CLOUD SURFERS

A game that fosters connection between parents and children to strengthen children's digital resilience

Master thesis by Klaske Galema

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MASTER THESIS
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Graduation period: September 2025 - March 2026

DECLARATION ON AI
This thesis investigates the risks associated with the digital world. However, it tries to do this with a positive approach, because the digital world also poses many benefits. Therefore, AI is also used in this thesis to reach better results. AI is used for inspiration in the ideation phase, to help restructure thoughts, make visualisations and rewriting sentences. All output is always critically checked by the researcher.

IN COLLABORATION WITH

Monimentor TU Delft

“So your kids must love the iPad”

“They haven’t used it. We limit how much technology our kids use at home.”

- Steve Jobs

(Bilton, 2014)

Preface

I am proud to share with you my master thesis ‘Cloud Surfers: A game that fosters connection between parents and children to strengthen children’s digital resilience’. This thesis is written for the graduation project of the master Strategic Product Design from the faculty of Industrial Design Engineering from the TU Delft. The project is carried out in collaboration with Monimentor.

The inspiration for this assignment came from a creative session with Monimentor during the course Creative Facilitation. I had previously completed a project on screen use during my exchange. This, along with my personal interest in how technology relates to our behaviour and social design, led us to develop this assignment.

Whereas in Industrial Design we have to work together all the time, this half-year project was carried out on my own. This in itself was a learning experience: how to keep yourself motivated, plan with uncertainties and make your own decisions. Now, the end result is here and I hope it makes you think: What do you consider normal screen use?

This project would not have been possible without the support of the people around me. Therefore, I would like to thank my supervisors from the TU Delft, Valentijn Visch and Rebecca Price for their enthusiasm in the project’s relevance, positive encouragement, critical feedback and motivation to get the project to the next level. I would like to thank Maarten Nijhuis and Bas Beelen from Monimentor for always being available to help, their flexibility and the pleasant collaboration. Next to that, I would like to thank all experts for sharing their views and participants giving me an insight into their lives. I would like to thank everyone that tested my games in the countless iterations. Lastly, I would like to thank my family, friends, roommates, peers and everyone that supported me.

I hope you enjoy reading.

Klaske Galema

March 2026

Abstract

Screen devices, once a novelty have become an integrated part of our lives. The usage of these devices can pose many risks to children, whose brains have not fully developed yet. Screen use can result in lagging behind in language, physical, social-emotional and cognitive development. It can also have severe effects on (mental) health and education and cause behavioral problems.

This is a complex problem, involving many stakeholders; wrongdoers, families, schools, knowledge institutions, government, Big Tech, but also police, court, parental control apps and the healthcare sector. They play a role at different levels: individual, home, community and society. Multiple interventions at all these levels are needed to combat the negative effects of screens. One step in the right direction is building children's digital resilience. Digital resilience is the ability to recognize digital risk and know how to seek help to recover from negative experiences and learn from them for future scenarios.

This project is carried out for the start-up Monimentor, which is developing an app to help families build digital resilience. The aim of this thesis is to design a proof-of-concept for a product for Monimentor that facilitates building digital resilience for primary school children aged 8-12 in the physical context.

A social implication design approach is used to tackle this assignment. For this a literature review, expert interviews, desk research and generative sessions are executed. For development various creativity tools are used.

The study found that exposure to risk is necessary to build digital resilience. Multiple factors influence whether risk leads to growth or harm. Parents can have a buffering effect in case a child is exposed to risk. In this the connection between the parent and child is crucial, which among other factors is influenced by their communication. However, in many families communication about the digital world is limited. Therefore, the design goal is to create a solution that facilitates parents and children in sharing and understanding each other's digital activities and experiences regularly in their daily lives in a positive way to normalise talking about the digital world and digital adversities by means of a tool for the physical world.

The final design, Cloud Surfers, is a persuasive boardgame designed as an addition to the Monimentor app. By using screenshots from the players' digital activities as input, the game ensures personalisation and helps trigger conversations about the digital world. Through this process, parents and children create a shared understanding of their digital worlds, making the image of each other's screen use more realistic. This understanding and the building of trust in the game enhances the parent-child connection, serving as a strong basis to discuss and reflect on future negative and positive digital experiences to build digital resilience.

The evaluation results are promising in reaching the desired goals. However, a longitudinal evaluation is still necessary. It is recommended to refine Cloud Surfers based on the results of the longitudinal study and bring it to the market.

Keywords: digital resilience, connection, parent-child relationship, children 8-12, persuasive game design

Reading guide

Build-up

Each Chapter starts with a divider page explaining the relation to the previous Chapter and the content discussed in the Chapter to follow.

A subChapter title is shown as:

X.X SubChapters

Sub subChapters are formatted this way:

Sub sub Chapter

In case of limited reading time key insight can be found in this format:

Key insights

> *Key insight*

Glossary

Connection: Bond between two people.

Digital: Technological systems storing data in a binary system. Online systems are part of this.

Digital adversities: Harmful, negative or challenging experiences people come across when using a digital system.

Digital activity: Activity done on a screen device

Digital experience: Situations encountered when using a digital system and the emotions and thoughts they evoked.

Digital resilience: The ability to recognize digital risks, know how to seek help to recover from negative experiences and learn from them for future scenarios.

Digital risk: Potential harm encountered when using a digital system.

Digital world: Combination of all digital activities and experiences.

Resilience: Being able to adapt to situations to remain in your preferred state of being.

Screen device: Any device with a screen, like smartphone, computer, television, tablet, or game console.

Screen time: Time spent on a screen device.

Screen use: How a screen device is used including the activity, the type of device, with who, when, where and the screen time.

Tool: a means that makes it easier to carry out a task or activity.

Online: Systems connected through a network, like the internet.

Table of contents

1

Introduction

This Chapter introduces the project by describing the relevance and the problem context. Following this, the scope of the assignment and approach are explained

1.1 Introduction to the project

Figure 1: (RTL, 2024)

As a student, I often use the train. Figure 1 gives a good representation of what it looks like.

Sometimes I wonder, what it used to be like, when people had no smartphone? Would people be reading the newspaper or talking to each other? I will probably never be able to experience it.

Screen devices, once a novelty, are now deeply integrated into our daily lives. Commercials at the station, a TV in the living room, or the phone in our pockets; They are almost a part of us. We depend on them, and there is almost no escaping them.

And it is not only us, adults, using them. Today's children are exposed to screen devices from a young age onwards. At school children frequently use digital screens and laptops. At home they often have a TV and a tablet, and later they get their own smartphone. In the Netherlands on average children receive their first smartphone at the age of 9,5 (Middag et al., 2025).

This high accessibility of devices and the fact that software designers have become skilled at creating addicting designs (Neyman, 2017), could explain why screen times among primary school children are exceeding recommended amounts. In 2020 Dutch children 4-6 years old spent 3 hours and 8 minutes per day on digital media. 7-12 year olds spent on average 3 hours per day in 2021 (Van der Rijst et al, 2024). Herewith exceeding the recommended amount of 1 hour for 4-8 year olds, 1,5 hours for 8-10 and 2 hours for 10-12 year olds (Koning et al., 2025). Even rising to 6 or 7 hours halfway through secondary education (Vasanthi et al., 2024.).

Now that the first generations have grown up with screen devices we start to discover the effects of screen devices on children. There are many positive sides, like accessible education and exposure to diverse cultures (Bhutani et al., 2024). However, at the same time they can bring many negative effects like physical impairments (Agarwal et al., 2022) (Mupalla et al., 2023) and falling behind in development. Next to that, children can come across numerous adversities (harmful, negative or challenging experiences) in the digital world, like unfit content and bullying (Livingstone & Stoilova, 2021).

Figure 2: Recent headlines about digital harm

These risks can escalate; Headlines like in Figure 2 are not uncommon these days.

And these are just the current problems, but when looking at the bigger picture and fast-forwarding 30 years ahead what will this mean for our society?

- What if an increase in (mental) health problems puts even more pressure on health care?
- What if children grow up doing everything with AI? Will they learn the critical thinking skills needed for example to distinguish real and fake from each other? Will this be a danger to our democracy?
- What if apps become even more addictive? Will the devices completely control people?
- What if the media and AI create even more biases? And algorithms make people adopt opinions that others want them to? Will this lead to more polarisation? And this to more violence?

Scenarios that sound like a black mirror episode, but could be our future if we do not take action.

How the problem arises

Many stakeholders play a role in this domain. The map in Figure 3 shows the context of the child and the stakeholders that play a role in digital adversities. The map starts with the child in the middle at the individual level. In direct contact is the family of the child. Around this the community forms with school, sports, friends etc. At the societal level, stakeholders stand at a distance from the child.

There are various reasons for the existence of the problem. Firstly, the primary goal of Big Tech is profit. A child's well-being is often not a priority. Therefore, they design addictive products. This kind of design is hard to resist for adults, let alone children, whose brains are still developing. The second reason is the presence of wrongdoers online. They harass stakeholders across the whole system in many different and inventive ways. Sometimes harm is intended, like putting people under pressure to perform self-harm while others may be more unaware of their impact, like influencers spreading misinformation.

