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The challenges of successfully implementing AV1 in school

A qualitative study

Master's thesis in International Social Welfare and Health Policy

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Acknowledgement:

This thesis is written as a conclusion to my master's degree in International social welfare and health policy. The work on the thesis has at times been demanding and challenging and marks the end of something that feels like a journey consisting of blood, sweat and tears. At the same time it has been a process including excitement, curiosity and contentment.

During my work on the thesis the world has changed a great deal, and many new worries and uncertainties arose in the wake of a global pandemic. It has been a confusing and stressful time for people all over the world, as it has for me. Therefore, this certainly represents a very proud moment for me, since it has been hard to focus on my school work at times, with everything happening in the world.

I am incredibly grateful that I have been allowed to conduct this study. A big thank you goes to the informants who lined up benevolently and allowed themselves to be interviewed about their views and experiences with the use of AV1. They invited me into their homes and in classrooms, and I really appreciate that I was allowed to get an insight into their lives. Without them, there would be no thesis!

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Abstract:

Every year, many children and adolescents are prevented from attending school because of poor health. AV1 is a tool for chronically ill children and adolescents, which allows virtual contact with peers and school to reduce feelings of loneliness and isolation in the event of illness. However, there are many factors that come into play when something new is to be implemented in the school and classroom. There is often skepticism about new technology, and a robot in the classroom is not something most people are used to.

This is why I have chosen to focus on implementation research in my thesis. Implementation research is a growing but not well-understood field of health research that can contribute to more effective public health and clinical policies and programs.

Based on this information, the following research question is formulated.

What are the challenges in implementing AV1 in schools?

I have chosen the qualitative interview as an effective way to acquire knowledge about how the school employees and parents have experienced and reflected on the implementation of AV1. This master thesis is also inspired by an interpretive view of qualitative methods.

The data is analyzed using thematic analysis. Here, the essence of the informants' statements is extracted and discussed in light of the theoretical framework of the study; NASSS - **N**onadoption, **A**bandonment, and challenges of **S**cale-up, **S**pread and **S**ustainability of technology in health and social care.

The findings of the study report that the biggest obstacle with AV1 is the technology, especially the network connectivity and the audio. As a result, plenary teaching and communication does not always work that well. Other than that, I found there is a need for guidelines on how to retrieve consent, how to introduce AV1 to the class and how to use it in lessons, as well as new practical routines. Having rules and guideline to adhere to can potentially eliminate a number of uncertainties around implementation. Lastly, the study report that teachers have positive attitudes towards adopting AV1 to include the chronically ill student in school life, provided the technology works.

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1. Introduction

The motivation to write this master's thesis started a few years ago with an advertisement that rolled across the TV screen. It was a simple idea: A little robot that would go to school for chronically ill students who could not be there themselves. This robot was named AV1 and is the starting point for this thesis.

1.1 Description of AV1

AV1 is a tool for chronically ill children and adolescents, which allows virtual contact with peers and school to reduce feelings of loneliness and isolation in the event of illness. The term "chronic illness" refers to illness that requires at least three months of treatment, as well as permanent lifestyle changes (Daaleman & Helton, 2018, p. 199). The robot is personal and meant to be a substitute in the classroom for the children and adolescents with long-term illnesses. AV1 allows the student to have a direct dialogue with the teacher and classmates, as it sends video directly from the classroom to a technological device where the student resides. Via AV1, the student is allowed to participate in the class without being physically present. The robot is built to allow children and adolescents to participate in school and social activities on their own terms (NoIsolation, 2020)

Figure 1 – illustration of AV1

Figure 1 shows an illustration of AV1. To use the robot, you need a mobile or tablet that you can control AV1 with. This is done through an app with a personal code. AV1 is designed with eyes and speakers that can convey what is happening in the classroom and allows communication with the class. It gives them the opportunity to see, hear and talk to their classmates even if they are lying at home in bed. The robot has light signals on its head and can rotate 360 degrees. All information sent from the robot is communicated in a direct stream from where AV1 is situated, straight to the child´s tablet or mobile. No data is stored, and only the student who has a personal code for the AV1 app can use AV1 and see what this conveys (NoIsolation, 2020).[1]

In this study, AV1 will be referred to as AV1, robot and avatar. The ill child or adolescent sitting at home with the tablet controlling AV1 will be referred to as student, child or user.

1.2 Research question

AV1 has received a great deal of positive press coverage, and there are many people who are interested in trialing it themselves. However, there are many factors that come into play when something new is to be implemented in the school and classroom (Greenhalgh et al., 2017). There is often skepticism about new technology, and a robot in the classroom is not something most people are used to. There are also several agencies and laws/regulations to adhere to when using new technology at school, and it will likely be a challenge for teachers and other school employees to successfully implement into school life and the classroom.

This is why I have chosen to focus on implementation research in my thesis. New technology can be of great help to children and adolescents who for various reasons cannot participate physically in school. At the same time, implementation studies show that there are often a number of barriers to adopting such technology (Peters, Adam, et al., 2013). Internet connections can be difficult, those who will use the technology may be skeptical, and there can be a lack of clear guidelines for how a technology should be adopted, to name but a few examples (Johannessen & Haldar, 2020, pp. 43-44). This raises the question of what potential barriers AV1 encounters when it is implemented in schools.

[1] AV1 instructional video https://www.youtube.com/watch?v=nJNBILgd9ag&t=3s.

Implementation research is a growing but not well-understood field of health research that can contribute to more effective public health and clinical policies and programs (Peters, Adam, et al., 2013, p. 1). There are many aspects that can serve as indicators to assess the success of an implementation process, and this study address some of these. This thesis is particularly inspired by a theoretical framework for implementation research, called NASSS – an evidence based framework to study non-adoption, abandonment, and challenges of scale-up, spread and sustainability of technology in health and social care (Greenhalgh et al., 2017).

The study is based on the school's experience and their views on using the robot in school, and all the aspects that accompany it. I have chosen to focus on the school employees to highlight the challenges they have in implementing AV1, while also interviewing some parents and a user to see things from their perspective as well. I want to generate more knowledge about the complexity of adopting a new technology, the challenges that are encountered and the experiences the schools have with AV1. Based on this information, the following research question is formulated.

What are the challenges in implementing AV1 in schools?

The purpose of the study is to look at the challenges that can affect the implementation of a new innovation. The objective is to create a deeper understanding of the implementation process of AV1. Through interviews with teachers, inspectors, assistants, parents and a user, this study seeks to provide insights into their experiences of using AV1 in school. By focusing on implementation research, this study looks to highlight both the challenges of using AV1, as well as how one can help overcome these challenges. In the field, there is insufficient research regarding the organizational orientation in technology. Hopefully, this study will be able to give new insights into these fields, and possibly uncover and find solutions to problems that are unfolding.

1.3 Outline

Beyond this introduction, the thesis is divided into the following chapters:

Previous research: This chapter presents research done on the prototype of AV1 and similar phenomena.

Theoretical framework: Here I will give a general introduction to implementation research, as well as present a theoretical framework for implementation research called NASSS.

Method: This chapter discusses my data and methods. This includes descriptions of research design, selection method, data collection and analysis and ethical assessments.

Presentation of findings: In this chapter I will highlight the key points from my findings, to answer the thesis' research question: What are the challenges of implementing AV1 in schools?

Discussion and conclusion: Here I will discuss the findings in light of previous research and theoretical frameworks. I will also review further research, as well as suggestions for improvement.

2. Previous research

Welfare technology is a common term for technical installations and solutions that can improve the individual's ability to cope with daily struggles and help ensure quality of life and dignity for the user (E-helsedirektoratet, 2020) In this study, I will focus on a specific type of welfare technology called mobile robot telepresence (MRP). These are systems that include video conferencing equipment on mobile robotic devices that can be controlled from remote locations. These systems are primarily used to promote social interaction between people, and they are becoming increasingly popular in healthcare, nursing homes and office environments (Kristoffersson et al., 2013, p. 1) This field is rapidly expanding with an increasing number of different mobile robots one can adopt. The robots are also increasingly used in school environments (Kristoffersson et al., 2013, p. 5), which is the context I will focus on in this thesis.

There is limited research on the use of telepresence robots in schools, but there are some exceptions. Børsting and Culén (2016, p. 34) have conducted a study based on the prototype of AV1. Their research addresses children with ME[2] (HelseNorge, 2019), where they try to understand the children, their relationship with technology and their social relationships with others (friends, families, teachers, and others). They also focus on the experience of their parents and teachers. Børsting and Culén (2016, pp. 39-43) concluded that the use of AV1 for these children was very positive. This was demonstrated through positive feedback from the students, the parents and the teachers.

Børsting and Culén (2016, pp. 39-43) highlight that the robot they used is in need of further development, and that challenges presented in the form of extra work for the teachers and organizational challenges must be addressed. No Isolation and AV1 is repeatedly met with skepticism and opposition from the school, teachers and parents, as well as several technical

[2] ME (myalgic encephalomyelopathy) is characterised by extensive fatigue, in addition to sleep disturbance, pain and difficulty concentrating.

problems. For the teachers in the study, the challenge was to find good ways to manage the increased workload of charging the robot, as well as establishing a working internet

connection. The teachers also had to be aware of the location of the robot in the classroom, and of how to include the student in the activities of the class. How willing teachers were to solve these challenges had an impact on how successful the inclusion of the robot would be in the class.

A report by Johannessen and Haldar (2020, p. 43) also finds large benefits of adopting AV1. They highlighted several positive experiences that users have had with the robot. These benefits, however, are dependent on a number of technical, health-related, organisational and social preconditions. The level to which these preconditions were met varied. The report revealed several technical challenges, especially related to the internet connection and AV1's battery. This was frustrating for both users and teachers when adopting it (Johannessen & Haldar, 2020, pp. 30-31) The benefits also depend on the user of AV1 being motivated and "healthy enough". If the student is too ill, adopting the robot can be problematic, but on the other hand, one cannot be "too healthy" either, because then there is no need for AV1 (Johannessen & Haldar, 2020, p. 20).

There are also many routines that should be established when getting AV1 started. For AV1 to work, the schools need to be positive towards the development of new routines for the robot (Johannessen & Haldar, 2020, p. 28). However, schools are often found to meet AV1 with uncertainty and skepticism. This derives from having no clear guidelines for how the robot should be implemented. Uncertainty also arises around how to protect the privacy of those in the classroom (Johannessen & Haldar, 2020, pp. 26-27). In order to use AV1, it is also important to have knowledgeable supporters and resources that can help the user overcome barriers. Several parents found it tiring to pave the way for AV1 on their own. As mentioned, there are no specific guidelines, and this affects both users/parents and the school, as they need to find out the processes themselves along the way (Johannessen & Haldar, 2020, pp. 36-38, 30).

Another study is Weibel et al. (2020, p. 2), who investigate whether and how AV1 helps school-age children and adolescents with cancer, to stay socially and academically connected during cancer treatment. Weibel et al. (2020, pp. 7-8) also describes how network problems limited the use of AV1 and acted as an exclusionary factor. There were several places where AV1 was unable to connect to the internet, such as the schoolyard, and the classroom also often had problems. This made it harder for the student to communicate with the class.

In spite of this, Weibel et al. (2020, pp. 7-8) found several advantages when using the robot. Participants experienced the robot as facilitating social interaction with classmates and felt included in learning activities. This reduced the feeling of loneliness and the notion of being further behind in education than their classmates. The study established that AV1 has the potential to help students with cancer to stay socially and academically connected during treatment. As presented in the other studies, however, this potential depends on several factors that determine whether robotics is an inclusive or exclusive factor for these students. This includes the technical functionality of AV1, the well-being of the user, space in the classroom, user expectations and cooperation with the different parties involved. Robot interventions thus require consideration of which students will benefit from an AV1.

In addition to AV1, there are also a few studies of other telepresence robots. Newhart and Olson (2017, p. 1) address the usage and effectiveness of a similar robot to AV1. This robot allows the sick student not only to control the camera from home but also move the robot around in the classroom using its wheels. The study revealed that there are three crucial factors for a successful deployment of the robot; parents, pupils and schools. Participants in the study agreed that parental support and approval from the teachers when adopting the robot was essential. In schools where they chose not to use the robot, privacy was given as an argument. Another concern involved other adults in the student's room that could monitor what was going on in the classroom.

They eventually concluded that the use of robots for pupils leads to increased inclusion both socially and academically. They also emphasize that teachers and pupils need adequate training in technology to create a safe environment both in school and at home. Unfortunately, a successful deployment of the robot might be difficult since there is no research outlining

how to set up guidelines in this situation. Therefore, it is a necessity to make it easier for others to implement robots in schools in the future (Newhart & Olson, 2017, pp. 3-5).

Newhart and Warschauer (2016, p. 21) also studied a similar telepresence robot as AV1. They emphasised that when chronically ill children and adolescents use a robot in the classroom, this involves three complex topics within research: health, education and technology. The adoption of this technology helps the student to be included in class while focusing on their health, although it has also shed light on how socially-isolated and excluded the sick students feel. The difference with this robot compared to other technologies in the classroom, is the bottom-up approach. Historically it has always been the opposite approach. The robot's focus is to help the students to be socially and academically connected to class, and not to assist the teacher in creating better education (Newhart & Warschauer, 2016, p. 22).

Newhart and Warschauer (2016, p. 22) reported promising future prospects for the telepresence robot, involving the quality of life for the students. Nevertheless, the positive results depended on the setting and participant characteristics. Teachers were concerned that the robot went straight from production to adoption without researching the effect it would have on the students using it. The telepresence robot is a relatively new invention, and therefore there are no guidelines that the teachers can follow when adopting it in the classroom. To virtually include the student in the best possible way, a partnership between school, healthcare and technology must arise (Newhart & Warschauer, 2016, pp. 21-22).

