our case, the camera was not worn long enough to lose its effect on the subjects, but as discussed in the article, the camera never became "one" with the subject, thus providing a true first-person perspective. Therefore, it is always a hybrid in which the researcher is, to some extent, present.

This does not make the camera affect something I wanted to remove from the equation; rather, it is something I closely examined and allowed to be an important part of the context that forms the social practice in focus.

When using action cameras, easily identified faces and places can be recorded, providing a grounding for ethical risks (Mok et al., 2015). In the two different contexts of this study, these ethical risks differ. In the classroom, all students were given informed consent to participate in the study. In the excursion, the researcher and the teacher did not control who was in the camera's front similarly. The students were also given informed consent in this context, but as the fieldwork took place outside the classroom, and the students were walking around a large area wearing the camera, people, or objects they might film were out of the researcher's control to some extent. This should have been given more careful thought in advance, considering that other people in the museum were not given informed consent but might have been filmed. With this in mind, it may have been better to be in a limited museum area and to inform other visitors about this. Doing so might have changed the context and

affected the results. Although students were told not to film people who were not part of the research project, this was not maintained satisfyingly. As Mok et al. (2015) stated, wearable cameras challenge traditional ethical guidelines regarding informed consent, anonymity and confidentiality, data protection, and privacy. Existing guidelines state that when taking pictures or filming people in public spaces, it is not necessary to obtain informed consent unless they can be recognized when the data material is published (Kelly et al., 2013). This was considered in the presentation of the data material.

Kelly et al. (2013) discussed problems concerning the use of wearable cameras that take photos in the context of health studies. Many of their points are also relevant when studying students wearing action cameras, such as inappropriate or unwanted images. The person wearing the camera may forget that it is on, and thus, the camera can film actions that were not meant for the researcher to see; this is seen in Article 3, where one student looked another way when he was typing his password. This can be avoided by giving the participants a chance to watch the recordings. This was not done in this study because the generated data did not appear to be of such a nature that could make such a measure necessary.

3.3 Semi-structured Interviews

In this section, I briefly discuss general aspects of interviews as a research practice before engaging with how the interview process became relevant for the participants in this study and me. In their book, *Det kvalitative forskningsintervjuet*, Kvale et al. (2015) considered qualitative research interviews as a craft, knowledge reproducing activity, and social practice.

Interviews can be a way of accessing the participant's thoughts on a specific matter, but to a high degree, they are also events in a particular physical and social context. In this study, the analytical focus from interviews and conversations included both the "what" and the "how" and the challenges related to the interview report's validity and the relevance of the interview considerations. This also means that how the interviews were conducted and how they played out shaped the analyses. In many cases, such as in this study, interviews are used to extend what has been studied through other sources (Hitchings & Latham, 2019). This means that I have used the interviews to extend the findings in the video material.

The semi-structured interviews with students in pairs were conducted after the excursion to the outdoor museum to obtain another kind of information from the students that was not available in the video material. The plan was initially to ask the students about the

day at the museum and how they used their tablets and smartphones. The interviews were conducted a week after the excursion. Because it seemed difficult to ask about what happened at the museum when preparing for the interviews because the excursion did not turn out according to plan, the interview guide changed to comprise questions about the usage of tablets and smartphones at school and at home more generally. Because the interviews were semi-structured (Brinkmann et al. 2015), involving neither an open conversation nor a closed scheme of questions, a discussion was conducted with an interview guide circled around specific themes; the questions and answers were somewhat different in each interview.

The teacher put the pairs together according to where they were sitting in the classroom. The interviews worked well as they engaged all the students, creating a safe and lively environment in which they could talk. Although they may not have been real "focus group" interviews, some positive consequences of this type of interview were seen. The data generated in these interviews was transcribed and used as background information. The conversations with the students were useful in coming to know the students and the people in the video material better. It also provided insight into and information about how they use their digital tools. This insight was used in Article 4 to understand when and how students use their digital tools. In this article, the interviews were used to support the analyzes of the data material; therefore, they work as more than just background data, but again, analyzed on the bases of the finds from the video material.

3.4 Classroom Observations

Observations from the classroom were carried out in both fieldwork contexts. In the case of the outdoor excursion, classroom observation was conducted before and after the day at the museum. This was to inform the teachers and students about the research project's aim and how the research process would play out. It was also useful to meet with the group and understand the interaction within the group of students as background information. Unfortunately, a thorough observation guide was not generated before the classroom observation, and accordingly, the focus was not tight enough, as it was impossible to observe everything that was happening.

In the classroom, where the students worked on project-based learning, there was observation before, during, and after the project in focus. Video from full-class instructions was also obtained. This data material was used as background data (Table 4), and it was not analyzed as thoroughly as the video material from the group work. The thought was that this

data material could be used to obtain a better background for understanding the context of the study. When I was studying the data material from the classroom, I understood the interactions in the classroom and information about the assignment and class discussion before and after the group work. Classroom observations have been used to study teaching and learning (O'Leary, 2014) and to link instruction and student achievement (Klette et al., 2017). This type of video observation can access both the students' and teachers' views (Fisher & Neumann, 2012). As discussed in Article 3 about the first-person perspective, it is timely to criticize the term *view* here, as I do not argue that I had access to the teachers and/or the students' perspectives, but rather, part of what they gave the rest of the group access to. This information is not their perspectives, but still productive and informative data. The classroom observation has been used as background information. They were all transcribed but not analyzed systematically.

In this research project, the students were in focus, but the background information from the classroom was useful because this is what happens in the classroom and is part of the context in focus. In retrospect, this part of the context could have been further analyzed because the data material was available, and, as Klette and Blikstad-Balas (2017) argued, analyses and coding of video from the classroom are useful. As Klette and Blikstad-Balas stated, the use of coding and observation manuals in classroom studies is helpful when measuring aspects of instruction and explains different teaching approaches. They argued that this could contribute to a common vocabulary, decomposing teaching and learning into smaller parts and facilitating comparative analyses across contexts and classrooms, which would have been especially useful in this study (Klette & Blikstad-Balas, 2017). This is not to say that comparative analysis should have been a comparison between the two different research projects in this case, but it could have been employed to gain greater insight into what aspects were context specific. Because the focus in this project was on the students and how they interacted with one another and digital tools, the video material from full classwork was not analyzed in this kind of detail.

The background information generated from video in the classroom was not used explicitly in the analysis, but it represented a way of gaining further insight into the context and viewing the agents in other settings. Although the aim was not to study teaching and learning processes when using this type of data as background information, it gave me insight into how the teacher's instructions were adapted in the group work, the interactions among the students in the classroom, and how the digital tools were used. Together the research methods

give a broader understanding of the whole context and situations. The background information from field notes and teachers' meetings gives insight into the field and context of the study, whereas the video from interactions gives a closely focused insight into the interactions in small groups. The interviews and conversations following the videotaped group work were a way to verify what I had seen in the data material.

3.5 Reflections on Research Quality

In the first article in this study, I used Tracy's (2010) article on criteria for quality in qualitative research as a starting point and focused on sincerity. This is one of the eight criteria Tracy draws out. In addition, she underlined the importance of a worthy topic, rich rigor, credibility, resonance, significant contribution, ethics, and meaningful coherence (Tracy 2010, p. 840). Tracy explicitly criticized the use of classical terms, such as reliability, generalizability, and validity, with their origin in quantitative and positivist research traditions. In qualitative research:

However, applying traditional criteria like generalizability, objectivity, and reliability to qualitative research is illegitimate; akin to "Catholic questions directed to a Methodist audience" (Guba & Lincoln, 2005, p. 202).

Guba and Lincoln (1984, pp. 234–43) used the terms credibility, transferability, dependability, and confirmability (objectivity) in discussing quality in qualitative research to address questions relevant to qualitative research more specifically while still providing bridges to the established terms. Nevertheless, since the traditional criteria are still considered relevant when assessing the quality of qualitative research, I will discuss the reliability, generalization, and validity in dialog with other terms used to discuss qualitative research.

3.5.1 Reliability

Joppe (2000) defined reliability as the extent to which results are consistent over time, and an accurate representation of the total population under study is referred to as reliability. If the results of a study can be reproduced under a similar methodology, then the research instrument is considered reliable. (p. 1)

Reliability can and is also being used as a criterion for assessing qualitative research. Whether qualitative research is reliable is concerned with the consistency of the findings and whether they are replicable. The different steps of the research process and the following analysis and results should be feasible for another researcher. That could mean that a set of

meanings attributed in a coding process by several interpreters is congruent. The details and explanations of what has been conducted should be so transparent that it could, in theory, be replicated by another researcher, and the interpretation should be so that another researcher can come to the same conclusions. This understanding of reliability originates from a positivistic view on knowledge building but can be a criterion for judging the trustworthiness of knowledge. One of my main reasons for choosing a video to generate data concerning reliability issues is to watch the material repeatedly and give myself time to interpret, check, and reinterpret. Video can be more reliable than field notes and observations since the videos can be watched multiple times and can also be inspected and interpreted by other researchers.

When using video, selections as to what has been recorded have been made by the researcher. This is important to clarify what was available for analysis and how it was chosen. My focus was on group work, and to get a good insight into the groups and not the full class, the students were equipped with cameras. This gave high-quality recordings of the groups and their practices. When in the classroom, I also had cameras set up in the back and front of the classroom to go back to see what information was given before they went into the groups and to have a general overview.

The data material was transcribed, and part of the data material was presented, which also gave colleagues insight into the research data and analysis through the presentation of material research articles and presentations, giving the audience access to the background for my interpretations. In addition, this provides a way to see if the same results were validly seen from another researcher's perspective.

I still find it important to underline that, from this study, I gained a strong understanding that what I have studied is these specific groups at a specific time in a specific context. That is not to say that it is impossible to "replicate" or generate data that will allow similar findings. Conversely, through thick descriptions and insight into the research, I aim to provide enough information and a good account to make the limitations and possibilities for such a check for reliability and accessibility, but the data is still rooted in the research of a novice that made some good and well-founded decisions, and some not so good decisions, and that the context is very specific. Having taken all these precautions, I will examine generalization as the next classical criterion in the next section.

3.5.2 Generalizability

Generalizability in research indicates whether the research findings can be generalized and transferred to other populations. Small-scale research projects, as the one carried out here, are not in themselves generalizable studies. Giddens posited that they could easily become so if conducted in sufficient numbers that judgments of their typicality can justifiably be made (Giddens, 1984, 328). According to Kvale and Brinkman (2009), a somewhat different approach that they call analytical generalization "involves a reasoned judgment about the extent to which the findings of one study can be used as a guide to what might occur in another situation. It is based on an analysis of the similarities and differences of the two situations" (p. 262).

Generalizability is closely related to representativeness. Tracy used the term resonance to cover similar territory. She saw naturalistic generalization and transferability as points that make the research resonate with the reader to achieve resonance across various populations and contexts (Tracy, 2010, p. 844–845).

Generalization in a classic sense is not possible in such a small and context-specific study as this. But as Flybjerg (2006) discussed, the force of example, which is similar to Tracy's understanding of resonance, might not be generalizable, but it can still give important insights. As what has been studied here are small "samples" and therefore cannot be generalized, the force of an example can still be strong, and studying these types of interactions is rather an attempt to add to the existing body of research on the matter and in that way possibly help seeing patterns. As mentioned earlier, the samples are from a rather typical schools in middle sized towns, and two whole classes were studied, but the context and the people were highly specific for this study, and it is therefore not possible to use this data to generalize the findings. According to Kvale and Brinkmann, analytical generalization can, however, be gained from contextual descriptions of the research process. I will not argue for the generalizability of these studies, but I rather seek to make the findings as transparent as possible so that other researchers can transfer this knowledge to other situations. Such research can, in turn, be a part of a body of research that can be generalized (Yin 2006). Analytical generalization implies that the findings and conclusions are based on a combination of theoretical assumptions that guide the study, findings from the empirical analysis, and findings from related studies. The scope of this study is rather broad, and it may be too broad to make generalizations regardless of the study size and method, but paired up

with relevant research on the different aspects of digital literacy, both how the context and social interaction affect the students digital literacies in social practices where they choose relevant digital tools and how they argue for different digital sources can, in their right and together with other research, make limited generalization of the matters feasible.

3.5.3 Validity

The question of validity is concerned with whether the chosen methods are appropriate for investigating what they set out to investigate and whether the findings are interpreted based on the available data (Kvale et al., 2015). Joppe (2000) explained what validity is in quantitative research: validity determines whether the research truly measures what it was intended to measure or how truthful the research results are. In other words, does the research instrument allow you to hit "the bull's eye" of your research object (p. 1)? The question is both which type of data is to be gathered and how it is to be gathered.

Video and observation seemed to be the best choice of method, as I wanted to observe the practice that is happening in the students' group work. In this way, I did not make as many presumptions, and it made the analysis explorative. But, of course, video is not without presumptions; the choices made when it comes to camera angles, and in this case, the choice of focusing on groups, are a part of what sharpens the overall research focus. Challenges using video in research have been discussed in this extended abstract Chapter 3, and in Articles 1 and 3 of this study.

A constructivist view of knowledge as constructed in specific contexts and situations implies that the research and findings may change depending on the elements that make out the context and circumstances. Crotty (1998) defined constructivism from a social science perspective as "the view that all knowledge, and therefore all meaningful reality as such, is contingent upon human practices, being constructed in and out of interaction between human beings and their world and developed and transmitted within an essentially social context" (p. 42). In this lies that the reality we are observing and creating is changing, and that there are multiple constructions of reality (Hipps, 1993). Constructivism values multiple "realities" or constructions that people have in their minds and develop socially. For this reason, the validation of research cannot be absolute, but research validity can be enhanced, for example, by using different methods of gathering data, thus supplying different and supplementary perspectives on the same phenomenon. This is what Tracy called crystallization. She underlined that generating data from different sources or perspectives does not validate one

single truth but rather helps open a more complex understanding of the issue (Tracy, 2010, p. 844).

Thus, the combination of different approaches, including interviews and conversations with students and teachers and video data, can be interpreted as contributing positively to the validity of the data by providing different perspectives on the phenomenon.

Video and the transcripts of this data can also arguably validate the interactions occurring in the schools in focus, but they might also clarify the reality and context in which the interactions are affected by the video recording. This has already been discussed in this extended abstract and is further discussed in Article 3, where the effect of the camera as a hybrid between subjects is covered. The video makes the data available for others to study and this might reduce the risk of individual bias in the analysis (Heath et al., 2010).

When the data material in the articles was presented, I explained only the parts I found relevant and representative data to illuminate the overall research questions. In this extended abstract, I explained the entire research and data generation process and how I arrived at the claims I made. The aim of this was to increase transparency in my research and strengthen its quality.

3.6 Children as Informants

This study was reported to the Norwegian Center for Research Data (NSD) to meet privacy protection and ethical research standards. Teachers, parents, and students signed consent forms. Parents needed to sign because the students were under the age of 16, which means they needed parents' consent, but I also asked the students for their consent. The focus of this study was not on generating sensitive information, but because the data collection was participatory in that the students were the one's filming, and the participants were subjects, the nature of the information gathered could not be controlled by the researcher. What is sensitive information was also difficult to say beforehand. My understanding of what kinds of sensitive information was generated changed as the study continued. Moreover, although the subjects agreed to be a part of the research project and were given all the information available on the project at the time, handed out, and returned with a signed consent form, the participants might not have fully comprehended what they agreed to participate in. Such a lack of understanding may have occurred not only because of their youth but also because of their lack of awareness of how research works. (Moore et al., 2018). These concerns became

more salient when analyzing, watching the videos repeatedly, and having other researchers examine the material.

Did the students understand that this would happen when they agreed to be a part of the project? The project did not contain particularly sensitive information, but some actions and interactions occurred between students, which may be considered embarrassing for a stranger to access, such as when one student tried to attract the others' attention without any luck, or when another tried to make a joke, and no one laughed. In their informed consent, the students were promised anonymity, and for this reason, it was important to anonymize the pictures where the students' faces were included. Anonymizing faces in the graphic transcripts was done by deliberately distorting the facial features and proportions to counteract algorithmic deanonymization.

The students and their parents received information about the research project, what type of research data would be generated, and what the data would be used for. I use the term *generated* and not *gathered* data, as I understand that qualitative data is generated in a specific context where the researcher is present and not coming as an outsider to gather. This again raises the question of how informed the informed consent could be. When studying the data, I considered how I myself would understand what being a part of a research project is, where data were generated through video. Such a scenario involves the researcher repeatedly examining the participants' actions. I feel responsible for the participants and their participation, and now, to a greater extent than before, I question how much they understood what they agreed to be part of. I would argue that I did not violate informants' integrity or research ethics, but I acknowledge that a more cooperative and participatory approach would have enabled the students to have a greater say in this and, thus, a better understanding of what research is and does.

3.7 Researcher's Role

In the process of this study, my understanding and view as a researcher changed greatly, and the process was not as straightforward as expected. This was thoroughly discussed in the first book chapter (Article 1). The researcher's role was also discussed in Article 3, where the focus was on the action camera and the actors that this camera represents.

The meta-analysis of the researcher's role in these texts has made me more aware of the many choices made in the process and heightened my understanding of the challenges that occurred on both personal and professional levels. Furthermore, working on these articles has

made me more confident in my decisions, and looking at them with critical hindsight, the choices were not only the right ones or necessarily the best ones, but they were choices that can be understood and defended retrospectively. In sum, I argue that this focus on methodology and the role of the researcher has made the research more reliable, transparent, and valid (Tracy, 2010).

3.8 Organizing and Analyzing the Data

This study is qualitative, and my approach is inductive as I did not have a hypothesis or theory to verify when going into the field; instead, the aim was to generate and analyze empirical data. Therefore, the research design was not pre-determined but emerged as the empirical data were generated and explored (Silverman, 2013). This meant that there was no ready set of criteria or categories on which to build the analysis; instead, relevant findings and terms were based on the types of empirical data obtained.

The main portion of the data came from action cameras worn by students when doing group work, showing the dialogue and interactions taking place. Data gathered from the video made it possible to analyze the interactions and conversations by repeatedly looking closely at them. Additional data were ethnographical field notes from observing and interviewing the participants, conversations with the teachers and the students, observations from teachers' meetings, and insights and knowledge about the assignments the students were given. This entire corpus of data comprised a substantial part of the background that was the basis for analysis (Figure 8). Thus, the background information became part of a hermeneutic circle that was hard to define or record explicitly (Grondin, 2015). The field notes were transcribed but not systematically analyzed. The interviews were also transcribed and used as additional data and understood based on the findings from the video material generated with an action camera. However, developing categories in a more narrowly understood coding strategy based on interaction data was challenging because although I engaged in inductive research, theories, and concepts became more clearly formulated when working through the material, adding deductive steps, similar to the idea outlined by Tjora (2017).

It is difficult to draw a clear line between data generation, data presentation, and data analysis when it comes to analyzing the data. Even so, the different processes are presented separately in this section to give a more lucid and transparent presentation.

3.8.1 Transcribing

When working with the data, NVivo software was tried out to categorize and systematize the material at some points. This was done with the data material from interviews and video material from interaction in groups. From looking through the data and being in the classroom collecting the data, I thought about what I had seen and what to look for. Using NVivo, I tried to create categories, first with a starting point for the research questions and the questions asked in the interviews. However, this theoretically informed way of analyzing the data material turned out to be inadequate to make sense of the data. Making categories and forcing the data into them did not emerge as the best way to understand and work with the data material. When looking through the parts of the material of particular interest, transcribing them was useful because it allowed me to closely examine the data when working on the transcriptions. This provided a more in-depth view of what was happening in the conversations. In this process, the audio was extracted from the video files, and the audio files were listened to separately before going back to the combined video and audio. After looking through the videos thoroughly and repeatedly, the interactions that were of interest were those that seemed rich and diverse and representative of the greater corpus of data. These parts were then transcribed in more detail. NVivo was not fully used but working with NVivo was still a part of the analysis process. The transcriptions were used as part of the final analysis.

In the videos of the groups from both studies, it became evident that the group work fostered interdependence among the different students' actions. This did not pertain to the research question, but it did affect the analysis because it affected my understanding of conversation as a social practice. The dialog was not necessarily symmetrical and mutual, and power and domination in the groups were exhibited by spoken communicative acts and embodied gestures. This strongly influenced where the interaction ultimately led. Whether there was competition or cooperation within the group affected the outcome. Thus, even if there was a lack of symmetry within the group and this interdependence was not planned to be the subject of analysis, it necessarily became a part of it. If the conversation seemed polyvocal, that too provided great insights into the ambiguity within the group (Linell, 2001).

3.8.2 The Graphic Transcript

In three of the four articles in this study, the data was presented using what Laurier (2014) called a *graphic transcript*, which is "proposed as an alternative form of transcription that hybridizes the qualities and the evidentiary criteria of the transcript with the

representational conventions of the comic strip" (p. 235) in the field of human geography. The graphic transcript brings in many of the qualities of comic strips and serves as a record of an earlier event (Laurier, 2014). This type of transcript can visualize talk, time-series images, and visible features of interaction. This could be an insightful way to transcribe data in any field where humans, interaction, and space are part of the context. Because video recordings, as a way of generating data, allow for studying how words and actions are intertwined (Spinney, 2011), the graphic transcript gives a better depiction of this than written words alone. Laurier (2014) specified that graphic transcripts should not be used while analyzing video material; they should only be employed when researchers wish to present their analysis. However, the creation of comics in research has also been defined as a process of analysis (Kuttner et al., 2020); as Jones and Woglom (2013) commented, "Cartooning is a means of refining and discovering what you want to express through the process of drafting and editing a text" (p. 184).

Figure 6. Graphic transcript

Comic strips have been used as communication tools in many fields (McCloud, 1993). There is also a field of practice called comic-based research, where the creation of comics is part of the research process. Creating comics in research affords multimodality, involving both images and text, giving access to sounds, gestures, and spatial relationships. As comics are presented sequentially, they also make the representation of processes possible

(Kuttner et al., 2020). When depicting the data material as comic strips, they are illustrated as time series; the pictures and actions can be given duration and effects via different shapes and sizes to show how long the intervals are and how they are related. These types of images put in relation to one another can also show how people move and what appears. In this case, where action cameras are used, it can show how the student wearing the camera is changing the focus. In a way, they make the movement visible in the data and the changing of the environment, which is all part of what makes up the specific context.

Comic strips provide rich possibilities for representing speech, gesture, mood, emotion, motion, objects, sounds, and character (Laurier, 2014; McCloud, 1993). For example, using different speech bubbles shows the order in the conversation and how things are being said; this is illustrated in Figure 7, representing an example from Article 3.