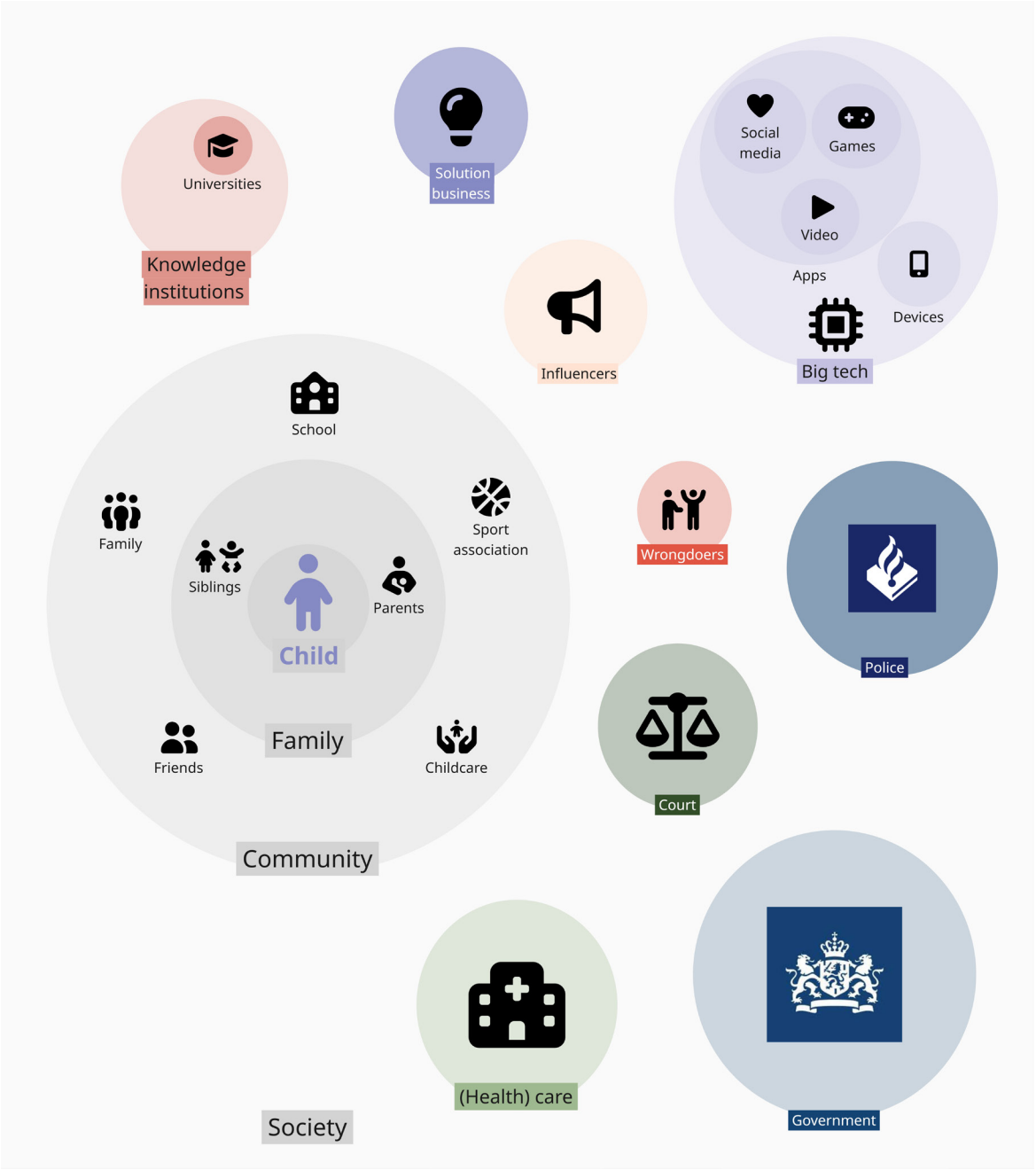


Figure 3: Stakeholders involved in the problem context

Current solutions

Currently, many stakeholders are trying to mitigate the effects of screen devices. Knowledge institutions are gathering knowledge about the effects, underlying causes and possible solutions. Other institutions and organisations are spreading awareness and providing information and support for parents. They also inform the government, who makes adequate policy and guidelines. The laws are enforced by police and court. On the community level, screen time effects and struggles are becoming an increasingly discussed topic. The solution business is trying to facilitate helpful tools for parents and children with parental apps. This shows there is a belief it is time for action.

Solutions do not work (enough)

Despite the efforts of various stakeholders headlines like in Figure 2 appear every week. How is this possible?

First of all, Big Tech is profit driven and therefore their developments go extremely quickly. Policy making on the other hand is quite slow and it needs to respond to developments after they have become public. In this way, no matter how hard the government tries to keep up with policy there is always a delay. This creates an ever existing moment of risk between technological developments and legal response (Figure 4); new developments keep coming and risk is only seen when danger has already happened to some.

Moreover, when a law is made, enforcing it requires capacity from police and court, which is not always available. So even when the government could keep up with the speed of developments, the question is whether the laws could be enforced. Because harassers do not operate by the rules, especially not when the chance of being found and prosecuted is low.

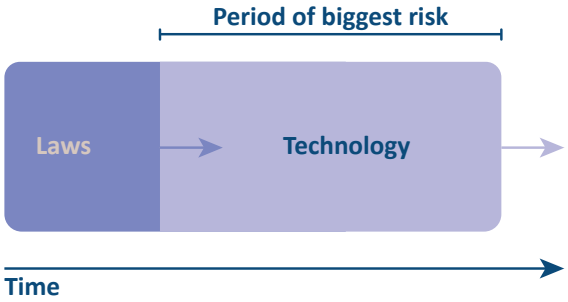


Figure 4: Ever existing moment of risk

On the community and family level screen use is already discussed in certain groups. However, the conversation about what is 'normal' has only just begun. We are at the starting point of a major cultural shift, similar to the transition we once went through with smoking. Just as it took years before smoking was no longer seen as normal, we now have to move through different stages with our screen use. At the moment, the majority of parents are not aware of the digital risks for their children. Those who do see the problems, often do not know how to handle them. They recognize that action is needed but lack the right tools to actually make a change.

This is a complex problem, with numerous stakeholders with their own interests and constantly changing risks. So even though concern is growing, effective interventions are scarce (Werner et al., 2024).

Potential of digital resilience

A contribution to decreasing the negative effects of screen devices is raising children's digital resilience. Digital resilience is the ability to recognize digital risks, know how to seek help to recover from negative experiences and learn from them for future scenarios. This could have a positive effect on children's ability to cope with digital risks.

All in all, to mitigate the negative effects of screen use on children, action is required across multiple levels. Institutions and governments are already working on providing necessary awareness and guidance. Schools are starting to implement digital skills education. Big Tech should take responsibility, but remain profit driven. Furthermore, while legislation remains essential, it is often too reactive and slow to address immediate needs. This leaves the family as the primary line of defense; yet, despite being positioned to act immediately, parents frequently lack the necessary tools and support.

1.2 Assignment

Stakeholders in the project

This project is carried out as a graduation project from the master Strategic Product Design of the TU Delft. The assignment is carried out for Monimentor. Monimentor is a start-up which develops an app that helps families to create digital resilience for primary school children by tracking screen behaviour to make screen use insightful.

Aim of the project

Monimentor's product is digital-only. Digital resilience is however also built through actions in the real world. Therefore, an intervention in the physical world has potential to break the barrier between the digital and physical world. Many steps are taken on the societal level, but not on the family level, where parents lack tools.

Hence, the aim of this project is to:
"Create a model of children's digital resilience and develop a proof-of-concept for a product for Monimentor that facilitates building digital resilience for primary school children (8-12) in the physical family context"

With this it aims to contribute to current practical and theoretical knowledge by answering the question: How can a product for the physical family context be developed for Monimentor to help Dutch primary school children to build digital resilience?

Target group

This project focuses on Dutch families with children between the age of 8 and 12 years old. This project focuses on parents that are aware of the negative effects of screen devices, but find it hard to tackle them. According to the transtheoretical model of behaviour change, health behavior change consists of the five steps shown in Figure 5 (Wagner et al., 2004). This project focuses on parents in the preparation and action phase.