Beyond this limited collection of studies, there is little research on the implementation of telepresence robots in schools. With this study I want to contribute with more knowledge on this topic. AV1 is a new invention, and there has been limited research around how it can be best implemented in schools. Hence, there is a gap that needs to be filled.

Several of the studies pointed to the lack of guidelines available. Without guidelines, it was difficult to ensure a successful implementation of the robot in the classroom. AV1 entails extra work for the teachers, the school and the parents. It would be easier to have some steps to follow in the implementation process. With my research I will try to contribute with useful information about the challenges of implementing AV1, and how to overcome these

challenges when implementing the technology. Hopefully my study can present some indicators of what might be effective to include in guidelines in the future.
While the existing studies have focused mainly on the user's and the family's perspective, I want to address the school's perspective and the challenges they have experienced.

3. Theoretical framework

3.1 Implementation research

This study is an example of implementation research. Implementation research originates from several disciplines and research traditions. Implementation research is the scientific study of issues regarding implementation – examples of which can be programs, individual practice or policies. This type of research helps to assess all aspects of implementation. One wants to understand whether, how and why an intervention works in the "real world," and then test ways to improve it. (Peters, Adam, et al., 2013, pp. 26-27; Peters, Tran, et al., 2013, p. 1)

Implementation research tries to understand how to implement new innovations, programs or practices into real-world conditions in the best possible way. This involves working with populations that will be affected by the new innovation, rather than selecting recipients who may not represent the target population for the intervention. For example, there is no point in studying healthy volunteers, if the new intervention applies to people who are unwell (Peters, Adam, et al., 2013, p. 35; Peters, Tran, et al., 2013, p. 1)

Context plays a central role in implementation research. Context means the conditions in the environment that are relevant to the understandings of an event, intervention, or the like (Svennevig, 2020). Therefore, one must always look at the context of the intervention when doing implementation research. Context may include the social, cultural, economic, political, legal and physical environment, as well as the institutional environment, which consists of different stakeholders and their interactions, and the demographic and epidemiological conditions. (Peters, Adam, et al., 2013, p. 36; Research & Training in Tropical, 2014, pp. 1617)

Implementation research is particularly concerned with the users of the research and not just to produce knowledge of the intervention. Users can include people who need to be convinced to use interventions, such as students with long-term illnesses who are not allowed to attend school, or teachers who are skeptical towards a robot being used in the classroom. Research from previous implementations involving robots in classrooms will aim to make it easier for

others to implement the robot in the future, and not just to produce information about the new intervention. Implementation research generates great value by highlighting the difference between what happens in theory and what happens in practice, and will be most useful to users where they are not only a passive receiver of the results, but are part of the intervention process (Peters, Adam, et al., 2013, pp. 18, 35)

3.2 The NASSS framework

This thesis is particularly inspired by a theoretical framework for implementation research, called NASSS. Technologies are often seen as the path to better, safer and more efficient care, but technology projects rarely provide all the benefits expected of them. A new innovation is usually different in theory and practice, because there are many unanticipated aspects that come into play in practice. Based on a literature review and empirical case studies of technology implementation projects, NASSS, was designed to study the **N**on-adoption, **A**bandonment, and challenges of **S**cale-up, **S**pread and **S**ustainability of technology in health and social care. Such projects usually face problems because they are too complex - and because the complexity is not handled well enough (Greenhalgh et al., 2018, pp. 2-4)

NASSS consists of 7 domains (a domain in this context means an interest or special area within this framework) (Greenhalgh et al., 2017, pp. 10-14):

Domain 1 – The condition: Addresses the condition the user has, comorbidities and sociocultural aspects of it.

Domene 2 – Technology: Addresses the material and technical features of the technology and the knowledge and support needed to use the technology.

Domain 3 – Value Proposition: Applies to whether a new technology is worth developing at all - and for whom it generates value.

Domain 4 – Adopter System: This domain is about adoption (and continued use) of the technology. The domain also addresses acceptance of the technology and work required by those who will implement it.

Domain 5 - Organizations: Addresses the organization's capacity to embrace a new innovation and their adoption decisions. The domain also assesses the extent to which

established work routines will be disrupted by the new technology and how much work is involved in the implementation.

Domain 6 – The wider context: Relates to the broader institutional and sociocultural context, which is often the key to explaining the organization's inability to go from a successful demonstration project to a complete scale-up that was transferable and sustainable.

Domain 7 - Adaption over time: This domain relates to the feasibility in the medium- to longterm when continuing to adapt the technology.

All the domains are relevant to understanding an implementation, and therefore also relevant for my thesis. However, I have chosen to mostly immerse myself in the domains involving the technology, the adopter system and the organization. I focus on the teachers and how they experience the adoption of AV1 and how it can create additional work for them in an otherwise busy everyday life. There is a significant amount of work and new processes one has to undertake in order to use the robot in the classroom, and this affects already established routines.

All NASSS domains can be classified as “simple”, “complicated” or “complex”. When most, or all, the domains are simple, it is likely that the program is easy to implement. When many domains are classified as “complicated”, the program will be achievable, but it will be difficult. However, when multiple domains are complex, the chances of the program succeeding at all are limited (Greenhalgh & Abimbhola, 2019, p. 202) Complexity in this context means a set of processes and objects that are not coherent or predictable, but dynamic, constantly emerging and interacting with each other. The more complex a new technology is, the harder it is to successfully implement it to achieve sustained adoption, and the more likely it is to be abandoned (Greenhalgh et al., 2017, p. 14).

As a matter of fact, few technology projects in health and social care are simple. These projects usually face problems because they are too complex - and because the complexity is not managed efficiently enough. NASSS can be used to acknowledge which impacts and contexts make a new innovation complex or simple, and thus identify parts of the project where complexity can be reduced, all the while assessing how individuals and organizations can be supported to better manage the remaining complexities. AV1 has only been on the market for five years and is therefore a relatively new intervention. Those who have invented and produced it are still in the process of ascertaining which challenges are the biggest to

prevent non-adoption or abandonment of the avatar. Therefore, in order to maximize AV1's chances of success, efforts must be made to reduce the complexity in as many NASSS domains as possible (Greenhalgh & Abimbhola, 2019, pp. 202-203).

As complexity tends to be fundamental in health programs, the main challenge is often to develop ways to learn to align with the complexity instead of trying to eliminate it. We live in a world where new technologies are constantly being discovered, although very often a new innovation experiences non-adoption, abandonment and failure of up-scale and proliferation over time, rather than the other way around (Greenhalgh et al., 2018, pp. 12-13). This is why I propose using this theoretical framework to investigate what challenges could potentially hinder the successful implementation of AV1 in schools. I will use NASSS as a source of inspiration for the analysis, and I will return to it in the discussion and conclusion. I will identify which aspects of the robot are classified “simple”, “complicated” and “complex”, and then make suggestions for improvements and simplifications of the domains that are seen as complicated or complex.

4. Methodology

I have chosen a qualitative approach to map out the challenges of using the robot at school. Qualitative methods have an openness and flexibility that allows the informants to express their experiences freely. The qualitative paradigm, as opposed to the quantitative, is concerned with studying a few cases in depth. This means collecting a wealth of information about a select few entities and interpreting the data from the social context of the informants (Bryman, 2016, pp. 470-471, 408) . Specifically, I have chosen the qualitative interview as an effective way to acquire knowledge about how the school employees and parents have experienced and reflected on the implementation of AV1. This master thesis is also inspired by an interpretive view of qualitative methods (Berg & Munthe-Kaas, 2013, pp. 132-135).

4.1 Methods and recruitment

In the beginning of the process I wanted my informants to be the user of the robot, and I wanted to use the diary method when collecting data (Haldar & Wærdahl, 2009). My initial plan was to hand out the diaries to children and adolescents who were about to start with AV1. I knew there were foundations like the Gjensidige foundation who lent the robot for free to those who needed it. All they required was for either the student, the parents or the school to apply for AV1. You can borrow it for a minimum of three months and have to return it when finished[3]. After extensive research based on this information I contacted many associations, foundations and hospital schools, but after six months and many e-mails I had not been able to find a single informant. Due to privacy considerations, the associations and foundations could not release information involving users of the robot. Nor could the producers of AV1, No Isolation. Furthermore, there is no public database that provides an overview of which schools use AV1.

Even though I was not able to find any informants that were about to start with the robot, an inspector at one of the hospital schools gave me information regarding some parents that were open to talk with me about their experiences with AV1. I decided to change my approach to

[3] The Gjensidige Foundation´s loan terms:
https://www.gjensidigestiftelsen.no/app/uploads/2019/02/Søknadsbetingelser-revidert-2019-1.pdf

the thesis and started interviewing the parents. In addition, I wanted to interview others that were familiar with AV1 and therefore contacted around 300 schools and several municipalities. This time I did not have as strict criteria for my informants, however the purpose was to interview people who had experiences with the robot. Most of them did not respond to my inquiries, and some did not want to be part of the study for privacy reasons. Nevertheless, it generated 13 informants and several of these were school employees. I decided I wanted to explore their experiences and views on the adoption of AV1 in the classroom further and began reading implementation research.

It was difficult to determine the number of informants in advance, and due to the time constraint of the thesis, I decided to limit my study to13 informants. This is considered to be an appropriate amount of informants in smaller projects with limited time and finance (Ryen, 2002, p. 104). Furthermore, I felt that I had received a relatively wide coverage of different roles within the school and thus had a sufficient mix of different views on the challenges of implementing AV1, while these views were also underpinned by the parents. I wanted the participants to have different backgrounds, in terms of experience, education and gender, to ensure a broad representation of views and experiences. Conclusively, the sample included two assistants, two inspectors, four teachers, one user and four parents, from Viken, Rogaland, Trøndelag, Troms and Finnmark. It consisted of eight women and five men that were between the ages of 18 and 60. In my study, AV1 was being used for children living with ME, cancer and bowel disease.

My selection method was a mix between snowball sampling and convenience sampling (Bryman, 2016, pp. 201-202). Snowball sampling is about finding informants via networks (Ryen, 2002, p. 90), and convenience sampling are those that are only available to the researcher as a result of availability (Bryman, 2016, p. 201). However, both methods are forms of convenience sampling and therefore make the selection fairly arbitrary (Emerson, 2018, p. 166). Nevertheless, neither of the selection methods used are suitable for statistical generalization (May, 2011, p. 101), but for this thesis, a selection that offers variety and, at the same time, fits the purpose is seen as more valuable (Bryman, 2016, p. 201).

After transcribing and analyzing the interviews, I emphasized the information I received from the school employees and focused mostly on the school's experience with the adoption of AV1. I also got valuable information from the parents and the user, as they partially had their own perspective on the challenges of using AV1 in school, and also because much of what they expressed supported the school's descriptions.

4.2 Semi-structured interviews

An interview can be described as a simple conversation with a purpose. Specifically, the purpose is to gather information (Berg & Lune, 2012, p. 105). It has thus been stated that interviews can be used when seeking to understand the actions of individuals in their social worlds (May, 2011, p. 157). During an interview, however, the researcher is removed from the natural environment, which means that social interactions and individual behavior will be reported instead of being observed (Blaikie, 2018, p. 637).

The interview design was semi-structured, with the purpose of getting rich and comprehensive information about my informants' experiences with AV1 (Bryman, 2016, pp. 470-472). Semistructured interviews can be adapted along the way, and one has the opportunity to be flexible in how the interview is conducted (for example, the order of the questions), according to what information is revealed. The technique involves open questions, so the informant can present the areas he/she believes are important for the research (Kvale et al., 2015, pp. 47-50). In contrast, choosing a more structured type of interview would involve "sticking to the script," and possibly ignoring a topic that is central to the informant's understanding of the subject being discussed (Berg & Lune, 2012, p. 114).

An alternative method could have been observation. One of the most common methods is participatory observation where the researcher integrates themselves into an environment, community or group. This can give a good insight (Crang & Cook, 2007, pp. 37-38). Participatory observation on the adoption of AV1 might have provided me with more robust data on the many challenges of implementing the robot in school (Skagen, 2007, p. 2). Unfortunately, due to recruitment challenges and the thesis´s time frame, it was not possible to achieve in this study. Among my informants, the student was either finished with AV1, away for the time being or too ill to use it. I therefore opted to rely solely on interviews.

4.4 Conducting the interviews

Thirteen semi-structured interviews were conducted over a time period of three weeks, and these served as my main data source. Five of the interviews were undertaken at the informant's workplace and three were interviewed at home. This was convenient for the informants, since they were in a familiar setting, and thus could relax more easily. Five were interviewed over the phone because they were on the other side of the country, and one was busy with hospital visits and had therefore no time to meet.

Phone interviews might potentially eliminate some of the contact that occurs between the interviewer and the informant. By using this method, you do not get the opportunity to read body language or see facial expressions. This means that you have to listen to their tone of voice to a greater extent (Bryman, 2016, p. 488). In a face-to-face interview it is easier to use pauses to encourage the informant to elaborate more on the topic. This does not work as well over the phone. Nevertheless, the method has shown to provide as rich data as regular interviewing, as long as one is well prepared and has the follow-up questions ready. Phone interviews also make it easier to receive a scattered geographical selection. I would not have had the opportunity to speak with all of my informants if a phone interview was not possible. It also lowers the threshold for participation as it gives informants greater flexibility to choose the time and place for the interview (Leavy, 2014, p. 90).

An interview guide (appendix 1 and 2) was prepared to provide answers to the research questions, and to help in conducting the interviews. I read previous research concerning the use of virtual communication in contact between chronically ill children and the school when developing the guide (Børsting & Culén, 2016; Johannessen & Haldar, 2020; Newhart & Olson, 2017; Newhart & Warschauer, 2016; Weibel et al., 2020). The order and formulation of the questions was not completely predetermined, as I wanted to hear the informants' answers first and be open to new directions in the conversation. The interview guide was slightly changed depending on whether I spoke to school employees or parents/users, but the main essence remained the same.

