YOUNG CHILDREN (0-8) AND DIGITAL TECHNOLOGY

A qualitative exploratory study - National report - Norway

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Executive summary

Key findings

Most Norwegian children today have easy access to a wide range of information and communication technology (ICT), such as tablets, television, various video game consoles, smartphones and computers. The youngest children, those under the age of eight, who are the subject of this survey, preferably use tablets because they are so easy to use and require minimal training. On average, seven-year-olds in this survey spend about 13 hours a week on ICT. Children mostly figure it out on their own, or learn from older children.

The children mainly use ICT for three types of activities, which are playing video games, watching video clips on YouTube and television streaming services. YouTube is often used to find out how things are done elsewhere, such as solving challenges in the video games, but also for inspiration and help with things outside of the digital world. Overall, we see that the children have seamless transitions both between different digital tools and between digital and non-digital activities. Use of ICT has become an integrated part of Norwegian childhood.

The children’s parents have an ambivalent relationship to this. On one hand, they see the benefit of becoming digitally competent at an early age in our generally digitalized society. However, the concerns are more clear among the parents in this survey. The children were also aware of most of the disadvantages or risks:

- You could stumble onto things on the internet or in video games that you do not want to see. The children list scary things related to violence and dangerous creatures, while parents also mention sex-related inappropriate things.
- You could accidentally delete and destroy photos, etc., and unintentionally share photos with others.
- Sharing sensitive or intimate information.
- Pressure to buy, often to accomplish things in some video games.
- Computer viruses can accompany video games that are downloaded from the internet.
- Loneliness when playing video games, particularly when playing on a tablet or smartphone.

The parents were also concerned about

- Stress, irritability and addiction to playing video games (particularly boys)
- Less degree of control in the transition from stationary to handheld devices
- Social exclusion of children that are not current with certain popular video games, television shows, etc.
The future for the children when they become older and involved in social media, and amplified challenges within the above-mentioned concerns

The parents have several strategies for handling this. Some are constructive and talk to their children about the challenges, and they collectively determine rules for use, which often involve set times for playing video games. Other parents are restrictive and dictate the rules. They may use methods of punishment such as removing digital devices for certain periods. We found that surprisingly few families had technical filtering to protect the children against what they considered inappropriate content, but most understood that it was about time to install a filter.

Recommendations

1. Recommendations to Policy-makers
   - Facilitate the positive aspects of children’s ICT use.
   - Reduce the negative aspects of children’s ICT use through a combination of information, regulation and other active measures such as:
     - research and development work,
     - increasing the digital competence of teachers in kindergartens and in schools,
     - increasing the digital competence of parents and children, who will be enabled to make good user decisions through knowledge about digital technology.
   - Encourage and support information aimed at parents, schools and kindergartens that increases their digital competence when it comes to children’s safe use of digital devices and internet.

2. Recommendations to industries
   - The data industry is responsible for ensuring that children and young people will not be harmed by use of digital devices. Solutions that are child-friendly must be the default setting.
   - More video games for children and young people should be designed to stimulate creativity and mastery of skills that are useful in a variety of settings.
   - Remove the buying pressure in video games aimed at players under the age of 18.

3. Recommendations to parents and carers
   - Stay up-to-date on what digital devices the children desire and how the devices are used, and obtain information regarding safe use.
   - Talk to the children about screen time and collectively decide on safe rules for use that neither deprive children of necessary social skills related to data use.
nor lets them develop problematic habits in connection with use of digital devices.

4. Recommendations to schools and kindergartens

- Teachers must acquire enough digital competence to be able to instruct the children and parents on safe data usage, and for their own use of digital tools in education of the children. The digital competence must comprise knowledge about devices, relevant apps and digital judgement.
1. Introduction

In Europe, Norway is the country with the highest number of children with internet access through handheld technology, and Norway is classified as a ‘high risk, high use’ country in the “EU Kids Online survey” (Staksrud, 2012, p. 47). This means that it is important to investigate how Norwegian families with children under the age of eight relate to this risk and use new (online) technology as a part of their family life. How do Norwegian families perceive the digital technologies that they use every day? How do they relate to and engage with the various online technologies? What are the preferred activities? What do the parents think about their use of online technology? What advantages and challenges do parents see that their young children are facing when using online activities?

This survey was conducted under the European Commission Joint Research Centre’s (JRC’s) project, ECIT - Empowering Citizens’ Rights in Emerging ICT (Project No. 572).

ECIT has the following objective:

Identification of new threats to children by ICT besides social networks. Development of recommendations to empower children’s rights by preventing and mitigating these emerging issues through education, school and community co-vigilance, as well as reconciliation of digital and personal interactions.

So far, research that targets advantages and challenges related to children’s use of online technology, where the children themselves are informants, has mainly been aimed at children aged 9 to 16 (see the EU Kids Online project which has been ongoing since 2006 as an example), and the Norwegian Children and Media surveys that are conducted by the Norwegian Media Authority every two years. These also focus on children under the age of nine, but the parents are used as informants (Norwegian Media Authority, 2010, 2012, 2014, 2016a). However, research shows that children are using online technology at increasingly younger ages. Despite the significant increase in young children’s usage, the research appears to be lagging behind. Research that explores the advantages and risks of using new online technology for children aged 0 to 8 will be an important contribution to this field.

This report is a qualitative study to investigate young children and their families’ experience with new online technologies. The survey was conducted in a collaboration with selected scientific communities in 18 European countries. This national report examines Norwegian children aged 0-8 and their use of online technology and potential advantages and risks associated with this. The results from the study form the basis for recommendations to politicians, the industry, parents and schools, etc. and proposals for larger EU projects that should be implemented in

1 http://www.lse.ac.uk/media@lse/research/EUKidsOnline/Home.aspx
2 In the framework of the EU agenda for the Rights of the Child (2011) and the European Strategy for a Better Internet for Children (2012)
connection with advantages and challenges related to use of new online technology in early childhood.

The goal of this research project is to generate empirical data in order to answer the general question of what benefits, if any, do children and/or their families experience from using new (online) technology? In other words, what advantages and risks can be identified in connection with children’s use of digital technology at home.

A pilot study was conducted in 2014 with seven participating countries (Belgium, the Czech Republic, Finland, Germany, Italy, the UK and Russia), where 70 families were interviewed regarding children’s use of (online) technology. Four research questions (RQ) were prepared for this study:

- **RQ 1:** How do children under the age of 8 engage with new (online) technologies?
- **RQ 2:** How are new (online) technologies perceived by the different family members?
- **RQ 3:** What role do these new (online) technologies (smartphones, tablets, computers, video games, apps, etc.) play in the children’s and parents’ lives (separately and in relation to family life in general)?
- **RQ 4:** How do parents manage their younger children’s use of (online) technologies (at home and/or elsewhere)? Are their strategies more constructive or restrictive?

Experience from the pilot study resulted in certain simplifications in the interview guide for this study in order to prevent an overlap between the four research questions. At the same time, there was a desire to retain the four research questions in order to compare the findings in the pilot study and the main survey in 2015/16 with 18 countries. Four dimensions (use, perception, individual context and family context) were therefore added to the four research questions in the following manner:

<table>
<thead>
<tr>
<th>USE</th>
<th>INDIVIDUAL CONTEXT</th>
<th>FAMILY CONTEXT</th>
</tr>
</thead>
<tbody>
<tr>
<td>RQ 1: Individual Use: children/parents</td>
<td>RQ 2: Awareness to risks/opportunities of the children/parents</td>
<td></td>
</tr>
<tr>
<td>RQ 3: Family Use/Dynamics/Practices</td>
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<td></td>
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<tr>
<td>RQ 4: Parental Mediation</td>
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<tr>
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<tr>
<td>Restrictive / permissive</td>
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<td>Implicit / explicit</td>
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<tr>
<td>Reverse mediation</td>
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</tbody>
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Research questions 1 and 2 will remain the core questions, while questions 3 and 4 will elaborate upon these by looking at the family context and mediation.
Most of the material concerning the children comes from observations of them and use of cards that resembled lotto cards and an activity booklet that was used during the first part of the family interview, and attempting to discuss all four dimensions during the conversation. The material from the parents was obtained from semi-structured interviews with the same goal of covering the same four dimensions.
2. Family Portrait Gallery

Family portraits

In the following section, the ten families that participated in the survey are presented as ten family stories. This was done to anchor the findings in the specific families and to illustrate the variations between families. The families and their members are anonymous. The codes for each family member were structured as follows:

- Country code - NO for Norway
- Family number
- Family member code – g (girl), b (boy), m (mother), f (father)
- Age
- (additional letter a or b to differentiate between twins)

Example: NO3b7 – Norwegian family number 3, boy, age 7.
The informants in the ten surveyed families

<table>
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<th>Member Code</th>
<th>Low - medium - high family income</th>
<th>Ethnicity</th>
<th>Sex</th>
<th>Age</th>
<th>Year school / max level of education</th>
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Family NO1
Central Norway

Family members
- Father, Peter, NO1f37
- Mother, Anne, NO1m35
- Child 1, Kristian, NO1b7, 2nd grade
- Child 2, Ela, NO1g4, kindergarten

Family portrait
Kristian age 7, Ela age 4, the mother Anne and father Peter are all at home. The entire family visit took place in their kitchen and living room. The home is well equipped with technology and the children can use most of it. The family uses new online technology in four different ways: video games, entertainment/inspiration, communication and learning/schoolwork.

The video game consoles, tablets and occasionally the computer are used to play video games. The video game consoles are mainly used by Kristian and dad, while the tablet is used by both children and the parents. Kristian plays with Ela, and with his father. Schoolwork is sometimes done on the computer. They have used the computer for maths and some educational games to e.g. learn how to tell time. Mum and dad sit with Kristian when he uses the internet. Both children are skilled at using the tablets. With their parents’ help, the children search for and find the apps they want to play and download the games they want. Kristian can turn on all the devices, while Ela needs help getting started. She gets help from Kristian. Kristian makes new users for Ela so she can start from the beginning. “So she gets to learn it as well, and she won’t ruin it for me,” says Kristian.

Kristian thinks using the computer is most difficult. There are so many buttons you have to push. “There are not so many buttons on the tablet, so it’s easier,” says Kristian. Kristian says that the technology can make you feel uncomfortable, for example if you delete something unintentionally. The Batman game (age limit 16) is a little scary, because there is blood, but Kristian plays it anyway because he does not get nightmares. Kristian is allowed to play when his father helps him. Ela does not play Batman. Kristian has tested the limits occasionally, e.g. by playing the...
game GTA, which is not allowed in the house. The punishment is no more games for a few hours or up to a week. “He knows what the rules are,” says Peter.