Figure 7. Graphic transcript with speech and thought bubbles.

Many elements of comics can be shown in more traditional transcripts, for example, by using Jefferson's (2004) transcription, as done in conversation analysis; this symbolizes talk as an action via overlapping talk, intervals, pauses, etc. Goodwin and Goodwin (2012) inserted images into Jefferson's transcripts to meet the need to show visible features of interactions. In Article 2 of this study, Jefferson transcription is used as a starting point but

with modifications. Because the conversation is only a part of the study, this type of transcript does not give the viewer insight into all other aspects of the interaction.

Producing the type of graphic transcript used here is a result of the researcher's analysis and selection. In his article, Laurier (2014) discussed how the graphic transcript could make it easier to see what the researchers wanted to show and tell by using both text and pictures. This has been an important way to validate the empirical data material and form the graphic transcript as an important tool to deeply understand the actions in focus. In addition to illustrating time, action, and movement, this type of representation meets the criteria of transparency that Tracy (2010) discussed. Because graphic transcripts include photographs or pictures, they may help the reader understand the setting, as shown in Figures 5 and 6. Because interaction, group organization, and movement in space and time were important in the analysis, the graphic transcript turned out to be a useful way of presenting all the actions in addition to the spoken word. This way of presenting data is helpful when analyzing data material because the process continues when the graphic transcripts are created. Only the data presented in the articles were transcribed this way because it is time-consuming, but I do find this approach to be a way not only to give readers better insight into the data material but also to gain greater insight when making sense of the data in the context of an article.

The graphic transcript represents a rich way of presenting data because the spoken words are not the only focus on the conversations. Instead, the focus rests on interactions leading up to the spoken words and the interaction that follows, and such interactions are not centered solely on talk or words. This is shown in Figure 6, with an example from Article 4.

3.9 Data Represented in the Articles

The empirical data generated throughout the project and presented in the four articles are shown in Table 3. The overview illustrates the transition between the generated data and how they are presented.

Articles:	Main data:	Background data:	Presented as:
Bruk av teori for økt refleksivitet i praksis.	Video observations; school A and school B; B. Action camera	Observations; Researcher's notes	Comic depictions of students' conversations;

			image and text
Students choosing digital sources: Studying students information literacy in group work with tablets.	Video observations of six groups	Video observations in the classroom; Observations; Conversations with students and teachers; Background information from teacher; Student blogs	Extracts of the students' conversations from video material
First-person perspective or hybrid in motion?	Video observations	Observations	Comic depictions of student conversations; image and text
Digital literacies in social studies.	Video observations;	Observations; conversations with teachers and students. Semi-structural interviews	Comic depictions of student conversations; image and text; Extracts from semi-structured interviews in pairs

Table 5: Overview of the Data Material

The data was presented differently in the different articles—as written excerpts from interviews and conversations in Article 2 and comic presentations in Articles 1, 3, and 4.

3.10 Summary

This chapter focused on selecting the context and participants in the research project, the different methods used to generate data, how the data material was analyzed, and how the

material was presented. In retrospect, I may have made many decisions differently if I had known how they would play out. The methodological considerations and conflicts that arose from the decisions that were made are why method and methodology became a major part of this thesis.

CHAPTER 4: SUMMARY OF ARTICLES

In this chapter, the central findings of this study are discussed. First, each of the four articles is summarized with its empirical findings, following the research questions in the article, and the theoretical perspectives are discussed. Three of the articles have gone through anonymous peer reviews and have been published, the last is still in process. In Section 4.1, the findings are discussed concerning the overall research question and the main theoretical perspectives. This includes a thorough appraisal of how the articles relate to one another. In Section 4.3, theoretical, and methodological contributions are discussed, along with this study's implications for further research. Finally, the main conclusion is drawn.

4.1 Summary of Articles

4.1.1 Article 1: "Bruk av teori for økt refleksivitet i praksis. Praksisarkitektur som rammeverk for å belyse forskerens plass i datagenereringen"

Lofthus, L. (2017). In L. Frers, K. Hognestad, & M. Boe (Eds.), *Metode mellom forskning og læring: Refleksjon i praksis* (Chapter 7, pp. 35–55). Oslo, Norway: Cappelen Damm Akademisk.

In this article, the focus is on how the researcher's presence in the field affects the available data. Data are never ready, waiting to be collected. Rather, they are created in interactions between the researcher and research objects. The discussion is based on two criteria—reflexivity and sincerity. These should be met to strengthen qualitative research. In this lies the researcher's ability to see herself as the researcher-subject who she is and to be open and self-reflexive about this. Examining two research approaches where different methods have been used, the concept of practice architecture is employed as a theoretical framework to examine the researcher's role in data generation. The argument is that a well-suited framework systematizes the criteria mentioned above, helping the researcher cast an outside perspective on her engagement in the field.

4.1.2 Article 2: "Students Choosing Digital Sources: Studying Students' Information Literacy in Group Work with Tablets"

Lofthus, L., & Silseth, K. (2019). *E-Learning and Digital Media*, *16*(4) 284–300. doi:10.1177/2042753019835882

The focus of this article is on digital literacy and students' use of digital sources. We examined how students choose digital video sources when doing group work with tablets in a

social studies project. The analysis centered on how students collaboratively negotiated and reasoned around their choice of video sources for an assignment about environmental issues. The data corpus comprised videos of group work. A sociocultural perspective on learning was employed for analyzing student participation. We explored how the tablets influenced the group interaction and how the group members negotiated the choice of the video sources found online. The findings show that students did not discuss digital sources only regarding the formal criteria for digital competences; rather, they did so with their perception of how the video sources are presented. It is important to explain this aspect of students' use of tablets in school because being aware of this facet could materialize in greater digital skills, which might expand digital literacy.

4.1.3 Article 3: "Action Camera: First-Person Perspective or Hybrid in Motion?"

Lofthus, L., & Frers, L. *Visual Studies.*

In this article, we discuss the usage of action cameras in research. We refine the understanding of the camera as providing a first-person perspective, giving access to the research participants' subjectivity. The data on which we base our analysis were produced in two different research settings in which action cameras were distributed to groups of students, one setting being an outdoor museum and the other a classroom. In the analysis, we followed how the action camera creates hybrids involving both the camera and present and absent others. The present others are the other students in the group, whereas the absent other is the researcher, who is not physically there but remains present through the camera. The process becomes evident in different ways, and we argue that the camera is treated as a student–camera hybrid, camera-as-researcher hybrid, and student–camera–researcher hybrid.

4.1.4 Article 4: "Digital Literacies in Social Studies"

Lofthus, L. (Work in progress)

The focus of in this article on how the students obtain and used different digital tools for different tasks and activities. The article builds on empirical material from middle school students on an excursion at an outdoor museum in a social studies class. They carried networked individual tablet computers belonging to the school. They also brought their smartphones. Other tools available were the on-site historical buildings and information posters erected at the museum site. In this article, digital literacy was defined as a social practice, and in this case, the practice in which they used their digital tools was an excursion

for the school subject of social studies. Episodes from the excursion to a museum as a specific learning context were analyzed with practice theory as an entrance. My analysis of the data shows how different tools were used for different objectives in distinct contexts. Furthermore, it clarified how digital literacy includes knowing when and which digital tools to use in this social setting and when not to use them, even in a technology-rich environment. The aim of this article is to illuminate aspects of digital literacy that come into play in each context.

4.1.5 Overview of How the Articles Relate to Each Other

This section provides an overview of the articles, how they relate to one another, and how they connect to make a whole.
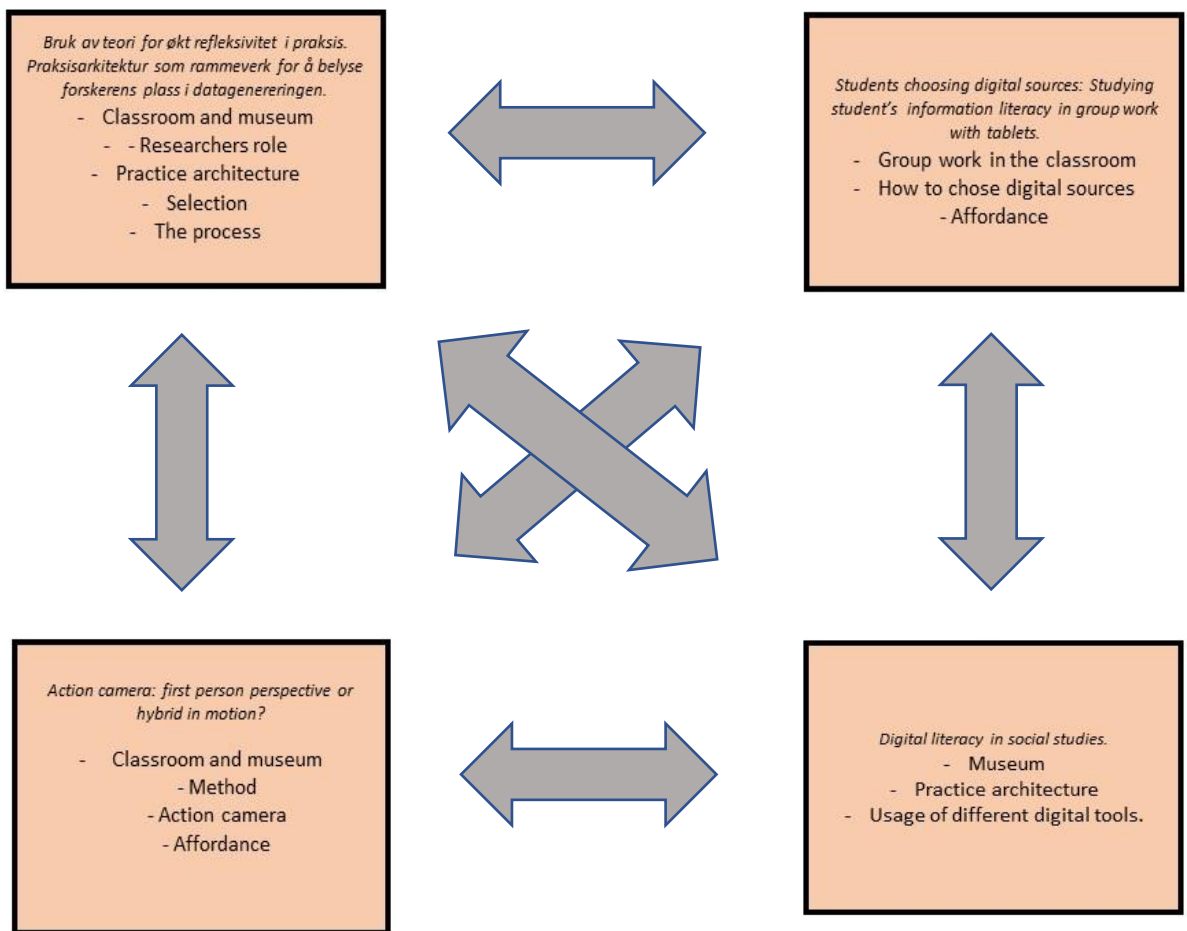
Figure 8. Overview of how the articles relate to each other. Starting in the upper right-hand corner is Article 1 and going clockwise, followed by Articles 2, 3, and 4.

In Figure 8, the articles were summarized using keywords. The arrows show that all the articles are related; the keywords shown here appear in the articles. Not all keywords appeared in all the articles, but they were intertwined in the articles, even if the articles did not actively relate to each other. All the articles were written based on empirical data from either

one or both contexts. As discussed above, how I used and understood the data material generated in the different contexts evolved over time. The two articles where the method is the center of the focus were written based on the analyses of data material from both contexts. Because I understand digital literacies to be highly dependent on the context and method to be a significant part of the context, methodological considerations are prominent in interpreting the data material and, therefore, of great importance in all four articles. To analyze the two different contexts, both focusing on interaction with the employed research methods and interaction with the digital tools as a part of digital literacy, I used interaction analysis, focusing on the interaction between students in technology-rich environments. Throughout the process of working with this study, the lens of practice theory and practice architecture, as described in Chapter 2, was used to understand the different contexts and conceptualize what I comprehend to be parts of digital literacies. Within this analytical framework, I used notions of affordance, agency, dialogism, a sociocultural view on learning, and tacit knowledge to different degrees to give analytic meaning to the material on which the articles are based.

4.2 Synthesizing Discussion

The main ambition of this study as a whole is to examine different contexts in which digital tools are part of the students' interaction. The school subject in question is social studies, but the particulars of this discipline and learning this subject have not been examined. In addition, the methods used to achieve this became an important aspect of the research. In this part of the chapter, I discuss the empirical findings of the articles and how they can answer the research questions at an aggregated level. The research questions are as follows:

- RQ1: In terms of social practices, how do digital literacies play out in social studies?
- RQ2: How do students relate to each other and to digital tools in different contexts in social studies?
- RQ3: What are the limitations and advantages of using action cameras to gain insight into students' digital literacies?
- RQ4: How does the researcher's openness to the generated data affect the outcome? The following findings are related to these research questions:

4.2.1 Digital Literacies as Social Practices

In this thesis, I have examined the data material to discuss aspects of digital literacy in light of a "practice approach" (Schatzki, 2001). According to Turner (1994) and Dreyfus

(1991), practice is the tacit knowledge that underpins activities. This is important for how I understand digital literacies as social practices. How the students interact with one another and digital tools in different contexts builds on tacit knowledge about acting in these settings. Thus, I elaborated on Kemmis et al.'s (2013) concept of relatings using the concept of tacit knowledge.

The term *affordance* is widely used in studies on the use of technologies and digital tools. This is especially the case in the research field of human–computer interaction, where the focus is on what the technology affords the users and how technology can be user-friendly. In this study, affordance is used to understand interactions in the interface between students and technology. Furthermore, it is employed to better understand how students interact in technology-rich environments, where the technology used to generate data (video cameras) is also to be understood as one of the technologies in focus. What is afforded relies on the relations between digital tools and the students, what the tools afford, and what the students perceive. In Articles 1 and 3, I studied what the method affords the students; in Article 2, I examined what digital video sources afford the students; and in Article 4, I discussed what the different tools in technology-rich environments afford.

What the students perceive as affordances again depends on the context, which comprises the learning environment, assignment, digital tools, and physical space. These elements affect the technology's affordance in a given situation, which is all part of the practice architecture.

In this study, I showed that the affordances perceived by the students were not necessarily obvious. This was the case in the methodological articles, where the empirical findings show that the technology, in the form of action cameras here, provides fertile ground for different social actions that were not expected or not expected to be as evident as they were. In Article 2, the affordance the students perceived when presented with different digital sources as online videos differed within the student groups. The affordances they perceived that made them take action are not the same as the formal requirements for choosing digital sources. An affordance is relational by definition, and it could be said that the initiative does not lie heavier on one or the other side but rather on the relation between them. In Article 4, when students used the different digital tools available, I discussed that the affordances the students perceived concerning the action that each tool afforded might differ from what was expected. Students are accustomed to using certain digital tools in specific settings because they perceive different affordances, which affects how they use the tools.

Affordance has been a useful concept in studying students' actions in different social practices where digital tools play an important role. It is a way of understanding the interaction that focuses on how the digital tools affect the interactions and how the interactions affect the usage of the digital tools. Students' agency, or their abilities to transform meaning of situated activities (Mäkitalo, 2016), was also transformed throughout the situations. The students' agency and the tools' affordances changed both in the longer term and during the practices as they unfolded moment by moment. This transformative agency (Lund et al., 2019) and the digital tools' affordances are dimensions of digital literacies and the social practices in which they play out.

As shown in Chapter 2, affordance and agency make up part of the social practices, which I understand as doings in Kemmis et al.'s (2013) practice theory framework. As shown in Chapter 2 and Figure 5, there are no clear borders between sayings, doings, and relatings, following this, agency and affordance, and dialogism and tacit knowledge. Dialogism is much more than the spoken word; what is said and understood in a conversation depends on the participants' tacit knowledge concerning how to act in given situations. This tacit knowledge is part of what gives the students their agency, including their agency to perceive what digital tools afford.What defines the practices and the limits of such practices is related to what Schatzki (1996) defined as dispersed and integrative practices (see Chapter 2).

Schatzki (1996) described dispersed practices as being "widely dispersed among different sectors of social life" (p. 91). These practices can be sayings and doings, such as explaining or following rules. To some extent, they are the same in different sectors of social life, whereas integrative practices are practices from more particular aspects of life, such as educational settings (Schatzki, 1996). The relationship between the two types is complex, but people are engaged in an integrative practice when carrying on a dispersed one in many cases. This is relevant in this research because many dispersed practices are intertwined in the integrative practice of using digital tools in an educational setting, which comprises both familiar and more unfamiliar parts. Focusing on and analyzing the interaction between students and between students and students and artifacts, examining the students' agencies, represent ways of understanding such practices.

4.2.2 How are the Contexts Part of the Students' Digital Literacies?

What makes up the context is a question that lacks a clear-cut answer because where the context starts, and ends cannot be precisely delineated. The context comprises the

environmental conditions that are important and relevant to understanding and interpreting the situation at hand. It is difficult to be certain which conditions in the environment are relevant and which are not in any given situation. In this study, I found the following conditions particularly relevant to understanding the situations in focus:

- The physical environment, here either the classroom or the outdoor museum, or other settings where students use their different digital tools (Article 4)

- Which digital tools the students had at hand; here, the digital action camera and the students' tablets or smartphones

- How the assignments they worked on were designed and given and whether this was teacher or researcher initiated.

All these conditions are part of what discerns the context and are important to examine because "digital literacies are seldom enacted as a separate practice but are intertwined with the use of multiple analogue, conceptual, symbolic, and social resources" (Lund et al., 2019, p. 55). By this, I understand resources as parts of the context.

All the conditions that make up the context affect how the interaction plays out; tacit knowledge about the situation and practice is different when the contexts are different, and the available resources affect how the situations are analyzed. Defining the analog, conceptual, symbolic, and social resources cannot be done once and for all, as discussed in the theory chapter and shown in the articles. These resources are part of students' agency and the affordances of the tools in play. Thus, the context affects the situation and, at the same time, what the researcher considers as part of the context, including methodological choices that affect research analysis.

4.2.3 How is the Method Part of the Contexts?

As seen in the articles, methodology is an important part of this study and the research conducted. The methodology is always an important component, but here, it is a significant part of the context in which digital literacies are studied because the specific method of using an action camera is part of what makes up the digital context. As the focus is on digital literacy in given situations, and understanding these digital literacies relies on analog, conceptual, symbolic, and social resources, the method used was mainly filming and analyzing interaction because interviews would not give an adequate picture of them. In my attempt to remove myself from social practices by equipping the students with action cameras, the researcher and the cameras became part of the digital tools differently, and their affordances became a part of the digital literacies I was studying. Because action cameras were used, how the students acted around them and interacted with the cameras became part of the social practice, which was part of the context making up the students' digital literacies. This is especially important because the camera not only comprises part of an external context but also forms part of the digital context and cannot be separated from the available resources. This was not a subject for discussion in Articles 2 and 4, but it is an important point for the overarching understanding of the data material and contexts I accessed. In this type of qualitative study, the research method affects the data generated, and I argue that this is especially important to account for in this case because the camera is also a digital tool. It is not one of the digital tools initially considered in the focus, but it is still not separated from the whole.

4.3 Research Contributions

How can I state that my findings are relevant and credible when I say that data generation and qualitative research are subjective and acknowledge that my research methods affected my examined practices? Digital literacies are contextual; accordingly, the study of different contexts provides valuable insight into them, enabling a deeper understanding of digital literacies in general. There is no single measure or standard of digital literacies, and a study like this cannot generalize about them; rather, it can illuminate how digital literacies are expressed in specific settings. In addition to the context sensitivity of this study, the research also adds to the knowledge on digital literacies in general through its active relation to established and relevant theories and concepts.

The elements cannot be separated from one another (see Figure 5). When elaborating on the concept of practice architecture using dialogism, affordance, agency, sociocultural learning, and tacit knowledge, it is possible to better understand the practices in focus, as I tried to show in the articles that makes out this study. Thus, the contribution also lies at the conceptual level.

The research conducted in this project contributes knowledge and insight into specific learning situations. As digital literacies are changing following emerging technologies and contexts (Tømte, 2013), research on digital literacies is in constant flux and needs to be examined in different contexts, with different tools and research foci. This study also contributes insights in this area as it addresses students' usage of digital tools in excursion and classroom-based group work in the social studies subject. It also contributes insights and critical views on how best to generate empirical data in these situations.

4.3.1 Empirical Contributions

Empirically, this type of research generates accounts of practices that contribute to a conceptual understanding of practice (Mills, 2015). The empirical research conducted is both descriptive and analytical but not intended to provide best practice examples or be normative in any way. Nevertheless, the results are important and useful for understanding the practices that occur and displaying what affects the interactions in learning environments where digital tools play an extensive role. Furthermore, this type of research clarifies what occurs in given situations and contexts where digital literacies are intertwined with multiple analog, conceptual, symbolic, and social resources. Thus, this type of research widens and deepens the understanding of how digitalization affects our interactions and how these interactions affect the usage of digital tools and other available sources, including research cameras.

Knowledge about how students interact and use digital tools is important because it provides an understanding of how digitalization affects established learning environments and how the learning environment in a wide sense influences how digital technology is used. In addition, this information is useful in the practice field because it explains what is happening in digitalized educational situations.

As developed in the articles, the empirical contributions of this study focused on how students argued for the usage of different digital sources (Article 2) and how they argued for the usage of different digital tools in different settings (Article 4). This insight is important within the growing body of studies on digital literacies because it helps define and capture

what makes up digital literacies in different contexts. Furthermore, this knowledge is important when discussing digital literacies and what it involves in teaching, including the appraisal and critique of sources.

4.3.2 Methodological Contributions

The methods chosen in this study changed as the research process unfolded. The main methodological contribution of this study revolves around the usage, research, and reflections on worn action cameras when studying students' digital literacies. This setup is a useful way to understand group work and digital literacies regarding how they play out on the screen and within and across groups. Accessing these types of data is difficult, and the original reasons for choosing this type of camera still appear to be good reasons now that the study is complete. The approach gives relevant and plentiful data generated in alliance with the person wearing the camera; it shows the students' different focus areas, both within the group and on the screen. Data material of similar quality would have been difficult to generate using a camera placed on a tripod or by observation alone. The data give the researcher and the reader a greater chance of gaining access to actions in motion, and the bias that comes with the researcher being present may not be as evident. As discussed in Article 3, this does not mean that there is no research effect in using this type of camera; rather, the bias or effect can be understood based on the data. Action cameras are widely used in research, and this project contributes to in-depth research on how this type of method is part of and contributes to the generation and limitations of data.