I designed the questions in the interview guide to be as neutral and open as possible to bring out both depth and breadth of the answers (Leavy, 2014, p. 287) In addition, the questions

were designed to be simple and clear for the informants to understand. I began each interview with some simple initial questions. This was to establish contact and a trusting relationship with the informants. I then followed up with dynamic interview questions to stimulate the informant to provide spontaneous experiences and emotions, thus approaching the topic from several angles (Bryman, 2016, pp. 476-479). To round up the interview, I asked if they had questions or comments. This gave the informants an opportunity for debrief. I ended the interview by thanking them for their time (Magnusson & Marecek, 2015, p. 60). All interviews were conducted by me, and I used a recorder as well as noting keywords. The interviews took 20-45 minutes. They were then transcribed closely to the informants' language, where modes of expression, including pauses and emotional expressions were written down. The statements presented in the quotations have been transcribed according to written language conventions to make the text reader-friendly.

Conducting effective interviews is a craft that requires practice (Magnusson & Marecek, 2015, p. 67). I therefore decided to take an exercise in interview as craftsmanship before the interviews themselves. Therefore, I conducted a test interview with an acquaintance to ensure that the questions were understandable, the number of questions were within the deadline set for each of the interviews, as well as to ensure I had the audio recorder tested (Krumsvik, 2014, p. 127). I then revised the interview after the feedback and comments I received.

As a result of the limited time for data collection I was unable to hold follow-up interviews around interesting and valuable information that appeared. There were several events and perspectives that came into view during the transcription and analysis process that I would have liked to delve deeper into.

4.5 Ethics

Ethics is an important topic that has become increasingly significant in the research world. All research should be rooted in recognized ethical values, which we find in the research ethical principles (Befring, 2015, p. 28) As noted by Berg and Lune (2012, p. 61), social scientists, perhaps even more than the average citizen, must take into account the ethical obligation that follows the involvement in other people's lives. Accordingly, all research involving other people requires an assessment of ethical questions (*Guidelines for research ethics in the*

social sciences, law and the humanities, 2006, p. 8). Most ethical questions in research fall into one of four categories; protection against harm, voluntary and informed participation, right to privacy and honesty with professional colleagues (Leedy & Ormrod, 2014, p. 106).

This project had a duty to report to the Norwegian Centre for Research Data (NSD), which helps researchers or students with ethical questions related to data collection and analysis. In preparation for my empirical data collection I made an abstract and described the overall goal of the project and applied for approval from there (Appendix 3).

The informants received the request via email regarding participation, together with information about the study and a consent form (Appendix 4). They were informed that they could withdraw at any time without justification, as well as participation was voluntary and that information would be processed confidentially (Kvale et al., 2015, p. 104; Thagaard, 2013, p. 91). Each interview was recorded with a tape recorder with the informants' consent. To protect the privacy of my informants, the voice recordings were then transferred to a password-protected computer and deleted from the tape recorder. It was important that audio recording and transcription were stored safely, and that they were deleted at the end of the project according to the approval of NSD (Kvale et al., 2015, p. 213). The confidentiality of the participants was safeguarded by anonymization (Befring, 2015, p. 32). The signed consent was maintained in a secure place, and all the informants were given codes instead of using their real names. If information that could be of a confidential nature emerged in the interviews, I neglected to transcribe this. Since the informants' identities were kept hidden, I made a link key between the informants and the transcribed interviews.

4.6 Analytical strategy

There are many different approaches to qualitative analysis, of which thematic analysis is said to be the most basic and student-friendly (Johannessen et al., 2018, p. 278). This analysis method is used to identify, analyze and report patterns/themes in the data material (Braun & Clarke, 2006, p. 79). Thematic analysis is widely used, but there are also disagreements about what this method of analysis is and how to conduct it (Attride-Stirling, 2016, pp. 386-388).

Thematic analysis is one of the easier qualitative analyses to conduct for scientists with limited experience. Among other things, its flexibility and theoretical freedom can facilitate a rich and detailed, but at the same time complex, account of data (Nowell et al., 2017, p. 2). Another advantage is that it can generate insights about differences and similarities across datasets. There are no clear and concise guidelines or detailed descriptions of how the method will be applied to the data. Therefore, it is important to present how one has done the analysis in the reporting of the results (Braun & Clarke, 2006, pp. 77-81).

Throughout the analysis process, I wrote notes to keep in mind the observations and reflections I made along the way. This was an important tool for capturing impressions and reflections that one does not get from sound recordings (Malterud, 2011, pp. 67-68).

My starting point in the implementation of the thematic analysis was the four-fold process described by Johannessen et al. (2018).

Phase 1: Get to know the data: I started with reading through the interviews to get to know the data better and took notes during and after I finished reading. I did not have a clear research question yet, but only some initial hunches about potential research issues involving the school employees. I therefore focused more closely on the data I thought would lead to the most interesting research question. This is where I decided that I wanted to focus on the school's experience of the implementation process of the robot.

Phase 2: Initial coding: After getting to know the data, I started coding relevant and potentially relevant data. I used a combination of markup, keyword summaries and writing of reflection notes. My focus was on what factors influence the implementation process of the robot in schools. The codes were descriptive and close to the informants' own experiences.

Phase 3: Search for themes / categorization: The next step was to sort the encoded data into more general categories – which constituted the study's themes. To make contexts and themes clearer, I created mind maps to gather the codes together into themes to more easily see the connection between them. I repeated this process several times until I was satisfied with it. My codes tended to overlap, as the technical aspect of the robot affects most other aspects. In the end, I was content with the themes and felt that the codes fit in successfully. These topics

were: Privacy and monitoring, network problems, establishing routines, and educational challenges.

Phase 4: Reporting: The next step in the analysis process was to write about each topic, what it involved and how it was related to the other topics. I clarified the order in which they should be presented and what statements illustrate the essence of the theme and how the theme relates to the school's experience of adopting the robot in school. Although I have summarized the analysis in phases, there was a lot of jumping back and forth in the process, especially between phases 2-4.

This analysis led me to the next chapter in my thesis, namely the results section. Here we will go over my empirical findings based on the interviews. Thereon, I will further analyze my findings through previous research and the theoretical framework NASSS in my discussion and conclusion section.

5. Results

I will now go over the challenges of implementing the robot in the classroom. From the thematic analysis of the data, four challenges stood out in particular. These are related to (1) privacy and monitoring issues, (2) network problems, (3) establishment of routines and (4) educational challenges.

5.1 Privacy and monitoring

5.1.1 Scared of being monitored

While most informants in the school system were positive towards AV1, they were worried about being monitored in the classroom. AV1 allows the child to see and hear what is going on in the classroom, but it is a one-way camera, so the teacher and fellow students can only hear the student sitting at home. This can make the teachers and assistants nervous and insecure, as they do not know who is watching them on the other side of the camera. In several schools, teachers did not want the robot in the classroom at all for this reason.

Many teachers felt they lost some control over who was in the classroom, as they could not see what was happening on the other side. The teachers were worried that the parents would sit with the unwell student and overlook the class, potentially thinking they were not good enough teachers. They feared they would not say or do the right things (according to the parents), which could potentially have unpleasant consequences for them. Teacher 1 explained that she found it “very scary” to have someone on the other side of the camera watching:

> [To use AV1] was very scary, I thought." Help, now someone's going to sit at the other end and watch what I'm up to and what I'm saying and all that." I'm really terrified of that.

Another teacher (teacher 2) said there had been no objection from the parents of other pupils in the class about the use of the robot, but that it was mainly teachers who worried about being monitored:

> I didn't get any reactions from the parents of the other pupils in the class, but there were some teachers who asked questions about whether the parents of the pupil could sit at home and watch the class. “Can they keep track of the class and what I do?". There were many who had these thoughts.

It is clear that many were nervous about the classroom situation before they adopted the robot, and the pupils’ parents was the main reason for this.

5.1.2. Trusting the parents

Some of the teachers were very clear about not wanting the parents to sit with their child while they were using the robot. For them, it felt like having the parents in the classroom, and they did not want this. Other teachers knew that the parents were sitting at home with their child during classes. Either they knew it because they had been told by the students’ parents, or they had heard someone sitting with them through the robot. As Teacher 1 expressed:

> Every time the robot has been talking, she's been the one who's been talking, but I've also heard a few times that there's been someone next to her, but I have such good communication with the parents, so I haven't really thought about it. I don't think they're using it to monitor what we're doing.

As we see, Teacher 1 emphasizes she has heard the adults sit with the student several times even though this is not allowed. However, the teacher also points out that she trusted that the parents of this pupil would not use anything in her education against her. She had a good cooperation and communication with them. Teacher 2 had quite a similar experience when it came to good communication and trust in the parents. Teacher 2 also felt like there was an adult who "came into the classroom” when the robot was in use, since she knew that the student’s mother was sitting with her. Teacher 2 explains it like this:

> I've thought about the idea that I needed to think a little extra over what I was saying, but it was only in the beginning. Especially when I knew her mother was sitting there with her. Teaching for the girl, I had no problems with. Luckily, the parents were just positive, but you might think about it a little extra. I'd do that no matter what adult came into the classroom.

This feeling changes the classroom dynamics and can make the teacher overanalyze what to say and do, so not to create a bad impression. She knew the mother was there with the girl, because she had said so, and Teacher 2 could sometimes hear her in the background when the robot was connected.

Teacher 3 explained she also trusted the parents, but before she decided to do so, she had to have a proper conversation with the student's mother about confidentiality and trust. Teacher 3 told it like this:

> 'We've been at their home, talking to the mother about the confidentiality in relation to her seeing and being a participant in the classroom. There's a lot going on at school and we have to be able to trust each other in relation to that. In relation to the school's confidentiality agreement, she is in a way employed now since she acquires a unique insight into a classroom situation. It's not normal for parents to come and observe a class, and there are some rules around it.

Teacher 3 also experienced a change in the classroom dynamics, as it was perceived there were no longer only pupils in the classroom anymore. The mother had both become an "adult entering the classroom" and "an employee" in relation to confidentiality agreements. AV1 is a representative of the student, and in principle there should not be a difference between having a student or a robot in the classroom. However, as the teachers see it, it is not just the student who is in the classroom via the robot anymore. When the video camera is there, there could potentially be more actors involved.

The teachers I interviewed mentioned the importance of trust between teacher and parents, but more than one of them expressed that there were several children in class who they would have been reluctant to use the robot, based solely on the skepticism of their parents. This can mean that some of the students may not get the same opportunity to use the robot as others.

The same teachers also expressed they would have been afraid that these parents would exploit the situation by spying on the teachers, and potentially try to use things they said or did in the classroom against them. Teacher 2 told me:

> I felt that privacy was protected because they had no opportunities to take pictures or film. But these were parents who I knew would never be there looking for anything either. They were the kind of parents who were just concerned about their child. I know that I have some parents who might have been interested in looking for something and then one might be skeptical. Because you don't have any control over who's on the screen at home.

In addition to themselves being monitored, some teachers also feared the robot could be used to monitor other students in class. They were concerned that others might see when students were behaving badly or in an unfortunate situation that did not put the student in a good light.

Teacher 1 was particularly skeptical about this:

> That's the danger of being watched. Not just the fact that I'm being it, but also the kids. If I say or do something strange, I'll always be able to explain why, but there are situations one can't predict and I think maybe that can be stupid with a robot (...) If someone had had a really bad seizure or something like that while she's on the robot, then I'd probably be a little concerned.

Teacher 1 was uncomfortable with the fact that the students could not have defended themselves and their actions properly if they were to get caught acting out on camera. She was less nervous about herself, because she knew she would be able to explain the reason behind her actions.

The problem with the monitoring was compounded by the fact that those in the classroom could not *see* who was using the robot. There were different reasons for that; some would feel less monitored if they knew who was on the other side of the screen, while others wanted to see what the student saw out of sheer curiosity. Several teachers mentioned they would have liked it if the robot included a screen. They would have felt a closer connection to the students if they could have seen them and their body language and facial expressions. It felt more impersonal with just the robot there. However, they understood the reason why No Isolation did not make a two-way camera - most of the ill students feel more comfortable sitting privately at home in their bed without anyone in the class seeing how unwell they are.

Even though some teachers would have preferred a screen, the situation still got better over time. The teachers who chose to adopt the robot, even though they were skeptical initially, expressed that it became a matter of habit after a while. As Teacher 1 explained:

> It's not dangerous. One might think the first hour she was on that "now I have to remember what I say, or not stand with my ass to it and stuff", but now I don't think about it anymore.

After a while, the teachers that had expressed concern about adopting AV1 in the classroom, got used to it and stopped being nervous every time it was in use. They realized it was not as dangerous as they had thought and stopped being concerned about being monitored. The teachers that did not get accustomed to AV1 were those who never took the step to adopt it at all.

5.1.3 Consent

Considering the potential problems of feeling monitored, the question of consent often arose. As for now, the schools need to decide on solutions to move forward. As they do not have any rules and regulation to adhere to, they must therefore decide on individual solutions.

Schools know they need consent, but some decided to have an oral consent, while others decided to have a written consent. The timeframe of gathering the consent was also different from school to school; some did not start using the robot before all parties had consented to it, while others waited a while after they adopted AV1 before retrieving it.

At one school, all parents had agreed to have the robot in the classroom, but one set of parents had declined to show their child on the camera. The teacher then had to make sure the robot was positioned so the student was not visible. However, it was still manageable, as it was easy to have the robot on one of the front desks in the classroom. This was conveyed to me by an assistant (assistant 1) who was heavily involved with the user of the robot. She had been in the classroom when the robot was connected, but most of the time she was at home with the child when he used the robot. She was there to help him with his homework and was his personal assistant for school. Assistant 1 told me:

> All the parents had to sign that it was okay for their children to be filmed by the robot. There is no one else looking at the IPad than me and the sick child, but we had to have it in writing anyway because of the strict rules. There were some parents who didn't want their children to be filmed, so we had to keep making sure they were behind the robot.