Kristian played a lot of video games at the beginning, and it affected his mood. On weekends he could spend all day inside, playing video games. This caused the parents to introduce set times for when he was allowed to play video games, and he has been able to regulate it himself ever since. Ela has not played enough to cause a need for regulation. The rules for Kristian are that he cannot play until after 10 on weekends. Homework must be done and mealtime must be over. This leaves almost no time before bed on weekdays. Communication via technology takes place via mobile phones. Kristian has his own mobile phone (not a smartphone), so his parents can reach him after school.

Television and tablets are used for entertainment. Netflix and YouTube are used in this connection. Kristian likes to watch Batman and YouTube. He is able to search for this himself. The family watches television together. Anne plays music via YouTube and dances with the children. They have set up a technical barrier against content that is not intended for children on Netflix.

The parents disagree a little on whether the new online technologies are positive or negative for the children’s learning. Anne believes that they learn things differently with the new technology, citing mathematics in particular. Peter believes that they should use their own brains instead and not have a machine fix things for them. “They trust the technology too much now. What will happen if the technology fails”? says Peter. Both parents believe that the new technology is important for the children to keep up with society. They had to learn this as adults and cannot manage without it in their jobs, while the kids are practically breastfed on technology. However, new online technologies have not completely taken over yet, and it is still important to have normal offline activities. On the weekends, they do several family activities outdoors (on the beach or in the forest). The highlight of the week is the city library on Saturdays. Kristian has a sword and a bow and arrow, and plays Minecraft with his friends. His favourite indoor offline activity is Lego, while Ela enjoys Barbie and drawing.
Family NO2
Central Norway

Family members
- Mother, Trine, NO2m46
- Child 1, Julie, NO2g7, 2nd grade
- Child 2, Synnøve, NO2g10, 5th grade
- Father, Not present

Family portrait
The family members that participated in the family visit were Julie, Synnøve and the mother Trine. The parents are divorced and the father lives on the floor below. The visit took place in the family’s kitchen and TV room. Synnøve is baking Christmas cakes in the kitchen. The first hour is spent on a pleasant conversation about various things. The family uses new online technology in six different ways, communication, video games, entertainment, inspiration/creative activities, schoolwork/learning and social media.

Both children have smartphones. Julie is almost the only one in her class with a phone. She got a phone because mum and dad were getting divorced, so they can reach each other and talk when they are not together. They both make calls and Synnøve texts with her friends. The girls mostly use their phones for games. There are three tablets in the family. The mother has an iPad, while the children have Androids, which are perceived as more difficult to use. The children are allowed to borrow mum’s iPad. Julie is saving up for her own, which she can soon afford, and the children will be allowed to buy their own iPad after Christmas. The best apps are Minecraft and YouTube – the sisters both agree. Synnøve likes Minecraft because she likes to create worlds and build things. The tablet can be used up to one hour a day and up to three hours on weekends. The girls have access to PlayStation 2 at dad’s place, and they use this once in a while when staying with him. Synnøve likes using technology because she wants to be an engineer when she grows up. She made her own robot at a Scientist Factory, which is a recreational facility for children. Julie and Synnøve are perfectly able to manoeuvre the smartphones and tablets themselves. They search and find the apps they want to play. Synnøve is a little more knowledgeable than Julie, and helps Julie when she runs into something she does not know. Julie can ask her big sister for help if she needs something. Synnøve often asks her cousin Petter for help if she is stuck on something. The girls
think that PlayStation is difficult. They cannot keep track of all the cords, so they need help from dad to turn it on.

The family has a television in a separate room for games, toys and media. The girls can use this and they watch Netflix and YouTube, especially with other friends. They sometimes watch movies. They particularly enjoy watching Barbie movies and playing with Barbie dolls at the same time. They play out the movie with their dolls. Julie plays Wings, which is a Disney TV series and a website. Together with their friends, they act out what they see on the television. “We’re fairies that have magic and stuff,” says Julie with a smile. Both girls are also in the school’s marching band.

The girls use their smartphones and tablets to make animations using a stop motion app. They also use YouTube as a source of inspiration for making their own things, such as jewellery, Christmas gifts, Christmas decorations, etc. On weekends, they often go to different museums and spend time together as a family. Synnøve brings along the phones to take photos when they are out and about.

The computer is sometimes used for schoolwork. Everyone in the family has their own laptop. Synnøve has taught the entire family about netiquette, which she learned at school. Dad likes it when they do some of the same things that he does, such as coding computing programs. “You do coding via the internet,” says Synnøve, “It’s a way to update robots and such,” she says. Dad has tried to teach the girls coding.

As for social media, Synnøve has an Instagram account. She only posts photos that she has asked for permission to post. She posts photos of herself, but never nude photos, she says. She has a closed private user. Julie uses chatting services on the computer, where she only chats with the people she knows when they have agreed in advance that they want to chat.

When it comes to positive experiences, the mother believes that the children get a lot of information from the internet. Newton on NRK (Norwegian Broadcasting Corporation) is popular for streaming. As regards negative experiences, the girls mention ads, pressure to buy and getting frightened by scary things. Julie says that you can be tricked on Moviestar Planet. You do not know who you are talking to on the chat function.

The children can use all the devices alone without supervision. Mum uses a log program to see what websites the children have visited. She mostly uses this to learn what the children are interested in, and less so for control concerns. She has not discovered anything troubling. Mum is most concerned with the physical ailments the children might suffer from with too much time in front of screens, such as tendinitis. They decided on the technology use rules during a meeting around the dinner table. They made a written agreement that the children signed concerning telephone use. The rules state that they need to do homework before they can use their phones. Both sisters have to follow the same rules. The girls think that the rules for playing games are quite strict, but they understand why, and it also gives them time for other things.
Family NO3
Central Norway

**Family members**

- Mother, Mari, NO3m45
- Father, Trond, NO3f45
- **Child 1, Stine, NO3g7, 2nd grade**
- Child 2, Peter, NO3b15, 9th grade, lower secondary school
- Child 3, Christina, NO3g17, 3rd year, upper secondary school

**Family portrait**

The family members that participated in the family visit were Stine, Trond and Mari. Christina is home, but is not participating, while the big brother is out training. The visit took place in the family’s living room and dining room. The first hour was spent on a casual conversation. *Lotto* is played as a warm-up, and this takes a very long time. The family uses new online technology in five different ways, video games, entertainment, schoolwork/learning, communication and social media.

Stine plays almost no games. Peter plays more, while Christina snaps and chats, because Facebook is “out” for young people. Stine mostly plays on her tablet. Stine got her own tablet as a present when she turned six, but she has used a tablet since she was four. She has learned what she knows from her big brother. She is skilled at using the tablet alone, but does not use it every day. Stine plays the games *Josefine Stjernehotell* [*Josefine - Star hotel*], *Barbie* and *Clash of Clans*. She knows about *Minecraft*, but does not play it very often. She occasionally plays on her parents’ phones. Sometimes, when Stine has friends over, they play *Edderkoppkabelen* on the computer. Stine does not spend much time on the internet. She says she is unable to do so because the computer is quite new.

Stine has a television in her room and occasionally watches children’s television and the Disney Channel, but this is not her favourite thing to do. The parents admit that they are not quite sure what she watches. The family has movie nights sometimes. This is popular. Stine is allowed to pick movies that she would like. The family has had some good times looking at holiday photos and planning upcoming holidays. The parents provide assistance if Stine needs to use a computer for schoolwork.

The parents believe that Stine can learn to collect information, write and not least communicate by using technology. Stine uses her parents’ smartphones because she does not have her own. She has just started being able to write and send texts. Stine says that if you search for something, something nice, anything could pop up no matter what you searched for,” says Stine (NO3g7).
is not addicted to digital media and enjoys doing other things such as playing with Barbie dolls, teddies, cutting, pasting, painting and drawing. She also does gymnastics, handball, football and plays the trombone.

When it comes to negative experiences, Stine says that you could see something scary when you search on the web, so it is best when parents are there to help. “Mum says that if you search for something, something nice, anything could pop up no matter what you searched for.” “What do you do to avoid that, then?” asks the researcher. “I just do this (turns away and scrolls back) – or I do something else.”

The parents say that the risks are if she uses the new online technologies incorrectly, and ends up on inappropriate websites that have sex, violent games and news articles about terrorism. They are also concerned about the amount of time spent on online activities, but mum is mostly thinking of Peter, who plays his shooting games late at night and wakes up the family. The parents are worried about the older siblings, particularly their son’s video game habits, but they do not have any rules. They realise that they need to start talking to the children about this. The only limitation so far is that they cannot spend money online, apart from the money that Peter controls himself through his account. The parents had more control before the mobile devices came along, because the computer was in the living room and it was much easier to know what was going on. The devices have now been moved into the children’s rooms.

“I am not allowed to bring my iPad to restaurants, because we have to eat and talk to each other. It is not so nice if I am playing games when we are supposed to have family time.” The same rule applies when the family eats at home. “But my big sister cannot stay away from her phone,” says Stine.
Family NO4

Central Norway

Family members

- Mother, Elisabeth, NO4m35
- Father, Jan, NO4f35
- Child 1, Roar, NO4b7, 2nd grade
- Child 2, Sara, NO4g4, kindergarten

Family portrait

The family members that participated were Roar, Sara, dad and mum. The visit took place in their living room and dining room. The first hour was spent on a casual conversation. They played Lotto and this took a long time. The family uses new online technology in four different ways, video games, entertainment, schoolwork/learning and communication.

Sara (age 4) has used a tablet since she was three, and uses it about one hour a day. Dora is a popular game for Sara. She also uses it to play Lotto. Sara can use the iPad alone. She finds the games and plays the games in her folder. Her brother Roar (age 7) also uses the tablet, and they argue a little about who gets to use it. He has used the tablet since he was five. He can use the tablet for up to two hours a day, often in the morning. He wakes up early to get the tablet before his sister. Popular games are Lego games, Minecraft and Clash of Clans. During the interview, Roar is so immersed in the game that it is difficult to talk to him. Roar also uses the family’s PlayStation with his dad, and they play Fifa, Supercharger and Skylanders. However, PlayStation is not his first choice, but Roar uses this when Sara is using the tablet. Dad learns about the games first, by reading about them online and by playing a little before Roar is allowed to play. Jan plays some Fifa together with Roar. Elisabeth tried “but it didn't go all that well”. Sara takes photos with the iPad and shows the researcher how she takes photos.

Sara watches Fantorangen, Disney Playhouse, Dr McStuffins and Sofie. This is preferably done on NRK Super, but also on YouTube. She is able to turn on the television, but cannot switch channels. Sara uses YouTube and plays the videos that pop up. Mum is concerned about things the children might see via YouTube and is generally worried about the children’s use of the new online technology. On the
other hand, she realises that it would be a social handicap for Roar to be kept away from it altogether, because much of the non-digital playing is an extension of things from television or video games.