The methodological contribution from Article 1 relates to research tools analyzed through the lens of practice architecture. This perspective provides important insight when considering the researcher's role and place in data generation, always recalling that neither the researcher nor the studied context operates in isolation. This is closely connected to the methodological contribution of Article 4, where the same researcher is highly present in her absence and part of hybrid situations (Lofthus & Frers, 2021).

4.3.3 Theoretical Contributions

In analyzing the empirical data material, practice architecture, agency, and affordance were used as theoretical frameworks and concepts. I used the framework of practice theory to understand the actions and interactions in focus. This was mainly done through practice architecture because I found it useful to systematize the practices. The main theoretical

contribution is how sayings, doings, and relatings from the practice architecture vocabulary were elaborated using the terms *agency*, *affordance*, *dialogism,* and *tacit knowledge*. Employing practice architecture, I found tools to analyze and understand empirical data material. Practice architecture gave me conceptual tools, but at the same time, I found other tools due to using practice architecture. When studying and analyzing the data material, I gained better access to the complexities in the data material, which enabled me to see the need for elaboration of these terms. Before deepening my understanding of the material and seeing the complexities through agency, affordance, dialogism, and tacit knowledge, I needed to examine the material through practice architecture. I argue that using the theory in this way can be fruitful when trying to understand the practices in focus. The way the data was presented in Chapter 3 and Articles 1, 3 and 4 is also part of this theorization. Presenting data through graphic transcripts helps us understand the practices and the affordances, agents, dialogues, and knowledge that form these practices. Consequently, the graphic data presentation helped pave the way for a further theoretical understanding of the data material.

4.3.4 Positioning in the Research Field

The main objective of this study as a whole is to describe and analyze different learning contexts in which digital tools are part of the interaction. In addition, the methods used to achieve this are important aspects of this study. This research is part of the growing body of ethnographical studies examining digital practices. Within the New Literacy Studies tradition, the boundaries of literacy are widely discussed, and within this study, I examined how students enact digital literacies in these specific contexts. Mills (2010) stated, "Proponents of the New Literacy Studies regard literacy as a repertoire of changing practices for communicating purposefully in multiple social and cultural contexts" (p. 247). This also involves the understanding that the practices that make up literacies are constructions within groups and are not based on individual cognition alone. Hence, I attempted to understand and unpack the practices by using the theoretical terms *agency*, *affordance*, *dialogism,* and *tacit knowledge* to analyze the empirical material.

4.4 Closing Reflections and Conclusion

Throughout the work on this study, both the research project and the researcher have changed. I have learned much about the field of study, qualitative methods, and the analysis of empirical data material. The learning and research processes have in no way been linear. I questioned my abilities as a researcher, and I questioned the data material that was generated—Is it enough? Is it the right empirical data to clarify my focus areas? As mentioned above, I tried to balance self-reflectivity and rigorous research, which were challenging at times. Now that this project is coming to an end, I see that these two goals are not so far apart. From experience, I can now agree with Tracy's (2010) eight big tent criteria, wherein she stated that self-reflectivity and rigorous research are not mutually exclusive; rather, self-reflectivity is part of what makes rigorous research. It was sometimes disruptive for me as a novice in the research community, but it was highly important for me, as a researcher, to go through these stages. Working on this study took me through difficult processes that are important in learning research skills.

In retrospect, there were many things I would have done differently regarding the research selection, methods, and focus. I now know more about the process of analyzing research data, and in future research projects, I am particularly looking forward to working with other researchers.

4.4.2 Implications for Future Research

The way this study was conducted has implications for future research on students and digital literacies. The use of action cameras is becoming increasingly widespread in both educational research and other types of social sciences. As digital tools are in focus, this approach has proved to be a useful way of generating data that includes both the screen and the interactions with it. The information gathered from the screen could have been gathered in other ways, such as video cameras placed by the researcher or programs that record what is happening on screen, but then it would have been difficult to understand what was happening in the interaction between students and the digital resources, except for the picture they were focusing on or the keys they pressed. I stand by the decision to use an action camera in this research, and I acknowledge the impact this method has on the practices in focus and the understanding of how digital literacies may be operationalized.

All the sub-studies have implications for further research on different aspects of digital literacies and methodological issues that are relevant for further research on digital practices

and literacies. Article 1 has a theoretical perspective on the researcher's role and how this can affect the research on students' digital literacies and the contexts in focus. This can be a useful reflection for a research field. The focus in Article 2 is on how the students chose different video sources. The results of this study have implications for further research on information literacies because they explain the students' argumentations when choosing digital sources. This is relevant for the school subject of social studies and for what makes up digital skills in the Norwegian curricula, including the critical interpretation and evaluation of information from various digital sources. Article 3 gives different views on the use of action cameras in research, providing useful thoughts and reflections for further research with such cameras, which are useful for generating data about digital literacies.

Article 4 clarifies how and when students used different digital tools in and outside of school settings and what the different tools afforded the agents as learners. This research adds to the empirical corpus that nuances and defines the content of the term *digital literacies*. This type of empirical data, which seeks to clarify students' digital literacies and what they entail, broadens the understanding of what digital literacies are and how human interactions and interactions between humans and digital tools form an important part of this picture.

4.4.3 Implications for Practice

Because digital literacies comprise much more than a set of skills that the students should master, and because the explicit content of this "set of skills" is hard to define, empirical research that provides access and insight into the practices as they are conducted in different school settings is important for practitioners. This will give room for reflection about how digitalization, such as tablets and smartphones, affects interactions among students and how interactions among students affect the use of digital tools. It is important to know what the students do to address unwanted interactions and usages, to address, discuss, and understand the interactions and uses of digital tools in different school-related settings, and to reinforce the students' strategies for learning and interaction.

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APPENDICES

- Article 1
- Article 2
- Article 3
- Article 4
- Approval for research from Norwegian Social Science Data Services.
- Letter of consent to video record students sent to students.
- Letter of consent to video record students sent to parents.
- Overview of project week.
- Interview guide.

Bruk av teori for økt refleksivitet i praksis

Praksisarkitektur som rammeverk for å belyse forskerens plass i datagenereringen

Liv Lofthus

Abstract

In this chapter, the focus is on how the researcher's presence in the field has an effect on the data that becomes available. Data is in no case something ready, waiting to be collected by the researcher. Rather it is created in interaction between the researcher and research objects. The discussion is based on two criteria; reflexivity and sincerity. These should be met in order to strengthen qualitative research. In this lies the researcher's ability to see herself as the researcher subject that she is, and to be open and self-reflexive about this. Looking at two research approaches, where different methods have been used, I focus on the researcher's role in the generation of data. To investigate this, I use the concept of practice architecture as a theoretical framework. I argue that this is a well-suited framework to systematize the above-mentioned criteria, helping the researcher to cast an outside-perspective on her own engagement in the field.

Introduksjon

I dette kapittelet vil jeg diskutere hvordan forskerens tilstedeværelse i forskningsfeltet har en effekt på dataene som blir tilgjengelige. Dataene ligger aldri tilgjengelig og venter på å bli hentet inn av forskeren. Det er noe som skapes i

interaksjon mellom forskeren og forskningsobjektene. Ordet datainnsamling er derfor problematisk. Datagenerering er å foretrekke, ettersom dataene i stor grad påvirkes av ulike faktorer. Diskusjonen tar utgangspunkt i to kriterier for god kvalitativ forskning; refleksivitet og *sincerity* (åpenhet). I dette ligger forskerens evne til å se seg selv og det subjektive hun tar med seg inn i forskningen, og å være åpen og selvrefleksiv om dette. Teksten omhandler to tilsynelatende uavhengige feltarbeid som er utført i sammenheng med mitt ph.d.-prosjekt, hvor forskjellige metodologiske tilnærminger har blitt brukt. For å se nærmere på forskerens rolle i datagenereringen bruker jeg praksisarkitektur som teoretisk rammeverk. Dette bidrar til å gjøre forskeren mer eksplisitt, og viser tydelig hvordan forskerens tilstedeværelse påvirker alle ledd i datagenereringen. Praksisarkitektur er definert i boken *Changing practices, changing education* (Kemmis et al., 2014), som oppbygging av en praksis. Teorien sier noe om hvordan utforming av praksiser endrer utfallet av læringen som finner sted. I dette kapitlet benyttes teorien som rammeverk i en kontekst som er utvidet fra lærings- til forskningskontekst. Som Frers diskuterer i denne boken, er disse to kontekstene nært beslektet. Fokus vil være på hvordan forskeren og metoden er en del av praksisarkitekturen, og hvordan arkitekturen i praksisen elevene er en del av, påvirker forskeren og metodevalget. Jeg argumenterer for at dette er et rammeverk som bidrar til å systematisere og teoretisk kategorisere refleksivitet og *sincerity*. Analysen kan være med på å underbygge begrunnelser for metodevalg, og hjelpe forskeren å få et utenfra-blikk på sin egen påvirkning på datagenereringen.

Det er ikke utformet universelle krav for hva som utgjør god forskning. Målestokken for kvantitativ forskning består av treenigheten validitet, reliabilitet og objektivitet. Standarden for god kvalitativ forskning er mer nyansert og omdiskutert. Ettersom kvalitativ forskning er svært variert, både med tanke på metode og forskningsområder, er det utfordrende å enes om ett felles sett kriterier. Dette fører til at det kan være vanskelig, og ikke nødvendigvis nyttig, å nøyaktig følge en liste av gitte krav (Northcote, 2012, s. 33). Det er identifisert mer enn 100 sett med kriterier for kvalitativ forskning (Dixon-Woods, Shaw, Agarwal & Smith, 2004). Hvilke av disse forskeren velger å ta utgangspunkt i, har stor påvirkning både på forskeren og forskningen.

For å reflektere rundt og lære mer om metodebruk er det viktig å være åpen om hvilke metodiske grep som fungerer og ikke fungerer for det man vil undersøke. I forskningen som omtales her, er det elevgrupper

som er forskningsobjekter. Å studere hvordan elevene blir påvirket av hvordan forskningen gjennomføres, gir mulighet for refleksivitet om forskerrollen og metodevalget.

Først vil jeg diskutere noen utvalgte kriterier for god kvalitativ forskning, og se hvilke av disse som passer for å belyse forskerens rolle i datagenereringen. Jeg vil så beskrive praksisarkitektur, før jeg beskriver feltstudiene som er gjennomført. Videre vil jeg se på hvordan forskerrollen påvirker praksisen, og således dataene som genereres.

Kriterier for god kvalitativ forskning

Kvalitativ forskning gjennomføres ofte som en induktiv utforskning, der forskeren går åpent inn med alt det subjektive hun er. Det subjektive elementet er en av hovedgrunnene til behovet for kvalitetskriterier i forskningen. Subjektivitet gjør det også vanskelig å enes om kriteriene. Som kvalitativ forsker på mennesker blir parameterne man jobber med, i stor grad definert mens data genereres og analyseres (Macfarlane, 2010b, s. 19). Da kreves det at man som forsker har evnen til å være dynamisk og spontan, og være åpen for uforutsette hendelser. Ved å se på et utdrag av definerte kriterier er det tydelig at selv om det er forskjeller, er det også stor enighet om hva som må til for å oppnå god forskning. Forskeren skal arbeide systematisk, og samtidig kunne improvisere når situasjonen krever det. Frers (2017) problematiserer dette, hvor han skriver at forskningen på den ene siden krever systematikk og etterprøvbarhet, samtidig som det krever at forskeren kan tilpasse seg situasjonen som oppstår, når den oppstår (Frers, 2017, s. 3).

Noen kriterier går igjen hos flere forskere, om enn med noe forskjellig ordlyd, og ulik vekting i betydningen. Her følger en kort liste for å skape en oversikt. Videre forklares refleksivitet og *sincerity* mer inngående.

Cohen og Crabtree (2008) legger vekt på at kvalitativ forskning bør være robust. Det innebærer at forskningen skal være relevant og viktig, og skal gjennomføres ved hjelp av metoder som er passende for å besvare de gitte forskningsspørsmålene. Etterprøvbarhet, validitet og kredibilitet er avgjørende. Dette bør komme til syne gjennom en klar og tydelig forskningsrapport, hvor forskeren også viser evnen til refleksivitet og åpenhet (Cohen & Crabtree, 2008). Tracy (2010) definerer i sin artikkel sitt sett med kriterier for god kvalitativ forskning. Hun påpeker viktigheten av at alle ledd i forskningen er

gjennomført med styrke, eller det Cohen og Crabtree definerer som robust. Styrken oppnås ved at teori, data og kontekst er komplekst, tilstrekkelig og passende for å studere det man vil studere. Forskningen skal være troverdig og gi resonans hos andre forskere. Denne gjenklangen hos andre kan oppnås gjennom ærlighet, eller *sincerity*, om hele forskningsprosessen. I begrepet *sincerity* ligger kravet om forskerens refleksivitet og åpenhet for gjennomsyn. Andre har vektlagt forskerens evne til å utøve mot, respekt, besluttsomhet, åpenhet, ydmykhet og refleksivitet som viktige i forskningen (Kiley & Mullins, 2005; Macfarlane, 2010a; Pring, 2001).

En mulig måte å imøtekomme standarden for systematikk og tilpasning (Frers, 2017) er gjennom *refleksivitet*, et kriterium som går igjen hos overnevnte forskere. Så hva innebærer refleksivitet, og hvorfor er dette viktig i forskningen?

Malterud bruker metaforen «the knower's mirror» om refleksivitet (2001, s. 484). I dette legger hun at refleksivitet er holdningen til det å forholde seg systematisk til den konteksten der kunnskap dannes. Spesielt gjelder det rollen forskeren spiller i dette, og hvordan forskeren påvirker datagenereringen. Forskeren har alltid fordommer, og/eller forkunnskaper om feltet hun går inn i. Disse forkunnskapene er bygd opp av både personlige og profesjonelle erfaringer (Malterud, 2001, s. 484). Refleksivitet handler ikke om å forsøke å fjerne disse, men å være ærlig på å definere hva disse forkunnskapene innebærer. En annen metafor som er brukt for å omtale refleksivitet i forskningen, er Guba og Lincolns «Human as instrument» (Guba & Lincoln, 1981). Dette kan forstås som at mennesket/forskeren er instrumentet virkeligheten går gjennom for i det hele tatt å være en virkelighet. Siden forskeren selv er instrumentet, har hun stor og uunngåelig innvirkning på det som kommer ut som «virkelighet» om situasjonen som er studert. Det er da en styrke i forskningen å kunne reflektere over hvilket instrument man selv er.

Som tidligere nevnt utdyper Tracy (2010) *sincerity* til å innebære det å være ærlig og oppriktig i forskningen. Forskningen skal være transparent, og forskeren skal være selvrefleksiv. Dette innebærer stor grad av åpenhet rundt forskningsprosessen. Transparent forskning kan oppnås gjennom formidling av prosjektets utfordringer og uforutsette endringer, og gjennom formidling av hvordan fokuset for studien endrer seg gjennom prosessen. Dette forutsetter økt oppmerksomhet for interaksjon mellom kontekst, forsker, metode, setting og aktører (Altheide & Johnson, 1994, s. 489).

Selvrefleksivitet, eller evnen og villigheten til å se seg selv, er en viktig egenskap for å kunne være åpen og ærlig i forskningen. Tracy påpeker at fokuset på refleksivitet øker oppmerksomheten rundt forskerens tilstedeværelse og påvirkning i datagenereringen. Ærligheten og selvbevisstheten innebærer åpenhet med tanke på styrker og svakheter om seg selv som forsker og forskningen man driver med, og refleksiv inngang til bakenforliggende årsaker som påvirker valgene man tar. Ved å være åpen reflekterer man over hvilken kunnskap som ligger tilgjengelig, og hvilken kunnskap som kan være skjult, samt hvilken kunnskap man selv bringer inn i feltet (Tracy, 2010, s. 842). En måte å få dette frem i forskningen kan være å skrive feltnotater som inneholder selvrefleksive kommentarer om egne følelser og forståelser (Emerson, Fretz & Shaw, 2011). Andre foreslåtte metoder for økt refleksivitet er å føre en selvrefleksiv dagbok, skrive seg selv inn i feltnotater, og å dokumentere de analytiske og metodologiske avgjørelser man tar. Mjøberg (2017) beskriver i sin studie studentaktiv forskning. Et av hovedfunnene i studien er at studentene trekker frem refleksjonsnotater som en av flere viktige erfaringer fra det å drive forskning. En av studentene i undersøkelsen understreker; «Å skrive notater er en god måte å planlegge og vurdere arbeidet på, en blir mer bevisst på hva en gjør eller ikke gjør og hvorfor» (Mjøberg, 2017, s. 16).

Forskeren bør være refleksiv i alle avgjørelser hun tar i forskningsprosessen (Mason, 1996). Vanligvis er refleksivitet i litteraturen diskutert som noe som gjøres individuelt. Man kan likevel oppnå økt innsikt gjennom samtaler om egen refleksivitet og ved å være refleksiv sammen med andre (Malterud, 2001). For å være refleksiv overfor sine lesere kan det også være effektivt at forskeren skriver seg selv inn i teksten i førsteperson. Dette kan fungere som en påminnelse om forskerens tilstedeværelse i teksten og i datagenereringen. Det er en måte å få frem at forskningen ikke dreier seg utelukkende om objektene man studerer, den inneholder også forskerens påvirkning på dataene. Videre i teksten hvor feltarbeidet omtales og i diskusjonen, vil jeg derfor i stor grad skrive meg selv inn i teksten.

En naturlig følge av økt refleksivitet i forskningen er økt imøtegåelse av andre definerte kriterier for kvalitativ forskning. Å være åpen og refleksiv om sin egen plass i forskningen skaper en mer robust gjennomføring både i valg av metode og gjennom forskningsrapportering. Refleksjon og åpenhet øker også forskningens validitet og etterprøvbarhet. Gjennom åpenhet mot seg selv som forsker, mot forskningsobjektene og mot datagenereringen, reflekterer man også over etiske aspekter ved forskningen. En viktig følge av refleksivitet i forskningen kan være økt kvalitet. Gergen og Gergen (1991) begrunner dette med

at man gjennom kritisk refleksjon ser på forskningsprosessen fra forskjellige posisjoner, og dermed beveger seg utover for å oppnå økt forståelse.

Refleksivitet og åpenhet kan tenkes å være et endeløst felt. Jo mer man reflekterer, desto mer er det å reflektere over. Kan det dermed bli for mye refleksivitet i forskningen? Kan forskeren ta for stor plass i eget prosjekt? Utdypinger og refleksjoner over egne erfaringer skal brukes i studiet for å belyse en praksis, og med dette gi leserne en større forståelse for praksisen og dens kontekst. De personlige erfaringene bør ikke i hovedsak fungere som et sted forskeren kan lufte og rense egne tanker (Krizek, 2003, s. 149). Selv om man er åpen om at å oppnå objektivitet i forskningen er umulig, kan man ikke tillate seg å gå seg vill i det subjektive. Det selvrefleksive må ikke ta så stor plass at det ikke er rom for det objektive (Denzin, 1997, s. 218). Bruk av praksisarkitektur som verktøy for å plassere meg selv som forsker i datagenereringen kan være en måte å motvirke denne tendensen.

Praksisarkitektur

Praksisarkitektur var ikke et analyseverktøy jeg gikk inn i datagenereringen med, men et verktøy som fremsto som nyttig da jeg skulle være refleksiv med tanke på min rolle som forsker, og hvordan jeg påvirker data som genereres, og videre hvordan disse dataene fører til endring og justering av forskningsmetode.

I boken *Changing practices. Changing education* defineres praksiser, og det beskrives hvordan arkitekturen i praksisene kan endre utfallet av læringen som finner sted. En praksis kan sies å være en menneskelig aktivitet som avgrenses av en felles forståelse blant de som inngår i den. Dette innebærer felles forståelse av det som gjøres – aktiviteter (doings), den karakteristiske diskursen, samtalen og tankene rundt aktiviteten (sayings), og forhold mellom mennesker og objekter involvert i praksisen (relatings). Når disse doings, sayings og relatings bindes sammen i et prosjekt, kalles dette en praksis. En aktivitet utgjør en praksis når den bindes sammen av mennesker i et fellesskap (Kemmis et al., 2014, s. 32). Fellesskapet jeg vil se på, utgjøres av datagenerering som finner sted gjennom aktiviteten som skal gjøres. Aktivitetene er prosjekter initiert av forskeren eller av læreren. Doings er her en kontekst jeg som forsker har plassert elevene inn i. Måten elevene samhandler gjennom språket om denne aktiviteten og forholdene, utgjør diskursen. Denne fremstår som forskjellig ut fra hvordan jeg som forsker har lagt opp datagenereringen. Forholdene som er involvert

i datagenereringen, består av forholdet mellom forskningsobjekter (elevene) og forskningsobjekter, forsker og forskningsobjekter, forskningsobjekter og nett-brett og action-kameraer, samt forskningsobjekter og læringsarena.

Praksisarkitektur er det som muliggjør og tilrettelegger for praksiser. Praksisarkitektur består av det kulturdiskursive, materialøkonomiske og sosial-politiske som bringes frem i praksisen (Kemmis et al., 2014). Praksisene som er tilgjengelige for deltagerne, innrammes av flere forskjellige intersubjektive rom. Disse intersubjektive rommene utgjør praksisens sayings, doings og relatings (Kemmis et al., 2014, s. 4). Rommene finnes i språket som brukes, den gitte konteksten og tiden deltagerne befinner seg i, den materielle virkeligheten de er en del av, og de sosiale forholdene som er en del av praksisen. Språkets inter-subjektive rom kalles kulturdiskursiv. Dette innebærer en felles forståelse innad i praksisen av kulturen og diskursen, som gir deltagerne mulighet til å uttrykke seg gjennom språk. Kontekstens intersubjektive rom, som defineres av stedet, den materielle virkeligheten og tiden, kalles materielløkonomisk. Rommet gir deltagerne en forståelse av hvordan ting skal gjøres i den gitte praksisen som utspiller seg i en gitt kontekst til en gitt tid. De sosiale forholdenes intersubjek-tive rom kalles sosialpolitisk. Her skapes en forståelse blant praksisens deltagere av samspillet i sosiale relasjoner innad i praksisen, og i forhold til andre praksi-ser. Teorien om praksisarkitektur er kommet til på grunnlag av et behov for endring i undervisningsformer og læringspraksiser. Utdanning bør endres i takt med den verden vi lever i, men selv med endringer i læreplaner, lærings-metoder og vurderingskrav er skolens sosiale form den samme som den alltid har vært. For å endre utdanningen, og følgelig læringen, må praksisen endres (Kemmis et al., 2014, s. 3). Jeg vil her bruke praksisarkitektur for å belyse min egen læring gjennom bruk av ulike forskningsmetoder, og se på hvordan metodevalget og jeg som forsker påvirker selve praksisarkitekturen. Jeg vil stu-dere hva som skaper endringer i praksisarkitekturen jeg som forsker er en del av, og hvordan dette påvirker min læring om metodebruk og datagenerering. For å belyse dette vil jeg videre se på de to feltstudiene som er gjennomført.