Some of the schools only gathered consent from the class, meaning AV1 could only be used in the classroom. Other schools took it out during recess or on gatherings with other classes. Teacher 1 told me they only used the robot in the classroom based on who had signed the consent form. Teacher 4 said the robot could be used in the building where the classroom was, and that the student often took it out to socialize, while Teacher 3 said it could be used anywhere on school grounds.

The schools wanted to have the opportunity to follow spesific guidelines or rules when deciphering how to retrieve the consent, from whom to retrieve it, and where AV1 was

allowed to be used after that. As for now, they had to work this out themselves via trial and error, making them unsure if they were doing it the right way, and giving them extra work.

5.2 Network issues

5.2.1 Poor network connection

Another challenge with using AV1 in the classroom was the technical problems, especially related to the network connection. All of my interviewees expressed dissatisfaction with the robot because of this, and the poor network connection has led to various challenges when they use it in the classroom.

The robot often connected well to the network at the students´ home, while it struggled to connect to the school's wireless network. The school network might be of a lower quality than the one at home, but there are also many more individuals that connect to the network in school at the same time. The poor network connection leads to poor sound and video, and if the robot is unable to connect at all then it is completely useless. The robot also has support for using the 4G mobile network, but this could also be problematic on school grounds. At times, the robot´s connection jumped between the 4G and the school's wireless network. This disjointed connection almost made it impossible to use the robot.

When the robot jumps between being off- and online, it has consequences for the robot's sound and image. Sometimes it is possible to communicate through the robot, but more often not because the screen freezes. When this happens, the person sitting at home views an interrupted lesson, and it is also frustrating for the teachers who want to include the robot in class. They have to make sure the student is present at all time, since they know AV1 is constantly having problems with connecting. Often the sound comes later than the image, and this makes it hard to engage in fruitful communication. Several teachers and assistants have experienced that when the student wants to answer questions, they are already somewhere else in the lesson.

A teacher (Teacher 4) explains her frustration around the network issues and how it affects image and sound. She explains they eventually decided to stop using the robot because there was so much latency, poor coverage and technical problems.

> The robot worked very poorly. We had classrooms inside the building and there was very poor coverage there. Very often when she was going to use AV1 she didn't see us or she didn't hear what we were saying and it just lagged. There was a lot of technical trouble. This made everyone shout to the robot since the sound was bad and then she only perceived it as noise. All the technical problems made her want to stop using the robot.

Teacher 4 told me they had used the first model and not tried to update to the latest one before they finished using it.

5.2.2 Two different models

There are two different models of the robot. I have interviewed people who have used the first model, used the second model and who have used both of them. Those who upgraded from the first to the second model experienced an improvement in the network connection, but still said it was not good enough. An improvement was very welcome, but there is still a way to go.

Those who experienced the upgrade were Teacher 1, two inspectors (Inspector 1 and 2), and an assistant (Assistant 2). They all mentioned how it had been almost impossible to use the first robot because of all the technical problems, but after they upgraded to the second model, it had improved considerably even though the processes were not yet optimal. Inspector 1 told me:

> It was a little too often that the first one didn't work well, so then we got a new one and that's probably the last model. Luckily, it's much better than the previous one even though the network may still fall out.

Although the technical aspects of the robot were far from perfect, this improvement had made them feel more positively towards the robot and gave them belief that it was something that could work in the long run.

Due to the network problems it can take months before the robot is put to use. This results in extra work for schools and parents, which is time consuming. This creates frustration in the process of trying to integrate the robot into the classroom, particularly when teachers and assistants try over and over again to get AV1 to participate in class, but the network issues constantly prevent this from happening.

5.2.3 Delivery defects

It also seemed like the lending scheme could complicate the maintenance of AV1. Some experienced having to submit the robot for general updates several times, as it had shortcomings from the start. In one example, AV1 had been lent to another student beforehand and it had not been properly fixed or updated by the foundation before lending it to the new user. AV1 might also be in a poor condition because the previous family had not maintained it adequately. Assistant 2 told me they received an old model that lacked several updates, and this meant they had to submit the robot for updating several times before it could be used.

> We didn't get it online in the beginning, but via the IPad you can contact the support department. I was in contact with them a couple of times before we finally discovered that it was an old model that had been used by others and lacked lots of updates. Then it was updated, but we had to do this several times before the robot managed to be OK. It was a bit stressful to get it going. But then we got it started, but the network often disconnected, or the screen or sound froze. What was said out loud could come a few minutes later on the IPad. But now we have one that works tip top.

Even after the updates, it failed to work properly, so they eventually ended up getting the new model which worked better. This process created a lot of frustration and additional work for everyone involved. There were several times they considered not continuing with the robot because of this, but the teachers and assistant at the school believed in the potential of the robot and wanted to make it work for the sake of the unwell child. Other schools might not be as patient or have the resources to deal with this, and therefore abandon the technology. A teacher (Teacher 5) from the same school explained it like this:

> It's really nice that the student gets to experience what it's like in the classroom and doesn't miss out on so much teaching, but I have to say that the quality is not so good. Every time it is used there are problems with connection, the students loose contact with the IPad or robot, and we need to press restart or call support. There is a lot of work with the robot and there is a lot that can and must be improved. If they [the producers] could have got it right then it would have helped a lot, but the idea itself is awesome.

He likes the very idea of the robot and would like it to be part of the class, but there is a lot of work involved and it is tiring when it almost never works.

5.2.4 Internet solutions

Some schools chose to get their own internet box for the robot, and this worked well in several cases. The robot in Teacher 1's class had begun to work better after switching to a newer model, but when they also provided their own network for the robot it worked even better. Teacher 1 shared her experience about this:

> When I started it didn't work at all. We got a new model after Christmas because it was constant chopping, lagging and had poor video, which made her very gratuitous to use it. After we contacted the people who make AV1 they told us there were several with the same problem and we got a new model. We also contacted the ICT department in the municipality and they came and put up their own box in the classroom with network only for the robot, and after this it worked properly for the first time with clear picture, good sound and everything. So now we're really very happy.

This is a solution that other schools might also find more effective. Teacher 1 was very happy, and she told me that both the class, the parents and especially the student shared this joy as well.

5.3 Establishment of routines

In addition, to the network problems there are also several practical aspects that need to be solved to get the robot up and running. These aspects relate to retrieving AV1 when it is needed, setting it up in the classroom and deciding who should have the day-to-day responsibility.

5.3.1 Creating new routines

Teachers or assistants are usually the ones who are responsible for the practical aspects of the robot, such as charging it or taking it to the classroom before use. This creates more work as there are new routines that need to be established. It is not unusual for teachers to create new routines, but none of the teachers had experienced a robot in the classroom before, and most had not used FaceTime or Skype in the class either. Moreover, most of the students used the robot sporadically because of the unpredictable course of their disease. This made it more difficult to establish a routine when using the robot. Teacher 4 said she struggled to remember to put it on charge and have it ready due to its sporadic use:

> We tried to have it charging overnight, but it was forgotten eventually. We tried to have a routine that it was always put to charge when we went for the day, and we did it at first but then it got longer and longer between each time it was put into use. It would probably be easier if she used it regularly every day.

Another essential aspect of having control over the charging routine, is the importance of having a full battery. Several mentioned that if the robot had less than 50% battery it was not possible to use it until it was recharged. Some also said that if it was uncharged, they would not be able to use the robot for the rest of the day even if it was put on charge - it needed to be fully charged first. This created frustration for everyone involved. Inspector 1 told me that in their routines, the student contacts him if she is sick at home and will use the robot, and then he informs her assistant who will set up the robot. Unfortunately, they have sometimes forgotten to charge the robot, and then it either does not work or it works poorly. Inspector 1 explained:

> As a rule, I'm told if the student is at home due to illness and is then asked for the robot to be set up, and then I'll let her assistant know. Then it is her task to set up the robot in the classroom, take it out after class and put it on charge again. We've become pretty good at looking after it, but we have forgotten to put it on charge a couple of times and then it does not work. It seems like it has to be fully charged for it to work and it's a bit strange.

Inspector 1 expressed the importance of having good routines one can follow even if the situation is unpredictable. Otherwise, it may end up with the student not being able to use the robot at all that day.

5.3.2 Unpredictability due to disease

As indicated, the unpredictability of the robot does not only derive from network problems, but also as a result of the child being seriously ill. The illnesses are often complex and longlasting. ME, cancer and bowel disease are some of the most prevalent diseases children who use AV1 have. This causes are complications due to an unpredictable course of the disease – they may have periods of severe illness and undergo intensive treatment for weeks at the hospital, while being in remission at other times. Pain and fatigue both physically and mentally also affect the use. Unpredictable illness often makes it difficult to know when the student will be a part of the class. As a result, there will have to be extra communication with parents or the user to get an overview of how the student is doing and what is best for them.

Inspector 1 had regular contact with the user of the robot instead of the parents. The user attended high school and had chosen to be responsible for the contact with the school. She was also the oldest robot user in my study (the others attended primary school). She had ME and often did not know until the same day whether she was going to use the robot, as her form was very varied. Inspector 1 said this unpredictability could make him nervous, because he was afraid the routines would not be in place when the student needed the robot. He was the only person at school that had direct contact with her, so if he was unavailable then the message was harder to pass on. He was also concerned there would not always be people available to help out, since they never knew for sure when she was using the robot and therefore could not establish a specific routine. He has hectic days with a tight calendar and meetings, so it can be stressful. However stressful, he still found it manageable. Inspector 1 said that he understood that the student cannot plan so much in advance because of the illness, even though it makes the situation quite unpredictable for both him and her.

Teacher 2 was also considerate of her pupil's diagnosis, but still felt frustrated when it was difficult to create routines in school life, since she never knew when the student was going to connect to the robot. She also had to put in extra time in her day to communicate with the student's parents. The girl also suffered from ME. She was in fourth grade and too young to communicate for herself. Teacher 2 told it like this:

> I had a lot of contact with her mother in terms of what time she was going to use it, but I never knew if she was going to connect that day because her form was so different from day to day. She also slept very long in the morning, so it was best with the late classes. All of a sudden it didn't fit either since we were going to have gym or do something else one day. I had to keep it in the back of my mind and remember it all the time.

When the student suddenly felt healthy enough to participate in class, they could be having gym or other classes that would not be suitable for AV1. Teacher 2 wanted her to join when she had the opportunity, but it was impossible to set up every day according to the varying severity of her symptoms. Instead Teacher 2 always had her in the back of her mind and tried to accommodate as best as possible.

Many teachers expressed understanding of the unpredictable use, however still wished a more stable use of the robot was possible, making it easier to establish routines. Several of the

teachers told me that it could be frustrating to never know when the student was connecting to AV1, and there could be long stretches between each time. Nevertheless, this was something to be expected with unwell students, and many were passionate about including the students in class anyway.

5.3.3. Acquisition, ownership and routines

Just like with consent, there are not any rules, regulations or guidelines to follow when it comes to ownership of the robot. Several lent the robot through a foundation, some lent it from the municipality, one family bought it themselves and one school bought it. This makes it difficult to create a fixed routine when a school or a pupil at the school wants to procure and use the robot. There is also a financial aspect to this, because it is an expensive robot – especially for families, but also for schools. There might be only one student using it for a year or two, and nobody after that. Several of my informants expressed they wanted the municipality to own the robot and rent it out to those who needed it. This would make the acquisition process easier, since they would know where to get it from, and it would also allow re-use of the robot, as the municipality could lend the robot to another child in need of it. Inspector 1 (who was working at the school that had bought the robot) argued in favor of municipal ownership, because it would be easier financially for them, furthermore, the robot could then be used by other children in other schools if there was no longer a need for it (at his school).

> I contacted the county council and asked if they'd rather buy into AV1 so they could lend it to schools when the need occurred, but we didn't get a response to it, so there was none of it. I think it might be a good idea, if you think municipalities or county municipalities that have such technology can lend it to schools instead of the individual school to buy it. Then it goes a couple of years and that student graduates or gets well and they don´t need the robot anymore. Then you do not sit on expensive technology that one either has to pay for or terminate.

This form of centralized ownership would also mean that one could gather knowledge and experiences to a greater extent and learn from previous attempts to use. This could also create opportunities to train teachers in the use of the robot in the classroom, and possibly result in guidelines that others can follow later. This is in contrast to the present situation, where those involved are working out best practices via trial and error, which causes a great deal of frustration. Non-adoption and abandonment would possibly be less frequent if there were

guidelines to follow and easier processes to adhere to. I return to this in the Discussion chapter.

5.4 Educational challenges

There are many challenges in getting the robot integrated into school life. One of the challenges that I have not dived into yet is the educational one: How the robot can best be used for educational purposes.

5.4.1 Robot-friendly classes

Not all subjects and types of education are equally suited for robot use. All informants mentioned that the robot worked best in basic subjects or subjects that have a "lecture style". It is easiest when the robot can stand still and observe the class without much talk and turmoil in the classroom. It has not had any great success in active or practical classes, such as gym or arts and crafts. It is possible to include the robot in these classes so the students at home can see what is going on, however this was not deemed successful when the students did not have the ability to participate themselves. The same applies to classes with group work, where several pupils talk at the same time, or where movies are shown. One of the main reasons for this is that the robot cannot process a lot of sound, which therefore makes it difficult to effectively use it in a classroom with a lot of talking and noise. It can be problematic to have the robot in basic subjects as well if it is a noisy class.

Teacher 5 told me that it was often frustrating for the student if several people were talking at the same time or if there was a lot of noise in the classroom because then he did not hear what was said. As a result, Teacher 5 increased the focus on everyone being quieter and calmer in the class and most students had shown an understanding of this.