Roar is not addicted to digital devices and the digital technology does not dominate either child’s day-to-day life (see ranking of activities above). They play with Lego, Playmo, are read to, have outdoor activities and play handball in the winter and football in the summer. Roar mostly asks to use the digital devices when he is bored, but is still happy to play a board game instead. When the adults are too busy to play with the children, they can use the tablet and television as an easy solution, according to the parents. The parents say that Sara might get a little annoyed if she is having trouble with a game. She wants to do things on her own, with as little help as possible from her brother. It is easier to accept help from her parents. Roar says that there are sometimes stupid things on YouTube. “I don’t really know what to do then,” he says. But Roar does not think that there is anything scary on the iPad. It is only on the television that some things are scary. Roar says that movies can be scary. Sara does not think there is anything dangerous on the iPad, but sometimes when “Elsa and Anna” from the Disney movie “Frozen” is on television, Sara thinks it is a little scary. “It’s better with Cinderella,” says Sara, “that is not so scary”. Sara has never experienced anything scary on the iPad. Dad has blocked YouTube with an age restriction so that the children do not see things that are age inappropriate.

In order to prepare the children for the negative aspects of new online technology, Elisabeth believes it is important to have a good self-image and to be happy with yourself. “We need to talk with them about some things,” she says, but she is uncertain how much they understand. They have a rule that technology can be used in the morning until breakfast is ready, and a little in the afternoon when homework is finished. The problem is that Roar gets up very early to have more time to play, which makes mum think that he should maybe only be allowed to play in the morning and not the evening. The parents think that they are stricter with the children’s use of digital devices compared to many others in their social circle. This means that the children can go to other homes where the rules are less strict: “We know what happens when they go there. It’s fine when they are outside, but as soon as they go inside, the computer games come out. They only play using the devices.”

The rules do not apply to a specific technology, but total time spent on tablets and video game consoles. Both kids are equally interested in the tablet, so they argue over it sometimes. The children found a way to regulate this on their own, with an alarm that sounds when they have to switch. They switch after 5-10 minutes of use.
Family NO5
Central Norway

Family members
- Father, Jørgen, NO5f40
- Mother, Elisabeth, NO5m39
- Child 1, Marius, NO5b7, 2nd grade
- Child 2, Anne, NO5g3, day-care

Family portrait
The family lives in a suburb and consists of mum, dad, Marius age 7 and Anne age 3. Dad is a psychologist and mum is an educator about to start on a doctoral program. The family uses new online technology in four different ways, video games, entertainment, schoolwork/learning and communication.

The children preferably use the tablet or smart TV, where they use Netflix or YouTube, and sometimes Spotify. Marius got his own tablet when he was four. He uses it more than the television, while Anne mostly uses the television.

Marius has received some training from his dad, but is largely able to work things out by himself. He does this by pushing buttons here and there and seeing what happens, and then he sees what gives the desired result. Marius is able to download video games himself.

The parents find that Marius is very engaged when he is playing video games, but gets frustrated when he is having trouble doing something, or that he gets frustrated because he cannot act out physically in accordance with what is happening in the action games. They got a Wii U instead of PlayStation to encourage more physical movements while playing, and dad has played more with Marius so that they can stop the game before he gets too frustrated. They talk about the game while they are playing, much in the same way as when you are watching a football match or the like. Marius likes his football game a lot. He likes tackling others. Marius says that he is not so good at playing Minecraft. The researcher says that this cannot be true, because she can see for herself that Marius is good! “A little good,” says Marius.

“Video games have a type of addictive stimuli built into the system. It looks easy to begin with, and then it escalates, until you become addicted. Like a rat getting different stimuli and going into the hole.”

Jørgen NO5f40
The parents believe that the games have a certain educational value, for example when it comes to reactivity, but they wish the video game industry would also make captivating problem-solving games and not just reward or punish players by letting them make it to the next level in the game. Marius has access to some problem-solving games through his schoolwork, but they do not particularly interest him. Dad’s viewpoint on technology is that it is inherently neutral. However, he does see that video games are addictive, as stimuli are built into the system. Mum believes that the technology is so well made that it becomes a very low threshold option. She wishes it offered more resistance. Marius’ frustration with video games has led to some rules:

- Ask before video games are downloaded, and stay within the age limit of 7 years.
- Video games only on days when he has no homework, and no more than one hour on weekdays and two hours on weekends, preferably with equal amounts of time spent on the tablet and smart TV.
- Never buy things with real money in a game.

The rules were made in cooperation with Marius and are founded in his frustration with aspects of playing video games, and the fact that he projects his bad mood onto the rest of the family for a good while after he has stopped playing.

For Anne, who is three, there are no rules yet as she is able to regulate it herself.

The parents have talked a bit with Marius about what he could encounter online, for example on YouTube, where related videos often pop up automatically. Marius knows this and tells his parents when things pop up that he did not search for: “Mum, look! It just popped up!” The conversations with him have also been fruitful when it comes to new video games. He was considering a new video game one day and thought that “dad will say ‘yes’ to this game”, and downloaded it, but told his dad, and dad agreed that the game was okay.

Even though Marius likes to play video games, he also likes other things, see photo above where he ranks his favourite activities. Drawing, Lego, board games and swimming are all activities that he enjoys.
Family NO6
Central Norway

**Family members**
- Mother, Stina, NO6m40
- Father, Roger, NO6f40
- Child 1, Tobias, NO6b7, 2nd grade
- Child 2, Tone, NO6g4, day-care

**Family portrait**
Tobias [NO6b7], Tone [NO6g4], Roger [NO6f40] and Stina [NO6m40] participated in the family meeting. The visit took place in their living room and dining room. The first hour is spent on a casual conversation. They play Lotto and this takes a long time. The family has a wide range of different digital devices and they uses new online technology in four different ways, video games, entertainment/inspiration, schoolwork/learning and communication.

When it comes to video games, the tablet is the most used digital device for the children. Tobias was three and a half when he started using the tablet, but had used the parents’ smartphones before this. Tone has been exposed to tablets since she was born, and could handle it independently since she was one and a half. Dad said: “They are so easy to use, so they learn fast.” They can use the tablet or television approx. two hours per weekday; more if homework needs to be done electronically. On weekends, they get 3-4 hours. He mostly spends this time watching YouTube and building Legos there. This helps relax Tobias, while playing video games can rile him up. Tone does not use the tablet much for playing games, her motor skills are not developed enough yet.

Tobias is able to technically download games himself, but still needs help from one of the adults to install it due to the password requirement. Digital devices are not often used for joint family activities, but Tobias likes to sit with someone and play on the tablet, or “at least likes us to watch,” the father says. They have a Wii U and play this with dad. Dad always checks the video games in advance before potentially installing them on the tablet. If dad rejects the game, he will do by so saying “No, this might be a little scary”. Tobias accepts this, but is still disappointed. He accepts the explanation that the game is for older children. Tobias knows which games in
app stores are suitable for him, because the games that are downloaded have an age limit of 7. He knows where he needs to look to determine the age limit for the game. Tone sometimes plays with mum and dad, but Tone also plays by herself. She is able to do this. Tobias sometimes shows Tone how to play games. He has, for example, taught Tone how to play *Nintendo Wii U*.

Tobias occasionally gets help from his parents to find good movies. For Tobias, *YouTube* is a tool for playing with his own *Legos*, which means that online activities inspire offline activities. The parents do not want Tobias to fall behind socially, for example if he is not familiar with the games that the children play outside. The parents consider the digital activities to be positive for the children to the extent they can search for and find information by themselves. Tips for building *Legos* and playing *Minecraft* have given Tobias inspiration to make things himself. He has also picked up many English words from *YouTube*. They also believe that through this, they learn to function in a modern society. Though Tobias ranks activities related to digital technology higher than other games, he is also fond of the playground, *Lego* and *Playmo*, see photo of Tobias’ ranking of his favourite activities.

Generally, the parents have been slow to introduce or allow digital devices for the children. “We put the handbrake on.” The parents do not like it when Tobias brings the tablet into his room. Particularly when he is going to bed, because it keeps him awake, both because he gets irritated when he doesn’t succeed with the games and because of the light from the screen. Mum says that he needs screen-free time to calm down. The use of *YouTube* is also worrisome in connection with the related videos function that could show videos that are not necessarily appropriate for children. They believe it is time to establish age restriction barriers. Tobias finds some things on *YouTube* scary (zombies), and understands that he should not watch them because he gets nightmares. He has learned to move away from such things himself. He talks to his parents about this: “He told me that he chose not to watch this, which he showed me. ‘Yes, that was smart,’ I said.” The researcher asked Tobias if there was anything about the tablet that was not good for him. He answered “like when I lose”. He does not like it because he loses money, which makes him angry. So he tries again and again, and gets angrier and angrier.

The parents realise that it is time to set boundaries for how long he is allowed to play video games. So far, the rule has been to complete homework first, but this makes it difficult to restrict video game-playing on the weekends. The time spent playing video games is the biggest concern for the parents, because they see that when he plays for too long, he gets annoyed when he cannot accomplish things. The parents ask him to put the tablet away when it gets to this point.
Family NO7
Central Norway

**Family members**

- Mother, Siw, NO7m35
- Father, Stian, NO7f40
- **Child 1, Emma, NO7g8a, 2nd grade**
- **Child 2, Rita, NO7g8b, 2nd grade**
- Child 3, Olav, NO7b5, kindergarten
- Child 4, Anders, NO7b1.5, kindergarten

**Family portrait**

The participating family members are Siw [NO7m35], Stian [NO7f40], Emma [NO7g8a], Hanna [NO7g8b], Olav [NO7b5] and Anders [NO7b1.5] who is sleeping while music is playing. When the music stops, he wakes up and cries loudly, but he calms down again when they put new music on. The entire interview takes place in the family’s kitchen and living room. The first hour is spent on a casual conversation. The parents themselves are active users of the Internet and technology, particularly dad, who is a technician and co-owner of a technology company. The family has several digital devices and they use new online technology in three different ways, video games, entertainment/inspiration and communication.

The family has *PlayStation* 2, 3 and 4. Moving this activity out of the house has had an ‘out of sight - out of mind’ effect, and less requests from the children, and they have more control over when they should play. They also have not taught the children how to connect the *PlayStation*, so an adult has to help them get started. This is considered a family activity. They gather and play in the storehouse. They play Disney Infinity 1234, Little Big Planet and a new game, *Just Dance*, which is sometimes played online with a camera. Dad laughs and says that he also plays *PlayStation* alone in the storehouse. All the children have their own iPad. Emma, Rita and Olav think that *Minecraft* is the most fun, because they can make things in *Minecraft*. Olav is able to use the iPads himself and says that he likes to make things. In order for the girls to understand how to download games to their tablets, they have purchased pre-paid cards to the Android store for the children. The children mostly download free games, but since they have a certain amount available on their pre-paid cards, they need to decide themselves what to spend the money on. This makes the children more critical, because they are using their “own” money. The children can use their tablets independently. They can download apps themselves. They sometimes want more money, so the parents buy app store gift cards.
cards if they want to give them more money for downloads. The video games are selected according to age limit.