Feltstudiene
Pilotprosjekt / design-based study
Første prosjekt ble gjennomført over en periode på fire dager. Utvalget av elever ble gjort på bakgrunn av kriteriet om å studere en skoleklasse på ungdomstrinnet

som bruker nettbrett i den daglige undervisningen. Fokus var på hvordan elevene forholdt seg til hverandre og nettbrettet/smarttelefonen: Hvordan brukte elevene nettbrettet til å orientere seg, dokumentere og å innhente informasjon i en gitt situasjon? Dette skulle belyses ved å se hvordan elevene arbeidet utenfor klasserommet. Med min bakgrunn som museumspedagog falt valget på å ta med elevgruppa på museum. Her er det muligheter for læring i nye omgivelser, hvor samspillet mellom formell og uformell læring kan komme til syne. Gruppa ble med på friluftsmuseum, der de fikk i oppgave å lage en digital fortelling på bakgrunn av stedet de var, hverandre og nettbrettet/mobiltelefonen.

I forkant av å studere praksisen som utspant seg på friluftsmuseet, hadde jeg et informasjonsmøte med elevene. Jeg møtte elevene i klasserommet for å snakke om prosjektet og om hva vi skulle gjøre. Dette innebar også å få underskrifter på samtykkeerklæringer.

Dagen på museum ble gjennomført ved at elevene ble delt inn fem grupper. Gruppene ble inndelt av læreren, som kjenner elevene og vet hvem som jobber greit sammen i grupper. Hver gruppe hadde med seg nettbrett, og de hadde også mobiltelefoner tilgjengelig.

Oversiktsbilde fra museet

Gruppene hadde fått informasjon om hva den digitale fortellingen skulle innebære av bilder, kartdata og tekst. De skulle gå rundt på museumsområdet og ta bilder og innhente informasjon. I tillegg til å ha fått denne informasjonen

muntlig på tidligere skolebesøk og før oppstart av dagen, fikk hver gruppe utdelt skriftlig informasjon. Nettilgang og strøm var tilgjengelig.

For å dokumentere hvordan gruppene jobbet, var en av elevene i hver gruppe utstyrt med et actionkamera. Kameraet ble festet på elevenes hoder. (Andre i Norge som har gjennomført studier ved bruk av denne typer kamera er Blikstad-Balas og Sørvik (2015) og Sigurjónsson (2007).) Løsningen var valgt for å kunne innhente informasjon som muligens ikke ville vært like tilgjengelig om forskeren hadde gått etter elevene med et håndholdt kamera. Med fem grupper som arbeidet i forskjellige deler av uteområdet, var dette også en måte å få informasjon fra flere grupper. Jeg, som forsker, var med hele dagen prosjektet ble gjennomført og observerte gruppene, samt hadde samtaler med elevene om det de holdt på med. Målet var å se hvordan elevene brukte verktøyene til å orientere seg og dokumentere hva de så og opplevde. Noen dager etter museumsbesøket var jeg med elevene i klasserommet for å se resultatet av de digitale fortellingene. Denne dagen og en påfølgende dag ble elevene intervjuet i par angående dagen på museum og oppgaven de hadde gjort, samt mer generell bruk av mobile digitale verktøy både på skolen og på fritiden.

Studien kan sies å være utført som en design-based study (Brown, 1992). Jeg gjorde en intervensjon og la føringer for hva elevene skulle gjøre. Studien hadde ikke som mål å endre praksis, men ble gjort for å legge til rette for å skaffe data som var nyttig for å belyse problemstillingen. Dataene som ble produsert, fremsto i etterkant som uoversiktlige. Det var på et stort uteområde der elevene ikke var vant til å være. Det virket som det var uavklart hva som var forventet av dem. Det gjaldt bruken av redskaper, gruppesamhandling og orientering i uvante omgivelser. Ettersom omgivelsene var en åpen park/friluftsmuseum, fremsto dagen som en utedag, og praksisen som utspilte seg, er en ganske annen enn praksisen i klasserommet. Praksisarkitekturen er en annen, og det kan kanskje sies at elevene ikke er helt enige om sayings, doings og relatings i denne praksisen, og hva disse skulle innebære, ble forhandlet blant elevene, læreren og forskeren i selve praksisens forløp. Det måtte ved hjelp av praksisarkitekturen skapes en meningsfull praksis. Det som ligger tilgjengelig for dem i kulturdiskursen kan sies å være språket og ideene de bruker. Her tar de utgangspunkt i informasjonen de har fått om oppgaven. Det materialøkonomiske kan sies å være nettbrettet, mobiltelefonene og stedet de er på – et friluftsmuseum. Den sosialpolitiske delen av arkitekturen i denne praksisen er forholdet mellom deltagere, både elever og forsker, i praksisen. Praksisarkitekturen kan sies å være ufullstendig og uavklart. Oppgaven

fremstår som noe uklar, så adekvat språk og ideer kan være utfordrende å skape. Det er også uklarheter rundt det materielle – her er det actionkamera, nettbrett og mobiltelefoner. Hva skal brukes til hva og når? Forholdet mellom elevene i gruppa fremstår også uavklart. Når de resterende delene av praksisarkitekturen er ufullstendige, er det vanskelig å plassere seg i gruppa. Det er også uklart hvordan relasjonen mellom elever, lærer og forsker skal forstås i denne praksisen. Alle uavklarte intersubjektive rom skapte en usikkerhet rundt dataene som var generert, og hvordan disse skulle analyseres.

Første datainnsamling fremsto uoversiktlig og rotete, og ikke som et godt nok grunnlag for å skrive en doktoravhandling. På bakgrunn av erfaringer fra første datainnsamling ble neste prosjekt gjennomført på en annen måte, og første datainnsamling ble således ansett for å være et pilotprosjekt. Yin (2014) understreker i sin beskrivelse av en case-studie viktigheten av et pilotprosjekt. Dette kan bidra til å justere planer for datainnsamling både med tanke på innholdet i dataene man samler inn, og prosedyrene som følges for å gjennomføre dette. I dette tilfellet ble et prosjekt gjennomført, og endringer gjort både med tanke på prosedyrer som ble fulgt, og data som ble samlet inn.

Case study

Bakgrunnen for å gå bort fra forskningsdesignet i første datainnsamling var altså tanken om å ville observere elevene i deres vante omgivelser. Jeg ville studere en praksis som fant sted uavhengig av meg som forsker – en praksis jeg observerte utenfra heller enn å være med å skape. Forskerens tolkning skaper bias i ethvert kvalitativt forskningsdesign. Begrunnelsen for valg av ny metode var med bakgrunn i tanken om at denne skjevheten muligens blir større i en design-based studie, hvor forskeren ikke bare studerer data, men er i større grad med på å produsere data.

Ettersom jeg søkte å finne svar på hvordan elevene bruker mobile digitale verktøy som læringsressurs, fremsto det etter første gjennomføring klart at det beste forskningsdesignet for å belyse dette ville være en beskrivende casestudie. En beskrivende casestudie kan være en god innfallsvinkel når spørsmålene er «hvordan» eller «hvorfor» (Yin, 2014). Ved å bruke design-basert studie fikk jeg innblikk i noe jeg hadde initiert heller enn deres vante praksis i klasserommet. I en casestudie er det viktig å definere hvilken case det er som skal studeres. Casen her

vil være bruk av nettbrett i et skoleprosjekt i en niende klasse. (Andre som har drevet videobasert klasseromsforskning i Norge, er blant annet Klette (2015), Silseth (2013) og Davidsen (2017).) Utvalget var også her gjort med tanke på å studere en skoleklasse på ungdomstrinnet som er vant med å bruke nettbrett som læringsressurs i skolen. På bakgrunn av dette ser jeg en case som potensielt er informasjonsrik, og som kan være med å belyse fenomenet. Målet med studien er å beskrive hvordan en klasse bruker nettbrett som læringsressurs, med sikte på å produsere konkret, kontekstavhengig kunnskap. Fra Yins (2014) perspektiv består casestudie som forskningsdesign av fem komponenter: et forskningsspørsmål, hypoteser (om det finnes), analyseenheter, logisk forbindelse mellom data og hypoteser og kriterier for å tolke funnene.

Dataene fra casestudien inneholder feltnotater fra planleggingsmøter med lærere, observasjoner, feltnotater, blogginnlegg, som er tilgjengelig på skolens egen blogg, og videomateriale fra seks skoledager (11 skoletimer). Videomaterialet består av helklassesamtaler, samt data fra gruppearbeid hvor elevene ble utstyrt med kamera plassert på hodet, eller på bordet ved siden seg.

Oversiktsbilde fra klasserommet.

Casen var et prosjektarbeid som pågikk over en uke. Elevene var delt inn i grupper og fikk nye oppgaver hver dag gjennom ukesprosjektet. Oppgavene besto i at elevene skulle skrive forskjellige typer blogginnlegg. For hver oppgave skulle elevene skrive et individuelt blogginnlegg. I gruppene skulle de bli

enige om hvilke av de individuelle innleggene som var det beste og som skulle legges ut på klassebloggen. Alle elevene skulle i løpet av uka ha et av sine innlegg på skolebloggen.

Ved å analysere dataene, hovedsakelig video fra gruppearbeid, kan man gjenkjenne en avklart praksis elevene jobber i. Praksisen kan sies å være prosjektarbeid i grupper med nettbrett som læringsressurs. Med utgangspunkt i data som er samlet inn, kan man gjenkjenne samtalene. Praksisen disse delene utgjør, kan sies å være konstruert av praksisarkitekturen som innebærer en kulturdiskursiv arrangering som kommer til syne gjennom språk og tanker som utgjør sayings. Her er samtalen avklart rundt gruppearbeidet, der de skal velge ut hvilket av gruppas bidrag som er det beste. De gir hverandre tilbakemeldinger på arbeidet de har utført, og spør hverandre om hjelp med nettbrettet.

Den materialøkonomiske arrangeringen som tilføres praksisen gjennom nettbrettet og gruppesammensetningen, påvirker både aktiviteter og arbeid, eller elevenes doings som skapes gjennom bruk av nettbrettet som ressurs, og deling av hverandres tekster og multimodale blogginnlegg. Deling fasiliteres med nettbrettet som ressurs.

Siste del av praksisarkitekturen, som består av det sosialpolitiske, kommer til syne gjennom elevenes forhold til hverandre, til læreren og til nettbrettet, deres relatings. Elevene ser ut til å ha et avklart forhold til hverandre i gruppa, og til de andre medelevene i klasserommet. Hvem som gir hjelp, og hvem som tar imot hjelp. Forholdet til nettbrettet ser ut til å være avklart ved at elevene har en utbredt delingskultur. Saying, doings og relatings bygger altså på en enighet blant deltagerne, og skaper den intersubjektive forståelsen for praksisen de er en del av. Selv med denne forståelsen mellom deltakerne påvirkes praksisarkitekturen av meg som forskeren. Hvordan jeg påvirker praksisen, er ikke like tydelig, men med min tilstedeværelse og kameraets tilstedeværelse er praksisen allikevel tydelig.

Gjennom analyse av dataene ser det ut til at elevene har et avklart forhold til praksisen de er en del av. Saying, doings og relatings bærer preg av tydelig praksisarkitektur.

Diskusjon

Ved gjennomgang av videodata og feltnotater kommer det tydelig frem at min påvirkning på datagenereringen endrer metoden og metodevalget. Ved en

refleksiv bruk av datamaterialet, altså ved å bruke datamaterialet for å belyse egen tilstedeværelse, selv når jeg ikke er til stede i filmen, vil jeg diskutere dette i lys av praksisarkitektur, og bruke dette for å reflektere over forskeren i metoden, og metoden hos forskeren. Målet er ikke å sette metodene opp mot hverandre for å se hvilke som er best, men for å diskutere forskjellene de skaper, og se nærmere på hva det betyr når man ser på ulike video- og actionkameradata i de ulike praksisarkitekturene som skapes.

Som nevnt fremsto datamaterialet fra det som etter hvert ble pilotprosjektet som uoversiktlig, og datamaterialet fra en tydeligere definert praksis i klasserom som mer oversiktlig. Praksisarkitekturen utenfor klasserommet består i stor grad av andre doings – en annen kontekst enn den de er vant med fra klasseromsundervisningen. Relatings kan også sies å være uavklart, da jeg som forsker kommer inn som en elevene skal forholde seg til. Det endrer følgelig sayings også. Elevene tas ut av sine vante klasseromsomgivelser, der det er en klar struktur på undervisningen, og de må i dette skape en felles forståelse og skape mening. Sosial struktur og mening ser ut til å skapes ved bruk av mobiltelefoner og nettbrett.

Denne friksjonen kommer ikke til syne i samme grad i klasseromsdata, der elevenes rolle, både i forholdet til andre elever, nettbrett og lærer virker kjent og avklart. I klasseromsdataene er ikke forskeren så tydelig til stede, men kan allikevel sees i samtalen elevene fører. Ved denne tilstedeværelsen endres elevenes sayings. Dette kan sees ved at elevene forholder seg til forskeren gjennom samtaler om kameraet. Samtalen føres ut fra at forskeren og kameraet er aktører i konteksten (Frers, 2009). Aksjonskameraet som elevene er utstyrt med, og kameraene som er plassert i klasserommet, er en del av det intersubjektive rommet som utgjør konteksten.

Gjennom begge prosjekter har jeg sett på hvordan elevene forholder seg til hverandre i mer eller mindre dagligdagse situasjoner. Innenfor sosiologi er etnometodologi en retning hvor man studerer folks handlinger i dagligdagse situasjoner, og hvordan folk skaper mening og følger regler og normer i disse situasjonene (Garfinkel, 1964) – i etnometodologien har den type forhandlingsbasert aktivitet, og aktivitet med åpent utfall enda større vekt enn innenfor praksisarkitekturbegrepet. For å studere hvordan mobile digitale verktøy kan brukes som læringsressurs ved å studere grupper som er vant til å bruke disse redskapene i undervisningen, er det følgelig en dagligdags situasjon jeg vil studere nærmere.

Forskerrollen

I dette avsnittet vil jeg diskutere forskerens rolle i praksisen som studeres. Ved å se på eksempler fra data som er blitt generert gjennom egne notater og video, vil jeg diskutere hvordan forskerrollen påvirker metodevalget, og metodevalget påvirker forskerrollen, og hvordan dette påvirker dataene som genereres. Problemstillingen som skal belyses gjennom forskningen, er: Hvordan kan mobile digitale verktøy brukes som læringsressurs?

Etter gjennomføring av første prosjekt opplevdes det som vanskelig å jobbe med dataene, da det var noe uavklart hva elevene skulle gjøre. «Datainnsamling» ble i stor grad «dataprodusering». Dermed ble andre prosjekt gjennomført inne i klasserommet, hvor det var læreren som initierte skolearbeidet. I disse dataene er det en avklart læringssituasjon, som ved første øyekast fremsto som mer oversiktlige data, og derfor i større grad fremsto som «datainnsamling». En del av åpenheten rundt datagenereringen jeg vil ha fokus på, innebærer å diskutere utfordringene og de uforutsette vendingene datagrunnlaget og analysene har tatt. Dette igjen på bakgrunn av to forskjellige metodiske tilnærminger til feltet. Ved første analyse av datamaterialet fra første runde reflekterte jeg rundt begrensninger ved metoden som var brukt. Bakgrunnen for dette var at dataene fra første datainnsamling ved første blikk fremsto som rotete og uoversiktlige, både for deltagere (i selve situasjonen) og forsker (i situasjonen og i analysen).

Gjennom økt utøvelse av refleksivitet ser jeg tydelig at det ikke kun er dataene i seg selv som påvirker analysen, men hele prosessen av datagenerering, som jeg er en viktig del av. For å belyse hvordan jeg har påvirket praksisarkitekturen, ser jeg gjennom feltnotater at min tilstedeværelse er svært tydelig. Dette gjelder i begge feltarbeidene.

Følgende sitat er hentet fra feltnotater gjort under prosjektet som ble gjennomført utendørs på museum. Feltnotatene ble skrevet under og etter at prosjektet ble gjennomført. Før feltarbeidet ble gjennomført, hadde jeg klare tanker om hvilke typer data jeg ville ha. Refleksivitet og *sincerity* rundt oppdagelsene man gjør i feltet, som skiller seg fra oppfatningen man hadde før man gikk ut i feltet, er viktig for å reflektere rundt hvilke data det er man har skapt.

> *«Det er jo derfor jeg i utgangspunktet ville ut, for å sette det i den konteksten jeg ville se det i. Jeg ser at det ikke nødvendigvis er så enkelt, det blir et tilgjort handlingssted jeg skaper.»* (Egne notater)

Gjennom notatet kommer min tilstedeværelse i de intersubjektive rommene svært tydelig frem. Forskeren ville ta elevene med i en kontekst, sted og tid definert av forskeren. Denne konteksten påvirker deres språk og deres relasjoner. Jeg, som forskeren, er også en del av deres relasjoner, ettersom jeg er den som initierte denne praksisen. Det fremstår her som om jeg tar stor plass, og at dette påvirker praksisen som finner sted. Hva er det da som studeres? Om det er et handlingssted og en kontekst som kun eksisterer der og da, observeres en svært spesifikk praksis hvor forskeren spiller en svært stor rolle.

Dette utdypes gjennom følgende feltnotat:

> «Men så fort elevene er vant med læringssituasjonen så er jo utgangspunktet for at læring skal finne sted et annet enn om de ikke har gjort det før.» (Egne notater)

Igjen viser notatene at læringssituasjonen jeg har skapt, oppleves som noe annet enn elevenes vanlige læringssituasjon. Notatene bidrar til *sincerity* i forskningen ved å synliggjøre endringen i synet på datagenereringen fra før den fant sted til da den fant sted.

I denne prosessen var jeg ikke en del av elevenes arbeid, da elevene beveget seg rundt i grupper. Observasjonene ble derfor springende. Tilstedeværelsen i en praksisarkitektur som omhandler refleksivitet i forskningen, kommer også til syne i videodata, da fra elevenes ståsted.

Måten å fremstille data i illustrasjonen er inspirert av Eric Lauriers «graphic transcript» (Laurier, 2014).

Dataene viser at elevene er usikre på hva de skal gjøre: «Hva er det egentlig vi skal gjøre?» Dette påvirker diskursen i gruppa, som påvirker relasjonene elevene imellom. *Sincerity* og åpenhet rundt hva som påvirker datagenereringen, er viktig i videre tolkning av data.

Følgende datautklipp viser igjen elevenes usikkerhet rundt hva de er bedt om å gjøre. En elev leser opp en tekst fra en plakat, og responsen fra en medelev fremstår som en spøkefull kommandering.
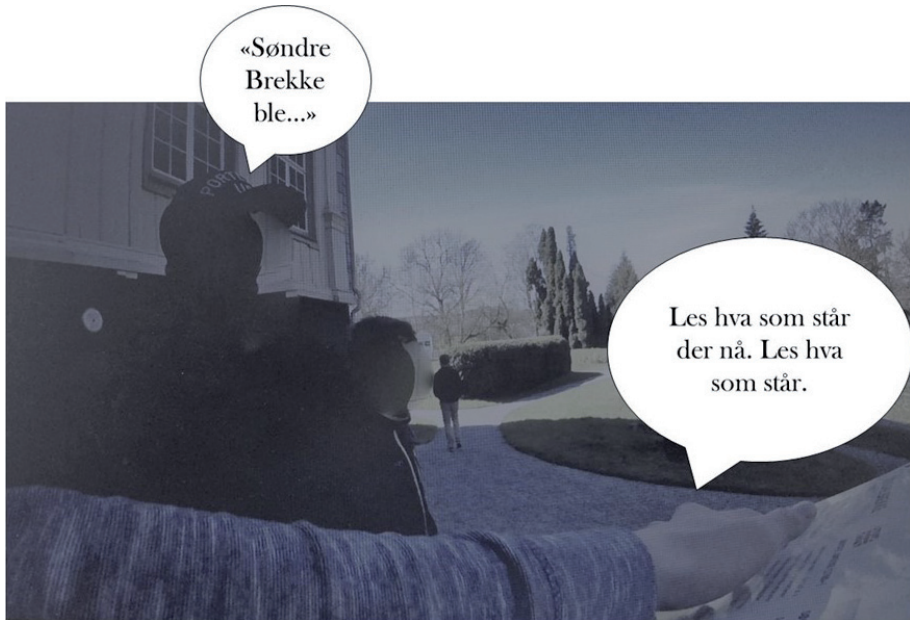
Det er uklart for elevene hva de skal gjøre, og forskerens rolle i å påvirke arkitekturen er veldig synlig. Usikkerheten elevene opplevde rundt hvordan oppgaven skulle løses, kommer til syne i elevenes kommentarer om hva de skal gjøre. Hvordan de skulle løse oppgaven var uklart. I samtalene rundt dette ble forskerens rolle tydelig. Jeg var ikke ute etter å se en så tydelig forskerrolle. Som en følge av dette ville jeg endre praksisen.

Gjennomgang og analyse av data gjorde det klart at det er dataene innhentet i klasserommet som skal analyseres for å belyse bruk av mobile digitale verktøy som artefakter i en sosial setting. Egen tilstedeværelse i datagenereringen skulle da ikke bli så tydelig. Kameraene ble satt opp, og klassen jobbet med en praksis de er vant til å jobbe i. Forskeren kommer inn med et utenfrablikk. Å tro at man på den måten ikke er en del av datagenereringen, men

bare driver med «datainnsamling», ser jeg gjennom videodata og egne refleksjonsnotater at er feil. Jeg påvirker i stor grad praksisarkitekturen, og er en del av den. Endringen i egen oppfattelse av hva som skulle finne sted under datagenereringen, og hva som ble oppfattet som tilfelle da jeg var der, kommer til syne gjennom feltnotater. Selv om jeg som forsker ikke initierte læringssituasjonen som skulle studeres, var jeg i stor grad til stede i datagenereringen.