The teachers had to adapt their lessons so the robot could fit in better. This was done in different ways: by trying to keep the class extra quiet; always letting the first part of the lesson be a "lecture"; and doing group work when AV1 is not used. Every teacher in my study tried their best to adapt their class to AV1. However, Inspector 1 mentioned that there was a teacher at his school who had declined to have the robot in class because they focused on group work:

> One teacher said there was no point having the robot in her class. She told me it was just group work and there couldn't be anything interesting watching and did not want to try to include the robot.

This is an example of a teacher who did not want to change her lesson to include the robot. In a related manner, Teacher 2 eventually felt there was no point in using the robot, as the student did not get anything out of participating in class through AV1. Teacher 2 had tried to facilitate the education by having the lecture part at the beginning of the lesson, but found it too difficult in the long run. Teacher 2 and her student worked better when she visited the student's home and had lessons there. Teacher 2 explained it as follow:

> In primary school there's very little lecture time before you have to do something active. It may be max 20 minutes of the lesson. We tried to have an appointment where she was going to be part of it, but it was also difficult for me to organize all my lessons so that we always started with a 20 minutes lecture, because it depends on where we had ended up in the previous lesson and what we were going to start working with. (...) I felt it was much better that I went home and had lessons with her. Because then I could see and follow her and there wasn't much noise in the classroom.

Similarly, Assistant 1 told me about her experiences with using AV1 and how she often sat at home with the student when he used the robot. This was more helpful for the student as it became more hands-on teaching, while it was also positive for the assistant's work life. She had been home schooling him for years but had no formal education and was not very good in mathematics. However, now she had the opportunity to get extra help from the teacher in the classroom while she was helping the student with his subjects. It was easier for this robot to work in several subjects, since the student also had an assistant sitting with him at home. If there was too much noise in the classroom, Assistant 1 and the student simply turned off the sound and worked together with the subject.
Nobody else I talked to had tried this solution. Several had a mix of home schooling and using the robot, but nobody else had tried it at the same time.

As indicated already, there were several ways teachers had to adapt their lessons to fit the student who used the robot. Among other things, this involved preparing papers and assignments in advance so that they could be sent out to the pupil before the lesson. Most teachers told me that they grew accustomed to these adaptions, after an initial transition period. This entailed a little extra work, but it became part of the everyday routine after a while. It also helped to figure out which lessons AV1 was best suited to be used in. Teacher 1

explained how she and the student's parents started planning schedules in advance, but that it eventually went by itself:

> I just have to be a little extra structured in the morning and think about those sheets or books I need to put in the shelf. For a period of time she was going to be a lot gone, and we planned a lot. I sent the schedule home to the parents where we ticked off what lessons it was a good idea to be part of and what lessons there was group work, collaboration and a lot of movement. We crossed out so she let it go. But we have also had group work where one student has been given responsibility for carrying AV1 around. Playing games and some turning for AV1.So it's not really much more we're taking into account now. It was more at the start.

This is also proof that it is possible to use AV1 for group work and activities if conditions are facilitated, and network access is working sufficiently.

5.4.3 Disturbance

5.4.3.1 From the class

As indicated, it can be difficult for the teacher to include the robot in the class because of class disturbance. Every teacher expressed that when the class is noisy it creates difficulties for the robot to hear. Teacher 5 told me that it was often frustrating for the student using the robot if several people were talking at the same time or there was a lot of noise in the classroom. The student could not hear what was said. This meant that Teacher 5 had to increase the focus on having a quiet class when teaching, and fortunately most students displayed an understanding of this. Teacher 5, however, had a small class, and so did Teacher 1. Both told me that it would probably have been much harder to adopt AV1 in a class with twice as many students. They already had to work a lot to keep it quiet in a classroom with under 15 students. Teacher 1 told me:

> If we had been twice as many, it would have been difficult to use it in teaching. It's not as easy to use the robot in noisy classes.

One parent told me that one of the main reasons they chose to stop using the robot was because of the classroom situation. It was a very noisy class and the teachers had no control over it. This did not give the teachers much possibility to focus on the robot becoming part of the education. The noise in the class made it almost impossible for the user to hear anything of the lesson. This is what the father of the user told me about the situation:

> The classroom situation was quite chaotic. When they received a diploma in tenth grade, teachers thanked them for the three years that had been, at the same time as they said that there had been some challenges and a lot of unrest in the classroom, and they never added the typical "but it's been nice." The teachers looked very tired. And I'm sure he was extra unlucky with his class. It had been a class that had been troublesome all the way from kindergarten, so they had their hands full. It was also extra difficult to pay attention through a screen with so much noise.

While this is the experience of a parent and not from the school's perspective, it still demonstrates how it can be difficult to implement a robot in the classroom when the class is disruptive.

5.4.3.2 From the robot

The relationship between the robot use and disturbances could also happen the other way around: In several lessons the robot itself caused the class to be noisy. The students typically considered it a joyful reunion whenever AV1 connected, especially in lower levels of schooling. The students could become very eager when the robot was activated, and they would rather talk to AV1 and give it their attention than pay attention to the teachers. Assistant 1, who home schooled the student through AV1, told me about what happened when they connected to the robot. Students got very eager, curious and wanted to give the robot a lot of attention. It was usually fine, but the teacher had to focus on changing the students' focus back to the lesson (the school level in question is grade 5).

> The students in the class find it very exciting. When we turn on the IPad at home, the robot lifts its head on the chair. Then the students come to it and say "Hello," waving and showing off. When we turn our heads and look around the classroom, they become almost more focused on the robot than what happens on the blackboard. There are some students who get a little more eager than others and just want to chat and wave to the robot all the time, but we quickly get them back to focus so it usually gets well.

Teacher 1 (in grade 3) also told me about how students could get a little too eager when AV1 connects:

> Students get very distracted when it's on. The focus will be somewhere other than teaching and everyone will look after it. But everyone enjoys having it there, they're just very curious.

Even though they are easily distracted it seems like the robot is a positive addition for the other students in Teacher 1´s class. They like it when the student at home connects to AV1.

However, the robot is still a disturbance in the class, before the students become more accustomed to having it there. Here again, the unpredictable course of the robot user's illness complicates things, because this in turn makes the use of the robot sporadic. There can be a period of months between each time it is used, while sometimes it is used several times a week. This makes it difficult for teachers and fellow students to get used to having the robot in the classroom and facilitating teaching for the user.

Was the robot ready to come on the market?

In light of what the informants told me, we see that there are several challenges in implementing AV1 in schools, related to privacy, network issues, establishing routines and educational adaptions. However, all the school employees I spoke to thought that the *idea* behind the avatar is indeed fantastic. They also emphasized that they wished the technical aspect was far better in particular, because this affects all the other aspects with the robot in a negative way.

In light of this, there was one hospital schoolteacher who speculated that the robot came on the market too early. The hospital school had used the robot for several years and he undeniably liked the idea of the robot, but he also thought the technical aspect was far from good enough. He wished that No Isolation had waited a little longer and made the robot work more efficiently before they put it on the market. He elaborated like this:

> The quality doesn't live up to its promise. The network is too poor and there is a lot of timeout. I think the robot came too soon on the market. It was very important for No Isolation to get it out, to get it known, and maybe get it out before someone else took the idea. The first version was very bad. And today's version may also be a little too bad. The technical component needs to be better. The sound is bad and the internet connection is bad. It's too much on and off and the robot must have at least 50% battery at all to be turned on. If teachers forget to put it on charge, then maybe the whole next day is gone. They might have benefited from getting slightly better components, at least if you see it from an educator's point of view, but for now the quality is too poor for the robot to be placed on a student's desk so the student can see what's happening in class. It does not have a good enough camera and good enough audio connection. But when you think about the starting point of No Isolation, maybe it was to take care of the contact with the fellow students, so then we might have two different points of view.

The teacher is highlighting a typical dilemma for start-up companies like No Isolation because the quality of the robot does not live up to its promise. He emphasizes that the technical

component needs to be better and that the robot came on the market too soon. The robot needs to be better technically to be placed on a student's desk.

6. Discussion and conclusion

The purpose of this study was to find out what the challenges of implementing AV1 successfully in schools are. In this chapter, I will discuss the findings in light of the previous research and theory presented in chapters two and three. I will do this in relation to the four main themes from the results section: Privacy and monitoring, network issues, establishing routines and educational challenges.

6.1 Privacy and monitoring

The privacy concerns surrounding the use of AV1 have been frequently discussed in the media. Several statements from teachers and teachers' organizations have expressed their skepticism around the use of the robot in the classroom (UtdanningsforbundetPorsgrunn, 2017). One of the most frequent arguments is whether one knows if someone can record what is happening in the classroom or whether others can observe the classroom with their children (Børsting & Culén, 2016, p. 38). This was evident also in my study. Most of the teachers mentioned they were nervous and insecure when they started using the robot, even though they were positively tuned to the idea behind it. They were worried about what was happening on the other side of the camera and felt like they lost some control over who was in the classroom. Many also felt like there was an adult “entering the classroom” when the robot was being used. This was reported as well in the study of Newhart and Olson (2017, p. 4).

This same uncertainty is mentioned in other studies as well, where teachers are skeptical about the safeguarding of privacy when adopting new technology (Johannessen & Haldar, 2020; Newhart & Olson, 2017) Of the people I interviewed, there were teachers who did not want the robot in the classroom at all for this reason. It has also emerged from another study that students had to change schools because the school declined to adopt the robot into class because of this skepticism (Newhart & Warschauer, 2016, p. 19). A substitute teacher also refused to use AV1 in her class (Børsting & Culén, 2016, p. 41).

This can also be seen in the context of the teacher-parent relationship. A teacher who knows the parents and has a good relationship and communication with them would probably have a greater propensity to try out the robot than a substitute teacher. This is also highlighted by

Colby and Young (2006), who point out that a good relationship in a virtual context assumes a trusting interaction before entering into the virtual space (Mathisen & Wergeland, 2009, p. 183). The importance of feeling that one can trust the pupil's parents also appears in the study of Johannessen and Haldar (2020, pp. 28-29). In addition to my thesis, where several teachers expressed, they were more open to allowing those students who had parents they could trust, to use the robot.

In terms of the NASSS framework, the uncertainty and discomfort around surveillance and privacy concerns increase the complexity of adopting AV1. Teachers, assistants and inspectors are part of the adopter system that is expected to use the technology, however they may also refuse to use it (non-adoption) or find that they do not want to use it any longer (abandonment) (Greenhalgh & Abimbhola, 2019, p. 198). The Ministry of Education and Research has stated that it is up to each school to decide whether or not they want to use AV1. The use of the robot must be a voluntary measure from all sides, and students/parents cannot require the school to accept a robot in its classroom. However, the Ministry emphasizes that all enquiries should be considered thoroughly and accommodatingly, and that it is important to emphasize the positive effects it may have on the pupil's training and social affiliation (Utdanningsforbundet, 2017).

When people choose to oppose the use of technology, it is rarely only on the basis of lack of knowledge or skill, but also because it threatens their accustomed roles in the workplace or is contrary to their code of conduct (Greenhalgh & Abimbhola, 2019, p. 198). This reluctance to change their classroom routines and the concern about privacy put an end to the uptake of the technology both in my study and others (Newhart & Olson, 2017, p. 3). The robot would have been less complicated to use if school employees had not felt this discomfort. However, my study has shown that most people who adopt AV1 get used to having it in the classroom and the skepticism disappears after a while. The very idea of what could potentially become a problem was bigger than the reality of the situation. It also appeared in another study that the concern about monitoring and privacy decreased with time (Johannessen & Haldar, 2020, p. 29).

Retrieving consent also increases the complexity of adopting AV1. There are no specific regulations to adhere to, so there will be extensive work needed to implement the changes in the class and school, since every school has to figure it out individually. This complexity could be reduced by developing guidelines for everyone to follow (Greenhalgh et al., 2017, p. 13).

6.2 Network issues

AV1 is seen as a "simple" technology. It requires little knowledge of the user and it has a limited number of functions. According to the NASSS framework, this technology should therefore be easy to use, as not much training is needed for school employees to understand how it works (Greenhalgh & Abimbhola, 2019, p. 198). As long as AV1 is fully charged and in the right place, there is only one on/off button for teachers to press. However, in reality the technology is more complex than this, as there are major network problems associated with the robot.

Everyone I interviewed reported challenges with the network using AV1. The sound did not work properly, and this made a functional dialogue difficult. The user was therefore dependent on having AV1 in a quiet classroom to be able to hear anything. This is consistent with findings from the study of the prototype of AV1 (Børsting & Culén, 2016). These findings present that the technological challenges must be overcome in order for this robot to function appropriately. If technical challenges are resolved, school employees, students and parents alike have a more optimistic belief in future opportunities for this product (Børsting & Culén, 2016, p. 42).

Another study also describes how AV1 network problems limited the use and acted as the reason for abandonment of the technology. There were several places at school grounds where the robot was unable to connect to the internet, which created a lot of frustration. This made it harder for the user to communicate with the class (Weibel et al., 2020, p. 7). The network connection places a limit on the use of AV1, and several informants express that it has generally poor coverage, which makes it difficult to use it in class. This creates a great deal of dissatisfaction for school employees, as the possibility of participating in lessons and group work is thus limited, and the education is often interrupted because AV1 cannot connect

(Børsting & Culén, 2016, p. 42) These studies present the same results that I have displayed in my thesis.

When the study for Børsting and Culén was carried out, only the prototype was on the market. However, No Isolation has now released another model, the AV2. Several of the informants reported that the network problems decreased considerably after they adopted the new model, although not completely. The AV2 has a better network chip. This does not solve the problem where the signal is poor, or connecting to a suitable network, but the chip can make the robot perform better under mediocre network conditions (Johannessen & Haldar, 2020, p. 17). As shown in this thesis, it might help to use a dedicated internet box for the robot or use the robot in a classroom that is close to the school router.