When the children started school, they got one mobile telephone to keep in touch during the time they were home alone after school. This arrangement only lasted six months. The children were not able to keep the phone charged, or they could not find it, and it did not go as expected. Today they have a home telephone instead of a mobile phone so that the children can reach their parents.

The family watches *NRK Super* while they colour in. The parents want the children to remain children for as long as possible: “They do not get to watch *Disney XP*. We deleted it, but *Disney jr.* and preferably *NRK Super* and the children’s programming on *Netflix* are okay. This is also because we have the little guy, and little brother. In a way, it is he who chooses the television, and it becomes a form of compromise. They have watched one of the *Star Wars* movies. Olav likes the *Angry Birds* movie that is out now. The girls use YouTube as inspiration and for dancing. The entire family enjoys listening to music. The children also have their own music players in their rooms.

When it comes to negative experiences, the girls explain that some downloads can contaminate their tablets with viruses. This happened to a girl they know. The children discuss the flow of photos (via cloud-based services) between the iPads in the family. “It is a little stupid, especially if you accidentally take a picture of something you shouldn’t take a picture of. Someone took a picture of me while I was sleeping and drooling once, that wasn’t fun,” says Rita. The girls explain that the photos cannot be posted on the Internet because they could end up somewhere else. Both the girls and parents independently mention a cousin that the girls had played *Just Dance* with. They said that the cousin played the game only dressed in her underwear, which the girls considered a bad idea. The girls agree that they need to wear proper clothes when they are online. There could be scary things on *YouTube*. “If I encounter something scary, I just leave what I am watching and find something else, another video that makes me happy,” says Rita. “Then I completely forget about it”.

The tablets are not the most important things in the girls’ opinion. They believe that homework is more important. All the children in the family enjoy drawing, and they do this often. Mum and dad decide when the children can use the tablets. Sometimes they have the tablets with them in bed for as long as they want and they can use the tablets alone. They can bring along their tablets when they are travelling. They use them to take photos.

The parents are relatively liberal when it comes to use of digital devices compared to many of the other families in this survey, but they are concerned with making sure the children are exposed to content that is intended for their age. The children also need to be allowed to relax through using digital tools. The rules generally relate to the distribution between the children. The rules are the same for all the children, regardless of age. “We have not discussed netiquette yet.”
Family NO8
Central Norway

Family members
- Father, Jakob, NO8f45 (not present)
- Mother, Hanna, NO8m45
- Child 1, Tom, NO8b7, 2nd grade
- Child 2, Ole, NO8b5, day-care
- Child 3, Maria, NO8g3, day-care

Family portrait
The family consists of the mum and dad (not present during the interview) and three children, Tom aged seven, Ole aged five and Maria aged three and a half. Mom trained as a social worker, but now runs her own company. They have a spacious home in the countryside with excellent outdoor recreational facilities, some 12 miles from the big city. The family uses new online technology in four different ways, video games, entertainment, schoolwork/learning and communication.

The children have access to the parents’ smartphone, two tablets, television and a video game console (Nintendo DS). They do not use Internet explicitly other than for the games that require internet (AngryBirds, the mum thinks) and so they can snapchat with aunts and uncles.

The tablets are not used on weekdays, but can be freely used on weekends, though they are rarely used more than 2-3 hours on the weekend, depending on whether any activities have been planned with the children. The boys’ favourite device is the smartphone, which they use to play AngryBirds. The boys handle the devices on their own. They learned how to use the phone by observing their dad. Though Tom likes to use digital technology, he also likes other things. “Handball is my most favourite thing,” says Tom [NO8b7], and he ranks both musical instruments and swimming high on his list of favourite activities.

Mum struggles to come up with positive things that the children might learn from technology, but does mention that being able to use a keyboard can be useful when
they are adults. Mum is also concerned that digital devices have almost completely taken over from offline activities and that they lose motor skills they previously had when some traditional games are moved over to two dimensions on digital devices. Tom plays sports, but that is just one hour a week. Mum feels bad that she is not able to engage the children more with non-digital activities, but says it is because she had three children in quick succession at a relatively old age and she is busy with work.

Mum believes that Tom has developed an addiction to video games, but does not want to take away his games as this could cause him to fall even more outside his group of friends. Her remedy is “strengthening his self-confidence”.

“There is no norm,” says mum when asked about rules for technology use. “How long they are allowed to play depends on their mood and ours.” There are restrictions on use, but they have not been set out in clear rules. The children obey the restrictions that are set, and if they do not, further restrictions are imposed. However, the parents are not consistent and admit that things easily get out of hand.

Mum is sceptical of “all technology” and dreads the future when the kids will be older. Mum says that she gets regular reality checks from experts regarding netiquette and what can happen if you are naïve on the Internet.
Family NO9
Central Norway

Family members
- Mother, Sofie, NO9m40
- Father, Stian, NO9f45
- Child 1, Preben, NO9b7, 2nd grade

Family portrait
Preben and his mum and dad are participating. The entire interview takes place in the family’s dining room and in the sofa nook. First, they talk about a typical day for the family. Some of the family’s devices are old and they use new online technology in four different ways, video games, entertainment/inspiration, learning/schoolwork and communication.

Preben is very fond of playing video games, which he is very skilled at. He has a PlayStation, but he does not play this too much anymore because he has “rounded” all his current games, and wants new ones. Preben also has an iPad, version 2. This is too old and there are several games that do not work on it. He has a smartphone without a sim card that he uses for playing games. He uses it like a tablet. Preben plays Minecraft, AngryBirds, Clash of Clans. He has more games, but he plays these most frequently. Preben does not play Minecraft when he is alone, because he is a little scared of the music in the game. When he turns off the music, he feels like he is alone, so he mostly plays Minecraft when he has friends over. Monsters can appear when it gets dark in Minecraft, and “I’m a little afraid of that, it’s a bit scary,” says Preben. Preben and mum play together sometimes. Mum quickly realised that Preben was much better than her, so she thought she might practice a bit on her own, but has not got around to it yet. “The children are so quick!” she says. Video games played a very big role in Preben’s life. He plays a little less now, as they made new family rules after the parents decided to take part in this survey. He gets to play a little more than usual when the parents need to get other things done. Preben is on the internet with mum and dad sometimes. He gets help to download games. Preben is not allowed to download games alone. Even though Preben enjoys playing digital games, he also enjoys non-

3 All levels of the games have been achieved.
digital activities such as being outside on the playground, ball games, swimming and drawing, see his grouping of his favourite activities. Preben has ranked his favourite activities in three groups: group 1 which is his very favourite, group 2 which is not quite as much fun and group 3, which are the least fun activities that he likes to do, see photo above.

Preben does not spend much time on YouTube when he watches television on his phone. He prefers NRK Super. The parents watch what he is doing when he is on YouTube. This is because other things than expected could pop up here, according to the parents. Preben plays Skylander and Minecraft with his friends in the schoolyard. They pretend they are saving the world, “we can make fights and defeat the bosses,” he says.

Preben likes photos of himself that are posted online on closed social media. The family uses Path, not Facebook, because they believe they have more control over things on Path, e.g. due to a limited chat storage time. Preben likes to know who has seen photos of himself, which have often been edited with filters.

Preben is not the only one who uses digital devices in this family. Mum and dad were also occupied with their phones, during meals too. The family therefore had to make rules that applied to everyone, not just Preben. Preben helped make the rules, so this was a family project. They are not always able to follow them, but that way the parents show that they can also be weak and make mistakes. Mum was very clear that, if rules were to be followed, her son needed to know why the rules were in place. Rules were never explained when she was young, which “caused me not to listen,” so she did not want to make the same mistake with her son. They thanked us for taking the initiative to conduct this survey, because it started the whole process with a family council and making rules for the entire family.
Family NO10
Southern Norway

**Family members**
- Mother, Tina, NO10m36
- Father, Oliver, NO10f40
- **Child 1, Randi, NO10g8, 2nd grade**
- Child 2, Truls, NO10b6, 1st grade

**Family portrait**

Randi, Truls and mum are participating. The interview takes place in the family’s living room. Dad is not present, and we talk about how dad is from another part of the country and mum comes from another country in Europe. They have not installed parental controls, but they use safe mode. The family has a diverse technological home and uses new online technology in four different ways, video games, entertainment/inspiration, learning/schoolwork and production. This family also has a drone that the children help use, but dad operates it.

The children play games with each other, dad or on their own tablet. Mum has played a racing game with the children. The game consoles are rarely used. Dad chooses the games that the children can play on the game consoles and he downloads the games. The children were allowed to use the video game console from when they were five and six years old. They like playing *Hungry Shark*. Truls and the children know that what happens in the game cannot happen in reality. Randi likes racing games, because it is a competition. Randi previously liked *Bratz*, and she has Bratz pyjamas. The children use an iPad about two hours each on weekends. Randi likes the *Frost* app and shows how she can draw and make characters in that universe.

When the children come home, they relax with television. They also do this on weekends. They watch *NRK Super* and *Netflix*. They do not watch much television together as a family, but Randi and Truls often watch together. When the family watches television together they watch *Mesternes Mester* or *Discovery*. Randi has a television in her room. The children are allowed to watch movies for 1.5 hours on

Photo 7 Randi’s Grouping of her Favourite Activities

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* A popular family TV program on NRK where retired sports athletes from different sports compete about being the best among the retired.
weekdays and 2.5 hours on weekends. The children do not like that the parents always have to decide what they will watch.

In a *Newton* book (spin-off product for a Norwegian television program for children) that her friend owns, they have written down the different things they tested from the show.

Randi does not pay attention to age limits, because she does not know where they are. Randi says that you should not give out your password because you might get hacked. If the rules are broken, they have to take a break from the tablet for a week, or they are not allowed to watch television the following day. Mum says they could be better at following rules.

The technology is part of the family life, but is not the only thing. Truls enjoys being physically active, and likes being outside. He does Taekwondo and swimming, biking and skating. Randi does swimming and loves to draw – more than using any of the new online technologies. Mum says that one positive thing about the internet is that this is where she met her husband.
3. Findings

This part of the report will answer the four research questions, based on the four dimensions: use, perception and attitudes, individual context and family context. The below matrix shows the correlation between these dimensions and research questions 1-4.

<table>
<thead>
<tr>
<th>USE</th>
<th>INDIVIDUAL CONTEXT</th>
<th>FAMILY CONTEXT</th>
</tr>
</thead>
<tbody>
<tr>
<td>RQ 1: Individual Use: children / parents</td>
<td></td>
<td>RQ 3: Family Use / Dynamics / Practices</td>
</tr>
<tr>
<td>PERCEPTIONS / ATTITUDES</td>
<td>RQ 2: Awareness to risks/opportunities</td>
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<td></td>
<td>of the children</td>
<td>RQ 4: Parental Mediation</td>
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<td></td>
<td>of the parents</td>
<td>• Passive / active</td>
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3.1 How do children under the age of eight engage with new (online) technologies?