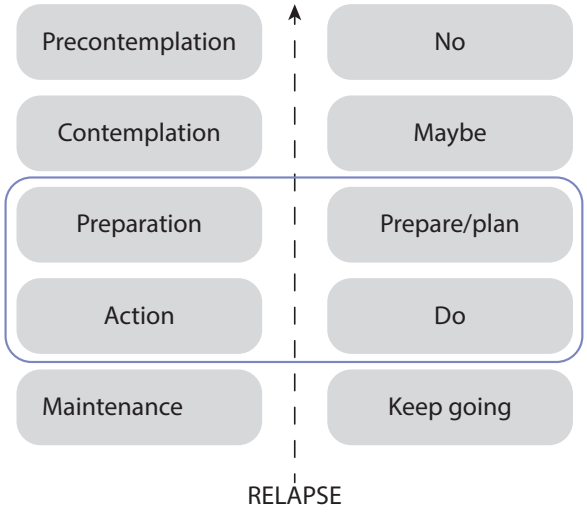


Figure 5: Transtheoretial model of behaviour change Wagner et al., 2004)

Approach

To answer the research question a Societal implication design approach was used. This approach combines principles of VIP and user-centred design to address complex societal issues. The method supports the general stages used in the double diamond method (Van Boeijen et al., n.d.). Figure 6 shows a visualisation of the process and methods used per phase.

Sub research questions

The main research questions has three sub questions:

1. What are barriers and enablers in building digital resilience for children aged 8-12?
→ Chapter 3 & 4

2. What are barriers in the connection between parents and children regarding the digital world?
→ Chapter 4

3. Is the designed intervention able to build digital resilience?
→ Chapter 6

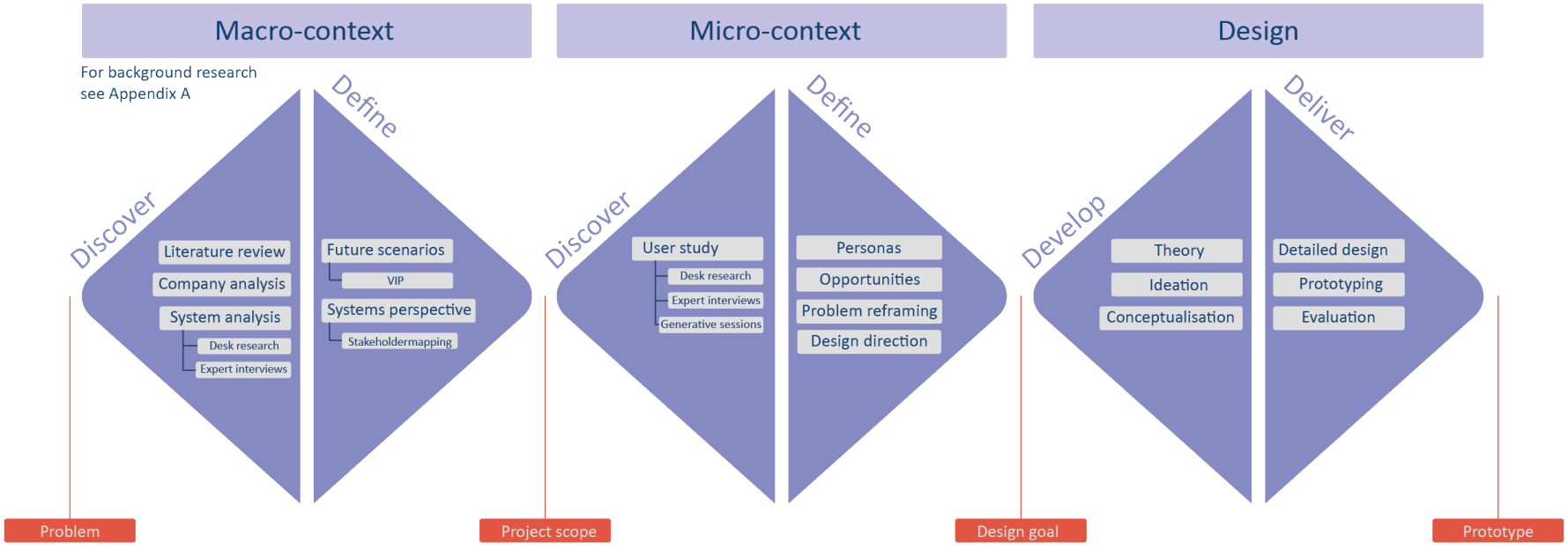


Figure 6: Project approach

2

Monimentor

This Chapter describes the early phase start-up Monimentor for whom the project is carried out. The company's motivation, vision & mission and product are described. Next to that, the unique selling points are presented. This serves as a basis of understanding to see how the developed tool fits Monimentor.

2.1 Motivation behind Monimentor

From their own environment and experience as fathers, the founders see an urgent need for a good solution, as screen time is exceeding the recommended amounts and the market is dissatisfied with the current solutions. Lastly, there is a cultural shift demanding more positive educational approaches towards digital parenting, in which parents wish to be a guide instead of a guard (Monimentor, n.d.).

2.2 Vision & Mission

Vision

"We envision a world where every child confidently navigates the digital world with a sense of wonder and wisdom."

Mission

"Our mission is to learn the skills needed for this journey, moving families from digital anxiety to shared discovery. This path is about empowering children to live a happy healthy life".

Monimentor believes the digital world has many benefits if used in the right way. For this, children need to learn skills to build resilience. Their app helps to do this by providing a safe playground in which they empower children instead of enforce them. Next to that, they strive for active engagement, meaning conscious choice instead of passive consumption. They do not want to replace parents but be an addition. They believe every child is different and should have its own journey (Monimentor, n.d.).

2.3 The product

Monimentor is developing an intelligent app that aims to help build digitally resilient families. It is initially targeted at Dutch families. The Monimentor app aims to create a safe online space in which risk exposure can lead to growth. This is done by teaching skills at the 'invisible playground'. Called invisible playground because the app runs in the background during screen use. The idea behind this is that learning in context is more effective. The Monimentor app helps children understand when they are at risk, provides help, support and education. This is done with the help of an avatar, Moni. Moni acts as a personal mentor for the whole family. Moni guides children along a personalized digital freedom path, building skills along the way needed to thrive online independently. The more skills they develop, the more freedom children get. The ultimate goal is 'to learn the skills needed to live a healthy digital life' (Monimentor, n.d.). Figure 7 shows in steps how the app works.

Steps		Explanation	Example
1	**Observe**	The application identifies behavioral signatures. This is a pattern in the behavior of the child that the system has identified, showing the child is ready for a new skill.	Child is exploring ad-heavy content
2	**Guide**	Moni gives a micro lesson from the digital freedom path.	Lesson on spotting hidden ads
3	**Empower**	Learn skill through a quick challenge or demonstrating right behaviour during screen use	Learn skill through quick challenge or demonstrating right behaviour during screen use
4	**Guide**	Digital resilience score increases, unlocking trust and freedom within the app	Being allowed on YouTube

Figure 7: Overview of steps in Monimentor app

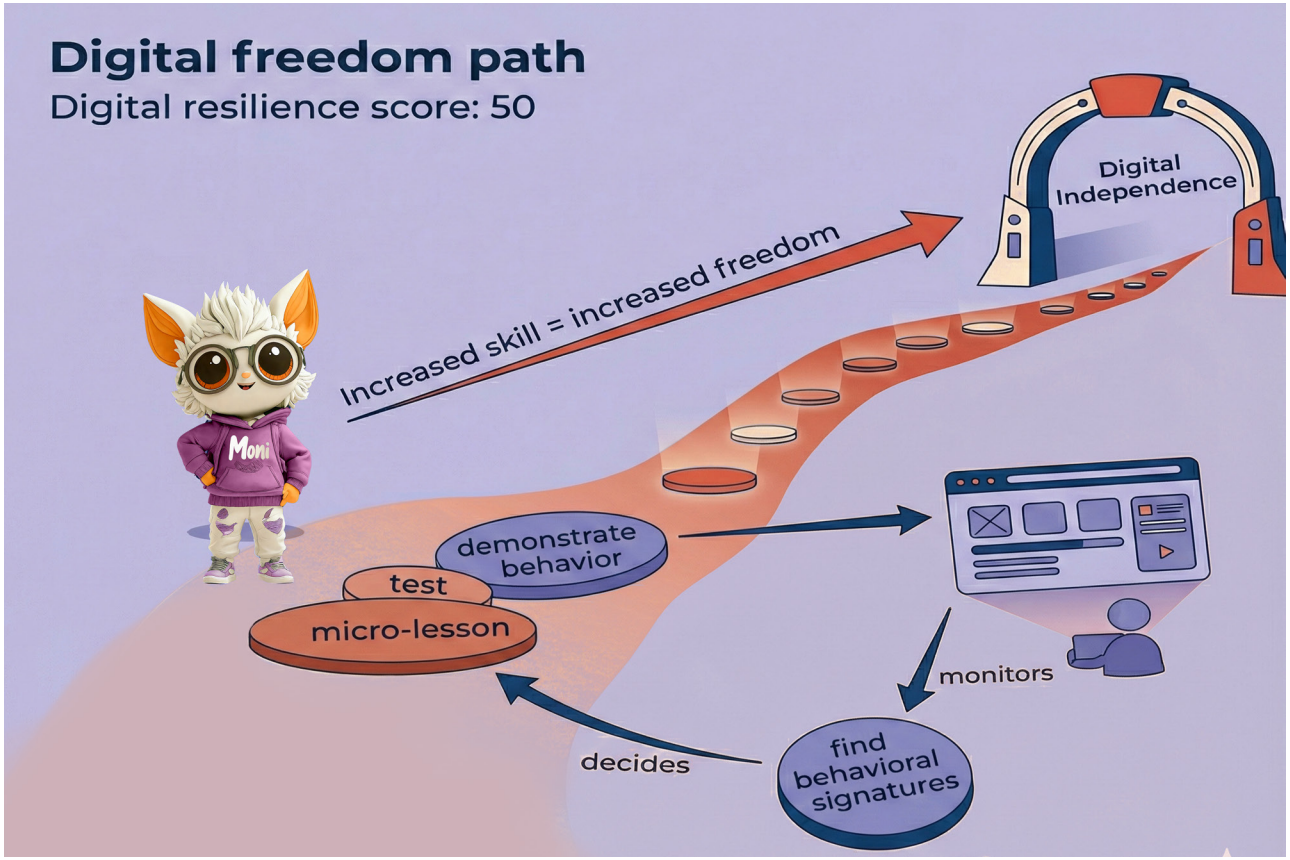


Figure 8: Working mechanism of the Monimentor concept

Figure 8 shows a visualisation of this working mechanism.