The reliability of a technology is key to getting people to want to use it (Greenhalgh et al., 2017, p. 11) Because of the network problems, it could take a long time for the robot to enter the classroom, as there was a lot that needed to be fixed before it worked properly. These problems can cause school employees, parents and users to lose confidence in the technology, as it can take time for that trust to build up. As a result, the robot goes from being a "simple" to a "complex" technology, which complicates the implementation of AV1 in school. There was limited trust in AV1 in my study. Most of my informants did not trust the robot to work properly when they used it. Reliability is especially important when a technology is to be used in social situations, such as in a classroom. The use of AV1 is based on being able to attend the class through a video stream, and if the student cannot hear what the teacher is saying there is no point in using it (Greenhalgh et al., 2017, p. 11). The harder it becomes to use the technology, the less chance there is of it being successfully implemented (Greenhalgh et al., 2017, p. 13). In order to benefit from AV1, the technology must work.

Even though the robot has technical problems, many teachers understand the importance the robot has for the students who use it, and they want to help the students to have a better quality of life. This may be why many schools and teachers are willing to accept that it can take a long time to get the robot up and running, even if it is discouraging and gives them extra work. They see the value that AV1 has despite this (Greenhalgh et al., 2017, p. 11). At least, this is what the school employees in my study expressed.

6.3 Establishment of routines

There were several new routines that had to be implemented to get the robot started. One of these was the charging routines. It was important to remember this routine, as otherwise the robot would not work, since it relies on sufficient power to function properly. Establishing clear responsibilities for this routine can help immensely (Johannessen & Haldar, 2020, pp. 30-31). In Børsting and Culén (2016, pp. 40-41) the teachers said the charging took time and it was an easily forgettable task. Nevertheless, this study also presented that a delegation of responsibility for AV1 helped in creating new routines. However, remembering to charge the robot after it has been used is a disruption to existing routines and increases the teachers' workload. This increases the complexity of the innovation (Greenhalgh & Abimbhola, 2019, pp. 197-199; Greenhalgh et al., 2017, pp. 11-13).

Unpredictability due to disease was also an aspect that made it hard to create routines, because the teachers never knew for sure when the student was going to connect to AV1. In Johannessen and Haldar (2020, pp. 20-21) this unpredictability was also shown to impact teacher routines negatively. The fact that AV1 is used by students with unpredictable illnesses further increases its complexity (Greenhalgh & Abimbhola, 2019, p. 196). The illness often make the use of AV1 sporadic, which affects how the teachers implement it into their class, if at all (Greenhalgh et al., 2017, p. 10). This is a disheartening process for many, as they cannot plan effectively for AV1 and the student.

There are limited instructions available on how AV1 works. This further complicates the establishment of new routines, as one does not necessarily have adequate knowledge about the robot. Teachers might have a more positive experience if they receive technical training first, concerning how technical issues should be handled and the functionalities of the robot (Johannessen & Haldar, 2020, p. 48; Newhart & Olson, 2017, p. 4). Since AV1 is a "simple" technology it would not take long to educate the teachers and assistants on how to use it, and this reduces the complexity of the innovation.

6.4 Educational challenges

AV1 presents several educational challenges. An assessment should therefore be made of which activities and lessons AV1 should be included in. The challenges of planning the

lessons around AV1 can create additional work for teachers. The overall impression among the informants was that AV1 worked poorly in lessons such as gym and arts and crafts, nevertheless it could be used in core subjects if the class was able to stay quiet. There were different opinions around how useful it was in group work, but this also depended on how quiet the class managed to be. Although other studies have found it suitable for group work (Børsting & Culén, 2016, p. 40)

There were also other types of interference that occurred when the robot was used. AV1 received a lot of attention from fellow students, who could disrupt the class. Therefore, when the class was noisy, the unwell student could not hear what was going on in the classroom properly. This is also found in Børsting and Culén (2016, p. 39).

Several of the teachers who had used the robot over a longer time period explained there was not much extra work or facilitation once they got used to the robot, but in the beginning, there was a time investment required. The situation can be exasperating for teachers with extra work, and if the workday changes much it may reduce the chances of a successful implementation (Greenhalgh et al., 2017, p. 13)

6.5 Suggestions for improvement

A lot is still unresolved, but there are many possibilities with AV1. Further research, development and testing is probably necessary before the robot is finally recognized for use in schools.

This is not unique to AV1. Almost no technology projects in health and social care are simple. While policymakers are calling for technology to be implemented quickly, efficiently and easily, the reality is that when it comes to the many complexities of health and social care, there are a number of contributing factors which make it extremely difficult to implement new innovations, especially on a large scale (Greenhalgh et al., 2017, p. 15).
NASSS is a framework that can help simplify this process. In order to maximize a program's chances of success, one must strive to reduce the complexity in as many NASSS domains as possible, as well as learn to deal with the complexity that remains (Greenhalgh & Abimbhola, 2019, p. 202). This is something to keep in mind when implementing AV1 in school. Most

processes involving the robot are either complicated or complex, which can make it difficult to implement successfully. If one is to increase the likelihood of successful implementation of AV1, one should work to reduce this complexity (Greenhalgh & Abimbhola, 2019, pp. 202203).

One possible simplification is to limit the types of illnesses AV1 could be used for, however this will go against the offer No Isolation wants to provide for chronically ill children. Serious illnesses are complex; therefore, this is a domain that becomes difficult to reduce. A domain that might be easier to simplify is the technology. AV1 is easy to use, however the technology has a lot of improvement potential. If No Isolation manages to enhance the network of the robot, its sound and image will also improve. This will make the robot much more user friendly. Reducing the complexity in this domain will probably have the most positive effect and decrease the chances of non-adoption and abandonment of the innovation (Greenhalgh et al., 2017, p. 11).

Some of my informants mentioned they would have liked the municipality to be the owner of AV1. Johannessen and Haldar (2020, p. 47) also recommend that associations and foundations should lend the robots to schools and municipalities instead of private individuals. A more centralized ownership could enhance the opportunity of gathering knowledge and experiences to a greater extent. Through learning from previous attempts, it could create opportunities to educate school employees in the use of AV1 in school. This could also result in possible guidelines for others to follow. One thing that has become definite in my thesis is the need and want for simple guidelines in the process of adopting and implementing AV1.

This need was also reported in other studies; Newhart and Warschauer (2016, p. 22) emphasized it, (Newhart & Olson, 2017, p. 5) said it was a necessity to create guidelines to make it easier for others to implement robots in schools and (Johannessen & Haldar, 2020) reported how it affected both the users/parents and the school, as they need to figure out the processes themselves. Developing specific guidelines could help many schools and their employees, and they should apply to both ethics, privacy, practical and educational procedures.

This thesis´ findings also provide support for several more of the recommendations proposed by Johannessen and Haldar (2020). They propose that a stable internet connection must be established; that the Ministry of Education and Research, in consultation with the Norwegian Data Protection Authority, should clarify the legal status of robotic use and that the school must be able to establish good routines for using the robots (Johannessen & Haldar, 2020, p. 3). As indicated, I find particular support in my thesis that No Isolation needs to improve internet connectivity so that it becomes easier to use, and that it is important for the schools to establish good routines so that the robot does not steal time from the education and creates frustration among teachers and peers.

It must be mentioned that one will not always be able to reduce the complexity of a domain. In such cases, the approach to the problem should include recognizing and exploring the complexity, and from there identifying any subdomains where this complexity can be reduced (Greenhalgh & Abimbola, p 203).

6.6. Concluding remarks

To conclude, I briefly summarize the key findings in my thesis. The biggest obstacle with AV1 is the technology, especially the network connection. No Isolation can benefit a great deal by upgrading it.

Many teachers are nervous that it will have negative consequences for them if they teach with AV1 in the classroom (e.g. that the parents can monitor them and use their actions or words against them). However, in most cases, the teacher quickly gets used to AV1 and loses the uncertainty a short while after adopting the robot. Still, a trustful relationship with the parent of the user helps.

Having rules and guidelines for everyone to adhere to can potentially eliminate a number of uncertainties around implementation. There is a need for guidelines on how to retrieve consent, how to introduce it to the class and how to use it in lessons, as well as practical routines. Creating these may be a goal to strive for, and potentially make it easier for other schools to implement AV1 in the future.

At the same time, the implementation of a new innovation is a dynamic process, where one must take into account all types of obstacles and challenges – especially when the innovation involves ill children. Guidelines might make the process easier, but it is important to have in mind that everyone who uses the robot has individual needs and personalities and must be treated thereafter.

Ultimately the robot has great potential, which is still untapped, and everyone I interviewed agreed with this. AV1 has the ability to be of great importance to many children and adolescents who struggle with poor health, as well as reduced quality of life and social isolation.

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Appendix 1 – Interview guide for parents and users

Intervjuguide

Er det greit om jeg gjør opptak av intervjuet?
Anonym + jobber uavhengig av produsentene og GS –> vil ikke få noen konsekvenser for hvorvidt dere får låne robot eller ikke Er det noe du lurer på?

Bakgrunnsopplysninger
Jeg tenkte vi kunne begynne med noen enkle spørsmål:

Hva heter han eller hun som bruker roboten?

Hvor gammel er hen?

Hvilken klasse går hen i?

Og så over til noen bakgrunnsopplysninger for foreldrene Hva jobber dere med?
Hvor gamle er dere?

Om tilstanden
Så tenkte jeg vi kunne gå over til å snakke litt om grunnen til at XXX får AV1. Hva er det som gjør at XXX må være borte fra skolen?
Hvor lenge har XXX hatt [sykdommen/tilstanden]?
Må XXX være ofte borte fra skolen?

Om AV1

Anskaffelse
Når var det dere først fikk høre om AV1?
Hvordan gikk dere så fram for å få en robot?
Når var det dere fikk roboten?
Hvor lenge har dere fått låne den?

Har roboten blitt tatt i bruk?

Brukes den nå?

Hvor er det dere (tenker å) bruker roboten? Er det først og fremst på skolen?
Hvordan gikk dere fram for å få godkjenning fra skolen?
Måtte dere få godkjenning fra noen andre?
Var det andre ting dere måtte gjøre?
Har dere støtt på noen utfordringer i prosessen med å ta roboten i bruk?

- Kan du gi meg en gjennomgang av disse utfordringene?

Samarbeid (kan stilles uavhengig av problemer eller ei) Hvordan har samarbeidet med skolen vært?

- Har dere møtt på noe motstand fra skolen?
- Hva har motforestillingene vært?
- Hvem har hatt disse?

- Har dere fått tydelig beskjed om at den ikke kan brukes?
- Eller forsøker de å stoppe det på en mindre uttalt måte?

HVIS UPROBLEMATISK: Andre jeg har snakket med har fortalt om problemer med å få lov til å bruke robot i skolen. Har du noen tanker om *hvorfor* det har vært så uproblematisk i deres tilfelle?

- Har skolen eller læreren noe tidligere erfaring med å bruke sånne roboter?
- Lærer, rektor
- Kortvarig forløp - Andre ting?

Har dere fått noe tilbakemelding fra de andre foreldrene i klassen?

- Hvis ja: Hva har deres innstilling til roboten vært?

Har dere hatt noe kontakt med selskapet som utvikler roboten, No Isolation?

- Hvordan har samarbeidet med No Isolation vært?

Har dere vært i kontakt med noen andre angående roboten?
Tror du noen kunne gjort noe for at denne prosessen skulle vært enklere for dere?

Forventninger

Hva tror dere den vil hjelpe mest med?
Ser dere noen utfordringer eller problemer med robotbruken?

Bruken av AV1 – spm til bruker

Enkle spørsmål om 'når?' og 'hvor ofte?' Når begynte XXX å bruke roboten?
Hvor mye har XXX brukt roboten?

- Hvor mange dager i uka?

Hvor er det du bruker roboten? Er det først og fremst på skolen?
Når du bruker den på skolen, bruker du den hele dagen, eller er det mer av og på?

- Er det noen fag eller tidspunkt der du bruker den særlig mye?
- Er det noen fag eller tidspunkt der det passer dårlig å bruke den?

Bruker du den mest for å følge med på undervisningen, eller for å være sosial med vennene dine?

Tekniske aspekter

Har du hatt problemer med internett-dekning når du har bruk roboten? Ofte?

- Wifi eller 4G?

Har du hatt andre tekniske problemer? -
Med appen?

- Med batteriet?
- Andre ting?

Deltar du via roboten, eller sitter du bare og observerer?

Roboten og vennene
Har du noe inntrykk av hva vennene dine i klassen syns om roboten?
Hva kaller dere roboten? Har den et kallenavn?
Er det noen på skolen din som tar spesielt ansvar for roboten?
Syns du vennene dine behandler deg noe annerledes når du bruker roboten, enn når du er der sammen med dem i klasserommet?
Pleier vennene dine å ta med roboten ut i friminuttet?
Har de noen gang tatt den med hjem fra skolen?

- Er den blitt brukt utenfor skolen overhodet?

Har du opplevd at roboten har blitt med på noe som du skulle ønske den ikke var med på?

Roboten og lærerne
Har du noe inntrykk av hva lærerne dine syns om roboten? Har du inntrykk av at det er noen som mener noe annet?
Syns du lærerne dine behandler deg noe annerledes når du bruker roboten, enn når du er der sammen med dem i klasserommet?
Syns du lærerne dine er flinke til å inkludere deg, når du følger undervisningen via roboten? Er alle like flinke?

Første/siste gang (avhengig av avstand i tid)
Husker du den første/siste gangen du brukte roboten?
For at jeg skal få et bedre inntrykk av hvordan det er for deg å bruke roboten, lurte jeg på om du kan forsøke å fortelle meg om den første/siste gangen du brukte roboten på skolen. - Hvilken time var det?