> «… det å dra med seg så mye utstyr skaper en avstand – når jeg syns det er vanskelig å ta plass så tar jeg kanskje enda større plass.» (Egne notater)

Sincerity og refleksjon går her ut på hvordan jeg oppfatter at kameraer og utstyr skaper en distanse. Ikke bare endrer det praksisen som utspiller seg og blir en del av det intersubjektive rommet som påvirker kontekst og relasjoner, det gjør også meg som forsker til en aktør i praksisarkitekturen. Usikkerheten rundt egen rolle påvirker også datagenereringen. I videre notater kommer usikkerheten omkring hva som observeres, til syne.

> «Kan jeg stole på egne observasjoner? I det å vite at man ikke får med alt ligger en uro i å fokusere feil.» (Egne notater)

Notatet viser den kjente utfordringen det er å velge ut hva man fokuserer på, og tanken på at dette er med og påvirker det jeg observerer av praksisen som utspiller seg.

Gjennom videodata blir den utfordringen til en observerbar del av datamaterialet: Forskerrollen inngår i feltet som en del av praksisarkitekturen ved elevenes fokus på kameraet de har blitt utstyrt med.

Det materielløkonomiske rommet er endret av den materielle virkeligheten som nå består av et kamera. Det sosialpolitiske rommet påvirkes ved at elevene filmer hverandre. Denne påvirkningen kommer til syne gjennom samtaler. «Hvem filmer jeg?» Det sosiale samspillet endres gjennom utstyr forskeren har plassert der. De intersubjektive rommene er ikke klart avgrenset og forstått.

Følgende data viser også hvordan forskeren har plassert elevene i en noe annen praksis enn den de er vant med.

Relasjonene elevene imellom, og språket deres, påvirkes av konteksten som inneholder forskerens blikk gjennom kameraet.

Ved gjennomgang av dataene blir det også tydelig at data fra første datainnsamling fortjener større plass i analysen enn å være et pilotprosjekt. Her ser det ut som om den faste strukturen som kan sees i data fra klasserommet, ikke er like gjeldende. Det fremstår uoversiktlig, men i dette ligger også mange interessante data. Elevene fremstår som noe mer enn bare elever med faste regler og normer for det å være elev i et klasserom. Gjennomgang av data fra klasserommet øker også innsikten om hvordan forskerens rolle i datagenereringen

endrer praksisen som finner sted, selv om det finner sted innenfor elevenes kjente rammer, som klasserommet kan sies å være. Heller enn å forsøke å skape data hvor jeg er minst mulig til stede, har jeg fokus på å være åpen, og etterstrebe økt refleksivitet og *sincerity* om hvordan jeg er til stede i dataene. Denne åpenheten skaper økt refleksjon rundt forskningsprosessen.

Konklusjon

I dette kapittelet har jeg hatt fokus på *sincerity* og refleksivitet som et mål i kvalitativ forskning. Dette har jeg gjort gjennom å være åpen om hvordan jeg har innhentet, eller i stor grad, vært med og produsert data, og diskutert hvilke begrensninger og muligheter metodologien muliggjør. Med utgangspunkt i dette har jeg sett nærmere på hvordan *sincerity* også innebærer å være åpen for hva dataene inneholder, selv om det var noe annet enn det som var synlig for meg ved første gjennomgang. Gjennom åpenhet om prosessen og åpenhet ut mot dataene fremstår ikke én av de gjennomførte metodologier bedre enn den andre. De forskjellige metodene for å generere data gir forskjellig kunnskap om feltet i fokus. Ved å bruke praksisarkitektur som analyseverktøy for å belyse egen plass i datagenereringen fremstår det tydeligere hvor stor påvirkning jeg har, uansett hvor lite direkte tydelig jeg er i videodataene. Dette er en nyttig måte å belyse egen praksis for å få økt innsikt innover, og økt åpenhet utover. Hvilke roller man tar i datagenereringen, avhenger av metodevalg. Det avhenger imidlertid også av hvem man er som forsker, og hvordan man finner sin plass som en del av de intersubjektive rommene i praksisen man forsker i. Noen forskere er mer synlige enn andre i datagenerering, men ingen er usynlige (Lofland, Snow, Anderson & Lofland, 2006). I omtalte praksiser ville jeg endre praksisen jeg ble en del av ved å være en mindre del av den. Ved å endre metode, ville jeg være en observatør av noens praksis heller enn en del av den. Ved gjennomgang av dataene ser jeg at dette ikke er mulig. Forskjellige metoder påvirker forskeren og forskningsobjektene, og dermed praksisen man og de er en del av, på ulike måter. Mye av det som er dokumentert, er samtaler hvor elevene ikke forstår hva de skal gjøre. Bruken av GoPro-kameraet gjør også dataene springende og ufokuserte. Dataene fra andre datainnsamling er også videodata, men det som filmes, er i større grad velregissert. Elevene kjenner sin plass og sin rolle, i klassen, klasserommet og i gruppearbeidet. Dataene er observasjoner av skoletimer og arbeidsmåter elevene er kjent med. Det som

er dokumentert, er ryddig, kameraene står (i stor grad) i ro, og teknikken fungerer. Forskerrollen i klasserommet fremstår også som mer avklart for alle involverte. Forskeren er en observatør med kamera som vil studere deres vanlige arbeidsmåter.

Endring av praksis endrer utdanning, og følgelig læring som finner sted. Gjennom endring av praksis endres også hva jeg lærer om åpenhet og selvrefleksivitet, og hvordan jeg lærer dette. Endringen av praksis er uunngåelig når man kommer inn som forsker, og man påvirker praksisen på forskjellige måter gjennom ulike metoder. Ved å trekke inn teori om praksisarkitektur for å belyse min egen rolle og plassering blir det mer tydelig hvordan jeg påvirker hele forskningsprosessen, og hvordan metodene jeg velger å bruke, påvirker forskningsobjektene og dataene som genereres.

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Students choosing digital sources: Studying students' information literacy in group work with tablets

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Abstract
The focus of this article is on digital literacy and students' use of digital sources. We are examining how students choose digital video sources when doing group work with tablets in a social studies project. The analysis centers on how students collaboratively negotiate and reason around their choice of video sources during an assignment about environmental issues. The data corpus consists of videos of group work. A sociocultural perspective on learning is employed for analyzing student participation. We explore how the tablets influence the group interaction and how the group members negotiate the process of choosing the video sources found online. The findings show that students do not discuss digital sources only in terms of the formal criteria for digital literacy, but in relation to their perception of how the video sources are presented. It is important to shed light on this aspect of students' use of tablets in school, because being aware of this facet could materialize in greater digital skills which in turn might expand digital literacy.

Keywords
Digital literacy, group work, digital sources, affordance, interaction analysis

Introduction

The article is focused on digital literacy and students' use of digital sources in group work, specifically their use of tablets in school. The use of mobile digital tools is now widespread,

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and as tablets have become more affordable and user friendly, they have become a learning resource in daily use in many schools (Furió et al., 2015; Kim and Frick, 2011). As handheld technological devices are now widely used in different learning environments at all levels of formal education, it is important to gain knowledge about how such technology affects learning. Since handheld digital tools give students access to multiple sources when doing schoolwork, we need to gain knowledge about how students orient themselves toward the sources that are made available through these devices. We also need more knowledge about what role handheld devices have in the interactions that take place in group work in school settings.

By closely examining interaction in these groups, we can produce knowledge that is important for mapping students' digital literacy. In this article, we examine how groups of students evaluate and negotiate around information sources in computer-supported group work on environmental issues. The group work was carried out in a social studies project in a Norwegian lower secondary classroom. We were interested in examining how students orient to different knowledge resources made available on and through their tablets. We examine the role the tablet and its content play in group dynamics and how this affects the students' decision making. In doing so, we analyze the interaction that takes place between the students in their groups and between the students and the tablet during the assignment. By examining face-to-face and face-to-thing interaction in student groups when they are discussing available sources, we can gain insight into how the group chooses which sources to use in their assignment. Through understanding the students' choices, we can also illuminate how they develop digital literacy and what the teacher needs to pay attention to when teaching digital skills. Employing a sociocultural and dialogic perspective, we analyze how students work in groups with tablets. This perspective emphasizes that the negotiation of meaning is carried out through interaction between people and cultural tools. To understand these interactions, we combine a sociocultural approach with the concept of affordance. Cultural tools have different affordances, and people have different abilities to perceive these affordances. Video data of group interaction that occurred during the project was subjected to a turn-by-turn analysis. When examining in detail what the digital sources afford the agents in the groups, and how the group members negotiate these possibilities, we can get a closer look at the students' digital literacies. This enables us to understand how the various dimensions of digital literacy appear in groups. The analysis aims to illuminate the following research questions:

- How do students make choices when selecting digital sources in a school assignment?
- How does the tablet influence the group interaction?

Background and review of relevant research

In this article, we analyze how students reason and negotiate around digital sources through dialogues within a computer-supported collaborative learning (CSCL) environment. CSCL is cooperation that is facilitated by digital tools (Stahl et al., 2014) and can mean collaborative learning supported by digital tools that takes place in different physical spaces or face-to-face communication. Arnseth and Ludvigsen (2006) make a distinction between systemic and dialogic approaches to CSCL. Systemic approaches look at how programs and apps affect the students' interaction and how the specific programs result in learning outcomes. Dialogic approaches focus on how the meanings and functions of discourse, tools and

knowledge are constituted in a social practice. We assume a dialogic approach to the collaborative work that took place in this study. Tablets enable new options for active collaboration among students in class activities (Avery et al., 2010).

The term "digital literacy" is a broad term, and it has been argued that it consists of multiple literacies rather than just one (Knobel and Lankshear, 2006). Being digitally literate means being able to understand learning and social interactions that take place in a digital context, both inside and outside educational settings (Potter, 2017: 387). Various literacies associated with the use of digital tools have been defined, such as information literacy (Eisenberg et al., 2004), computer literacy (Tobin, 1983), media literacy (Buckingham, 2007), and digital literacy (Gilster, 1997). As Talib (2018) states, agreeing upon one definition is difficult as the area of digital media is ever changing and dynamic. When seeing literacies as a practice rather than a skill, and a practice that is changing, schools should use tools in the classroom that can be used to adapt to these practices that are in motion (Stewart, 2015). This fits well with our sociocultural view on learning. According to Gui and Argentin (2011), digital literacy has three main aspects: theoretical, operational, and evaluation. Meyers et al. (2013) consider digital literacy to consist of technology skills, critical thinking capacities and contextually situated practices (Meyers et al., 2013: 361). We will focus on the evaluation dimension of digital literacy, which comes close to what is called information literacy. Miller and Bartlett (2012: 39) argue for what they call digital fluency, a form of information literacy that contains specific knowledge on how information from the internet works. The importance of source criticism is evident in the evaluation of any information source. With the internet and digitalization ever-present in all areas of our lives, we have to evaluate numerous information sources. Some of the more formal criteria as to how to evaluate sources are questions such as: Is the information objective? Is the information valid? Who is the writer and what does the writer want to accomplish? How old is the source at hand? Research shows that how students evaluate different information sources is sometimes on the basis of intuition rather than formally defined criteria (Walraven et al., 2009). Studies have shown that when students evaluate sources, they focus on why the sources are relevant to the task rather than on the reliability of the sources (Coiro et al., 2015). In their study of how students evaluate information online, Walraven et al. (2009) found that the main criteria for the students were the sources' connection to the task they were engaged in and the title, language and appearance of the information. Metzger et al. (2015) looked at how children evaluate information they find on the internet. The research shows that the students who rely on what others tell them do not critically evaluate the internet sources in the same way as the students who are more open to exploring different perspectives. In a study about reading and navigating on the internet in secondary schools, Frønes (2017) found that only the strong readers manage to read critically and to evaluate online sources. Miller and Bartlett (2012) argue that teachers often consider students' digital fluency to be poor and that they need to be taught how to approach information on the internet critically. Giæver et al. (2017) examined how teachers understand the part of digital literacy that concerns evaluating information and found that they mainly consider this evaluation to be about source criticism, digital bullying, and netiquette. The findings showed that the teachers did not feel they have enough competence when it comes to understanding what digital literacy is about and how it should be taught (Giæver et al., 2017; Pusey and Sadera, 2011). There exists important knowledge both about learning with tablets and digital literacy in school. However, we need more detailed knowledge about how students use and argue for the different sources and how tablets influence group work.

We aim to generate knowledge about how students negotiate meaning when different sources are at hand and how this can be an implication of their literacy. In this article, we will scrutinize how students discuss and evaluate the digital information and how the tablet is affording information as part of the group discussions.

Theoretical framework: A sociocultural perspective on tablets in groups—Affordances and abilities

In assuming a sociocultural perspective on mobile learning in groups, we approach learning as a social process that takes place through dialogue and the use of cultural tools (Vygotskij et al., 1978). Learning is viewed as negotiation of knowledge and participation in social practices (Wenger, 1998). This fits well with the above mentioned view on literacy as a social practice. Learning is seen as taking place both within groups and on an individual level, and these two levels of learning are entangled in the learning processes (Greeno, 1998; Sfard, 1998). The basic unit of analysis in Vygotskij's theory is mediated action, or action operating through mediational means, such as language (Wertsch, 1998). In the sociocultural tradition, there has been an interest in how technology can support students' learning (Hmelo-Silver et al., 2007; Kyza, 2009; Roschelle et al., 2010). According to Koole (2009), mobile learning takes place at the intersection between the technical tools, the social practice and the persons learning with the tools—in our case, members of student groups.

The tablet as a cultural tool is both a physical object and a provider of numerous information sources. In our analytical work, we employ the concept of affordance, which guides our investigation of how the tablets provide different ways of interacting, both in relation to the tool and to group dynamics. The theory of affordances goes back to Gibson's ecological approach to visual perception (Gibson, 1986). Gibson's view on perception and action focuses on the interaction between the agents and the environment. According to Gibson, perception does not merely consist of how we construct the environment, but also of physical and mental processes that give information for the agent's activity. Affordance can be understood as what the environment affords the perceiver. However, affordance is not merely what the environment has to offer the perceiver, but what the perceiver sees that the environment has to offer. This means that both the environment and the perceiver define the affordance.

The concept has also been used in the study of human–computer interaction, and Norman (1999) has redefined the meaning of affordance to include the perceiver's earlier experiences, former knowledge, and culture. This has parallels to the sociocultural view on learning, where former knowledge and culture play an important part in the learning process; however, Norman, as does Gibson, focuses on the individual (Kaptelinin and Nardi, 2006; McGrenere and Ho, 2000). From a sociocultural perspective, Greeno (1994) has used the concepts of affordance, agents and abilities as a way of analyzing activity. As opposed to Gibson, who focuses on the individual, Greeno focuses on interactive processes where agents cooperate with other agents and the environment, or the physical systems with which they interact. This interactional view of perception is useful as we are considering group work. The activity taking place is reliant on the interaction between affordances and abilities. The activity of conversation, among other things, consists of the agent's ability to speak and perceive the language.

The affordance is different for different agents, depending on what Greeno calls the agent's ability to perceive. Whereas affordance refers to what it is about the environment that contributes to the interaction, ability refers to what it is about the agent that contributes to the interaction. Greeno underlines that the affordance of the environment is both dependent on the abilities and the constraints that the agent recognizes. Our focus is how the tablet affords different types of interactions as part of the learning process. We find studying face-to-face interaction to be a useful way to grasp these affordances through the students' conversations. How do students perceive what the tablet has to offer, and how is this negotiated by the group? According to Greeno (1994), people have different abilities to gather information in their activities, as they have different learning trajectories. We focus on the ability to perceive not ability to learn and understand. All students have the ability to perceive affordances, regardless of their learning skills. We chose affordance as a theoretical viewpoint when examining the data as we were seeking to look at the individuals within the group and how they each reason for their choices. We argue that how they make their choices depends on their abilities to perceive what the tablet affords.

In our analysis, we look at different spheres of affordances, as different things, settings and situations can all have affordances. We consider affordances located in the physical sphere, the informational sphere, and the social sphere. By using affordance as a theoretical lens, we analyze how students' orientations to the tablets' affordances influence the student groups' ways of carrying out the activities. By analyzing the interactions, we get an insight into the students', or agents', abilities to perceive. This, in turn, gives a valuable insight into the students' digital literacy. In this article, we look at how learning is achieved through the use of tablets and how this tool is modified by the ways members of student groups use it. By examining the face-to-face interactions of students using tablets, we can gain insight into how individuals within the group view what the tablet can afford the individual and how this influences group learning.

Research design

Settings and participants

The data upon which this article builds was collected in a ninth grade classroom at a Norwegian secondary school. One class with 24 students was followed during a project in social science that lasted for 15 lessons within the course of one week. The students were 14–15 years old. All the students had their own personal tablet that belonged to the school. Some only used this tablet in school and for schoolwork, while others used it as their private tablet as well. They were working on a project on environmental awareness the whole week. The project consisted of different tasks each day, and they wrote blog entries for each task. They wrote about how they can make a difference, such as sorting trash, walking instead of driving, showering less, eating less meat, etc. Either they wrote a blog entry together as a group, or they wrote individual blog entries, which they discussed within the group.

Only one entry from each student was put up on the group blog, and only one group blog entry was put on the class blog. The students choose if the individual blog should be open. The group blog was open for the school, and the class blog was open online. During the week the project lasted, they made several different blog entrees. Within the group they agreed on which one they thought was the best, and that was the one they got graded on.

The focus was the group work that took place following the assignment to find one information video that they could discuss and explain to others in a blog entry. The setting was the classroom, and the participants were the students working in groups. We looked at six groups, each consisting of four students. The activity we observed was how the students negotiated meaning when looking at information videos. The task they worked on was to find an online video about environmental issues that they could write about in a blog entry. The teacher gave them some examples of videos to choose from, and they could either use these or find their own videos. We looked at how the students argued for or against the different videos at hand.

Method and analytical procedures

The study was a qualitative case study focusing on groups of students. The data corpus consisted of two parts: (1) interviews with the teachers and the students, two teacher meetings, observing the class before the project started, field notes, the final class blog products, and full-class video, and (2) video data of the group work. The first part of the corpus was employed as background data, whereas the second part was the primary data for this study. The first author video-filmed all 15 lessons that were collected. The total corpus of video data consisted of 15 hours, of which 6 hours were on the group work interaction. Action cameras were used to film the group work, as a way of seeing both what was happening within the group and what was happening on the tablets. The analysis of the talk-in-interaction was partly informed by ethnomethodology, where the aim of a study is to look closely at how people make sense of the world and the methods they use to follow social orders (vom Lehn, 2014). We also employed coding strategies, as described below. We studied what the conversation was leading up to and how they negotiated meaning and came to an agreement. The video data were categorized according to the different group tasks. In order to get a closer view and insight into what is happening in the material, the main part of the video material was transcribed. This made it possible to look at patterns within the total data corpus. We focused on the conversation and the use of the tablet when the students were discussing digital sources. The focus was on the conversation and tablet use when discussing the digital sources at hand. We looked at interactional episodes where the students were disagreeing and had to reason as to why they wanted to use a specific video. The students' actions were coded according to different affordances and abilities that appear in the data material. We have selected interactions that illuminate our research questions.

Data analysis

The teacher's aim with the project was to increase students' awareness and knowledge about environmental issues and encourage them to reflect upon how they can make a difference in saving the planet. This was done through different assignments, that all became blog entrees. Being critical about the use of digital sources was not an explicit part of the task. The project was carried out as full class teaching, group work and individual work, and individual homework.

When the project started, the teacher distributed formal criteria to guide the students in their work on the assignment. The task we focused on was each of them finding a video online to present on their group blog. We were interested in the reasoning behind their choices that was revealed in their discussions while performing this task. The students found

different videos, following either the teacher's tips, or other information sources they pursued, such as YouTube videos about environmental issues. They also needed to write about the video in their own words. By analyzing the conversations that took place, we observed the different affordances the students explicitly make relevant in the data material. These affordances in turn gave insight into the students' digital literacy.

Available affordances

The data show that the students approached the information sources differently. Their different arguments become a part of the meaning making and reveal the ways in which tablets affect and are affected by the group dynamics. The focus is the affordances the students see in the videos on the mobile digital tools when used in a school context. In many cases, the criteria given by the teacher for the assignment at hand also played a big part in the conversation and negotiation of meaning that occurred. Some of the affordances available to the students were similar in each group. These are the affordances provided for the activity that were physically present in the environment, and which were part of the background for the analyses. These include the physical presence of the tablet and other affordances that were located in the physical sphere. The assignment given by the teacher is defined as a set of affordances contained in the information the teacher conveyed about the assignment. Such affordances are located in the informational sphere. A third set of affordances is provided by the social practice of group work in school and represents the affordances located in the social sphere. Group work in school is a setting that the students know, but what it affords differs for different agents. As the students looked at different videos, the affordances provided by the videos and the video content was different in the different groups. This can be considered the fourth sphere, and, in the analysis, we sought to gain more insight into how these affordances, in addition to the agents' abilities in interaction, made the activity possible. We sought insight into other affordances that were not as visible, as well as insight into the students', or agents', abilities to perceive the affordances.

Findings

When analyzing the data, we identified three considerations on which the students based their evaluation of sources, which are of special interest.

- How a topic is presented in the sources?
- To what extent students can extract information from the sources and rephrase it with their own words?
- How easily accessible the information in the sources is?

The following episodes have been chosen to illustrate the different considerations. They show how the discussion and interaction led to the agreement as to which video they were going to use for the blog. The data show that the tablets afford different things for different students, and for different groups. What they consider to be the tablet's affordances can be seen by analyzing their interactions. Even though the students perceive different affordances, how they constitute their meaning is part of a social and collective process and not the product of autonomous individuals alone. In the social process, the students' knowledge and meanings are recreated, reproduced, renegotiated, reconceptualized, and recontextualized.

Evaluation of topic presentation

In the following episode, a group of four students has watched two different videos. Both videos are about environmental issues and how and what humans can do to save the planet (see Figure 1). They are discussing which one of the videos they should write about in their blog entry. In video 1, the main focus is on what we can do to save the planet. It gives the viewer tips on how we, as individuals, can make a difference. Video 2 is more descriptive and informational. It explains how the way we live affects the planet and how pollution leads to natural disasters. Student 4 (S4) has seen video 1, and students 1, 2, and 3 (S1, S2, and S3) have seen video 2. The extract starts with S4 showing the rest of the group video 1 on her tablet. She is holding her tablet so the others can see. After watching video 1 together, S4 watches parts of video 2 on her own tablet. After viewing both videos, they are discussing which one to use in their blog. S2, S3, and S4 argue for video 1, while S1 argues for video 2.