Individual context

*Significant variation in time spent using digital devices*

The seven-year-olds in this study spent an average of 13 hours a week using digital devices. Use varied from five to 19 hours. They spent most time on tablets (46%) and television (21%), while music devices such as iPods were rarely used at all.

*Four main types of digital activities*

When analysing the collected empirical data, we found three main types of digital activity across the different digital devices and the ten families.

Main type 1 is activities where entertainment is the primary goal of the activities. Watching clips, television shows, movies and playing some games are examples of this type of activity. Games such as *Clash of Clans, Angry Birds, Super Mario, Batman* and *Skylanders* are examples of games that were developed to obtain different types of rewards, such as reaching the next level, earning or collecting more “money” or points.

Main type 2 is games or programs where you can make or construct things using your own imagination and skills. *Lego* games and *Minecraft* games are examples of this type. This category also includes creative programs such as *StopMotion*, which is used to make animations. Another variant of this main type is programming. One of the dads has tried to teach his daughters coding, and one of the girls in the study has helped make a game through coding at school.
Main type 3 is when types 1 and 2 form the background or point of departure for another type of activity. In these types of activities there is a seamless transition from digital to non-digital activity. This use is common among several children in this study.

Main type 4 is communication. In this type of activity, the children use online technologies to communicate with their parents, friends and family (e.g. an aunt that lives far away).

**Tablets**
All the families have tablets such as *iPad* or *Android* that the children use. Some of the children share a tablet, but most have their own that they are in charge of. They can use these tablets alone in their room. The children play different games on the tablets, and some of the children use the tablet to take photos, make animations, to do “art activities” and filming. The children also like to watch *YouTube* with the tablets, and even the youngest children are able to find videos that they want to watch. The tablets appear to be the most popular technology among the children, particularly among the youngest. This is in line with the study *Foreldre om barn & medier [Parents about Children & Media]*, where 77% of the families with children aged 1-4 have tablets (Norwegian Media Authority, 2016b, p. 15).

**Video game consoles**
All of the families have at least one video game console. Most families have a *PlayStation* and *Wii U*. One of the families also has *Xbox*, and another has several versions of *PlayStation*. Video game consoles are not so popular among the children and several of them say they prefer to play on tablets.

Some of them need a little help with the consoles to get started.

**NO2g10:** *It is a little difficult to understand the cords. Dad helps us to turn on the PlayStation, but we know how to turn it off.*

**Computer/laptop**
All of the families have a computer. Even though the children do not use the computer as much as tablets, they know what it is and what it can be used for. There is a children’s computer in one of the families, but it is not used often. The children there almost forgot that they had it. In another family, each of the children has their own laptop. The children use the computer for schoolwork and for playing games. One of the children said that computers are difficult:

**NO1b7:** *It is most difficult to use the computer. There are so many buttons you have to push. There are not so many buttons to push on the tablet.*

**Telephone/smartphone**
In three of the families, the children have their own smartphone, these children are 7/8 years and older. In two of the families where the children do not have a smartphone, they can borrow their parents’ phones to make calls and play games.
Smartphones are used to play games, take photos and make calls. The children have their own mobile phones in some families (not smartphones), so that the parents can reach them when the children come home from school.

**Music players, radio, television, movies**

In three of the families, the children have a music player and/or radio in their room. In two of the families, the children have a television in their room. All of the families have a television in the living room or in media/playrooms. The televisions are not often used by the children to watch normal television shows or television channels. They would rather use streaming services such as Netflix or Viaplay to watch movies or to play games with video game consoles.

**YouTube**

Most children in the study use YouTube. This corresponds with the study Foreldre om barn & medier, which reports that 27% of children aged 1-4 and 38% of children aged 5-8 use YouTube regularly (Norwegian Media Authority, 2016a, p. 45). YouTube is often used as a main type 3 activity. In two families, the girls in the family used YouTube to learn different skills. One of the boys watched Lego videos as inspiration for his own Lego constructions. Two twin girls use YouTube to watch various gymnastic or dancing clips to learn how to dance. NO2g10 likes to make things that are inspired by watching YouTube clips:

The dream of YouTube fame:

NO2g10: *I want my own YouTube user when I grow up, I can upload everything I make, that would be nice.*

NO2g7: *You can put your art stuff there.*

NO2m46: *NO2g10 is not allowed to publish anything yet.*

**Video games and age limits**

Children have several types of games, and the children in our study mostly play games that are intended for their age group. However, there are some instances of a seven-year-old boy playing a game with an age limit of 16. He says:

NO1b7: *I can play Batman which has age limit 16 together with dad, because I don’t get nightmares. I don’t get scared of the blood.*

The arguments that this child presents to play games that are rated with a higher age limit than his own age, are juridical and psychological: The father (his “authority”) allows it, and he does not experience psychological discomfort – at least not according to what he says.

The fact that children play video games with age limits that are higher than their own age is also described in Foreldre om barn & medier, where 4-8% of children aged 5-8 say that they have played video games with an age limit of 16 or 18 (Norwegian Media Authority, 2016a, p. 52).
Minecraft
The most popular tablet game among the children is Minecraft, which is played by both boys and girls. In Minecraft, children can build things and be creative, which could be part of the reason for the game’s popularity (main type 2 game). Several other studies have also shown this tendency. The research study Foreldre om barn & medier in 2016 shows that Minecraft is the most popular game among children between the ages of nine and eleven. A little more than one in five children say that they play this game (Norwegian Media Authority, 2016a, p. 50). Other games that are popular among the children in this study are Clash of Clans and Fifa, while the younger girls play Barbie, Just Dance and Disney princesses.

Independent but willing to learn
The children in the study are mainly independent and competent users of digital devices within the digital activities they are engaged in. Everyone can use the tablets independently, including the youngest (under the age of 5). Several of the children download apps themselves. They know where they can find the age limit for games and they know that elements inside the apps can cost money. Some of the younger siblings learn from their older brothers and sisters, but some prefer learning from their parents. The oldest child learned from parents, cousins and friends. However, many say that they learn by trying different things.

Family context
At home and out at a restaurant are two different things
Most children in the study say that they can use their tablets almost as much as they want when they are home:

NO2g10: When we are having dinner at a restaurant, we are not allowed to bring the tablets, because we are supposed to talk together and have a nice time being social.

Researcher: What about when you have dinner at home?
NO2g10: We are not allowed then either.
NO2g7: Sometimes NO2g10 can’t leave the phone alone.
NO2g10: It’s hard!
Using video game consoles is also a family activity
All the ten families have at least one video game console. PlayStation and Wii U are most common. Several of the fathers enjoy playing video games themselves, and they play with their children. Video game consoles are most likely the preferred technology when children play together, both in the family and with friends.

The children generally use computers for schoolwork and occasionally to play games. When the children do homework on the computer, they receive help from their parents.

3.2 How are new (online) technologies perceived by the different family members?

Opportunities, from the children’s standpoint

Exciting and fun
The children say that they think it is great fun to use the tablets. They like watching YouTube, children’s television shows, playing games and being creative with the technology. The technology is an important part of the children’s lives, but it is not the only thing they do. When the children are asked to rank the cards with pictures of all types of technology and activities, it is revealed that other, non-digital activities also make up part of their day-to-day lives.

Information and inspiration opportunities (main type 3 activity)
Children often use digital technology along with traditional activities. This makes for a seamless transition between digital and non-digital activities, categorised as main type 3 in Chapter 3.1. The digital technology can inspire and inform the children’s non-digital activities. Children get ideas and information from the internet, and they are inspired by games and movies. Most of the boys in the study enjoy playing Minecraft outside the digital realm, which can be characterised as “media play” (Rönnberg, M., 2009). This usually takes place during recess in the schoolyard.

NO6b7 (enthusiastically): We pretend to be characters in Minecraft, and we build things. We have bows and arrows and we pretend to have fights to defeat bosses. We save the world and stuff.

Aarsand (2010) has examined how the technology affects social interaction beyond what happens in front of the screen. In the study, he sees how knowledge and expertise which the boys have gained by playing video games are also key components when boys play at the playground. The boys use their knowledge from the games as a resource for their social interaction and organisation of activities they initiate themselves. Some of the girls play with their Barbie dolls while watching Barbie movies. As the movie unfolds, the girls try to find the same clothes as the Barbie dolls in the movie are wearing. This way, the children use their media and digital technology experiences to create their own games and stories that
highlight their media experience. Imitation is a common strategy for children, and they explore and learn by using this strategy.

**Risk, from the children’s standpoint**

*Unintentional incidents*

Several of the children have experienced doing something unintentionally. This could be deleting things that they did not want to delete, losing track of photos, and coming across something the children do not want to see when searching the internet. It can be particularly unpleasant that pictures taken by one of the children are shared between the tablets in the family. It could be unpleasant if a photo taken with one of the children’s tablets suddenly pops up on dad or mum’s tablet through a cloud sharing service. These unintentional incidents can also become an opportunity that sparks a thought process in the children, where they reflect on what photos they should take and what photos they should save on their tablets. This is useful practice for the children.

**Experiencing fear**

The children have experienced getting frightened while playing games or watching videos on YouTube. The children mention that seeing blood can be scary. Furthermore, it emerged that several of the children experience fear and discomfort from scary music, monsters, skeletons and zombies, e.g. in Minecraft. The children have different strategies if they encounter such scary things.

NO7ga7: *I can put away the tablet, or find something I know is pleasant to watch.*

NO4g4: *I just look away, and find something else to watch.*

The reason why the children want to avoid scary things is the fear of having nightmares. But not everyone is afraid of seeing blood. As boy NO1b7 described earlier, he does not get nightmares even though he plays Batman, a game with an age limit of 16.

**Pressure to buy**

Some of the children say it is negative that they are squeezed to buy things in different apps and games. The children say that the parents do not like these games. It is easy to become tempted to buy more lives, coins or other elements that will help them advance and reach new levels. Some children see this as a type of scam, and feel they are wasting money if they buy products in these games.

**Discomfort when playing games**

Several of the boys mention stress and anger when they play games. Tobias (NO6b7) becomes angry when he gets stuck in the video games. This causes him to try again and again, and he gets angrier and angrier, he says. Preben (NO9b7) talked about how it makes him feel:

NO9b7: *There are some things about the technology that are stupid too, you can get a little crazy, if you play a lot …*
Researcher: What do you mean by ‘crazy’? Do you mean that you get crazy after you’ve played? ...

NO9b7: What sometimes happens to me [gets up from chair and jumps up and down while talking] I got a little crazy, and I just wanted to keep playing. I just had to jump up and down and ask mum: Please can I play, please can I play, pretty please can I play a little longer?