Current Minimal Viable Product

The current MVP (Figure 9), focusses on giving insight in screen activities. This is done by showing a jar of marbles. The colours of the marbles represent whether time is spent on brain food (educational), fun food (fun) or empty calories (useless).

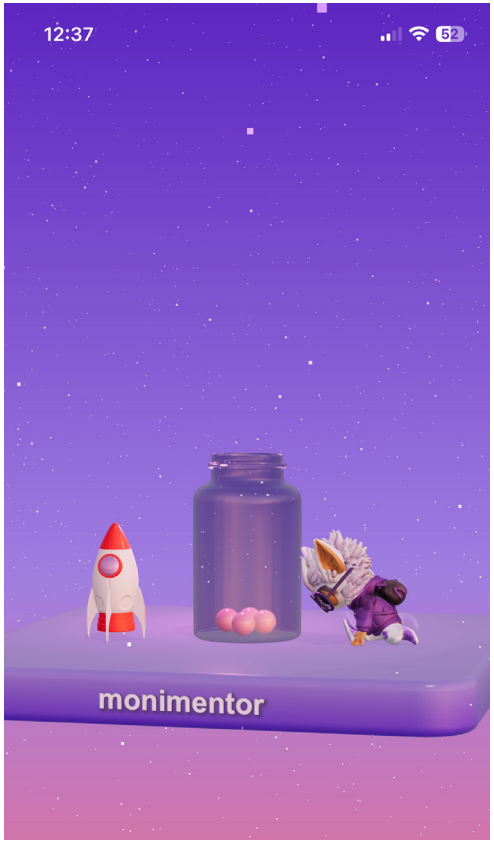


Figure 9: Current MVP

2.4 Unique Selling Points's

These are the USP's of Monimentor (Monimentor, n.d.):

1. **Positive psychology:** Approach technology as something fun (if used in the right way).
2. **Family-centred approach.**
3. **Focus on empowerment instead of restrictive mediation:** being a coach, not a cop. In contrast to most competitors (Appendix C).
4. Providing **personalised** education with the intelligence core.
5. **Community flywheel:** the system learns from participants creating a self improving platform.
6. **Founder-market fit:** father and technologists. They live in the experience.

2.5 Conclusion

The company analysis helps to understand who the product is developed for. This helps in developing a fitting product.

Key insights

> *Monimentor has 'eyes' on a child's screen behaviour*
>
> *Monimentor provides support with insight and education*
>
> *Monimentor focusses on positive psychology and empowerment in contrast to existing solutions*
>
> *Personalisation is important*
>
> *The product is digital-only*

3

Background of digital resilience

In the previous Chapter the Monimentor whom the tool is developed for is described.

In this Chapter the theory and background of digital resilience is explained. The Chapter explains what digital resilience is and the digital risks and effects children can encounter. Next to that, it explores how digital resilience can be build, the barriers and enablers of digital resilience and lastly how tools for digital resilience should be developed.

Resilience

Resilience is a term frequently used in many domains from engineering to psychology to economics (Martin-Breen & Anderies, 2011). Walker (2020) defined it as 'adapt, change, organize while coping with disturbance (p2)'. It is about identifying the tipping point to another state, and preventing passing this point by adapting.

When resilience is low, people struggle under pressure, leading to stress, trauma, anxiety or a feeling of hopelessness when things go wrong. People with high resilience, have the capacity to recover from negative experiences. People who are able to reach superior levels of functioning after a stressful event have extremely high resilience. They can be called 'thriving' (Joyce et al., 2018). This not only goes for individuals, but also for systems, organisations and communities (Martin-Breen & Anderies, 2011).

Family resilience

Family resilience is an example of resilience. Black & Lobo (2008) described it as "the successful coping of family members under adversity that enables them to flourish with warmth, support and cohesion (p1)". Important factors of resilient families are positive outlook, financial management, spirituality, family member accord, flexibility, family time, shared recreation, routines and rituals, family communication, and support networks.

Digital resilience

Another domain where resilience is an important topic is the digital domain: digital resilience. For enterprises, societal entities and individuals it can refer to the capacity to surmount problems related to cyber threats (Shandilya et al., 2024). For individuals this term is often used with slightly different meanings. Butorova et al. (2025) defined it as "people's ability to prevent, respond, and quickly recover from negative online experiences (p3)". Not to be confused with digital literacy, which is defined as "the effective use of digital technologies" (p9). This does not consider knowledge of risks (Butorova et al., 2025). Or with media raising, defined as "consciously and selectively managing media usage with a critical view of what they make and consume and estimate the value of this" (Middag et al., 2025).

3.2. Digital risks and effects on children

While screen devices offer significant opportunities for education, language, creativity, connection and social skills (Based on my analysis; Appendix D), they also pose risks. Risks can lead to digital adversities, with possibly negative effects.

Online risks

Online risk exists out of 5 main categories according to the 4C online risk model: content, contact, conduct, contract and cross-cutting. This categorisation can be seen in Figure 10 (Livingstone & Stoilova, 2021). These categories describe the potential dangers a child can encounter in the digital environment.

	Content Child as recipient	**Contact** Child as participant	**Conduct** Child as actor	**Contract** Child as actor
Aggresive	Violent, gory, graphic, racist, hateful and extremist content	Harassment, stalking, hateful behaviour, unwanted surveillance	Bullying, hateful or hostile peer activity e.g. trolling, exclusion, shaming	Identitiy theft, fraud, phishing, scams, gambling, blackmail, security risks
Sexual	Pornography (legal and illegal), sexualization of culture, body image norms	Sexual harassment, sexual grooming, generation and sharing of child sexual abuse material	Sexual harrassment, non-consensual, sexual messages, sexual pressures	Sextorion, trafficking for purposes of sexual exploitation, streaming child sexual abuse
Values	Age-inappropriate user-generated or marketing content, mis/disinformation	Ideological persuasion, radicalization and extremist recruitment	Potentially harmful user communities e.g. self-harm, anti-vaccine, peer pressures	Information filtering, profiling bias, polarisation, persuasive design
Cross-cutting	Privacy and data protection abuses, physical and mental health risks, forms of discrimination			

Figure 10: 4C Online risk model (style adapted from (Livingstone & Stoilova, 20221))

Negative effects

The literature identifies various negative effects of screen devices, if misused. These effects are categorised to my own insights in Figure 11.

Underlying factors

The quantity of screen time can have a negative effect on physical development. For social-emotional development content (activity done/seen), context (with whom) and function (reason) are equally important (Koning et al., 2025). According to my analysis (Appendix D) the other categories of negative effects are cause by excessive use, missing out on other activities or early exposure.

Language development	Reading skills, vocabulary, ordering of sentences (morpho-syntax), phonology, lexicon and pragmatics	(Bhutani et al., 2024)
Physical development	Motor skills	(Kumar et al., 2023)
Cognitive development	Cognitive development and executive (like working memory, switching between tasks)	(Hayes et al., 2025), (Kumar et al., 2023)
Education	Academic performance	(Kumar et al., 2023)
Social and emotional skills development	Solitary beahviour	(Hayes et al., 2025)
Health	Obese	(Kumar et al., 2023)
	Comorbidities	(Ziker et al., 2025)
	Sleep irregularities	(Kumar et al., 2023)
Mental health	Depression	(Werner et al., 2024)
	Self-harm, suicide, gaming disorder,	(Butorova et al., 2025)
	Eating disorders, social media disorder	(Werner et al., 2024)
(Social) behavioral problems	Craving behavior, lower levels of emotional understanding, externalising behaviors, aggression, emotional reactivity, emotional regulation, cognitive control, decrease in social coping skills, antisocial behavior,	(Kumar et al., 2023)
	Violence, self-harm, eating disorders, suicide, challenges, dysfunctional behaviour (creating relationships, prioritizing goals,	(Butorova et al., 2025.)
	Decreased ability to delay rewards)	(Ziker et al., 2025)

Figure 11: Negative effect os screen devices

3.3 Process of building digital resilience

Digital resilience is not stable but a cyclical process. It is dynamic and malleable, differing across time, context, domain and platform (Butorova et al., 2025). It can be build and shown across four levels: Individual, home, community and society. Of which the first two are the micro systems and the second two the macro systems. In this, the macro systems form the micro systems (Hammond et al., 2024).