All members of the group have seen both videos and are discussing which of the two they want to use when writing a blog entry. Student 4 holds the tablet throughout, showing the others video 1. The data indicate that the tablet does not need to be held to stand up in this way and that this way of presenting the tablet is an exception. In line 1, S1 states that he prefers video 1; however, he does not provide an account of why he prefers it. He also states that it is fine by him (to use video 1). In line 2, S2 states that she likes video 1. As a response to this, S3 says that it is fine by him, repeatedly, but the rest of the conversation shows that he has arguments for preferring video 2 (line 7). In line 5, S3 nods toward S4's tablet, thus

Talk	Gestures/Actions
	The group is watching video 1. S4 semi-embraces the tablet and presents the screen to the others throughout video 1.
1. S1: I liked the other better (*ref. video 2*), but it doesn't matter.	Holding his tablet without pressing any buttons.
2. S2: I liked it (*ref. video 1*).	
3. S1: Ok, fine then.	
4. S3: It kind of says what is going to happen, what might happen. But not what is happening (*ref. video 1*).	Nodding towards E4`s tablet (video 1)
5. S1: No, right. It was information there (*ref. video 2*).	
6. S2: But it was more motivating (*ref. video 1*). This was like "everyone dies" (*ref. video 2*).	Points towards E4`s tablet (video 1), then to her own (video 2)
7. S1: Yes, but it is facts, it is true. It will happen.	Tablet has gone black.
8. S2: Yes, but this motivates you to do something (*ref. video 1*). This one says that it is bad and stuff (*ref. video 2*).	Shows on E4`s tablet, then her own.

Figure 1. Evaluation of topic presentation.

displaying an orientation to the video it showed, and argues that this video explains what might happen as a consequence of pollution. S1 picks up on this position as a way of arguing for video 2, which is the video he prefers, by saying that video 2 gives more information about the situation in the environment. S2 responds by explaining her reasons for preferring video 1. She argues that it is more motivating, while video 2 is "bad and stuff." In line 7, S1 argues that video 2 gives the right information and facts compared to video 1. He does not refer to the tablet to underline his argument, as the screen has gone black. S2 stresses her and S3's argument about how video 1 leaves them more motivated to make a difference. The group ends up using video 1. While we cannot say for certain what the determining factors for these decisions were, we can follow what aspects the participants in the group work made relevant in their decision-making process. The way the information sources are being presented affects the students' choices. What part of the presentation of sources that comes across as affordances in the video, which in turn makes the activity of writing a blog entry possible, depends on the agents' abilities. As abilities are internal to each perceiver, this is something we cannot fully assess. However, we argue that part of their abilities can be seen in their actions. S1 has the ability to see and perceive a set of affordances in the video content. These affordances come across as something that, to him, gives trustworthiness to the video. On the other hand, it seems as if the other students see these as constraints rather than affordances, which in turn makes writing a blog entry difficult. On the other hand, these students have the ability to see the affordances in video 1 that leave them with a feeling of hope and tell them how they can make a difference to save the planet. These different affordances and abilities lead to the activity of interacting and discussing which sources to use. In the social interaction, the students' knowledge and meaning are negotiated and renegotiated throughout the conversation. In the group work, different affordances come into play that contribute to the interaction, and the different agents have different abilities to perceive these affordances. The three girls in the group seem to perceive the same affordances in the video, and the social process strengthens these abilities as their meanings are recreated when others' thoughts add to their abilities to perceive the affordances. In the same way, the constraints in video 1 become more evident as the interaction plays out. As one boy in the group is disagreeing with the rest, the social process does not afford for him to renegotiate his meanings and knowledge, and this might also be constrained by his abilities to do so. The example shows how different students perceive the affordance of what is being presented differently. Some have the ability to see the affordance of leaving them with hope important for the activity at hand, while others have the ability to see the affordance of the facts and trustworthiness in the sources as a way of carrying out the activity.

Potential for recontextualization

The data shows that the students made their choices based on how they saw it possible to recontextualize the content and recreate it in their own words (see Figure 2). In other words, they responded to the affordance that the video on the tablet offered concerning the ease of putting the content into their own words. This is important, as they were required to write a blog entry based on the video they watched. In the following episode, this task is the focus, but their abilities to perceive the affordances they consider important for this activity differ. In the following episode, we are looking at a different group. The dialogue taking place is mainly between two students, S1 and S3. Before and after the excerpt, it becomes evident

that two and two (S1 and S2, S3 and S4) are agreeing and that this is the typical arrangement within this group. Towards the end of the transcript, S2 participates in the conversation. They have all looked at two videos that are very different, one with much text and one with many pictures. They disagree on which video makes writing a blog entry easier. In the next example, the students are arguing for their preferred choices by discussing how they best can appropriate the information in the different videos they have seen.

In the opening utterance, the student presents a closing question with a positive notation: "So, should we take that video then?" without providing an opening for the discussion. S1 responds in a way that shows that she does not agree. She tries to recognize her peer's thoughts, but she also questions his decision and wants him to elaborate on how this can be used as the basis for a text. In line 3, he tries to elaborate on how he thinks the text can be used, but his statement is cut off by S1 repeating her concerns about the difficulties of using this video to work on the given assignment and how she finds it difficult to follow. The dialogue continues with S3 explaining what can be said about the video he has seen. He tries to reason with many facts, but stutters. In lines 5–10, S3 tries to explain, and S1 responds only by repeating the acknowledgment token "hmm" to confirm that she is listening but not giving much confirmation to his reasons. S1 is not convinced, but lets him talk. After S3's last remark in line 9, S1 responds by suggesting another video they can use. She explains that it contains mostly pictures and not so much text and that it is quite short (4 minutes). In line 12, S2 enters the conversation by underlining what S1 said about the video they have seen. In line 14, S3 argues that the video he has seen is easier to write about. In line 14, she asks S3 if he is interested in seeing the video. He does not reply, but she elaborates in line 16 how there are more pictures and not so much text and how this is better for their written assignment. The dialogue ends with the group not managing to agree on which video to use, and the teacher comes in to help by further questioning them about the reasons for their choices.

The analysis shows that one way the students reason for their choices is based on the perceived availability of the information for recontextualization. In line 2 of the transcript, S1 questions how it will be possible to write a text for the blog about video 1. Following this, it becomes clear that the focus for the interaction, or the activity, is the redistribution of the video content, and this is what the conversation focuses on. The students' abilities to perceive the affordances of the video vary. S3 has the ability to perceive what video 1 affords when there is more text. S1 and S2 have watched another video that mostly consists of pictures. S1 has the ability to see a video with many pictures as one that affords the activity of redistribution of the content on the blog. This shows how the information in the sources is evaluated, and what it affords varies from person to person. Some evaluate a video with many pictures and less text as good for appropriation, while others evaluate the same video as a bad information source for appropriation. As the students' individual abilities are being recreated and renegotiated in the interaction and social process, what the video affords can be reproduced. Some members of the group argue that it is easier to redistribute the information from the video with much text, whereas two others seem to think that it is easier to appropriate the information for the blog from the video that mainly consists of pictures. As Greeno (1994: 338) states, affordance and ability are reliant on each other, and it might also be a lack of ability from the agents to reach agreement on the desired activity. In a social process, meaning and knowledge are recreated, but for this interaction to take place, the agents must have the abilities to perceive the affordance, which in this scenario does not seem to be the case. Following the dialogue, it becomes clear that they each have their own

Talk	Gestures/Actions
1. S3: So, should we take that video, or…? *(Ref. video 1).*	S3 shows video 1 to S1 and S2 on his tablet. S4 is partly watching a different video on his tablet, with headphones on.
2. S1: Well, it was kind of, it was very nice, and it explained very well, but how are we going to write a text about it? Do you think that it will be easy to write a text kind of about that video or…?	S3 turns the screen towards himself and collects the tablet.
3. S3: We can bring in what is happening for in, øh-eh, what is happening to the earth.	
4. S1: Because I could not quite follow what was…	
5. S3: But kind of what they are saying, right, what they say like that they say, right, when they say, they say, yes, we can kind of start in what, what, what, what, which place they say in the video. For example, that the ocean rises. Because of ice melting, right?	S4 watches a different video and does not engage in the conversation.
6. S1: Hmm	
7. S3: If it comes to, if every one in a way, if all the ice. Everything on the North Pole and South Pole and it melts then takes, eh.	
8. S1: Hmm	
9. S3: The water, more sun or in a way, eh, yes, those areas take more sun.	
10. S1: Hmm. We found a video, lasts 4 minutes *(video 2).* There it is not so much text really, they don`t say so much. But there are very many <u>pictures</u> in a way.	Points to her own tablet.
11. S2: About what is happening.	
12. S1: Hmm	
13. S3: I would say that this video here would be really more easily written.	Points to his tablet.
14. S1: Would you like to see it? Would you like to see the one on 4 minutes? It is kind of mostly pictures, but it is kind of a little bit of text also, so it is kind of in a way. Yes, eh, it is called: "Four-minute video that will change your life forever! Save the environment!"	Reads from her tablet.

Figure 2. Potential for recontextualization.

reasons for their choices. The group ends up not agreeing and needs help from the teacher. With this help, the students might gain a better understanding of the abilities other individuals in the group have to perceive other affordances in the video that can facilitate completing the assigned activity.

Ease of access

When working with information sources, the data shows that the students have different views on what makes the videos accessible (see Figure 3). This again depends on the students' different abilities to perceive what the video affords. In the following episode, we are looking at a different group. Their task is to write a blog text about one of the videos they have watched. Before they start writing, they have to agree on which video to write about. This activity of coming to agreement about a suitable video depends on each individual's abilities in interaction with the video's affordances and how these are negotiated and renegotiated in the group work. In the following dialogue, they are mainly discussing the activity of watching the video, which can be considered an intermediate goal in the assignment.

Talk	Gestures/Actions
1. S3: No, this was boring…	Everyone watches the video on the same tablet.
2. S4: You only want to use the one with Leonardo in it.	
3. S3: No, but I think this one was boring. But it does not matter to me which one we use, but this was boring.	
4. S2: Give me the tablet.	S4 hands S2 the tablet. S2 finds a video.
5. S1: This is with a dialect.	Referring to the video on S2's tablet.
6. S2: Yes, but it is good. We just put it here, we don't have to watch the whole video.	Saves the video.
7. S4: We have to watch it.	
8. S2: Why?	
9. S4: Because we have to write what it is about.	
10. S1: Continue watching then.	
11. S3: He is talking dialect, we cant…	
	S2,S3 and S4 are watching the video.
12. S1: How long does it last?	Finds a different video and starts to watch.
13. S2: But that one is in Danish.	
14. S1: This one is NOT Norwegian.	

Figure 3. Ease of access.

When they are choosing which sources to use, they mainly focus on the video's affordances in the activity of watching it, and not on using it as the background for a text.

In line 1, S3 and S4 are watching a video together. As S3 states that it is boring, S4 replies, asking if she only liked the one with Leonardo (DiCaprio) in it. S3 tries to convince the rest of the group that it does not matter to her which video they choose for their blog entry, when S2 says in an ironic tone (line 4), that it seems like she (S3) cares. While the others are talking, S1 is searching for a video on his tablet. He starts one and states that they are talking with a dialect, meaning that that video is not so interesting (line 5). In line 6, S2 seems to think that this is not a valid reason for not choosing the video that S1 has been watching. As they keep watching the video, S3 also comments on the video host's dialect (line 11). S1 searches again for a different video, and finds one in Danish. S1 and S2 are agreeing, without debating, that the language makes it irrelevant to them (lines 13 and 14). The group keeps watching different videos, but they finally decide to use one of the first ones that they watched—giving the reason that they had watched the entire video, and it was not too long. This gives an insight into how they chose digital sources before they considered the assignment. In the interaction, the element of who narrates the video (Leonardo DiCaprio) is an affordance that, with this agent's ability, makes the information in the video more accessible. This can also be seen as a preference. In this case, we argue that a preference is an affordance that can reframe the student's ability to perceive, and thus facilitates the activity of watching the video. Another affordance they seem to focus on is the duration of the video. Again, they are focusing on affordances that do not challenge their abilities to perceive, as they chose the video with the shortest duration, which in turn does not afford as much as the longer video. S1 is watching a video where the presenter speaks a dialect. Following the interaction, this is considered a constraint of the video, rather than an affordance. The students show that, in choosing video sources, they consider the video's accessibility to the viewer as significant. This does not relate to how accessible the information in the source is, only how it is presented. Therefore, the video in Danish might be considered in the same way as the video in the dialect. In the group interaction, constraints are made more relevant than affordances. By focusing on constraints, it is difficult to make room for one's own abilities and in turn carry out an activity. Following this, they seem to focus on eliminating constraints rather than choosing to put their abilities into play with the video's different affordances. The above interaction shows how abilities and affordances are renegotiated and recreated in interaction and social processes.

Discussion and concluding remarks

In this article, we examine how students interact when choosing digital sources in a computer supported collaborative learning environment. To illuminate this, we focus on two research questions: How do students make choices when selecting digital sources in a school assignment? and How does the tablet influence the group interaction? This exploration gives insight into how students reason for their digital choices and their digital literacy. The study contributes to the research by concretizing which aspects affect the choices made. The analysis shows that the students choose digital sources on the bases of different criteria. The results indicate that formal criteria for digital judgment, such as who has made/written the source, how old it is and whether the information source is based on facts are not taken into consideration in this setting. Instead, what is considered when discussing the digital

sources are (1) how the topic is being presented, (2) the source's potential for recontextu-alization, and (3) how easily accessible the information is.

In example 1, the students are disagreeing on which sources to use depending on the focus of the representation. Some think that the one with statistics and numbers seems more trustworthy, while others prefer the video that leaves them with more hope for the future. These preferences affect their interaction. The data also shows that how the digital sources are presented affects their trustworthiness. The students are discussing how pictures and text are presented together and also that who is presenting the film has an impact on their choices. The conversations give insights into how the tablet, and the different sources made available through the tablet, afford different things to different students. The findings show that, when choosing the sources, what the teacher says about the different videos is important for the students' further argumentation. They discuss what is a better source to meet the teacher's requirements for the assignment. Our findings show that even if the teacher is not present in the group, and they are free to choose their own sources, the teacher's suggestions still have a strong influence on their choices and lend strength to their arguments. The group dynamics become evident in the way that the tablet as a physical object affords different actions for the perceivers.

Research has shown that students do not have a reflected perspective on how they evaluate information online (Walraven et al., 2009) and that their reasons for their decisions are made based on the main criteria of title, language and appearance. This also seems to be the case in our study. As mentioned, the students were not specifically asked to look critically at the sources, and, in our examples, we see in their conversations that they do not reflect on how they evaluate the information and the video sources they use. In addition, we have focused on how their decision making takes place in a face-to-face group interaction. Other studies show how the information's relevance to the task is a main criterion (Coiro et al., 2015). This is confirmed by our analysis as well, in that the students use other than the formal criteria for information literacy to evaluate information sources. It also shows how the tablet is easy to share when working in collaboration with others (Fisher et al., 2013). As seen in our research, the tablet becomes a part of the interaction taking place, and in the meaning making between the students. This gives better insight into how they evaluate the information at hand. Metzger et al. (2015) have used different criteria, but according to our study, it seems that the lack of willingness to explore different perspectives shows a lack of digital skills.

As a theoretical framework, we have used the concepts of affordance and abilities to perceive. This is useful when analyzing the interaction, as it gives a greater understanding of how the students reason in choosing video sources. As abilities are internal in each student, we only see the parts that the students act out, but by analyzing the interaction, we get an insight into the students' abilities to perceive the different affordances. We found that the students' different abilities to see the affordances in the digital sources made available on the tablet vary, and in interaction the abilities are reproduced and renegotiated. This is a useful way of illuminating the students' choices. In accordance with the above-mentioned studies, our study gives insight into how the students negotiate meaning and evaluate sources in action. We have also have focused on how the tablet is an important factor in the social interaction taking place when the students negotiate meaning concerning which digital sources to use when working on a group project in social sciences. This is seen in the conversations, as the students have to argue for their choices to their peers. It is through these interactions that we get an insight into their abilities to perceive affordances in the tablets and their content.

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Action camera: First person perspective or hybrid in motion?

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Action camera: First person perspective or hybrid in motion?

LIV LOFTHUS and LARS FRERS

In this article, we discuss the usage of action cameras in research. First, we elaborate on the idea of the camera providing a first-person perspective, possibly giving access to the research participant's subjectivity, and discuss this critically. Our discussion of these issues is based on data that was produced in two different research settings where action cameras were distributed to groups of students; one setting was an outdoor museum and the other a classroom. Second, we examine how using the action camera in research creates different hybrids involving the camera, the person carrying it, and both present and absent others. These hybridisation processes become evident in different ways. We argue that the camera is treated as a hybrid in four different forms. Arguing with these hybrids enables us to more adequately highlight aspects of the research process than understanding the action camera as providing a first-person-perspective.

INTRODUCTION

People move about in the moving and shaking images that unfold in the recording of the action camera. We look at the screen, trying not to be made nauseous by the wobbling up-down-around that we witness. At the same time, we try to understand how our experience as researchers overlaps with the experience of those that we see, including the person that is wearing the action camera. We are not part of what we see as embodied researchers, but we often encounter traces of us in the action that develops on the screen. We try to make sense of this complicated, embodied, and hybridised action and of the overlapping of different perspectives that display themselves in the recordings.

The use of action cameras to gather research data is becoming more and more widespread (Vannini and Stewart 2017).[1] In this article, we look at data generated in two different school-related research projects using action cameras. The main reason for choosing this approach was that, according to the literature, action cameras can give the researcher a first person perspective on what is taking place, offering an insight into the world as it appears to the research subject (Lahlou 2011). According to Pink (2015), who develops and refines Lahlou's argument, the cameras worn by the participants can act as an expression of the subject's perspective. The first person perspective introduced through the camera may also help maintain a neutral and naturalistic approach to qualitative studies. Another intention connected to handing out a camera to research participants, is to give them increased control over what is represented in the study (Kinsley, Schoonover, and Spitler 2016). Action cameras have often been used to film sporting actions, or nature experiences, trying to record spontaneous reactions, feelings and experiences (Brown, Dilley, & Marshall, 2008). Regarding the claims made above, Pink makes it clear that these must be treated with caution, and that we never get total access to someone else's experience. She states:

> [...] the use of first person image recording technologies does not limit 'intrusion' but rather implicates the role of the researcher/ research technologies in a rather different way, which means that the site, nature and quality of researcher-camera-participant intersubjectivity shifts, and this is one of the relationships that needs to be reflexively explored (pp. 245–246).

In this article, we will discuss the different ways in which perspective (first person and otherwise) and the involvement of different actors is negotiated in the recorded action. Our first argument is that we need to refine the understanding of what a first-person perspective actually is or entails – we will do this in a brief detour, where we visit the concept 'first person perspective'. Following this, we put forward the argument that positing the relation of the researcher, camera and participant as being 'intersubjective' is not going far enough, and that it is more productive to approach the relation between those involved as a hybridisation. We will begin with discussing these two

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arguments conceptually and then move on by examining our data to further qualify these notions.

Before we move into the discussion of the first person perspective, we want to briefly place this study in relation to a few select publications on action cameras. In one of the earlier studies using action cameras, Kindt employs them in a classroom setting, providing them to the students. The reason for this was to see 'through the eyes of the students' (Kindt 2011, 180). Kindt argues that the biggest benefit is to get the participants' view on what is happening, thus implicitly proposing a subjective first person perspective. The action camera makes it possible to see things he has not seen before, such as observing what is done when the students are divided into groups. He points out that these cameras can pick up the teacher's talk and how the teacher behaves, making it possible to study body language and how this appears to students in the classroom. He also discusses other aspects such as the camera's contribution to increased pressure on the students to perform, as the teacher (who can use the camera as a tool to develop her or his own practice) sees everything and thus increases surveillance, while at the same time opening new insights into collaborative work (Kindt 2011).

Kinsley, Schoonover, and Spitler (2016) discuss the issue of the first person perspective more explicitly. In their study, action cameras are used to observe how students orient themselves in a library. This is done to get a better insight into the first person perspective, the students' experience in real-time, and to increase the researcher's ability to observe and understand the challenges the students encounter when they orient themselves in a library (Kinsley, Schoonover, and Spitler 2016) . Waters, Waite, and Frampton (2014) have conducted a study about children's play in which they equip the children with action cameras during play. The researcher's argument for choosing this approach is based on a critique of the standard camera as giving an impersonal, insensitive and distant and supposedly objective way of watching the children's play. They argue that the action camera gives a first person perspective on what is happening and that this can counteract thinking video as a distancing tool, one that would suppose a more unfiltered way to observe than regular in-person observation. The authors' point is here that even though the camera's recording might detached, the person using it still filters what he or she is filming. Attaching an action camera to the children is repositioning the researcher. The researcher is thus

asked 'to take a "child's view" on the world, [...] to take a view on themselves and to interrogate responses they make as both subject and researcher' (Waters, Waite, and Frampton 2014, 24).

This article is not intended as a review of existing and now burgeoning research that employs action cameras, the above glances at existing literature only serve as brief pointer to different ways in which action cameras have been used in research, and how this research raises the issue of the first person perspective and the relations between camera, participants and researcher. As has been discussed by Pink (2015) and others, the challenge here is to walk the fine line between assuming that a so-called first person perspective gives (some) access to a subjects' perspective, while not pretending that the analysis will naturally become less biased or not rely on many of the same (re-)constructive moves that are involved in other, more established or 'less innovative' approaches to data analysis. Thus, we align with the argument that the researcher is still the main subject in the analysis of recorded data and we contribute to this perspective by further inspecting the contents of the peculiar 'black box' of the action camera, in which the world is constituted through a mobile lens attached to a person. We will employ two terminological registers to achieve this goal. On the one hand, we will use the well-established concept of *affordance* established by Gibson (1986), Greeno (1994), and Norman (1999). This will allow us to focus on the specific role of the action camera as a thing that affords specific actions under specific circumstances. We will not spend much time on this term, as it is frequently used in the relevant literature, even though it is not uncontested. On the other hand, we want to examine our data with an epistemological approach that looks at agency as a distributed phenomenon, creating different kinds of hybrids or assemblages and producing effects that go beyond the realm of intentional object-subject relations. (Pickering 1995, 54) From this perspective, we can ask how the action camera enables the researcher and the one who is wearing the camera by giving access to new or different actions. How does it figure into and produce hybridised situations, where the researcher-as-camera is weaved into (and out of) the field of action that includes those that record and are recorded in multiple open-ended ways?