NO9b7 explains how it feels on the inside when he just has to keep playing. There has been extensive research on potential adverse effects of video and computer games, but seldom with so young children’s own point of view as data material.

Computer virus
Some of the children are aware of the virus risk associated with games that they download from the internet. None of the children have experienced this themselves, but they know of others who got a virus on their tablet.

Sharing sensitive and intimate information
Some of the children have a clear understanding that one should be cautious with the information that is shared online. Girls talked about how they should be very careful with how they are dressed when posting photos of themselves online (no one had done this yet, but they talk about what is important if they were to do it). This applies both via online games and in social media such as Instagram.

Feeling lonely when playing video games
One of the boys sometimes felt lonely when he played games with the sound turned off. The lack of sound made him aware that he was sitting alone.

NO9b7: I don’t play Minecraft, I am a little afraid of it, so I play it if I have friends over. The music is a bit scary.

Researcher: But why can’t you just turn off the sound?

NO9b7: Yes, I can, but then I feel a little lonely.

Researcher: Oh, I understand, that is not a good feeling (nods to confirm). There could be some things that are not so good about the technology, too.

NO9b7: Yes

Researcher: So you feel lonely when you play Minecraft?

NO9b7: Yes, I feel lonely.

It is important for parents to talk to their children about how much time they spend playing video games. Children should be encouraged to spend time with their peers. It is important to help children make friends and have a social network outside the gaming world, to prevent them from feeling alone and lonely.

Opportunities and risks from the standpoint of the parents

Ambivalence
Several parents note the learning potential as a positive aspect of new online technology, but several are also concerned with ensuring the children have screen-free time, particularly right before bedtime.
One set of parents is clear in saying that we are living in a marvellous time, and the children are growing up with a lot of opportunities, but they are worried about digital bullying and the chase for “likes” when the children are older.

**Active mediation**
Some of the fathers evaluate the games before they install them on the children’s devices, for example by reading about them and playing the games themselves to test them.

Some of the parents have blocked *YouTube* against content that is not suitable for children.

**Motor skills**
One mother has noticed that her five-year-old’s ability to lay non-digital and three-dimensional jigsaw puzzles disappeared after he started only doing puzzles on the tablet. “He was unable to twist the piece when he put it down” (NO8m45). The mother did not mention how long this condition lasted, but the observation upset her.

**Social aspects**
Several parents are concerned with the social aspects of the technology. These aspects are both positive and negative, and there are some dilemmas. For example, the improved opportunity to communicate with relatives and friends is considered positive. Dilemmas occur when being up-to-date with the latest video game and various streaming services is essential for the child to function socially with peers, at the same time as spending a lot of time on e.g. playing video games in and of itself is undesirable (see next paragraph).

**Excessive gaming among boys**
All families with boys aged seven (7 out of 10) have introduced rules to limit the time the boys can spend playing video games. Our material shows a clear gender difference here, since this regulation is not clearly present in families where the seven-year-old is a girl. Most explain that the restrictions were introduced because the boys display various negative states of mind such as stress, irritation, rudeness and anger. In two of the families, this need for regulation was so severe that video games are ideally only allowed on weekends, and are limited then as well. However, the rules are often difficult to adhere to, in part because adults occasionally use the time when the children play video games to work undisturbed. The term ‘video game addiction’ is used in two of the families, partially as a description of a condition that the child already has, and partially as a fear for the future.

3.3 How do parents manage their younger children’s use of (online) technologies?
The parents use different strategies for handling the children’s use of digital devices.
Constructive strategies
Six of the families appear to use constructive strategies, as they explain why guidelines are necessary for use and talk to the children about how to regulate the use. In some cases, the regulation applied to the entire family, including adults. The children’s stress levels and anger in connection with playing video games for a long time was often used as an argument for reducing the playing time.

One of the fathers was involved in the son’s video game playing, in part to have a joint activity with him, but also to regulate the playing time based on the son’s reactions along the way. Conversations about what he felt when he was getting frustrated were also important, not least from the father’s standpoint, as a psychologist.

Another family gave the children pre-paid cards so that they would gain their own experience with reflections on buying games for their tablets. The parents said that the children carefully considered what they would spend their money on. The parents also had to approve the games after the children had made a decision.

Most of the children accepted the rules. The children helped design the rules in four of the families.

Restrictive strategies
We found restrictive strategies in seven of the families. Two of them used both constructive and restrictive strategies, and the rules were made in cooperation with the children in only one of these families. Three of the families with restrictive strategies combined this with punishment, which often entailed that the children were not allowed to use any digital devices for a certain period of time.

Passive strategies
Half of the families had little or no real regulation of the children’s use of digital devices, despite the fact that all the families actually had rules (see below). The rules were not followed up well, or breaking them had no consequences. In three of the families, the children regulated their own use by switching to non-digital activities in time. This particularly applied to the children that had not yet started school.

Active strategies
The active strategies that we found beyond the restrictive strategies mentioned above, are that one parent has a program that logs the children’s internet usage, a father that decides with whom the 2nd graders can play online games and three fathers who pay attention to the types of video games that the children have access to.

Implicit strategies
Only one family used a form of technical filtration against what they believed was unwanted content from the internet, but many realised that they would soon need to install such filters.
Rules
All the families had some form of rules related to data use, but it was difficult to comply with the rules in many families. “It easily gets out of hand.” The rules mostly relate to time spent using digital devices. The rules only allowed use on weekdays when the homework had been completed, which left very little time in practice. Rules are more liberal on weekends, typically 2-3 hours a day. However, many of the families often organised non-digital family activities.

Reverse mediation
We found two cases of the children being ahead in the mediation compared to the parents within two areas, which were netiquette and that the same usage rules should apply to the parents and the children. Synnøve (NO2g10) criticised her mother for posting photos of her on Facebook:

NO2g10: Mum, you didn’t ask me about this, and you are not allowed. You cannot post these photos here.

Preben criticised his parents for “having their noses buried deep in their smartphones”, also during meals. This resulted in joint rules for the entire family, regardless of age.

Parents’ concerns
In four of the families, parents were particularly concerned about the children’s current or future use of digital devices. The most common concern was related to how much time the children, especially the boys, spent on playing video games. One of the parents mentioned the risk of physical ailments from excessive data use, such as tendinitis.

3.4 What role do these new (online) technologies play in the children’s and parents’ lives?

Safe use of digital technology
In some families, the parents are concerned for the children’s safety when they use devices that are connected to the internet, while the children are left to themselves in other families and the parents have little control over what happens. The parents that get involved often check content or if games have the correct age rating before they download the game. Some parents are also with the children when they are on the internet.

Cooperation and time spent together as a family
Many families use video games together with the children or they facilitate other family activities, online and offline. They play board games and video games, watch movies and get information from the internet. Some parents try to play video games with the children, but find that the children learn everything much faster, leaving the adults behind. Some parents help the children with schoolwork when use of the internet is required, for example to search for information on the internet.
The dream of becoming famous on YouTube

In one of the families, there is a dream of becoming famous on YouTube:

NO2g10: “We watch YouTube and we make lots of art and stuff,” says Synnøve, showing several things she has made. “I watch YouTube and make the things afterwards, when I am older I want to make my own YouTube user,” she says with a smile.

Online community

Some of the children play games with people they do not know. They are aware that this is only acceptable within the game. They only Skype with friends that they know in real life and after pre-arranging this.

Influenced by the parents’ involvement

Some parents use their own interest in digital technology in their interaction with the children. In one family, the father is trying to teach his daughters to code computer programs.

What could I do without?

Most would miss their tablets or smartphones the most, if all devices were gone. Others would most miss the ability to draw or paint.
4. DIGCOMP framework

The evaluating of the children’s digital skills is done according to the following: The DIGCOMP framework has been scored only for the child perspective. The Child skills/competence has been rated against the code provided in the DIGCOMP grid (see p. 46). The entry is left empty when the researcher does not know how to score, whereas if the researcher feels that the child is not capable of the task, he/she has put “Not there yet”. The scores have been entered in three categories:

(*) observed

(**) self-evaluation or reported by another member of the family

(***) researcher evaluation

DIGCOMP: A Framework for Developing and Understanding Digital Competence in Europe

- **Authors:** Author: Anusca Ferrari
  Editors: Yves Punie and Barbara N. Brečko
- **EUR Number:** JRC83167
- **Publication date:** 8/2013


developed by our colleagues of JRC; IPTS. This team ask us to evaluate the developed grid of evaluation of digital skills of adults into the young children’s world and critically produce feedback over a possible tool of evaluation of children’s digital skills
4.1 Based on the interviews and observations what are the digital skills interviewed children as described in the DIGCOMP framework?

<table>
<thead>
<tr>
<th>DGCOMP Skills/ Interviewed Child</th>
<th>Family 1</th>
<th>Family 2</th>
<th>Family 3</th>
<th>Family 4</th>
<th>Family 5</th>
<th>Family 6</th>
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4.2 Discussion of the categorization of young children’s skills with DIGCOMP?

Using the DIGCOMP framework that was made for adults in this survey that covers use of new online technology in early childhood, has been problematic on several points. Firstly, this is a qualitative study, where aspects that are implicit in the DIGCOMP framework were not built into the observation protocol for the interviews of the parents or the children. This means that the DIGCOMP analysis framework and the empirical material do not correspond, which in turn means that the form can only be partially completed.

Secondly, it appears as if the framework should be filled out as an assessment of one’s own competence. For example, the first assessment is formulated as follows “I can look for information online using a search engine”. This becomes a validation problem when we, as researchers, are assessing the children’s competence without having asked the children how they themselves rate their competence relating to search engines, though we as researchers may have understood that the children are able to use search engines. This means that the validity of the output will be lower than that for which the framework is constructed.

Thirdly, the DIGCOMP framework is skewed in relation to the technological devices it covers. DIGCOMP appears to generally relate to computers or laptops and questions that concern use of these devices. The children only rarely use these devices. This means that the framework does not reflect the children’s actual competence.

Finally, aspects concerning video game activities are entirely absent from the framework. This is an activity the children enjoy immensely and learn a lot from.