According to the UK Council for Online Safety (n.d.) digital resilience deals with learning how to recognise, manage and recover from online risks. This consists of 4 elements:

- Learn from experiences and adapt future choices to this
- Understanding when you are at risk and make decisions about online use
- Know how to seek help
- Recover from online harm by receiving support

Hammond et al. (2024) suggested two approaches to building digital resilience: the proactive and the reactive approach. The proactive approach is preventive, implemented prior to the exposure to risk. The idea is that adaptive functioning can happen through adjustments made regardless of risk exposure. Reactive approaches are implemented at the moment risk happens. They build on the idea that risk exposure is essential to build digital resilience. The risk exposure should be balanced in a way that enables children to learn how to recognise, manage and recover from risky online experiences on their own. This mostly happens spontaneously, relying on individual experience (Milošević et al., 2024). It is suggested that prevention of exposure at the expense of learning is probably harmful rather than helpful in the long term (Hammond et al., 2024).

Proactive approaches

Awareness approaches aimed at children (Butorova et al., 2025) and parents can be effective in raising digital resilience (Hinkley & McCann, 2018). It could for example be beneficial to raise awareness of risks and guidelines (Hinkley & McCann, 2018). Lastly, awareness on how children use technologies and how this changes with age is crucial (Hammond et al., 2024). Next to awareness, guidance is important. Hinkley & McCann (2018) stated information should come from different reputable sources and be easily accessible. Hayes et al. (2025) suggested that parents should be guided in healthy screen habits of their children from an early age, focussing on management of screen time, parenting consistency and engaging children in other activities. If done from an early age it helps build healthy habits. Lastly, education strategies can be effective to educate children about digital risks and how to mitigate and cope with these. Methods including project-based practices, collaborative learning and practical engagement are effective in learning digital skills (Butorova et al., 2025).

Reactive approaches

In the reactive approach, when a child encounters a risk this can lead to acceptance or growth. In acceptance the child returns to pre-risk functioning. In growth the child develops increased capability and capacity to respond to similar risks in the future. It depends on the support systems, the nature of the risk and the child's developmental stage whether exposure to risk leads to acceptance or growth (Hammond et al., 2024). Next to that, recognising, managing and recovering from risks is mediated by the home, community and wider social context (Hammond et al., 2024). The severity of harm depends on the child, circumstances, nature of risk and the digital environment (Livingstone & Stoilova, 2021)

Influence of developmental stage

Figure 12 shows a synthesis of findings from the literature about relevant developmental characteristics to digital resilience.

Influence of parents

Supportive social relationships can buffer adverse experiences (Ziker et al., 2025). Parents play a crucial role, as a kind of moderator. According to Werner et al. (2024) parenting practices and behaviour have a significant influence on a child's development, as they are closest to the child. Therefore, it is important that they learn how children use technology, how to keep them safe in online environments and realize that threats change with age (Ziker et al., 2025) (Zhao et al., 2023).

Nikken et al. (2024) identified 6 parental media raising strategies:

1. **Active mediation (stimulating):** Parents' behaviour supports children to use media in a good way (talk, explain, listen, compare good and bad, making rules together)
2. **Restrictive mediation (stop):** Rules with regard to location, type of device and time, type of interaction and content.
3. **Co-use (together):** Use together for fun, without critical discussion (can be seen as kind of active mediation)
4. **Supervision:** Being close to keep an eye while a child independently uses devices.
5. **Monitoring (shadowing):** Checking screen activity.
6. **Technical restrictions (locks):** Restrictions by device (e.g. parental controls and child locks).

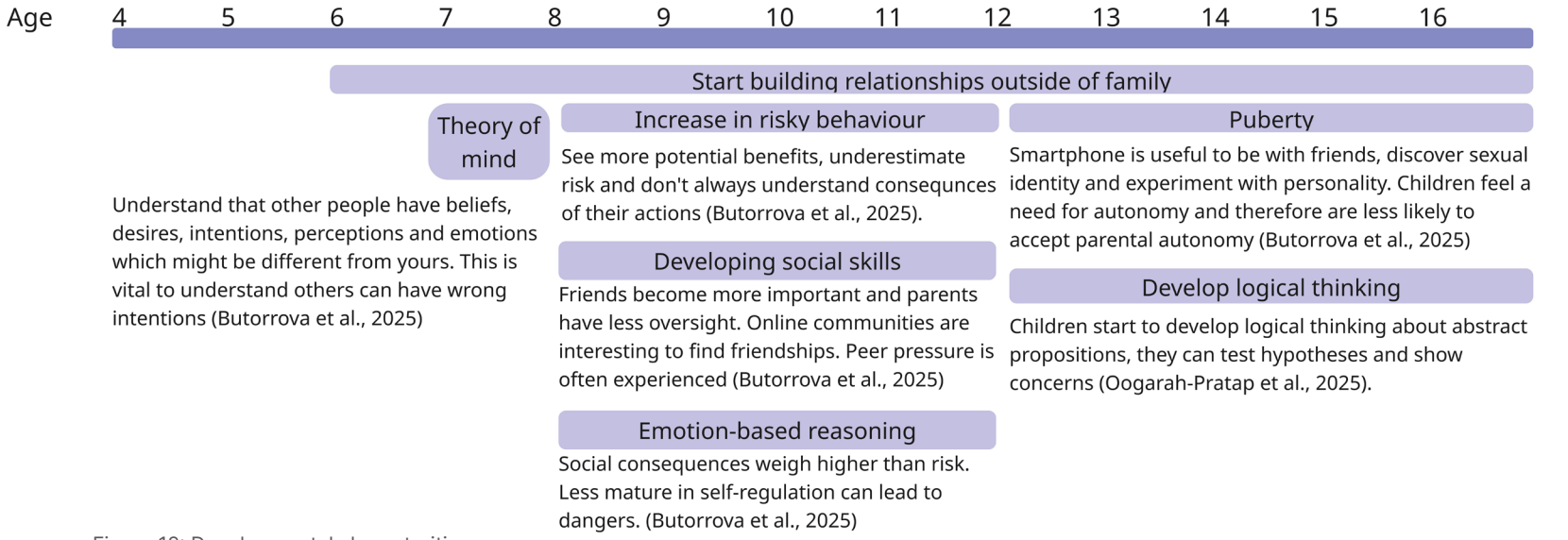


Figure 12: Developmental characteritics

3.4 Barriers and enablers to digital resilience

Various barriers and enablers to building children's digital resilience exist.

External factors

Raising children responsibly with devices is complex due to the use of a range of electronic devices (Kumar et al., 2023). Next to that, the digital world is a fast changing environment, in which a child's exposure might happen before parents are even aware of the possibility of a risk (Livingstone & Stoilova, 2021). Additionally, addictive elements and algorithms in social media platforms are hard to fight against (Koning et al, 2025). Lastly, Parents often have a busy lifestyle, caring for themselves and their children. Parental fatigue can lead to stress and failure to meet guidelines (Lien et al., 2024).

Parenting strategy

The parenting strategy is also of influence. Lien et al (2024) found that routine and limit setting may play a positive role in helping meet screen guidelines, particularly for older age groups above 3. However, many studies suggest that restrictive mediation and monitoring is not effective (Butorova et al., 2025)(Middag et al., 2025). It may lead to children distrusting parents, making them reluctant to talk about their online activities. Children aged 8-12 are in a phase in which they start looking for autonomy (Butorova et al., 2025). They may try to bend the rules and do things in secret, causing parents to lose control. When intensive social media usage already exists this is an often recurring problem. Only at a young age restrictive mediation can be effective (Middag et al., 2025).

Respectful and participative methods (co-use and active mediation) have a protecting effect in building digital resilience (Middag et al., 2025). In line with this, Ziker et al. (2025) suggested conversations with the child are seen as best practices. Next to that, technological approaches that encourage discussion about experiences can help build digital resilience, as well as goal setting prior to use and reflection about experiences.

Although their use is debated, active and restrictive approaches can be co-deployed with other strategies and should not be seen as opposites (Zhao et al., 2023). Parents should give children the space to make mistakes but remain in control to some extent to be able to get involved when necessary (Middag et al., 2025).