One of the central issues in this context is getting to grips with the multiple ways in which the camera, the person wearing it, co-present others, the present or absent researcher (i.e. the person responsible for the research project and doing the analysis – not the

participants in the study), and the making of the recording as a process figure into the data production. Also, how the agencies of the different components involved in the recording process overlap, conflict and fold into each other in impure ways. When looking at the world through the eyes of another, as we will argue, this 'other' is a subject-camera *hybrid*. If we as researchers want to account for what happens in the recordings, we need proper conceptual tools to understand and disentangle the recorded action.

In the next section, which can be read as a kind of digression, we will discuss the roots of the concept of the first person perspective, and argue for why it is important to differentiate between various kinds of first person perspectives. We will then return to discussing the different hybridisations that play out in the field, before diving into the data, analysed with the different hybrids as lenses.

CONCEPTUALISING FIRST PERSON PERSPECTIVE

How to understand the construct 'first person perspective' is obviously of terminological importance. While it has been addressed in the context of (auto-) ethnographic research (Chandler and Torbert 2003), it has to our knowledge not been addressed in a sufficient manner in existing literature on the use of action cameras as research tools. Before being used in relation to film and video recordings, 'first person perspective' was employed to refer to a point of view used to tell the story in a written narrative in the I and me form, as opposed to a second or third person perspective. As the medium we refer to here is different, we will only briefly address the classical use, and then contextualise the term further by pointing to its use in film and movies. Following this, we briefly address its use in computer games before we discuss the concept of first person perspective in the context of producing video data. We want to inspect these facets of the term a bit closer, to determine what is useful or not and why in our context.

In a *narrative, or written story*, the first person perspective is used by telling the story in a way that gives the reader access to the characters' thoughts and emotions, centred in the self of the authorial voice, also described as a homo-diegetic voice in narrative theory (Genette 1980). The one telling the story is the I, me, in some cases also the we or us of the story. (An exception would be the use of an impersonal voice, see Nielsen 2004). It is told in a way that gives access not only to the protagonists eyes, but also their thoughts and aspects of their experience that usually are characterised as being internal and (mostly) invisible to others, both intimate and strangers. The reader does not get access to the subject's free will, but they can be given insights into the character's reasoning for their choices, into their inner world (Keen 2006). The world arises from the narrator's perspective, thus implying some limitations.

Inspecting the different constructions of a point of view as used in *movies*, moves us closer to the perspective emerging in the later discussion of our video material. To create a first person perspective in movies, the point of view of the main character is (re)created, i.e. the supposed location of his or her moving eyes is the point from which the filming is done. As this still does not give insight into the first person's thoughts, in contrast to the first person perspective in a written narrative, another modality is used to achieve this, for example when a voice-over is included, or the sound of breathing or a heartbeat is mixed into the soundtrack to recreate a similar narrative effect, increasing identification with the camera's perspective. This way of dealing with a first person perspective in movies displays some of the crucial aspects of our argument about the incongruities or misfits implied in supposing that a first person perspective can be achieved by strapping action cameras to people's heads or chests. Even if a film is shot in what can be characterised as a first person perspective, it does not automatically give a subjective perspective, as we, as the viewers, are not getting access to the character's thoughts. We are rather placed on the back, or the forehead, or the chest of the protagonist. Whether this is a particularly informative or illuminating view highly depends on what the intention is, which story is being told and on the expectations of the viewers. Crucially, this type of first person perspective also does not give the viewer access to a subject's free will, and it does not open a window into the character's thoughts or feelings.

In computer or console gaming, the same modalities as in film come into play, but the first person perspective is markedly different from what happens in a movie, film or video – even though both appear in the same medium, on the screen. The reason for this categorical difference is that a first person or ego perspective in gaming gives the acting character the will of the person playing the game. The character thus becomes an avatar, inhabiting and acting in the scenery that displays itself on the screen through a variety of interfaces and digitised affordances. Accordingly, the phenomenology of playing a first person perspective computer game is completely different (de Freitas 2018). Playing through a first person perspective mediated by a screen does not give a character depth in a physical plane, but it enables

movement, orientation and relation-building that reaches through the screen and into a world of other interfaces that are being activated (Eugeni 2012).

Drawing on this typological sketch of different first person perspectives, we might say that the perspective we get when using the action camera is perhaps closest to the first person perspective as employed in movies. While we might lack the insight into a protagonist's thoughts that we get in a movie's narrative, we lack the capacity to act through an avatar as in gaming even more. As we will discuss in more detail later, we do get some access to the person's mobile, material/embodied, and first person centred experience of the world. We still do not get a window into people's thoughts and emotions, even though emotion and affect figure into and can become tangible in data that is produced with action cameras. We might have some access to the sphere of intentionality in a different way, as we will discuss later.

HYBRIDS IN MOTION

We argue that the camera can best understood as one component in a hybrid. More precisely, it is experienced, perceived and employed as a hybrid. One reason for this is that it becomes part of the field of perception, which simultaneously is the field of action. Action and perception are linked inextricably and they also – necessarily – are mangled with material agency (Pickering 1995). As such they make up the practices of the group or, rather, of a growing and moving assemblage, an impure hybrid of things and people that also encompasses the person wearing the action camera. This entanglement extends to include others who move in and out of the recording, who add their voice from the 'off', or who remain silent.

To produce our data, the first author distributed action cameras to groups of students in an outdoor museum and to other groups of students in a classroom setting. Which hybrids do we encounter in our data? We will briefly present an overview of four different hybrids, before demonstrating them in the action recorded by the cameras:

(1) *Student–camera hybrid*: One hybrid that we encounter in the data is created in the embodied interweaving of the agency of students wearing the camera with the camera's agency. The role of this *student-camera hybrid* within the group is shifting, constantly re-negotiated and not clearly defined.

(2) *Camera-as-researcher hybrid*: Another hybrid, the *camera-as-researcher hybrid*, is produced through the ways in which the researcher is becoming present in or through the camera. As is demonstrated in our data, the researcher's gaze is a present absence in the recording practices. While the researcher is bodily absent, it is the researcher who brought the camera into the field, and it is the researcher who will take the camera out of the field. It is the researcher who has exclusive access to all the processes and events that have been recorded or that are recorded in the now of the field situation. The researcher is thus not just absent, she is present in her absence (Frers 2013, 434) to those that wear the camera and act in its presence. This also makes the researcher's role less clear, thus requiring extra efforts in the analysis. The researcher-as-camera or the camera-as-researcher is made relevant and makes itself relevant in different constellations, or sites of agency, as Pickering (1995, pp. 23–26) puts it.

(3) *Camera-wearer–researcher–camera hybrid*: A third hybrid includes all of the three components brought into play in 1. and 2.: the student who wears the camera, the researcher, and the camera itself. Together, these three also set in motion a different set of agencies that again alter the negotiations in the field, with (a) the student wearing the camera having an impact on what is being filmed and focused upon, (b) the researcher's impact on design, scene-setting and her giving an intentional directedness to the recorded interactions, and (c) the camera with its own agency (which goes beyond just affording specific actions – it rather emerges as an entity that is giving impulses affecting the direction into which the interaction is moving).

(4) *Students-not-wearing-the-camera and camera hybrid*: A fourth hybrid of lesser evidence, but still discernible in our material, emerges between the students not wearing the camera and the camera. It only comes into being when the action camera's display shows what is being filmed, and this again is witnessed and referred to by co-present students that can see the camera's display. This creates a different kind of asymmetry, as the display is not

seen by the person wearing the camera. The display is only available to those that are positioned behind, looking at the screen on the backside of the camera. They see what is recorded and later accessible to the researcher, what will become 'data'.

THE STUDY

The data that is analysed in the following sections were produced in two research projects. In both projects the usage of tablets in educational settings is in focus (Lofthus and Silseth 2019). One project was carried out in an outdoor museum, the other in a group setting in the classroom. In both projects, the students were divided into groups, and equipped with action cameras to record their activities. The aim of the studies was not to inspect learning processes, not to see how the students used the action cameras. This methodological question became relevant when working with the data material. In both cases, we were studying students in 9th grade who were using mobile digital tools in an institutionalised learning situation. They were divided in groups of four or five. One student in each group was designated by the teacher to wear the action camera. The camera was mounted to their forehead. That means that the view we got was not at eye level but slightly above. All groups were working alone, while the teacher and researcher were available at a distance.

In both of the projects we are referring to, the students are using the camera for the first time. Both groups have been shown the camera, and told how it is used, as the research design was presented in advance. The students filming in the outdoor setting only used the cameras on the day the study was performed. The students in the classroom wore the camera during group work sessions for one week. The students visiting the outdoor museum are being filmed/filming themselves in an unfamiliar setting. As we will show, this affects the way they go about with the camera, and the way they act towards each other. The outdoor setting is markedly different from the classroom setting, where the students are filming their everyday classroom activities. At the same time, we see that there are many similarities in how they relate to the camera in both projects. We see these similarities as strengthening our arguments.

ANALYSING HYBRID AFFORDANCES IN DIALOGUE

In the following, we will present and discuss four different extracts from the data material. The first two examples are from the outdoor museum setting, the last two from the classroom. The examples have been chosen to illuminate our arguments, as they all explicitly focus on the camera in action in different ways. The excerpts show various stages and aspects of the camera use. We use these differences to highlight our argument that the camera is never just supplying a first person perspective. It does more than that because it unfolds its agency in a set of hybridisations.

The student's utterances have been translated from Norwegian to English by the authors, and the use of comic grammar in the visual transcripts is inspired by Eric Laurier (2014). We have developed a two-step approach that serves to anonymise the data while also keeping facial expressions readable. In a first step, we use the so-called 'liquify' filter in Photoshop to alter facial features, like nose, forehead and chin height, the distance between eyes etc. This step serves to defeat identification by face recognition technology. In the second step, we use another filter to pixelate the faces. This serves to obscure recognition by human viewers. As discussed below, in one case we black out the whole head of a person in the recording, to respect the stance displayed by the person in the recording. We do not try to achieve complete and total anonymisation (see Saunders, Kitzinger, and Kitzinger 2015, for a discussion of the real-world limits of anonymisation in interview data; Stephens Griffin 2019; Wills et al. 2016, for discussions on visual data), as this would require getting rid of most of the setting and change the aesthetics of the visual transcript in a way that would remove it even further from the specific field and that would purge it of the excess data that characterises non-staged images and recordings (Liggett 2007). Since the data presented here is of very low sensitivity, we decided for this approach.

Exploring Agencies: Getting to Know the Student-camera Hybrid

In this visual transcript (Figure 1), we are looking at a group of five students. They have just finished attaching and starting up the camera, and are now figuring out how it works. They are actually recording while wearing the camera, as they have been asked to by the researcher. Their getting started thus already produces data. As will become apparent, this early data is quite rich regarding the theme of this article, as the students reflect-in-action about roles and affordances, while they enact and shift between different hybridisations. They display their different degrees of awareness about when and where the camera would be filming, thus giving rise to a range of new affordances in
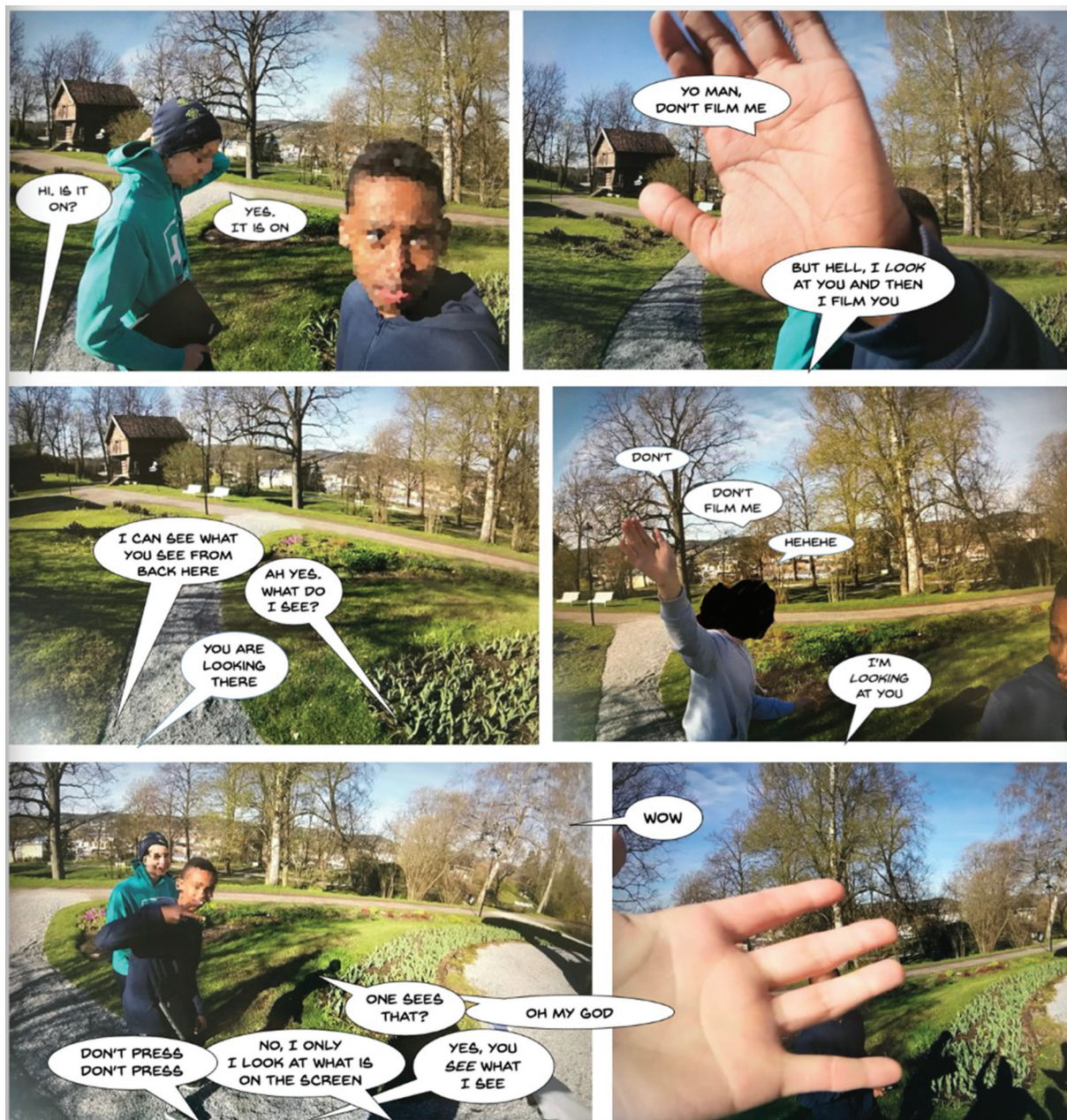
FIGURE 1. Getting to know the student-camera hybrid.

their explorative practice. One of the most surprising aspects for us was the inversion of hierarchies that arises from the fact that the student wearing the camera (as part of the student-camera hybrid) is the only one in the group that does *not* have direct access to check what is recorded through the lens, even though it is his perspective we are getting access to.

Based on the data presented in the visual transcription presented in Figure 1, we get access to the conversations and actions taking place after the students started the recording. S1 (wearing the camera) asks if the camera is on, S2 (wearing a dark blue beanie) confirms that it is.

S2 leaves the camera's field of recording, making himself absent. S3 (wearing a dark blue hoodie) asks to not be filmed, underlining his wish by moving his hand up in front of the camera and also leaving the field of recording. S1 responds to this with an objection 'But hell. I *look* at you and then I film you', displaying an awareness that looking and filming happens in parallel for him. This understanding is then checked, explored and confirmed by S3, who states 'I can see what you see from back here'. S3 is thus referring simultaneously to himself looking from the student-camera hybrid's corporal perspective and to the field of view of the recording, thus demonstrating his understanding of the

hybridity of the arrangement. This production of a shared understanding is underlined further by S1 interjecting "oh yeah, what do I see?", to which S3 responds with 'you are looking there'. S1 is thus displaying his alignment to the statements and activities of the students that are currently behind him, out of his and the camera's field of view, but very much present to him through voice and sound, as well as touch and even through their shadows on the ground, which are in his field of view (even though they are only occasionally in the camera's field of recording).

When S1 turns around (not visible in the visual transcript), bringing S4 (blacked out) into the field of recording in the fourth panel, she tries to move out of the field of recording but is still followed by the student-cameras gaze, while she says 'don't . don't film me ', and then begins to laugh as she is still being followed by the gaze of the hybrid who now utters 'I'm looking at you', picking up the same argument he used in his prior interaction with S3. (We blacked her head out to make her wish of not being filmed explicit in the visual transcript. Why don't we do the same for S3 in the first panel? The reason for this is that he changes his attitude and later uses the camera's recording as providing a stage for him to perform, i.e. he actively affirms the recording and uses this for his own purposes, to some degree even undermining the hierarchy established in the situation.) S4 then walks up behind S1 and starts looking at the camera from behind. To this, S1 responds by instructing her to 'don't press . don't press', fearing that she might deactivate or fiddle with the cameras buttons. S4 says 'no, I only look what is on the screen'. Of course, the students can 'see' more than just the screen, but like S3 in the third panel, she is 'looking' only at what is on the screen. S2 and S3 follow up on this interaction and S2 asks 'one sees that?' before they also move behind the student-camera hybrid, while S1 confirms; 'yes, you see what I see'. From behind, S2 now utters 'oh my god', while he further evidences this shared understanding of overlapping fields of view by waving his hand in front of the camera while looking at the screen. The fact that this is quite a feat as an interactional achievement is then expressed in the 'wow' uttered by S4.

Now, the students have together built a very encompassing and varied understanding. They are able to engage with the different hybrids that arise in these situations and their entanglements: (a) looking and filming go in parallel for the student-camera hybrid, (b) they confirm or establish the existence of the hybrid presented as 4. in the list above, i.e. the overlap of the perspectives of other students with the student-camera hybrid's perspective.

While the students negotiate their shared understanding and the different perspectives that are established, they also try out and learn about the involved agencies. They are subordinating themselves to hierarchies that are established but they are also challenging them. As they learn how the camera is filming and what its field of recording covers, they explore different responses and how these work. This ranges from holding a hand up both to shield themselves or their faces, or, when a hand gets close enough to the camera's lens, to blot out or cover much of the recording, and leaving the field of recording more or less completely. The students thus display different methods of relating themselves to the student-camera hybrid in the start-up process. But rather than just adapting and succumbing to the camera, they also respond by making themselves absent, by staying clear of where S1 is looking, as S4 in the fourth panel. Or, they undermine the hierarchy of the gaze (Frers 2009) by positioning themselves behind the student-camera hybrid in a way that gives them privileged access to both the camera's screen and (potentially) to the camera's controls, something that the action camera does not afford for S1 while he is wearing it. One consequence of this testing sequence is that the students stop displaying regular awareness of the student-camera's recording role and complication his performance of this role. This could be characterised as going from testing out the camera, to a more resigned approach, where they do not challenge or avoid the hybrid gaze with such explicitness or intensity. As the rest of the data shows, the students never 'forget' about this gaze, as they again and again demonstrate different kinds of alignments towards the hybrid and as they actively relate themselves to the camera's affordances, dancing Pickering's 'dance of agency' in myriad and highly competent ways.

In this example the student-camera hybrid is most evident. The group states that they see what the student wearing the camera sees when looking through the camera. The focus is not on what the researcher gets an insight into, but what is seen through the camera when this student is wearing it.

The Lonesome Hybrid?

In this section we are following a different group, currently consisting of three students. As the data discussed here and displayed in Figure 2 demonstrates, group composition is somewhat fluid. This becomes even more evident when groups meet each other and membership and recording boundaries get blurred. We are unpacking the student-camera hybrid to see what

kinds of affordances arise when it/he is trying to make conversations with the rest of the group, and we also examine how the student-camera hybrid dissolves to a certain degree when he/it is alone. In addition, the participants also actively display an orientation to the camera as a camera-researcher hybrid in the data discussed here. The absent researcher thus enters the fluid negotiations in the field, becoming present in her absence.

In the beginning of the episode, S1 who is wearing the camera seems to be well aware that the camera is filming others. The camera affords a specific way of getting into the conversation, and his ability to perceive this affordance is demonstrated in the interaction, as he accompanies his call for a response to his opening of the conversation by pointing out "the camera is filming". The camera is filming and what is visible to the gaze of the camera is thus visible to the researcher. After the group is merged again (second panel), S1 states 'and you just: let's check facebook', to which S2, using a tablet that is currently logged into facebook, aligns himself with a raised gaze and a slightly skewed smile. The students implicitly refer to the use of facebook in a school setting, which could be classified as

deviant behaviour by the researcher, who also is a representative of a higher education institution. The camera-as-researcher (or as-adult or as-teacher) thus becomes a topic, although the evidence for this link is mostly implicit at this point. This statement also shows that S1 still is quite aware that the camera is filming others. At the same time, one could argue that he only shows a limited degree of awareness of his own role in the recordings, as he, in the first panel, keeps calling S2's name to get his attention in a very repetitive way that does not work very well when looked upon from a film-producer's or cameraman's perspective.

When he is alone with the camera, the camera's gaze or the camera-as-researcher hybrid gets a much more prominent status in the interaction. Now, it is no longer only treated as a camera with a camera's affordances, but as the researchers' camera, with a different role in the interaction. When he is alone with the camera, S1 is talking, without initially making it explicit whether he talks to himself or the camera-as-researcher. This can be understood as a collapse of what is front stage and what is backstage (Goffman 1969, pp. 109–125) in a social performance. Is he alone, or does he still play a role for an

FIGURE 2. The lonesome hybrid?

audience? As mentioned, he seems to be very well aware of the camera filming others, but not so much that it is filming him. When he settles down at a table with the camera attached to his head, however, it becomes evident that S1 has the ability to perceive the affordances the camera has as a camera-researcher hybrid: he displays an awareness of the camera's gaze when typing his password. When he starts the login process, he bends his head backwards repeatedly (panel four and five), so that the keyboard and his hands entering the password is moved out of the action camera's field of recording, thus making sure that we cannot see his password. He then states: 'and there we are on facebook', thus making his alignment to the researcher as an absent presence evident. Thus, the camera unfolds an agency where it is not just a recording device, but a recording device that is mixed with the researcher's eyes and ears and thus giving access to the same login interface as the student, potentially compromising his privacy. He further demonstrates this awareness by holding one hand (which is now no longer needed in typing the password) in front of the camera's lens, thus blocking the field of recording. This sequence is another example of the first person perspective not being

relevant as such. It is neither relevant in the production of the data nor in the related practices nor in the analysis. Even though the camera remains attached to the head of the student, providing an almost but not quite eye-level perspective on the unfolding events.