- Hvor ble du plassert? Vet du hvem som satte deg der?
- Hvordan forholdt læreren seg til roboten? Snakket hen direkte til deg?
- Hvordan reagerte de andre elevene i klassen den første gangen du brukte roboten? Hva slags spørsmål stilte de deg?
- Deltok du eller bare observerte du?
- Hvordan opplevde du det å delta via robot? Følte du at du satt hjemme eller at du var der sammen med de andre på skolen?
- Hvordan var kvaliteten på lyd og bilde?
- Var det rart å kunne se de andre, uten at de kunne se deg?

Brukte du den i én eller flere timer denne dagen? Hvordan kom du deg fra én time til den neste?

De første gangene du brukte roboten: Fikk du mye oppmerksomhet?
Når du har brukt roboten: Får du oppmerksomhet fra *andre* enn de som til vanlig gir deg oppmerksomhet? Hvordan opplever du det?

Innlevelse
Når du bruker roboten, føles det som om du *er* i klasserommet?

- Hva måtte vært annerledes for at du skulle føle at du var *enda mer* tilstede i klasserommet?

Annen teknologi for kontakt
På en skala fra 1-10, der 1 er veldig lite og 10 er veldig mye, hvor interessert vil du si at du er i teknologi? Hva slags teknologi er du mest interessert i?

Hva slags tjenester bruker du vanligvis for å holde kontakt med vennene dine? (Snapchat?
Andre ting?)
Syns du AV1 skiller seg fra disse tjenestene? På hvilke måter?

Design

Har du fått noen kommentarer på robotens design eller utseende?
Hva syns du selv om designet til roboten?

Plusser, minuser og framtidsutsikter Hva
liker du best med å ha AV1?
Hva liker du dårligst med å ha AV1?
Er det noe roboten ikke kan, som du skulle ønske den kunne?

Hvor lenge tror du at du kommer til å ha roboten?

Avrunding

Er det noe du har lyst til å fortelle om, som vi ikke har spurt om? (*Problemer, positive erfaringer, morsomme episoder)*
Det kan være spennende å få høre hvordan det går videre med deg og roboten. Er det greit om vi tar kontakt med deg igjen?

Til foresatte Erfaringer

Har roboten fungert som du håpet? For barnet? For dere som foreldre?
Hva har vært bra?
Har dere hatt støtt på noen utfordringer?
Er det noe som har overrasket dere?

Dilemmaer

Har det oppstått, eller ser dere for dere at det kan oppstå, noen dilemmaer med [barnas] bruk av AV1?
Har dere fått noen instruksjoner på om dere kan være tilstede når barnet bruker roboten? -
Får dere lov til å se på skjermen når roboten brukes?

- Kan dere hjelpe hen å logge på?
- Føler dere en mangel på kontroll?

Enkelte har sagt at de er redd for at roboten skal bli en hvilepute for barnet, som kan gjøre det vanskeligere å komme tilbake til skolen. Er det en bekymring for dere? Hvorfor (ikke)?
Enkelte har også sagt at de er redd roboten skal *øke* barnets ensomhetsfølelse, fordi den bare lar barnet se *alt det det går glipp av*. Er det en relevant bekymring i deres tilfelle? Hvorfor (ikke)?

Andre(s) erfaringer

Før dere gikk for AV1, vurderte dere å ta i bruk noen andre teknologier eller løsninger?

- Hva gjorde at dere gikk for AV1 i stedet?

Kjenner dere noen andre som bruker AV1?

- Har dere snakket med dem om hvordan det er å bruke den?
- Hva syns de om roboten?

Avrunding

Er det noe du har lyst til å fortelle om, som vi ikke har spurt om? (*Problemer, positive erfaringer, morsomme episoder)*
[Spør barnet også hvis du ikke har gjort det]

Telefonintervju

Hvordan syns du forresten det gikk å gjøre intervjuet over telefon?

Veien videre

Det kan være spennende å få høre hvordan det går videre med roboten. Er det greit om vi tar kontakt med dere igjen?

Appendix 2 – Interview guide for school employees

INTERVJUGUIDE LÆRERE

Er det greit om jeg gjør opptak av intervjuet?
Anonym + taushetsplikt + uavhengig av selskapet
Er det noe du lurer på før vi starter?
Bakgrunnsopplysninger Hvilken skole jobber du på?
Hvor stor er skolen?
Hvor ligger den? Er det mange andre barne-/ungdoms-/videregående skoler i samme kommune?
Når begynte du å jobbe her?
Hvor gammel er du?
Hvor er du fra?
Hva slags utdanningsbakgrunn har du?
Hvilke trinn underviser du? Hvilke fag?
Hvordan er det å undervise på dette trinnet, syns du? -
Er det krevende? Mye stress?

- Er det noen spesielle utfordringer med dette trinnet, sammenlignet med [barne-/ungdoms/videregående skole]?

På en skala fra 1 til 10, hvor interessert vil du si at du er i teknologi? 1 er overhodet ikke interessert, mens 10 er kjempeinteressert.

Skolen og AV1

Bruker dere, eller har dere brukt, klasseromsroboten AV1 på skolen deres? -
Hvis ja:

- Når var det roboten ble tatt i bruk for første gang på skolen deres? ○ Vet du sånn ca. hvor mange barn som til nå har brukt robot hos dere?
- Hvem har tatt initiativ til at roboten skal brukes? Er det skolen selv eller er det andre (elever, lærere) som har forespurt det?
- Er roboten i bruk nå?
- Er det snakk om én eller flere roboter som brukes?
- Er det skolen som eier roboten(e) eller eies de av andre?

- Hvis nei:
  - Er du kjent med roboten?
    - Hvis ja: Kan du fortelle meg litt hva du vet om den?
    - Hvis nei, si bl.a. at den skal være en stand-in for langtidssyke barn som må være borte fra klasserommet, og at den har toveis lyd og enveis bilde)
  - Har det vært snakk om å ta den i bruk? ○ Hva skyldes det at man ikke har tatt roboten i bruk?

Læreren og AV1

Har du selv undervist i en klasse med robot tilstede? Hvis ja:

- Hvor mange robotbrukere har du undervist for?
- Når var første gang du hadde med roboten å gjøre som lærer? Når var siste gang du underviste foran en robot?
- Hvor ofte underviser du med robot tilstede? I løpet av f.eks. en uke.

Erfaringer

Hva slags erfaringer har du gjort deg med roboten så langt?
Kan du huske hva du tenkte om roboten før du begynte å bruke den? Tenker du det samme nå?

Den siste gangen

Når var siste gang du underviste foran en robot? Husker du det?
Kan du gi meg en gjennomgang av hva som skjedde da?
Hvor var det du hentet roboten?
Hvilken time var det?
Hvor ble roboten plassert? Funka den?

- Hen som brukte den, deltok hen eller bare observerte hen undervisninga?
- Gikk det greit for hen å delta? Hvordan var lyden?

Hvordan reagerte de andre elevene på roboten?
Ble roboten brukt i friminuttet etterpå? Ble den værende i klasserommet eller tatt med ut? Var det noen *utfordringer* med det å ha en robot tilstede i klasserommet?

Før vs. nå

Hvis du skal sammenligne den siste gangen med hvordan det var å bruke robot helt i starten – hva er likt, og hva er forskjellig?

- Medelevenes reaksjoner
- Plassering
- Det å undervise foran roboten

Hvordan er det å undervise foran en robot, sammenlignet med det å undervise elever som er fysisk tilstede?
Hvordan opplever du det at du ikke kunne se hvem som bruker roboten? -

Følte du deg *overvåket* på noe vis?

- Følte du at du måtte skjerpe deg på noe vis?
- Tenker du at det foregår ting i klasserommet som kanskje kan bli litt skjevt framstilt hvis man bare ser det gjennom kameraet på roboten?

Har det vært noen utfordringer eller problemer med roboten?
Er det noen hendelser eller opplevelser med roboten som stikker seg ut – enten positivt eller negativt? **Det praktiske**

Kan du fortelle meg litt om det praktiske rundt roboten? Hva må du gjøre på de dagene der roboten skal brukes?
For de(n) eleven(e) som bruker roboten, er det sånn at …

1. Roboten *settes fram hver dag*, også kan eleven(e) logge på når de selv føler for det?

2. Dere har en avtale om bruk på *faste* tidspunkt eller timer?
3. Eller må eleven si fra på forhånd *hver gang* roboten skal brukes?

Kan du si litt mer om hvordan dere kom fram til akkurat denne løsningen?
Har du sett om det er noen fag eller tidspunkt der det passer *dårlig* å bruke roboten?
Har du noen rutiner for lading av roboten?
Hvor står den og lader? Har det bydd på utfordringer?
Er det noen på skolen din som tar spesielt ansvar for roboten? Elever? Du som lærer?
Får barna lov til å ta med roboten ut i friminuttet? Pleier de å gjøre det?
Får de lov til å ta med roboten hjem fra skolen? Har det skjedd noen gang?
Utover det jeg har spurt om nå, har dere noen andre rutiner eller ordninger for robotbruk? -
Krever det f.eks. at man sender ut materiale o.l. på forhånd?

Tok det lang tid å komme fram til disse rutinene? Krevde det mye prøving og feiling? Var disse praktiske tingene noe du strevde mer med i starten?

Avklaringer *før* roboten ble tatt/tas i i bruk
Har du måttet gjøre noen avklaringer eller lignende *før* roboten kunne tas i bruk på skolen på første gang?
Måtte du avklare noe med **foreldrene** til de andre elevene i klassen?
Måtte du avklare noe med **rektor**?
Var det noen tekniske eller **praktiske** utfordringer som måtte løses?
Var det **juridiske** spørsmål som måtte avklares (f.eks. personvern)? Med hvem?
Var du kontakt med noen **utenfor skolen**? -
Kommunen?

- Fagforeningen?
- Selskapet som utvikler roboten (No Isolation)?
- Andre?

Har det dukket opp problemer eller innsigelser *etter* at roboten ble tatt i bruk? -
Har dere hatt problemer med internett-dekning? Ofte?

- Bruker roboten 4G (mobilnettet) eller er den koblet på skolens trådløse nettverk?

Har det krevd mye *arbeid* å avklare disse tingene?
Har det tatt lang *tid*?
Hva syns ulike aktører om roboten?
Lærerkollegaene
Har du noe inntrykk av hva lærerkollegaene dine syns om roboten i dag? -
Er dette noe man diskuterer på lærerværelset?

- Husker du sist dere diskuterte dette?

Er det et syn som deles av alle? / Er det noen som er skeptiske?

- Ser du noen systematikk i hvem som er skeptiske og hvem som er mer positive? (Alder; brukt robot eller ikke, etc.)

Er det andre lærere på skolen din som har en robot i klasserommet?
Har du snakket med lærere *utenfor* skolen din om roboten?

Er roboten blitt diskutert på formelle møter av noe slag? **Medelevene**
Har du noe inntrykk av hva de andre elevene tenker om roboten?
Har du noen eksempler på [entusiasmen/skepsisen/etc]?
Er alle like [entusiastiske/skeptiske/etc]?
Hvordan reagerer elevene når robotbrukeren logger på roboten?

Medelevers foreldre

Har du noe inntrykk av hva foreldrene til de andre elevene syns om roboten? Hvis ja: Hva forteller de?
Er roboten blitt diskutert på foreldremøter eller lignende? Hva diskuterte man da?
Hva ville dere gjort om noen foreldre sa *nei* til det å bruke roboten?

Hva roboten tilbyr elever og skolen (se an relevansen)

De barna som må være lenge borte fra skolen på grunn av langtidssykdom, hva slags konsekvenser kan det få for den videre skolegangen deres?
Finnes det en grense for hvor mye de langtidssyke barna bør være borte? Hva skjer om de krysser denne?
Får de gyldig oppmøte hvis de deltar via robot? / Ville de fått …
Spiller dette gyldige oppmøtet noen *formell* rolle for eleven? (Har det f.eks. noe å si for hvorvidt barnet kan få en vurdering i faget det gjelder?)
Spiller roboten noen rolle for at *skolen* skal nå de *formelle* målene som er satt for den? - Henger f.eks. elevenes oppmøtetall sammen med hvor store tilskudd skolen får?

- Kan roboten på andre måter være nyttig for skolens måloppnåelse?

Krysspress

Det er jo ganske mange aktører som berøres av denne teknologien. Opplever du at det er krevende å balansere forventningene fra 1) rektor, 2) robotbrukerne, 3) robotbrukernes foreldre, 4) medelever, 5) medelevenes foreldre, og 6) eventuelt også andre, til om og hvordan roboten skal brukes?
Hvem har de *mest uttalte* forventningene til om og hvordan roboten skal brukes?
Hvordan forsøker du å balansere de ulike forventningene?
Er det noen dilemmaer det rett og slett ikke finnes noen enkel løsning på?

Etiske utfordringer

Ser du noen *etiske* eller *juridiske* utfordringer eller problemer med robotbruken? Tenker du at roboten…

- truer lærernes eller medelevenes personvern?
- byr på merarbeid for lærerne? Er den verdt merarbeidet?
- kan få negative konsekvenser for barnet som bruker den? (Hvilepute; se hva de går glipp av) - tenker du det er en fare for at *andre* enn eleven kan bruke roboten?

Skolevegring

Jeg har snakket med skoler der roboten skal brukes i saker der man mistenker skolevegring – og da har enkelte lærere og rektorer vært skeptiske til roboten, fordi de er redd den skal gjøre det lettere å være borte fra skolen. Er det en relevant bekymring, tenker du?

Om teknologi mer generelt

Får dere mange forespørsler om å ta i bruk ny teknologi på skolen? Hva slags? Hva tenker du om det?
En mye diskutert teknologi er jo mobiltelefonen – har den vært et tema på deres skole?
Hva er skolens policy for mobilbruk i skoletiden?