Parent's insecurity to act

Parents who are aware of the risks of screen use say they feel 'handelingsverlegen' (insecure to act) (Koning et al, 2025). The advice parents receive is not sufficient. Advice should be more trustable. Many websites provide advice not based on scientific back-up (Middag et al., 2025). Besides that, recommendations are not clear (Werner et al., 2024) and hard to find (Middag et al., 2025). They are often open to their own interpretation for parents to decide how they see fit. Next to that, many parenting websites suggest restrictive mediation, while according to literature this is more risky and less effective than co-use and active mediation. They also offer limited practical tools for implementation. Lastly, guidelines are not customised to the family context. They do not take into account for example separated parents, cultural differences, multiple children and poverty (Middag et al., 2025).

Children's perspective

Current guidelines often do not include the perspective of the child, even though they often have a contrasting view to their parents. The effectiveness of strategies also depends on the extent the child is engaged in making the rules. When children and caregivers are not aligned, the chances are bigger children will not obey the rules. That is also why parents should learn about the media interests of their children (Middag et al., 2025). Besides this, children do not approach their parents when they experience online problems. Children are scared their parents will not understand what it is about and can not give appropriate advice. Moreover, they are scared to get punished. Therefore, creating an open atmosphere by showing interest, being involved and giving space is important (Koning et al, 2024). Within the home context trust between parents and siblings is seen as a protective factor (Hammond et al., 2024). A family factor that is of influence is open communication (Butorova et al., 2025).

Experiences of digital resilience

Figure 13 shows a conceptualisation made by Hammond et al. (2024) of children's, parents' and educator's experiences of digital resilience. Their main message is that to thrive with opportunities despite risky online experiences is a constant balancing and counterbalancing of opportunities between individual, home, community and societal contexts.

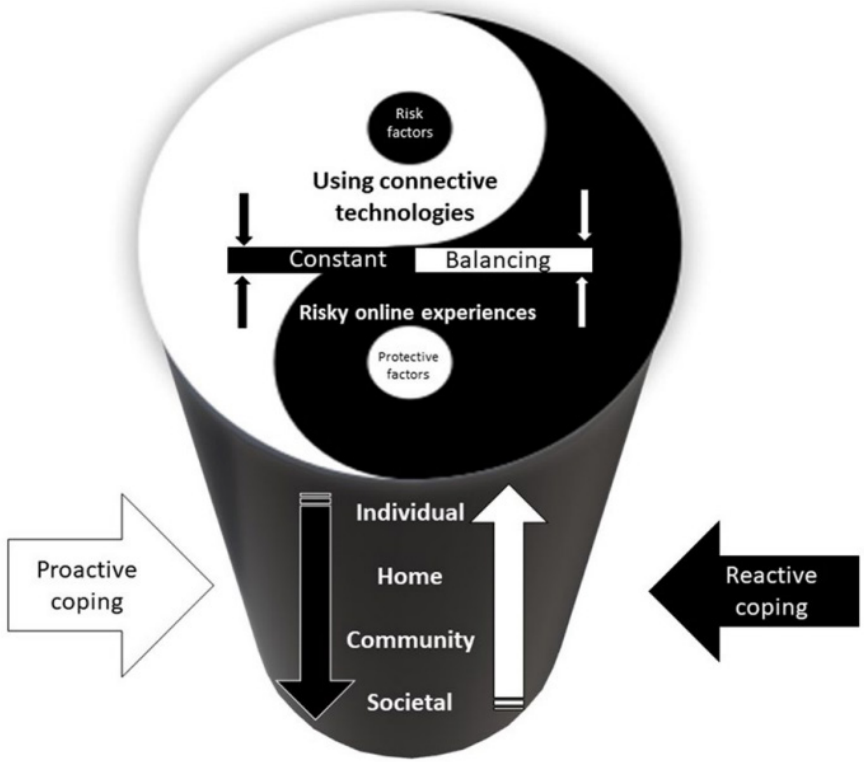


Figure 13: Conceptualisation of experience of digital resilience

3.5 Developing interventions to build digital resilience

Butorova et al. (2025) suggested three key issues to consider when developing interventions to promote digital resilience for 8-12 year olds:

1. **Safe exposure:** Create an environment in which children can safely explore with support and reflection. (E.g. scenarios)

2. **Awareness raising paired with learning skills and strategies:** this helps children to identify, reduce and respond to potential risks.

3. **Group-based learning:** between peers or cross-age teaching helps to develop critical thinking skills and thus evaluate online info, stay safe online and combat misinformation. The potential of cross-age teaching is based on three theories. Role theory suggests that young people take a tutor role seriously. Secondly, cognitive theory suggests it creates opportunities to learn and create links with existing schema. Lastly, Vygotsky's sociocultural theory states that tutors learn by reworking material.

3.6 Discussion & conclusion

Model of resilience

Based on the insights from the literature the concept of resilience can be visualised as in Figure 14. A person is normally in the 'preferred state'. A disturbance, like an exposure to risk, can take a person out of this preferred state. By adapting a person can bounce back to the preferred state. Resilience is how flexible someone is in adapting to keep returning to the preferred state. When the disturbance is too big or resilience low, a person reaches a tipping point and ends up in a new unpreferred state. From here, it is hard to return to the preferred state going along with negative consequences. So, the higher a person's resilience, the better a person is at bouncing back and the smaller the chance that a person reaches a tipping point. An example for digital resilience could be a child getting in contact with a stranger. When he responds in a desirable way he blocks the stranger, when he responds in the wrong way he might end up in an unpreffered state where he is being put under pressure to perform self harm.

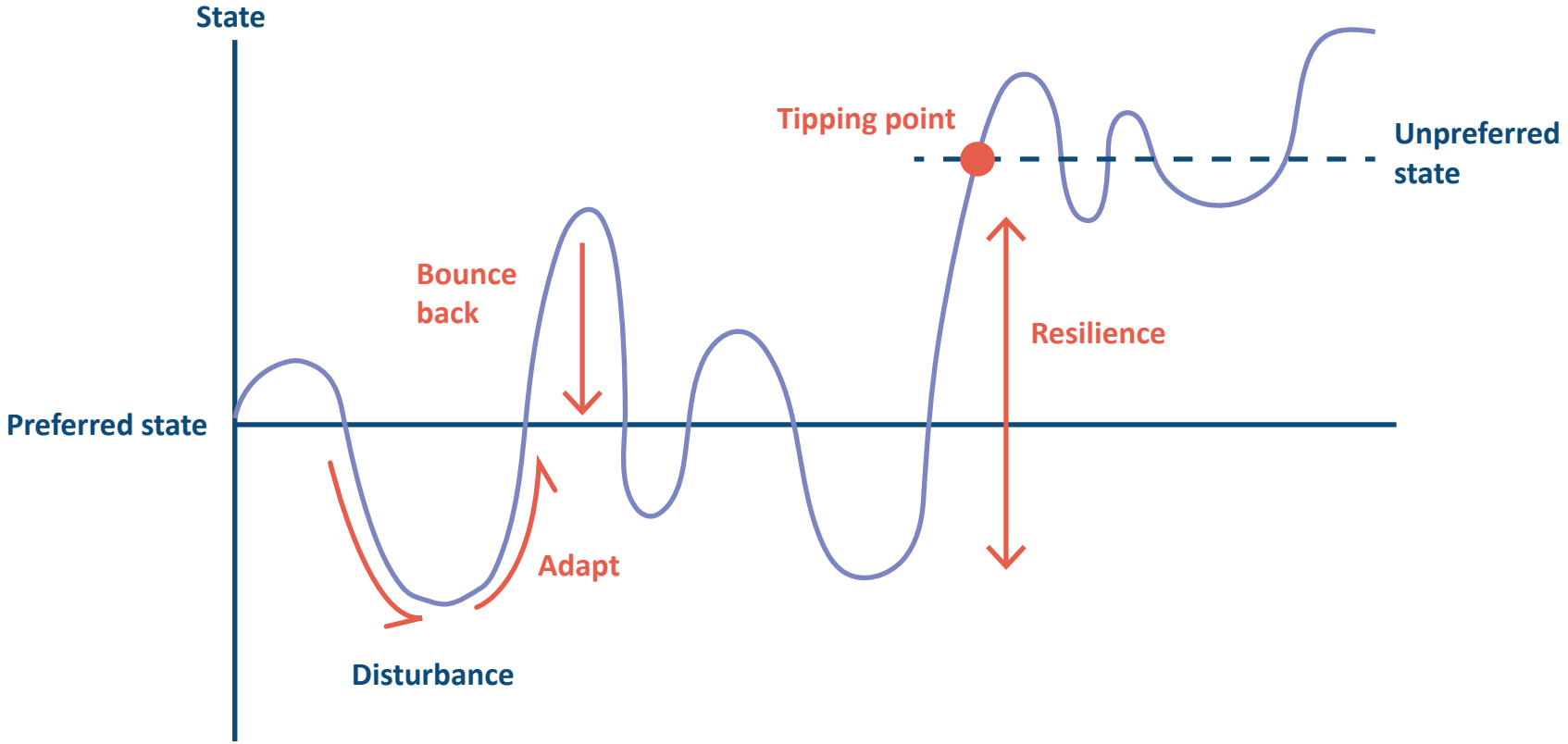


Figure 14: Model of resilience

Definition of digital resilience

Based on the reviewed literature digital resilience is defined as the ability to recognize digital risks, know how to seek help to recover from negative experiences and learn from them for future scenarios. The word digital is chosen instead of online as not all screen activities of parents and children are online.