Taking the Director's Role

In the following sequence, we get access to how a group of four students are starting to work on their classroom-based group task. Throughout the episode S1 is taking responsibility for what the researcher gets to see.

Again the camera affords topic development (Atkinson and Heritage 1984, 165–166) and features as a theme in an extended social interaction. This is displayed in the first panel (Figure 3), where S1 uses the camera as a starting point in the conversation. S1 gives a cue to S2, asking her to 'Say hi to the camera'. Thus he is taking the role of a director, who is asking the actors to perform their role in a certain way, thus arranging the frontstage. In this case, S1 asks S2 to treat the camera

FIGURE 3. Taking the director's role.

or the recording as requiring introductions from those that are being recorded, asking her to say hi and thus to introduce herself. At the same time, S1 is acting as student-camera hybrid, but even more than that, he is explicitly concerned with positioning the camera on and with his head in a way that will document the unfolding events, thus setting the agency of the student-camera-researcher hybrid into motion. He also tries to get the others to engage in the task designed by the researcher. He is taking the director's role in a play meant for a specific audience: the researcher. S1 is concerned with what is being filmed, asking the co-present others 'Who am I filming now?', and more specifically regarding the camera's field of recording when he asks 'Higher up?' and 'Am I targeting the iPad with the camera now?' and again, he demonstrates his ability to perceive the cameras' affordances both as an object and in its hybrid quality. In the latter it is placed quite specifically in a research and learning context that requires performing certain tasks in the group's social context. He works to get the rest of the group to orient themselves towards the camera, and to treating it as a relevant in framing their task. He does so by demonstrating how he himself orients himself towards the recording, commenting – similar to a comment from the off in a documentary – that 'Now we are watching this video'. The rest of the group, on the other hand, does not display a strong orientation towards the camera and the task at hand, with the exception of S3 in the centre of the second panel, when he gives feedback on the camera's field of recording. In addition to the camera affording topic development and similar aspects of social interaction, S1 also displays his ability to perceive the responsibility afforded to him as researcher-student-camera hybrid. In case that the visual evidence recorded by the camera might not be enough for the researcher, S1 takes responsibility and tries to organise the interaction so that it supplies additional information about what they are currently doing. S1 is making the hybridisations accountable.

The sequence analysed here thus displays a first person perspective, in this case occasionally supplied, movie-like, with a voice over or commentary from the off. Rather than providing closeness or intimacy regarding the group and its interactions – as one would guess would be the case for a first person perspective view –, the first person perspective camera is here folded into the development of the interaction in a way that adds distance, and that introduces the perspective of an outsider. This underlines the fact that the camera is actively treated as a hybrid, and that the researcher is made present in her absence through the camera.

When to Turn It OFF?

In the last sequence that we want to examine in this article, the students in the classroom setting are about to turn off the camera. However, they do not agree when to turn it off. This is an important moment in the filming, and it shows once more that the camera is not forgotten, that it always lingers at the margins of the unfolding events, ready to enter the dance of agency. It also, again, functions as a device that can be used for topic change or elaboration, giving the students, even across groups, a thing in common to relate to.

The visual transcript starts when the group work is over (Figure 4). S1 asks 'Do I keep wearing the camera?', thus expressing uncertainty about what to do with the camera. S2 replies with an affirmative 'yes', telling her that that she should keep wearing it, but not providing any further reasons or explanation for this. S1 continues to display insecurity about what is expected of her. Yet she decides not to take or turn the camera off, still wearing it when searching for her chair. It is obvious that the group and the rest of the class is aware of the camera, even though they have not displayed this in an explicit way in the prior work session. Thus, they also demonstrate that they have certain ideas about when and where the researcher hybrid should or should not be a part of their interaction – they negotiate recording ethics differently, but also similar to students in the other examples that we discuss. Again, this sequence shows that the camera affords specific interactions between the students, and that their ability to perceive and act upon this is displayed in how they use the camera in their interaction. This is demonstrated both in how S1 askes the others when and how to turn it off, and, even further in the third panel, when members of another group tell S1 'you have to take off the camera', with S1 aligning with this but also continuing to display insecurity by saying 'I don't know. Do I just take it off?' in the fourth panel. In fifth and last panel, another member of a different group displays how the presence of the researcher's camera in their interaction gives the students an opportunity to talk about and thus achieve a shared experience of employing this peculiar device. The way they are talking about this shared experience also displays shared distance and empathy, when she makes the utterance "Did it fall off? Mine was like on my nose" in a jovial way.

This example shows how the camera is more than a camera also when it comes to turning it off. Again, its agency unfolds as a camera-researcher hybrid. The added dimension in this sequence is that in physical
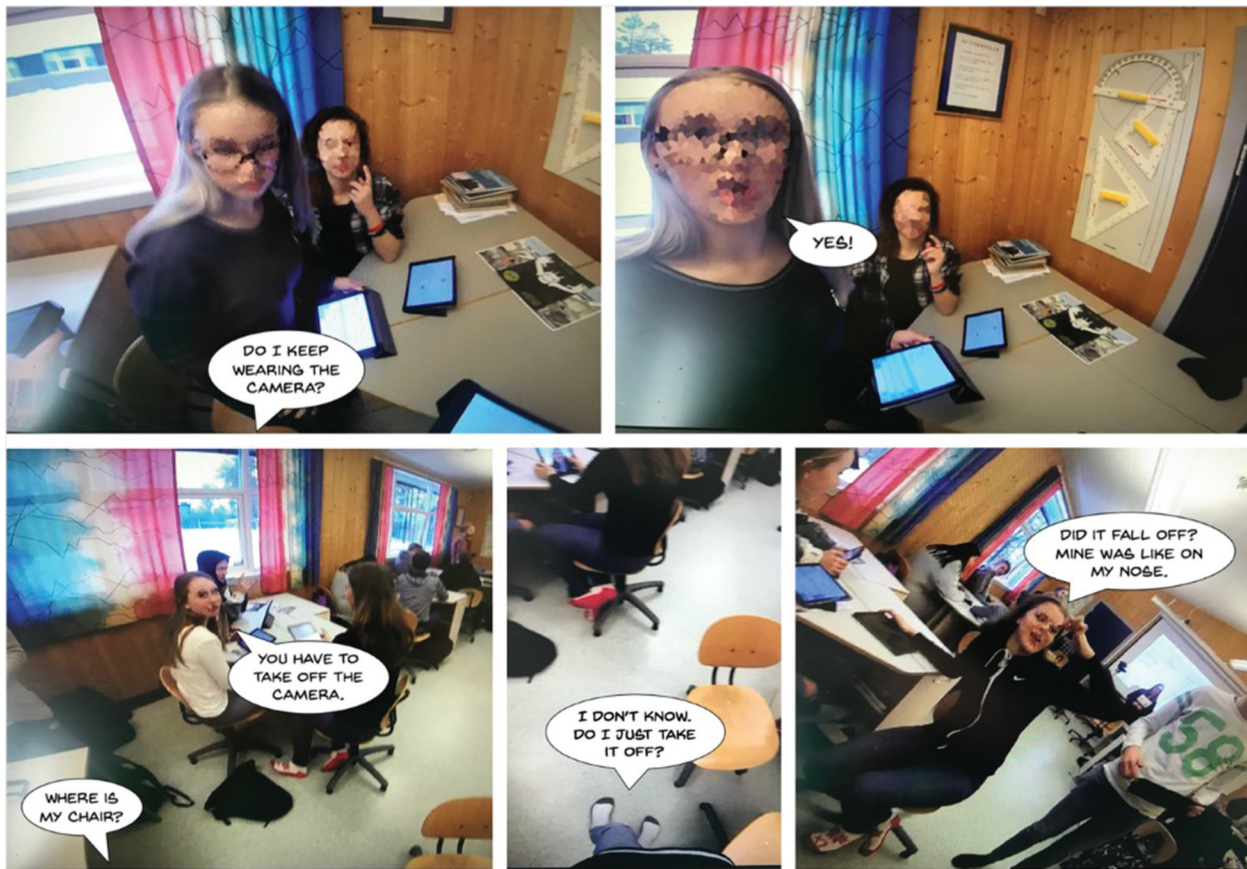
FIGURE 4. When to turn it OFF.

absence of the researcher, the student wearing the hybrid experiences insecurity in how to treat the camera and this insecurity extends into her/its interaction with co-present others.

CONCLUDING REMARKS

In this article, we have discussed how action cameras mounted on the study participants' heads feature into their recording practices as well as into the practices of co-present others – and thus also into the produced data. We have examined the camera's specific affordances, both technical and social, and the different hybridised agencies that are set into motion, along with the way it features into the negotiation of different roles by those that are co-present in the recording (in and beyond its actual recording field). In the course of this examination, we were able to establish a more nuanced understanding of what kind of perspective comes into play. While positing the head-mounted action camera as providing a first person perspective might describe part of the action, it does not provide an understanding that is taking account of the different hybridisations that are enacted in the recording field.

One of the reasons for choosing an action camera when planning our research was that it affords a certain 'data greed'. Using action cameras makes it possible to simultaneously gather data from several groups in motion. This data greed is rooted in a wish to get as much data as possible from as many groups as possible in the restricted amount of time available for the research project.

As the participants of the project demonstrate in our data, this type of camera use entails specific ethical qualities and challenges. It gives the informants authority to decide what they display, and what they want to record. The action camera also establishes a certain distance between the researcher and the informants, removing her from the physical action and thus giving access to interactions taking place without direct influence from a researcher 'stalking' around with a camera. However, the researcher remains present in her absence, figuring into the hybridisations generated in conjunction with the camera's agency.

Along with the mentioned data greed, one main reason for choosing this type of camera was to get a more holistic view of the situation we were studying, and to get access

to a first person perspective. During the project, and even more so when studying the data after its production, it became evident that this type of data was less straightforward than we thought to begin with and assuming a first person perspective is not adequate for understanding the multiplicity of perspectives that are embodied and negotiated in different hybrids in action.

Based on the analysis presented here, we can thus confirm that using action cameras generates data giving insight into interaction-in-motion. However, when using this type of camera in research, it is still important to keep in mind how the camera is folded into the interactions, and to continuously examine how a first person perspective established by the camera, but is at the same time embedded into hybridised interactions.

Using a camera that students can attach to their body when recording can be very useful for reasons that have already been established by other researchers, which we have briefly touched on in the introduction. Among other things, it is easier to produce data from multiple groups at multiple, also simultaneous times. It may also be useful to generate data in situations where the researcher's bodily presence would negatively affect the observed practices or the participants and thus hamper the generation of good, meaningful and ethically produced data.

The action camera's recording offers a perspective that in some areas overlaps with a first person perspective, but – as we discuss in our digression on what a first person perspective is in different media – as we show in the analysis of our data: this is not at all a given. There is no 'natural' connection between the perspective of a person involved in the action and participating in it in real time, and the recording of these events by a head mounted action camera. These connections must be carefully reconstructed in the analysis while at the same time paying attention to the areas where there is a disconnect, where the action camera is nothing but a natural part of the recorded practices' background. We also argue that focusing on these areas – areas where the roles, affordances and hybrid nature of the action camera and the recorded practices of the participants are made explicit – is a highly productive area of study. Using an action camera as a research tool certainly is a useful way to study interaction-in-motion. The action camera can provide insight that is undisturbed by the researcher's presence, but never unaffected by the researcher entering or being pulled into the hybridisations that are being enacted and actively negotiated by the participants.

NOTE

[1] With the term 'action camera' we refer to cameras specifically built to be worn by people, things or animals in motion. Action cameras often provide wide angle recordings and can be attached to the body in different ways – with headbands, on the chest, on a helmet, or they can be attached to bicycles and other devices. The GoPro models are a well-established brand in this category, but many other companies offer similar products.

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Norsk samfunnsvitenskapelig datatjeneste AS
NORWEGIAN SOCIAL SCIENCE DATA SERVICES

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Vår dato: 02.03.2016   Vår ref: 46669 / 3 / HIT   Deres dato: Deres ref:

TILBAKEMELDING PÅ MELDING OM BEHANDLING AV PERSONOPPLYSNINGER

Vi viser til melding om behandling av personopplysninger, mottatt 14.01.2016. All nødvendig informasjon om prosjektet forelå i sin helhet 29.02.2016. Meldingen gjelder prosjektet:

46669	*Elevene på oppdagelsesferd på 2000-tallet*
Behandlingsansvarlig	*Høgskolen i Sørøst-Norge, ved institusjonens øverste leder*
Daglig ansvarlig	*Liv Lofthus*

Personvernombudet har vurdert prosjektet og finner at behandlingen av personopplysninger er meldepliktig i henhold til personopplysningsloven § 31. Behandlingen tilfredsstiller kravene i personopplysningsloven.

Personvernombudets vurdering forutsetter at prosjektet gjennomføres i tråd med opplysningene gitt i meldeskjemaet, korrespondanse med ombudet, ombudets kommentarer samt personopplysningsloven og helseregisterloven med forskrifter. Behandlingen av personopplysninger kan settes i gang.

Det gjøres oppmerksom på at det skal gis ny melding dersom behandlingen endres i forhold til de opplysninger som ligger til grunn for personvernombudets vurdering. Endringsmeldinger gis via et eget skjema, http://www.nsd.uib.no/personvern/meldeplikt/skjema.html. Det skal også gis melding etter tre år dersom prosjektet fortsatt pågår. Meldinger skal skje skriftlig til ombudet.

Personvernombudet har lagt ut opplysninger om prosjektet i en offentlig database, http://pvo.nsd.no/prosjekt.

Personvernombudet vil ved prosjektets avslutning, 01.01.2021, rette en henvendelse angående status for behandlingen av personopplysninger.

Vennlig hilsen

Vigdis Namtvedt Kvalheim

Hildur Thorarensen

Kontaktperson: Hildur Thorarensen tlf: 55 58 26 54
Vedlegg: Prosjektvurdering

Personvernombudet for forskning

Prosjektvurdering - Kommentar

Prosjektet er en nasjonal samarbeidsstudie. Høgskolen i Sørøst-Norge er behandlingsansvarlig institusjon. Personvernombudet forutsetter at ansvaret for behandlingen av personopplysninger er avklart mellom institusjonene. Vi anbefaler at det inngås en avtale som omfatter ansvarsfordeling, ansvarsstruktur, hvem som initierer prosjektet, bruk av data og eventuelt eierskap.

Utvalget informeres skriftlig og muntlig om prosjektet og samtykker til deltakelse. Informasjonsskriv mottatt 16.02.2016 er godt utformet.

Merk at når barn skal delta aktivt, er deltagelsen alltid frivillig for barnet, selv om de foresatte samtykker. Barnet bør få alderstilpasset informasjon om prosjektet, og det må sørges for at de forstår at deltakelse er frivillig og at de når som helst kan trekke seg dersom de ønsker det.

Personvernombudet legger til grunn at forsker etterfølger Høgskolen i Sørøst-Norge sine interne rutiner for datasikkerhet.

Forventet prosjektslutt er 01.01.2021. Ifølge prosjektmeldingen skal innsamlede opplysninger da anonymiseres. Anonymisering innebærer å bearbeide datamaterialet slik at ingen enkeltpersoner kan gjenkjennes. Det gjøres ved å:
- slette direkte personopplysninger (som navn/koblingsnøkkel)
- slette/omskrive indirekte personopplysninger (identifiserende sammenstilling av bakgrunnsopplysninger som f.eks. bosted/arbeidssted, alder og kjønn)
- slette digitale lyd-/bilde- og videoopptak

Forespørsel om deltakelse i forskningsprosjektet

Bruk av iPad i samfunnsfagsundervisningen

Hvorfor?
I forbindelse med mitt doktorgradsprosjekt ved Høgskolen i Sørøst-Norge vil jeg undersøke hvordan iPad kan brukes i undervisningen.

Hva?
Jeg vil observere hvordan dere jobber med iPad i undervisningen. Jeg vil filme og observere hvordan dere jobber med det, og gjennomføre intervjuer.
Jeg ber om ditt samtykke til bruk av videoopptak.
Datainnsamlingen vil være under arbeidet med prosjektet «mye vil ha mer» i uke 46.

Dere kan få mer informasjon om prosjektet ved forespørsel.

Hva skjer med informasjonen om deg?
Alle personopplysninger vil bli behandlet konfidensielt, ingen andre enn forskeren vil få innsyn.

Det er frivillig å delta, og du kan trekke deg når som helst.

Prosjektet skal etter planen avsluttes februar 2021. Etter dette vil opptak anonymiseres.

Dersom du ønsker å delta eller har spørsmål til studien, ta kontakt med Liv Gardsjord Lofthus 91883951

Studien er meldt til Personvernombudet for forskning, Norsk samfunnsvitenskapelig datatjeneste AS.

Samtykke til deltakelse i studien

Jeg har mottatt informasjon om studien, og deltar i forskningsprosjektet

----
(Skriv navnet ditt i blokkbokstaver)

(Signatur, dato)

Jeg godtar at enkelte videoobservasjoner kan brukes i faglig sammenheng, dvs. presentasjon av forskning

☐   ☐
Ja   Nei

Forespørsel om deltakelse i forskningsprosjektet

Bruk av iPad i samfunnsfagsundervisningen

Bakgrunn og formål

I forbindelse med mitt doktorgradsprosjekt ved Høgskolen i Sørøst-Norge vil jeg undersøke hvordan mobile digitale verktøy virker som læringsressurs blant ungdomsskoleelever.

Utvalget er gjort ved å kontakte lærere i ungdomsskolen som bruker nettbrett i samfunnsfagsundervisningen.

Datainnsamlingen vil finne sted når klassen jobber med prosjektet «mye vil ha mer» i uke 46.

Hva innebærer deltakelse i studien?

Deltakelse i studiet innebærer at elevene, som en del av undervisningen, skal jobbe med nettbrett. Jeg, som forsker, vil være med i noen undervisningsøkter hvor jeg observerer hvordan de bruker nettbrettet, og snakker om bruk av mobile verktøy i skolen, her vil det gjøres videoopptak. Det vil også bli foretatt korte intervjuer med elevene.

Som foresatt til elev (under 15 år) i den aktuelle skoleklassen ber vi om ditt samtykke til bruk av filmopptak.

På forespørsel kan dere få innsyn i intervjuguide samt mer detaljert informasjon om prosjektet.

Hva skjer med informasjonen om deg?

Alle personopplysninger vil bli behandlet konfidensielt. Det er ingen andre enn forskeren som vil ha tilgang til dataene som hentes inn. Dataene er underlagt taushetsplikt, og opplysningene vil bli behandlet strengt konfidensielt. Data vil bli lagret på høgskolens server som krever brukernavn og passord.

Det er frivillig å delta i prosjektet og deltagerne kan på hvilket som helst tidspunkt trekke seg uten å begrunne dette nærmere. Alle personidentifiserbare opplysninger er underlagt taushetsplikt, og opplysningene vil bli behandlet strengt konfidensielt.

Deltakerne vil ikke kunne gjenkjennes i en publikasjon.

Prosjektet skal etter planen avsluttes februar 2021. Etter dette vil opptak anonymiseres.

Frivillig deltakelse

Det er frivillig å delta i studien, og eleven kan når som helst trekke sitt samtykke uten å oppgi noen grunn. Dersom eleven trekker seg, vil alle opplysninger bli anonymisert.

Dersom du ønsker å delta eller har spørsmål til studien, ta kontakt med Liv Gardsjord Lofthus 91883951

Studien er meldt til Personvernombudet for forskning, Norsk samfunnsvitenskapelig datatjeneste AS.

Samtykke til deltakelse i studien

Jeg har mottatt informasjon om studien, og gir tillatelse til at vår sønn/datter ------------------- deltar
i forskningsprosjektet

(Signert av prosjektdeltaker, dato)

Jeg godtar at enkelte videoobservasjoner kan brukes i faglig sammenheng, dvs. presentasjon av
forskning

☐   ☐

Ja   Nei

Ta bare kontakt om dere har noen spørsmål.

Med vennlig hilsen

Liv Lofthus
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918 83 951
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TIMEPLAN 9A MYE VIL HA MER

	MANDAG	TIRSDAG	ONSDAG	TORSDAG	FREDAG
1 0840 - 0940	*Hilde* *Maya* Mye vil ha mer Hva kan jeg gjøre? Gruppekonkurranse Blogg	Engelsk	Mye vil ha mer En verden av emballasje	Mye vil ha mer Nemi	Mye vil ha mer En råvare er en råvare
2 0950 - 1050	*Hilde* *Oddbjørn* Mye vil ha mer	Matematikk/ Utdanningsvalg	Fordypning	Mye vil ha mer Mia, Morten og miljøet	Mye vil ha mer Dele gruppeblogger
3 1120 - 1220	*Hilde* Mye vil ha mer Filmsnutter om miljøvern	Mye vil ha mer Live redder verden ep. 4 *Hilde*	Mat og helse/Kunst og håndverk	Fordypning	Mye vil ha mer Oppsummering/ Har dere blitt mer miljøvennlig? Mitt mål for fremtiden. Sorteringsoppgave
4 1225 - 1325	*Oddbjørn* Mye vil ha mer Miljømerking	Mye vil ha mer Klær	Mat og helse/Kunst og håndverk	Mat og helse/Kunst og håndverk	Matematikk
5 1335 - 1435		Mye vil ha mer Klær		Mat og helse/Kunst og håndverk	Kroppsøving

INTERVJU/SAMTALEGUIDE

- Har alle smarttelefon?

- Hva slags datautstyr bruker dere på skolen?

- Hva pleier dere å bruke det til i undervisningen?

- Bruker dere det i alle fag?

- Pleier dere å jobbe individuelt med dem, eller i grupper?

- Hvordan er det å samarbeide om å jobbe med det?

- Er utstyret dere bruker på skolen forskjellig fra det dere bruker hjemme?

    o Hvordan er det forskjellig?

    o Kunne dere brukt det samme dere bruker på skolen hjemme?

- Hva er det dere lærer på skolen som dere ikke kan?

- Hvorfor bruker dere ikke skolens utstyr hjemme?

- Hva bruker dere skolens utstyr til hjemme?

- Hva bruker dere nettbrett/telefon til hjemme?

- Hvorfor bruker dere ikke skolens utstyr til det samme?

- Hvordan hadde det vært annerledes om skolen hadde hatt annet utstyr?

- Når passer det ikke å bruke mobile verktøy?

—

usn.no