Sånn teknisk sett, tilbyr jo mobiltelefoner, ipader og PC-er mange av de samme mulighetene som AV1, hva gjelder filming og deling av det som skjer i klasserommet. - Har det vært noe diskusjon rundt dette på skolen deres?

- Har det vært noen problemer med at elevene snikfotografer eller -filmer andre? (Enten andre elever eller lærere.)
- Tenker du det er noen særegne utfordringer med AV1, som man ikke har med mobil og PC?

Har dere prøvd noen teknologier eller tilbud før, som ligner på AV1? Hvis ja:

- Sammenlignet med disse, har dere hatt andre erfaringer med AV1?

Plusser, minuser og endringer

Sånn generelt, hva syns du om det at roboten brukes i timene dine/på skolen din?
Hva liker du *dårligst* med roboten?
Er det noe som har overrasket deg med roboten?
Er det noe du skulle ønske var annerledes med roboten?

- Ville du likt om den hadde skjerm og du kunne se hvem som brukte den?
- Hva ville du tenkt om roboten hadde hjul?

Det finnes forresten to modeller av roboten – vet du hvilken modell du har hatt med å gjøre?

- Den nye har av-og-på-knapp og håndtak bakpå, og har ikke de fysiske øynene som den første - Av-og-på-knapp - er det for øvrig en funksjon du har savnet?

Avrunding

Er det noe du har lyst til å fortelle om, som vi ikke har spurt om? (*Problemer, positive erfaringer, morsomme episoder)*

Telefonintervju

Hvordan syns du forresten det gikk å gjøre intervjuet over telefon?
Veien videre
Hvis vi skulle ha behov for oppfølging eller avklaring – er det greit om vi tar kontakt med deg igjen?
Hva tenker du om mulighetene for at vi kan komme og observere roboten på skolen deres?

- *Kanskje mest spennende: når den introduseres for første gang.* Vet du om noen nye klasser der roboten snart skal tas i bruk?

Appendix 3 – Approval from NSD

NSD NORSK SENTER FOR FORSKNINGSDATA

NSD sin vurdering

Prosjekttittel

Avoiding social isolation for children and young adults from chronic illness with welfare technology.

Referansenummer

290494

Registrert

04.09.2019 av Siri Sirnes Hjellum - s330725@oslomet.no

Behandlingsansvarlig institusjon

OsloMet - storbyuniversitetet / Fakultet for samfunnsvitenskap / Institutt for sosialfag

Prosjektansvarlig (vitenskapelig ansatt/veileder eller stipendiat)

Lars E. F. Johannessen, larsem@oslomet.no, tlf: 48293782

Type prosjekt

Studentprosjekt, masterstudium

Kontaktinformasjon, student

Siri Sirnes Hjellum, sirihjellum@gmail.com, tlf: 95145558

Prosjektperiode

30.09.2019 - 01.12.2020

Status

27.09.2019 - Vurdert

Vurdering (1)

27.09.2019 - Vurdert

Det er vår vurdering at behandlingen av personopplysninger i prosjektet vil være i samsvar med personvernlovgivningen så fremt den gjennomføres i tråd med det som er dokumentert i meldeskjemaet den 27.09.2019 med vedlegg, samt i meldingsdialogen mellom innmelder og NSD. Behandlingen kan starte.

MELD VESENTLIGE ENDRINGER
Dersom det skjer vesentlige endringer i behandlingen av personopplysninger, kan det være nødvendig å melde dette til NSD ved å oppdatere meldeskjemaet. Før du melder inn en endring, oppfordrer vi deg til å lese om hvilke type endringer det er nødvendig å melde: https://nsd.no/personvernombud/meld_prosjekt/meld_endringer.html Du må vente på svar fra NSD før endringen gjennomføres.

TYPE OPPLYSNINGER OG VARIGHET
Prosjektet vil behandle særlige kategorier av personopplysninger om helseforhold og alminnelige kategorier av personopplysninger frem til 01.12.2020.

SÅRBARE GRUPPER
Barn og ungdom med kronisk/langvarig sykdom kan anses som en sårbar gruppe. Når man forsker på sårbare grupper, har man et særskilt ansvar for å ivareta informantenes interesser. Det kan oppleves belastende å delta i forskning og det må sørges for at belastningen deltakerne utsettes for blir minst mulig. Veileder har et særskilt ansvar for planlegging av datainnsamlingen, for god oppfølging både av studenten og informanter, og for at prosjektet gjennomføres i tråd med forskningsetiske retningslinjer. Vi viser til NESH sine retningslinjer for sårbare grupper: https://www.etikkom.no/FBIB/Temaer/Forskning-pa-bestemtegrupper/Sarbare-grupper/ og forskning med barn: https://www.etikkom.no/FBIB/Temaer/Forskning-pa-bestemte-grupper/Barn/

LOVLIG GRUNNLAG
Prosjektet vil innhente samtykke fra de registrerte til behandlingen av personopplysninger. Foreldre vil samtykke for deltakere 13-15 år. Ungdommer 16-17 år skal selv samtykke til deltagelse. Ut fra en helhetsvurdering av opplysningenes art og omfang, vurderer vi det slik at ungdommer 16-17 år har forutsetninger for å forstå hva deltagelse innebærer og kan samtykke til deltakelse på selvstendig grunnlag.

Vår vurdering er at prosjektet legger opp til et samtykke i samsvar med kravene i art. 4 nr. 11 og art. 7, ved at det er en frivillig, spesifikk, informert og utvetydig bekreftelse, som kan dokumenteres, og som den registrerte kan trekke tilbake.

Lovlig grunnlag for behandlingen om de registrerte under 16 år vil være foreldrenes uttrykkelige samtykke, jf. personvernforordningen art. 6 nr. 1 bokstav a, jf. art. 9 nr. 2 bokstav a, jf. personopplysningsloven § 10, jf. § 9 (2).
Lovlig grunnlag for behandlingen om de registrerte over 16 år vil være den registrertes uttrykkelige samtykke, jf. personvernforordningen art. 6 nr. 1 bokstav a, jf. art. 9 nr. 2 bokstav a, jf. personopplysningsloven § 10, jf. § 9 (2).

PERSONVERNPRINSIPPER

NSD vurderer at den planlagte behandlingen av personopplysninger vil følge prinsippene i personvernforordningen om:

- lovlighet, rettferdighet og åpenhet (art. 5.1 a), ved at de registrerte får tilfredsstillende informasjon om og samtykker til behandlingen
- formålsbegrensning (art. 5.1 b), ved at personopplysninger samles inn for spesifikke, uttrykkelig angitte og berettigede formål, og ikke viderebehandles til nye uforenlige formål

- dataminimering (art. 5.1 c), ved at det kun behandles opplysninger som er adekvate, relevante og nødvendige for formålet med prosjektet
- lagringsbegrensning (art. 5.1 e), ved at personopplysningene ikke lagres lengre enn nødvendig for å oppfylle formålet

DE REGISTRERTES RETTIGHETER
Så lenge de registrerte kan identifiseres i datamaterialet vil de ha følgende rettigheter: åpenhet (art. 12), informasjon (art. 13), innsyn (art. 15), retting (art. 16), sletting (art. 17), begrensning (art. 18), underretning (art. 19), dataportabilitet (art. 20).

NSD vurderer at informasjonen som de registrerte/foreldre vil motta oppfyller lovens krav til form og innhold, jf. art. 12.1 og art. 13, forutsatt at prosjektslutt i samtykkeskjemaet oppdateres.

Deler av utvalget i prosjektet er barn og ungdom. Deltakerne bør motta informasjon om prosjektet som er tilpasset deres ordforråd. Det er også viktig at barna får informasjon om at de kan trekke seg når som helst, selv om foreldrene har samtykket.

Vi minner om at hvis en registrert/forelder tar kontakt om sine rettigheter/barnets, har behandlingsansvarlig institusjon plikt til å svare innen en måned.

FØLG DIN INSTITUSJONS RETNINGSLINJER
NSD legger til grunn at behandlingen oppfyller kravene i personvernforordningen om riktighet (art. 5.1 d), integritet og konfidensialitet (art. 5.1. f) og sikkerhet (art. 32).

For å forsikre dere om at kravene oppfylles, må dere følge interne retningslinjer og eventuelt rådføre dere med behandlingsansvarlig institusjon.

OPPFØLGING AV PROSJEKTET
NSD vil følge opp ved planlagt avslutning for å avklare om behandlingen av personopplysningene er avsluttet.

Lykke til med prosjektet!
Kontaktperson hos NSD: Eva J B Payne
Tlf. Personverntjenester: 55 58 21 17 (tast 1)

Appendix 4 – Informed consent

Vil du delta i forskningsprosjektet

«Hvordan implementering og bruk av roboten AV1 påvirker det sosiale nettverket rundt?»

Dette er et spørsmål til deg om å delta i et forskningsprosjekt hvor formålet er å se hvordan implementering og bruk av velferdsteknologi - her med fokus på roboten AV1 – påvirker det sosiale nettverket rundt. I dette skrivet gir vi deg informasjon om målene for prosjektet og hva deltakelse vil innebære for deg.

Formål

Formålet med prosjektet er å undersøke hvordan AV1 ikke bare påvirker den som bruker roboten, men også de som er i det sosiale nettverket rundt. AV1 er navnet på roboten som dette studiet tar for seg og er utviklet for å hjelpe langvarig syke barn og ungdom. Gjennom AV1 kan de ha virtuell kontakt både med vennene sine og skolen for å redusere følelsen av ensomhet og isolasjon ved sykdommen.

Under prosjektet vil du bli intervjuet av meg om hvordan du har opplevd bruken av AV1, hvordan den har påvirket deg og de rundt deg i forskjellige situasjoner. Det vil være et intervju som blir utført på arbeidsplassen din. Hvis dette ikke er ønskelig, så kan vi møtes et annet sted.

Jeg ønsker å se på hvordan du har opplevd bruken av roboten, hva som har fungert, hva som eventuelt ikke fungerer og hva som kan gjøres bedre.

Dette er et forskningsprosjekt som gjøres i forbindelse med en masteroppgave.

Hvem er ansvarlig for forskningsprosjektet?

Oslo Metropolitan University (OsloMet)

Hvorfor får du spørsmål om å delta?

Du får spørsmål om å delta fordi du har verdifull erfaring med bruk av roboten.

Hva innebærer det for deg å delta?

Hvis du velger å delta i prosjektet, innebærer det at jeg skal intervjue deg på ca. 30- 45 minutter, hvor det vil bli brukt båndopptaker og notater for å dokumentere intervjuet. Intervjuet blir deretter transkribert (skrevet ned) og båndopptaket slettet slik at det vil bli helt anonymisert. Spørsmålene vil handle om dine opplevelser rundt roboten og hvordan den har påvirket deg og de rundt deg, samt dine tanker rundt temaet helseteknologi.

Det er frivillig å delta

Det er frivillig å delta i prosjektet. Hvis du velger å delta, kan du når som helst trekke samtykke tilbake uten å oppgi noen grunn. Alle opplysninger om deg vil da bli anonymisert. Det vil ikke ha noen negative konsekvenser for deg hvis du ikke vil delta eller senere velger å trekke deg.

Selv om foreldrene dine har samtykket kan du også velge å ikke delta i prosjektet.

Ditt personvern – hvordan vi oppbevarer og bruker dine opplysninger Vi behandler opplysningene konfidensielt og i samsvar med personvernregelverket.

- Studenten og veilederen vil ha tilgang til datamaterialet.
- Navnet og kontaktopplysningene dine vil jeg erstatte med en kode som lagres på egen navneliste adskilt fra øvrige data.
- Den innsamlede data om deg vil bli anonymisert innen prosjektslutt.
- Anonymiserte data vil kunne benyttes i fremtidig forskning hvis det er behov for det.

Hva skjer med opplysningene dine når vi avslutter forskningsprosjektet?

Prosjektet skal etter planen avsluttes i desember 2020. Anonymiserte data vil kunne benyttes i fremtidig forskning hvis det er behov for det

Dine rettigheter:

Så lenge du kan identifiseres i datamaterialet, har du rett til:

- innsyn i hvilke personopplysninger som er registrert om deg,
- å få rettet personopplysninger om deg,
- få slettet personopplysninger om deg,
- få utlevert en kopi av dine personopplysninger (dataportabilitet), og
- å sende klage til personvernombudet eller Datatilsynet om behandlingen av dine personopplysninger.

Hva gir oss rett til å behandle personopplysninger om deg?

Vi behandler opplysninger om deg basert på ditt samtykke.

På oppdrag fra OsloMet har NSD – Norsk senter for forskningsdata AS vurdert at behandlingen av personopplysninger i dette prosjektet er i samsvar med personvernregelverket.

Hvor kan jeg finne ut mer?

Hvis du har spørsmål til studien, eller ønsker å benytte deg av dine rettigheter, ta kontakt med:

- *OsloMet* ved *Lars E. F. Johanessen (veileder, e-mail: larsem@oslomet.no og Siri Sirnes Hjellum (student), e-mail: s330725@oslomet.no*.
- Vårt personvernombud: *Ingrid S. Jacobsen, e-mail: personvernombud@oslomet.no*
- NSD – Norsk senter for forskningsdata AS, på epost (personverntjenester@nsd.no) eller telefon: 55 58 21 17.

Med vennlig hilsen

Prosjektansvarlig
(Forsker/veileder)

Eventuelt student

Samtykkeerklæring

Jeg har mottatt og forstått informasjon om prosjektet *«Hvordan implementering og bruk av roboten AV1 påvirker det sosiale nettverket rundt?»,* og har fått anledning til å stille spørsmål. Jeg samtykker til:

☐ Å delta i personlig intervju.

Jeg samtykker til at mine opplysninger behandles frem til prosjektet er avsluttet, ca. Juni 2020.

(Signert av prosjektdeltaker, dato)