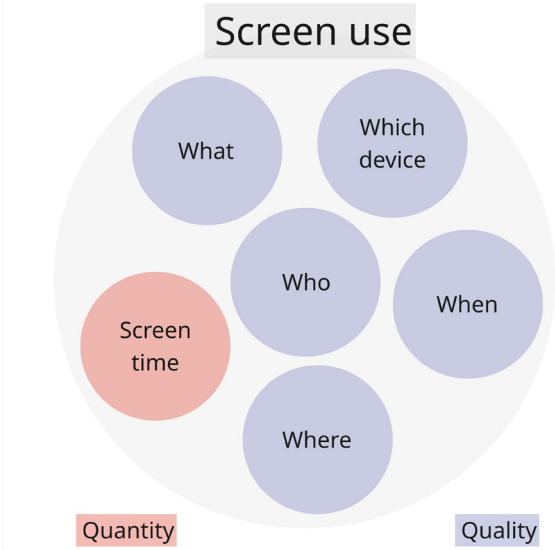


Figure 15: Definition of screen use

Model of digital resilience

Based on the insights from the literature a theoretical model of the process of building children's digital resilience is developed (Figure 16).It depends on many factors (shown in grey) whether risk leads to growth or harm and to what extent. Whether a child is exposed to risks depends on the quality and quantity of the screen time. Therefore, in this thesis screen use is seen as the combination of quantity and quality (the activity, which devices, with whom, when and where (Figure 15).

Key insights

Knowledge institutions and government are currently focssing on proactive approaches. In the reactive approach exposure to risk can lead to harmful situations, but with the right support this can lead to the growth of digital resilience; a preferred situation. To develop digital resilience it is crucial to be exposed to risks in a safe environment. However, there still is a focus on restrictive parental strategies. Digital resilience can be built over multiple levels. On the home level, parents play a crucial role as a kind of moderator.

Therefore, it is interesting to look at how the parent-child connection can be strengthened to facilitate building digital resilience. Parents feel 'handelingsverlegen' (insecure to act) in raising their children with devices and limited practical tools exist for this. In all four elements of digital resilience (Learn, understand, seek help and recover) communication between parent and child is essential to support the element. Especially considering that the parent is often the adult most nearby in case a risk happens. Next to that communication is an important factor in family resilience. Moreover, active mediation and conversation are seen as best practices.

It is especially interesting to look at the age group 8-12 as children start to develop more relationships outside the family and want more autonomy. This makes them vulnerable as they become susceptible to peer pressure, therefore being more risk seeking, whilst not having the critical thinking skills to see dangers. Next to that, it is the age group where they receive their first phone. The fact that a mobile phone is private and portable gives parents less oversight. Moreover, if connection is lost in puberty it is hard to restore, therefore it should already be established before this.

Therefore there is potential in developing tools for communication between parents and children aged 8 to 12 to strengthen their connection to facilitate the moderator role of the parent. The red circle in Figure 16 shows the intervention point in the digital resilience model.

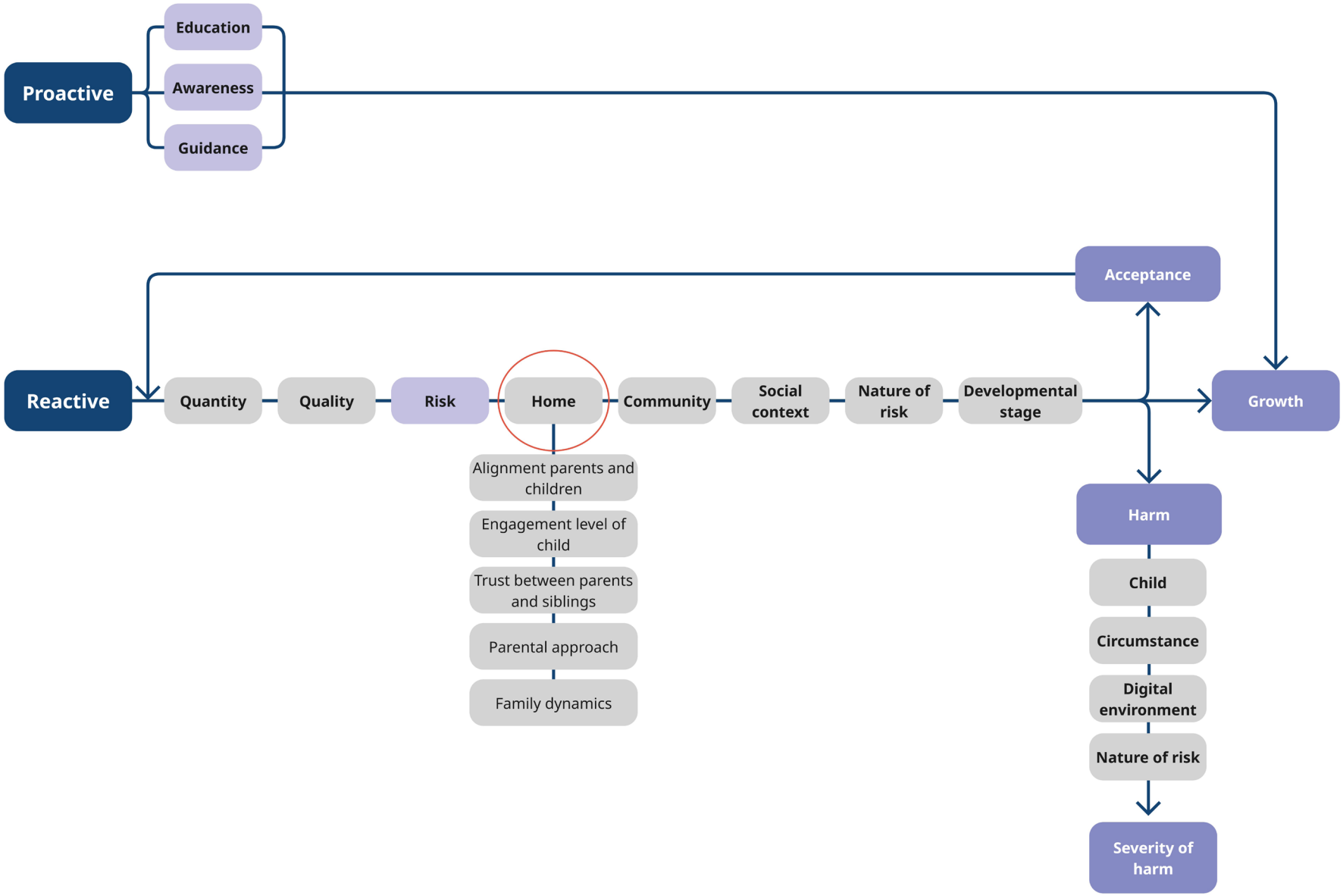


Figure 16: Theoretical model of the process of building children's digital resilience

4

Screen use in the family context: a user study

In the previous Chapter it is concluded that there is potential in developing tools for communication between parents and children aged 8 to 12. This can strengthen their connection to facilitate the moderator role of the parent.

For this, it is needed to understand the target group, including their values, needs, context and experiences around screen use. Next to that, it is important to understand the context and experiences of communication about screen use. This Chapter describes the three types of user research done for this: desk research, expert interviews and generative sessions with families. For each study the research aim, method, results and conclusions are described. Lastly, the results are synthesised into personas and barriers and opportunities are derived. Lastly, the results are discussed by comparing them to the literature.

4.1 Desk research

Research aim

The research aim is to discover how parents experience raising their children with screen devices. This can be used to identify barriers and opportunities within the communication about the digital world between parents and children.

Method

Desk research is done by analysing 4 parental forums with the topic raising children with screen devices. The insights are clustered into 5 themes.

Results

Good or bad

Parents are not aligned on what screen habits and rules are good and bad for their children. Some parents say giving freedom works for them, because the screen is not seen as something special. Other parents are more strict with rules about for example time.

Overloaded

Parents sometimes feel overloaded because children become annoying and it is difficult to change settings for every device.

Role model

Parents find it hard to be a good role model as all their work is digital.

Cheating the rules

Children often find a way to cheat the rules, like extending the time or playing at a friend's house.

Together

Parents suggest doing things together, like making rules together and doing activities together.

Conclusion

The barriers and opportunities identified from the results are presented in Chapter 4.5.

Key insights

> *Parents feel overloaded, their children sometimes cheat the rule and they do not know what is good and bad. Therefore, they find it hard to be the right role model. They say doing things together helps.*

4.2 Expert interviews

Research aim

The research aim is to discover the barriers and opportunities within communication between parents and children as seen by experts.