However, the DIGCOMP framework can be a starting point for the construction of a CHILDDIGCOMP where digital devices and programs that are frequently used by children are incorporated into the framework. A CHILDDIGCOMP can be answered by children with the help of adults. This would allow the children to show their own competence both to themselves and to those that might be interested in this information.
<table>
<thead>
<tr>
<th>Basic user</th>
<th>Independent user</th>
<th>Proficient user</th>
</tr>
</thead>
<tbody>
<tr>
<td>I can look for information online using a search engine.</td>
<td>1BU I can use different search engines to find information. I use some filters when searching (e.g., searching only images, videos, maps).</td>
<td>1IU I can use advanced search strategies (e.g., using search operators) to find reliable information on the internet. I can use web feeds (like RSS) to be updated with content I am interested in.</td>
</tr>
<tr>
<td>I know not all online information is reliable.</td>
<td>2BU I compare different sources to assess the reliability of the information I find.</td>
<td>2IU I can assess the validity and credibility of information using a range of criteria. I am aware of new advances in information search, storage and retrieval.</td>
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<tr>
<td>I can save or store files or content (e.g., text, pictures, music, videos, web pages) and retrieve them once saved or stored.</td>
<td>3BU I classify the information in a methodical way using files and folders to locate these easier. I do backups of information or files I have stored.</td>
<td>3IU I can save information found on the internet in different formats. I can use cloud information storage services.</td>
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<tr>
<td>I can communicate with others using mobile phone, Voice over IP (e.g., Skype), e-mail or chat – using basic features (e.g., voice messaging, SMS, send and receive e-mails, text exchange).</td>
<td>4BU I can use advanced features of several communication tools (e.g., using Voice over IP and sharing files).</td>
<td>4IU I actively use a wide range of communication tools (e.g., e-mail, chat, SMS, instant messaging, blogs, micro-blogs, social networks) for online communication.</td>
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<tr>
<td>I can share files and content using simple tools.</td>
<td>5BU I can use collaboration tools and contribute to e.g., shared documents/files someone else has created.</td>
<td>5IU I can create and manage content with collaboration tools (e.g., electronic calendars, project management systems, online proofing, online spreadsheets).</td>
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<tr>
<td>I know I can use digital technologies to interact with services (as governments, banks, hospitals, schools, libraries).</td>
<td>6BU I can use some features of online services (e.g., public services, e-banking, online shopping).</td>
<td>6IU I actively participate in online spaces and use several online services (e.g., public services, e-banking, online shopping).</td>
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<tr>
<td>I am aware of social networking sites and online collaboration tools.</td>
<td>7BU I pass on or share knowledge with others online (e.g., through social networking tools or in online communities).</td>
<td>7IU I can use advanced features of communication tools (e.g., video conferencing, data sharing, application sharing).</td>
</tr>
<tr>
<td>I am aware that when using digital tools, certain communication rules apply (e.g., when commenting, sharing personal information).</td>
<td>8BU I am aware of and use the rules of online communication (“netiquette”).</td>
<td>8IU</td>
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<tr>
<td>I can produce simple digital content (e.g., text, tables, images, audio files) in at least one format using digital tools.</td>
<td>9BU I can produce complex digital content in different formats (e.g., text, tables, images, audio files). I can use tools/editors for creating web page or blog using templates (e.g., WordPress).</td>
<td>9IU I can produce or modify complex, multimedia content in different formats, using a variety of digital platforms, tools and environments.</td>
</tr>
<tr>
<td>I can make basic editing to content produced by others.</td>
<td>10BU I can apply basic formatting (e.g., insert footnotes, charts, tables) to the content I or others have produced.</td>
<td>10IU I can create a website using a programming language.</td>
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<td>11BU</td>
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<tr>
<td>I know that content can be covered by copyright.</td>
<td>I know how to reference and reuse content covered by copyright.</td>
<td>I can use advanced formatting functions of different tools (e.g. mail merge, merging documents of different formats, using advanced formulas, macros).</td>
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<tr>
<td>I can apply and modify simple functions and settings of software and applications that I use (e.g. change default settings).</td>
<td>I know the basics of one programming language.</td>
<td>I know how to apply licences and copyrights.</td>
</tr>
<tr>
<td>I can use advanced formatting functions of different tools (e.g. mail merge, merging documents of different formats, using advanced formulas, macros).</td>
<td>I can use several programming languages. I know how to design, create and modify databases with a computer tool.</td>
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<tr>
<td>I can take basic steps to protect my devices (e.g. using anti-viruses and passwords). I know that not all online information is reliable.</td>
<td>I have installed security programmes on the device(s) that I use to access the Internet (e.g. antivirus, firewall). I run these programmes on a regular basis and I update them regularly.</td>
<td>I frequently check the security configuration and systems of my devices and/or of the applications I use.</td>
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<tr>
<td>I am aware that my credentials (username and password) can be stolen. I know I should not reveal private information online.</td>
<td>I use different passwords to access equipment, devices and digital services and I modify them on a periodic basis.</td>
<td>I know how to react if my computer is infected by a virus.</td>
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<tr>
<td>I know that using digital technology too extensively can affect my health.</td>
<td>I can identify the websites or e-mail messages which might be used to scam. I can identify a phishing e-mail.</td>
<td>I can configure or modify the firewall and security settings of my digital devices.</td>
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<tr>
<td>I take basic measures to save energy.</td>
<td>I can shape my online digital identity and keep track of my digital footprint.</td>
<td>I know how to encrypt e-mails or files.</td>
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<tr>
<td>I understand the health risks associated with the use of digital technology (e.g. ergonomy, risk of addiction).</td>
<td>I understand the positive and negative impact of technology on the environment.</td>
<td>I can apply filters to spam e-mails.</td>
</tr>
<tr>
<td>I understand the positive and negative impact of technology on the environment.</td>
<td>To avoid health problems (physical and psychological), I make reasonable use of information and communication technology.</td>
<td>I have an informed stance on the impact of digital technologies on everyday life, online consumption, and the environment.</td>
</tr>
<tr>
<td>I can find support and assistance when a technical problem occurs or when using a new device, program or application.</td>
<td>I can solve most of the more frequent problems that arise when using digital technologies.</td>
<td>I can solve almost all problems that arise when using digital technology.</td>
</tr>
<tr>
<td>I know how to solve some routine problems (e.g. close program, re-start computer, re-install/update program, check internet connection).</td>
<td>I can use digital technologies to solve (non-technical) problems. I can select a digital tool that suits my needs and assess its effectiveness.</td>
<td>I can choose the right tool, device, application, software or service to solve (non-technical) problems.</td>
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<td>I know that digital tools can help me in solving problems. I am also aware that they have their limitations.</td>
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<td>BU</td>
<td>When confronted with a technological or non-technological problem, I can use the digital tools I know to solve it.</td>
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<tr>
<td>BU</td>
<td>I am aware that I need to update my digital skills regularly.</td>
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5. Method

5.1 Procedure

Data collection: Family visits

Data was collected from ten families during the period from 4 December 2015 to 12 May 2016. The collection, in the form of interviews, was normally conducted by a team of two researchers from the Queen Maud University College of Early Childhood Education (DMMH), where Associate Professor Mari-Ann Letnes interviewed the children and Associate Professor Svein Sando interviewed the parents. Letnes conducted 8/10 of the children’s interviews and Sando conducted 7/10 of the parents’ interviews. Barbro Hardersen from the Norwegian Media Authority conducted four interviews and was responsible for the entire data collection in family no. 10.

The interviews were conducted at the homes of the ten families at times that were most suitable for them, usually around six o’clock on a weekday. Each family was interviewed once, and the interviews lasted about two hours.

The interviews had the following structure and content:

**Introduction** (about 10 minutes): The visit started with a quick introduction of the researchers, who briefly explained the intention behind the project and how they would carry out the visit. The entire family was together in the beginning, so that the children also were told directly what would happen and what they were taking part in. The consent forms were also presented to the parents and seven-year-old for their signature at this time. The forms were prepared by JRC and had been translated into Norwegian. The family members signed that they were willing to participate in the survey and that audio and/or video recordings of the interviews would be made. The families were also told that they could withdraw from the study at any time.

During this introduction, the researchers also obtained an overview of the family members, the gender and age of children in the family and who else looked after the children.

**Ice-breaker** (15 – 30 minutes): After the introduction, the booklet “Activity Book - Play and learn: Being online” was used to describe some of the activities in the family on a typical day. After this, the researchers split into two groups, one with the children and the other with the parents.

**Interviews with children and parents** (1 hours): The interviews of the children were recorded on video, but only audio was recorded in the interviews with the parents. The two interviews were preferably conducted in separate rooms. The conversations emphasised how and why questions. If any interesting topics came up, this was elaborated upon, and the interview guide was disregarded if necessary.
children tried to arrange picture cards that showed various activities and devices, according to which they liked best.

**At the end of each interview**, the researchers asked the participants if there was anything else anyone would like to add. During the parent interview, demographic details were collected, directly asked for or by observation. The income of the family was not asked for directly, but ascertained by observations and the parents’ professions.

**At the end of the interviews** the researchers asked the participants if they wanted to add anything. Demographic information was collected in the interviews with the parents. No direct questions were asked about income, but it was assessed based on observation and the parents’ occupations and work.

Conclusion (10 min.): Finally, the entire family and researchers gathered again, and the family members were asked again if they wanted to add or ask anything. We thanked them for participating. Nearly all the children were wondering when we would come back. Material such as “Insafe Activity Book” and “Donald Duck & Co Trygg på nett” were left with the families.

For the interviews, the researchers brought a bag of equipment containing:

- Some digital devices such as a smartphone and tablet
- Drawing paper
- Crayons
- Card game (memory) with drawings of digital and non-digital equipment
- *Insafe Activity Book* and *Donald Duck & Co Trygg på nett* (Skar, 2013)
- Video recorder and audio recorder

**The sampling procedure**

The ten families were picked out in or near two major cities in Norway. Attempts were made to find families that represented a variation with regard to the children’s age and gender (but one child had to be in 2nd grade), family composition and family income. However, it proved very difficult to get enough willing families, so it was challenging to stick to these selection criteria. Seven of the families were recruited through school classes (2nd grade) in three schools, and three families were recruited through the researchers’ contacts. The latter resulted in the overall material having a greater variation in socio-economic status. The families that were recruited through the schools received a brief introduction pamphlet with a request for permission to contact them again to agree on a time and place for an interview. About 60 families were contacted this way, and about ten responded positively to the contact request, but we never achieved further contact with some of these for unknown reasons. We were left with seven families with 2nd graders recruited through schools. The data collection was delayed in relation to the plan due to the difficulties of obtaining willing families.
The sample
The entire selection is shown in the table on page 11. Because it was difficult to find families that were willing to participate, there is reason to believe that the selection consists of families that were reasonably confident about their own data use. The selection is therefore presumed to be biased. See more on page 54.

Implementation of the protocol of observations
In order to avoid having a long list of questions that would be difficult to handle during the children’s interviews, a short version was prepared for convenience during the interview, and the entire conversation was carried out as a semi-instructed interview. The protocol was followed to the extent possible, but it was also important to follow the children’s thinking during the conversation. Children are not always interested in talking about a specific subject, and it is important to detect the things that are revealed through the children’s associative thinking. Nevertheless, the protocol formed the basic structure for the conversation. The card game was used to have the children rank different activities and digital devices they use in their spare time. The children also had to show the researcher what they could do on the tablet, either their own or the researcher’s tablet.

The stated interview guide for the parent interviews was changed from a long list of questions to a table containing all the questions, where notes could easily be added during the interview. The same table was also used as the basis for the transcript later on.

Recording
The children and parents consented to data collection before the recordings started. Video was recorded during the part of the interview before the parents and children were split up. Various other recording methods (particularly photos) were also used to make the data collection more efficient and to shorten notations. The forms showed in Tables 1 and 2 were filled out at the beginning of this part of the interview.

The video recording is the data collection method for the children’s interviews. No notes were taken during the interview due to the children’s alertness during the process.

Audio was recorded during the parent interviews. Some field notes were taken at the same time. The notes were helpful during the transcription, particularly when the audio recording was not fully able to capture what was said.
The researchers had a debriefing following each family interview.

Implementation of the protocol of analysis
The program Nvivo was used in the thematic analysis for constant-comparative analysis (Glaser and Strauss, 1967). The analysis took place through six phases:
1. Transcription of video and audio recordings
2. Open coding of the transcribed data
3. Search for patterns and codes in relation to the four research questions
4. Narrative analysis to present the two family stories
5. Axial coding by putting back data from the various categories related to the different family stories
6. Writing the report

The researchers stayed close to the interview material during all six phases and assigned codes to relevant segments. This process resulted in a long list of codes that were adjusted, merged or removed at a later stage of the analysis. Finally, the researchers compared the material and selected a limited number of key categories as the main findings. These categories were useful in the discussion on the four research questions.

In the first phase, the researchers transcribed the audio or video material that they themselves had helped collect the data for, to reacquaint themselves with the material. The material from the parent interviews was almost fully transcribed, but repetitions of the same content were not included.

In the children’s interviews, generally only the children’s opinions were put in writing. Complete transcripts were only used when the children responded explicitly to a question the researchers had posed.

In phase 2, open coding was used to form an initial set of codes. The transcripts were read several times to create tentative designations for blocks of the transcript, not based on theory, but just the meaning of the paragraph in the transcript.

The third phase involved searching for patterns and themes in relation to the research questions, and coding from both the children’s and parents’ interviews were used.

A narrative strategy was used in the fourth phase (Polkinghorne, 1995 pp. 5-6) to provide an understanding of each family and their use of the new technology. This formed the foundation for the ten family stories. They were structured according to the four research questions that form the basis for the entire study. These narratives were then merged into the individual family portrait for the family in question.

Axial coding was used in the fifth phase to gain an understanding of the category within the four research questions. In axial coding, data from open coding is put back together by combining different categories (Strauss & Corbin, 1990, p. 96). The main objective of this phase was to fine-tune each theme and the main impression provided by the analysis. Finally, the various sub-categories were merged and highlighted by assigning new names and descriptions to the themes.
In the sixth phase, Letnes wrote a first draft of the main findings based on research
questions 1-3 and Sando did the same for research question 4. Sando completed the
full report, in close cooperation with Letnes and Hardersen.

5.2. Discussion

Why might the results have turned out that way?

It was quite difficult to get hold of families that were willing to be interviewed.
Choosing the right families in order to have a good variation in gender, age and
socio-economic status therefore became much less important than finding willing
families in time. As this study is part of a joint European project, there were
deadlines to be kept. The selection may therefore be described as random.

However, it is not entirely random. The fact that only seven out of sixty families
were willing to be interviewed, is in itself a selection. One can envisage a number of
reasons why people did not want to be interviewed, such as lack of time, and being
ded up with all the people who get in touch to make one to participate in studies of
various kinds. Who has such reasons may be quite random, and from this point of
view, the remainder will also represent a random selection. It seems likely, however,
that certain things have to be in place in a family before they are willing to open
their home for a two-hour interview with two unknown researchers who will be
investigating their daily lives:

- Sufficient confidence in the children, one’s own daily life and the home to be
  willing to welcome questioning researchers.

- A sufficiently strong feeling that the children’s use of digital devices and the
  parents’ handling of it, can bear investigation.

People have different standards for what they feel they can show others, but most
people have some requirements for what they will let others see. We therefore
suspect that the families who participated in this study are happier with the state of
things, including the children’s digital activities, than most people. They probably do
not represent the average Norwegian family in this respect.

In a qualitative study, this possible imbalance is not that crucial for the findings,
since the purpose is not to describe an average family, but rather to highlight
phenomena that may arise with regard to the children’s digital activities and how
the parents relate to them.

Methodological recommendations for future research

Although this is first and foremost a qualitative study that asks how and why, it is
also desirable to obtain certain hard data, or that one at least can deduce them from
the qualitative data. The interview guide is quite clear that most of the questions
are “possible questions”, so that it is possible to skip them if other issues seem more
interesting. Therefore, it is difficult to deduce quantitative data from them
afterwards. Hence it would be an advantage to have such desirable quantitative
data put into a separate questionnaire with a suitable remark, so that the
interviewers are in no doubt about where it is optional to obtain information and where information is compulsory. This has been done to some extent (an overview of family members and a table for ticking off what digital devices the family owns), but it has not been done for some data that are needed to create the diagrams for ICT use in Chapter 8.
6. Conclusions

6.1. Key findings

- All the families in the study have TVs, tablets and video game consoles. Smartphones are available to the children in about half the families, as the children either own one or can borrow the parents’ phones. The tablets are the most popular of these devices, but since most of the activities can be carried out on most of the devices, children will often switch between the available devices. The TV has become smart and is a place for streaming services, and is used for this purpose even by the youngest. They are just as likely to watch NRK Super through apps on a tablet as on TV.

- The average weekly use of digital devices is 13 hours for the study’s eleven seven-year-olds.

- The children find the tablets fun to use. They enjoy watching YouTube, TV shows, playing games and making things with the technology, which therefore is an important part of the children’s lives. The new (online) technology is not the only thing they spend their spare time on. Parents are generally good at organising alternative non-digital activities, and the children themselves show by means of picture cards that they enjoy other activities than the digital ones.

- Through seamless transitions from digital to non-digital activities, children pick up ideas and inspiration from games, movies, NRK Super and the internet and use them for play and offline activities.

- YouTube is the most commonly used website among the children. They often use things from YouTube as a starting point for that seamless transition to non-digital activities. Another popular app is the construction game Minecraft.

- The children mostly respect the age restriction for a game. In a couple of cases, boys play games intended for a much older age group. The argument in favour of this is either that they are with their father when playing, or that the game does not give them nightmares.

- For the most part, the children are independent and competent users. They learn by trying and failing, or from siblings/other children. In some cases it is the fathers (mostly) who have shown them things.

- Children mostly use interactive digital technology on their own, even when they sit next to each other with their tablets. Video game consoles are an exception here; they are often used together with others. They are also to some degree used as a regular family activity.

- Parents consider their children’s use of digital technology a positive thing to the extent they can learn something from it. They are more worried about the time the boys in particular spend playing video games. Any
**undesirable content** (violence and sex) they might come across on YouTube and in the video games, is a concern to some. However, several parents say that some children apparently have to spend time on games and websites to **avoid** becoming **excluded socially when they get older**.

- A majority of the adults use **constructive strategies** to regulate their children’s use. In several of the families, the children are consulted, so that they work out the rules for use together. But even when rules are in place, many families prove unable to enforce them in practice. The need for regulation increases with the age of the children. Most of the youngest ones, who are girls in this study, do not use digital online technology so much that their parents have found it necessary to regulate its use. For those children who need regulations according to their parents, the rules are mostly such that they hardly allow for video games on weekdays (0-1 hour), while the regime is more liberal on weekends (2-3 hours per day). Homework must be done first.

- Only one family used **technical filtering** of undesired content, but many realised that it was probably time to introduce this measure soon.

### 6.2. Challenges and Recommendations

**Recommendations to Policy-makers**

- Politicians and decision-makers should support and facilitate for the positive aspects of children’s use of digital devices to empower them for life in a high-technology society.

- In the same way, the negative aspects of children’s use of digital devices should be sought removed or at least curbed. The measures that would be effective for this purpose might be a combination of information, requirements posed to the computer/game industry, and encouraging technical and cultural measures such as:
  - research that attempts to find good solutions for how to reduce the negative aspects of the data technology, particularly the aspects that have a negative impact on children
  - increasing the competence of teachers in day-care and schools, as described below
  - increasing the competence of parents and children so that they can use their knowledge of digital technology to make good choices as technology users.

- Politicians and decision-makers should encourage and support information directed at parents, schools and kindergartens that increases their digital competence concerning children’s safe use of digital devices and the internet.
Recommendations to Industries

- The data industry has a responsibility to make sure children and young people are not harmed by using digital devices, including the software. Child-friendly solutions should be switched on as a factory default.
- More video games should be designed to stimulate creativity and teach skills that are useful outside of that specific game.
- In video games intended for players under the age of 18, remove the enticement and opportunity to buy things for real money.

Recommendations to Parents and carers

- To be able to guide the children well, it is important to know about the reality that surrounds the children when it comes to digital devices and how to use them. This is particularly true for video games, which hold a fascination for children. Parents should keep track of what video games their children have access to and know whether the contents of these games are appropriate for the children’s age. It is also important that parents are aware of content which the children use on e.g. Netflix and YouTube, where children might easily encounter unsuitable material.
- To be able to guide the children well, it is important to talk to them about how to use digital technology. There is more success in helping the children understand why some things are good and other things not so good, than in just deciding the rules over the heads of the children. The rules for use should balance the advantages and disadvantages of children’s use of ICT.
- Reflect on why rules and regulations have become the way they are, and be prepared to adjust them as the children get older and new challenges emerge.
- Seek help if there are still concerns about the children with regard to social exclusion, problematic gaming or other issues.
- Adults should make it easy for children to also spend time with others of the same age. It is important to help the children make friends and have a social network outside the digital world as well.

Recommendations to Schools and Kindergartens

- Teachers in day-care centres, kindergartens and schools must acquire enough digital competence to instruct and be role models for the children and parents as users of digital technology, and for their own use of ICT in education of the children. Their digital competence must comprise knowledge about devices, relevant apps and digital judgement.
- Kindergartens and schools are encouraged to become venues for exchange of experiences and discussions among the parents.
7. References


Norwegian Media Authority. (2012). *Småbarn og medier 2012* [Young Children and Media 2012]. Fredrikstad: Norwegian Media Authority


8. Annexes

8.1 ICT use charts for each family

These graphics illustrate very simplified when then main child in each family (7-8 years old) started to use different devices, and how much that device is used in one week.

8.1.1 Family 1
8.1.2 Family 2

8.1.3 Family 3
8.1.6 Family 6

Hours of use in one week

Years of age

8.1.7 Family 7

Hours of use in one week

Years of age

Uncertain start year
8.1.8 Family 8

8.1.9 Family 9
8.1.10 Family 10

Hours of use in one week

- NO10g7
- Uncertain start year

Years of age