Method

Three semi-structured interviews are conducted with experts from the field (Appendix E for interview guide). One is conducted with a child psychologist, specialised in screen issues. One with a member of a public health organisation and one with member of a knowledge institution. Experts from different directions are consulted to ensure variation in point of view. Whereas one expert has experience from practice at the family level, the others work on the community and societal level. The interviews are audio recorded, transcribed and anonymised. The insights are clustered into themes.

Results

The following 13 themes emerged from the insights.

Asking a lot

Parents are unaware of phenomena happening online and what children understand about it. The addictive nature of apps asks more from parents' pedagogic capabilities. This is asking a lot next to their other tasks.

No overview

It is hard to see what is done on a screen, as devices are portable or used in another room. While parents are protective in the real world they let their children free in the digital world, where contact is easy and anonymity can lead to big consequences.

Neglect

Parents often think 'my child does not do that' or what they think what their children do is normal. Next to that, parents often make wrong conclusions between cause and effect. For example, they think playing a game makes a child calm while it causes unrest.

Difference between families

Every situation, family and child is different. Therefore, advice and guidelines are not always transferable to everyone.

Negative load

Parents find it hard to not make a conversation negative. This is where children drop out. Often a judgement comes fast, which makes it hard to stay in contact. Parents should try to talk about a current negative experience at a later moment, without being judgemental. They should ask questions out of curiosity and listen first before giving an opinion. It often helps to start a conversation while doing something else. Parent approach conversation negatively because they are worried and hear negative stories in the news.

Insecurity about knowledge

Parents feel like they are not an expert and can not help their children. Therefore, they do not know how to start a conversation. Parents can be vulnerable in this by admitting they do not know everything.

Parent not seen as expert

Children do not see their parents as experts and therefore do not ask them for help even though they have a lot of life experience.

Blur of worlds

For the generation of parents there is a distinct line between the digital and physical world, whereas young people see it more as one world and quickly switch between them. Therefore, parents often underestimate the importance of the digital world. Therefore, they have less interest and are not used to talk about it.

Openness

It is important to talk about screen use regularly. Not in all families it is normal to have open conversations. The border between interest and 'why do you want to know everything' can be vague.

Understanding

Parents and children need to understand each other's perspectives.

Role model

It is important that parents are the right role model for their children. When parents use their phone a lot they are unavailable for their children.

Change over time

It is good to do things in small steps. Rules and guidance should change over time with age.

Learning

Parents should learn about the apps their children use and dangers they can encounter.

Connection

The connection between parents and children is crucial. They should stay in contact.

Conclusion

The barriers and opportunities identified from the results are presented in Chapter 4.5.

> ***Key insights***
>
> *Parents feel like raising their children with screen devices is asking a lot from them, they find it hard to keep an overview and be the right role model. Parents do not feel like they have the right knowledge. Children in their turn feel this and do not see their parents as experts to approach.*
>
> *The connection between parents and children is extremely important. This can be reached by staying in contact. However not in all families it is normal to have open conversations. Parents and children also frequently do not understand each other, as for children there is a blur of worlds, while parents experience it as two seperate worlds. Therefore, they should learn about each others worlds and keep doing this as it changes over time.*

4.3 Generative sessions

Research aim

The aim of this research is to map parents' and children's values, needs, context and experience of screen use. Next to that, it aims to understand the context in which parents and children communicate about screen use and how they experience this.

Method

Three generative sessions are conducted with three families according to the convivial toolbox method (Sanders & Stappers, 2012). This method takes users to the present, past and future to discover the user's aspirations. Before the session all family members received a booklet with exercises. The aim of this was to start thinking about the topic. During the sessions the booklet was discussed and 2 assignments in which participants had to create something were used to gain deeper insight and as conversation starter for questions. From each family the two parents and their two children between 8 and 12 years old participated in the session. In two of the three families there was a younger sibling who did not participate in the session. The insights are clustered into themes. The insights are synthesized into target group personas and barriers and opportunities between parents and children. An overview of the session plan and composition of the families can be found in Appendix F.

Results

This Chapter discusses the main insights, all themes can be found in Appendix 17

Parents' and children's screen use

Context of screen use

Figure 17 shows for both children and parents what devices, what activities, when, where and with who they use devices. The purple box shows the overlap.

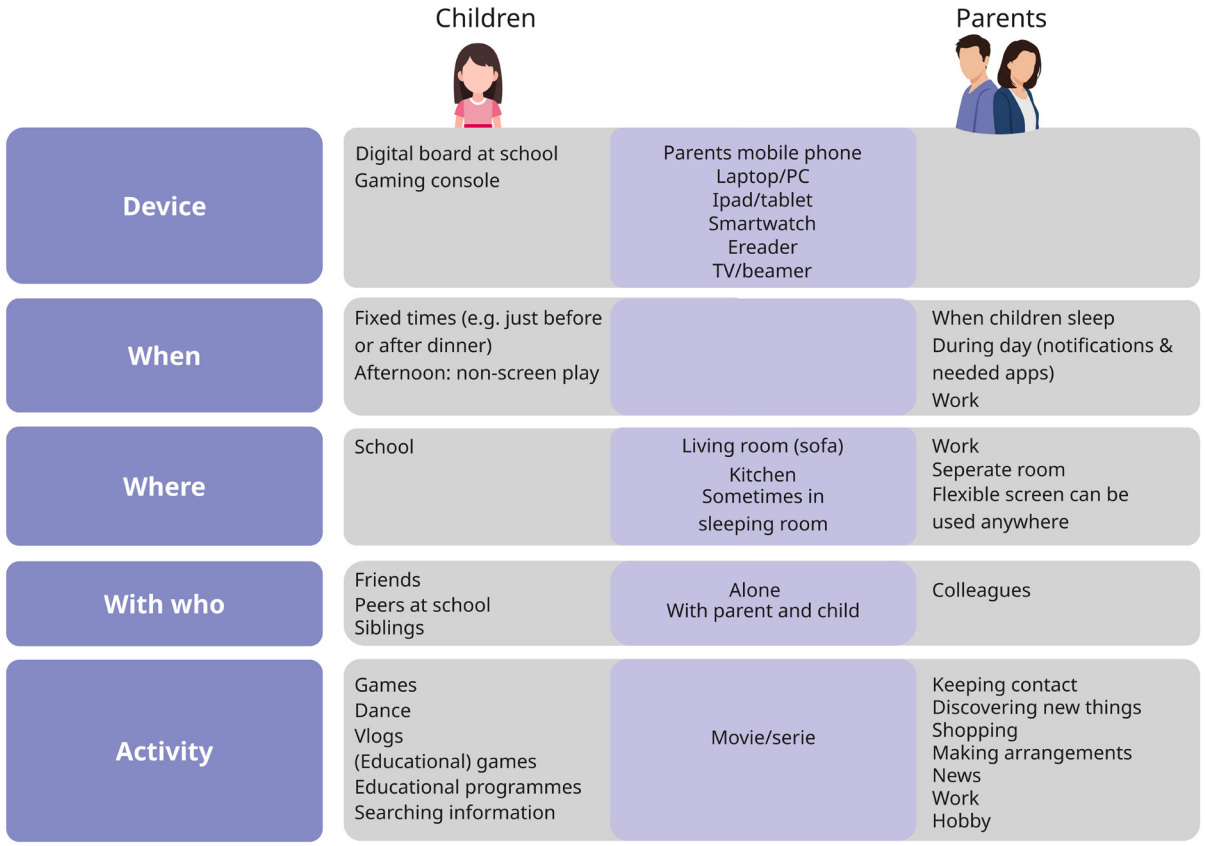


Figure 17: Parents' and children's screen use

There is an overlap in the kind of devices parents and children use. However they use it for different purposes. Parents use their devices both because they have to and for fun. They often have to use a device for work. For many daily tasks they are dependent on a device. Children use a device mostly for fun activities, like gaming and watching videos. Parents use devices throughout the whole day whereas for children there are often fixed times when they can use them. Children mostly use them in the living room, often on the sofa. It is sometimes used alone but often together with siblings and sometimes with parents. However, there are differences per family.

"Almost everything for the children I have to do via apps for football, for childcare, for tennis, for school and making appointments with friends." - father

Children's experiences with digital adversities

Adversities that children participating in the generative sessions have encountered are mostly related to unfit content. They have seen weird pictures, games and videos and series above their age recommendation. They do not always know beforehand whether content will be scary. Children have heard of peers experiencing addiction, online bullying and bullying with scary pictures. They also know other children who play above age games. When posed with a scenario of someone sending them an unkind message, children want help and protection. They would like to solve the problem by ignoring it, talking or punishing this person.

"'YouTube also has a lot of weird stuff" - son

Experience of screen use

Figure 18 summarises the insights about parent and children's experiences.

Prominent in the themes is that parents can experience happiness from screen devices, but they also see negative sides, like being distracted and physical complaints. Although children can feel many emotions during screen use, it mainly makes them happy. Next to that, many parents find it hard to keep up and they feel dependent on devices. It is asking a lot from them.

"Exhausting, because I have to use the screen a lot" - mother

"My favourite moment is watching a video, but I also like playing" - son

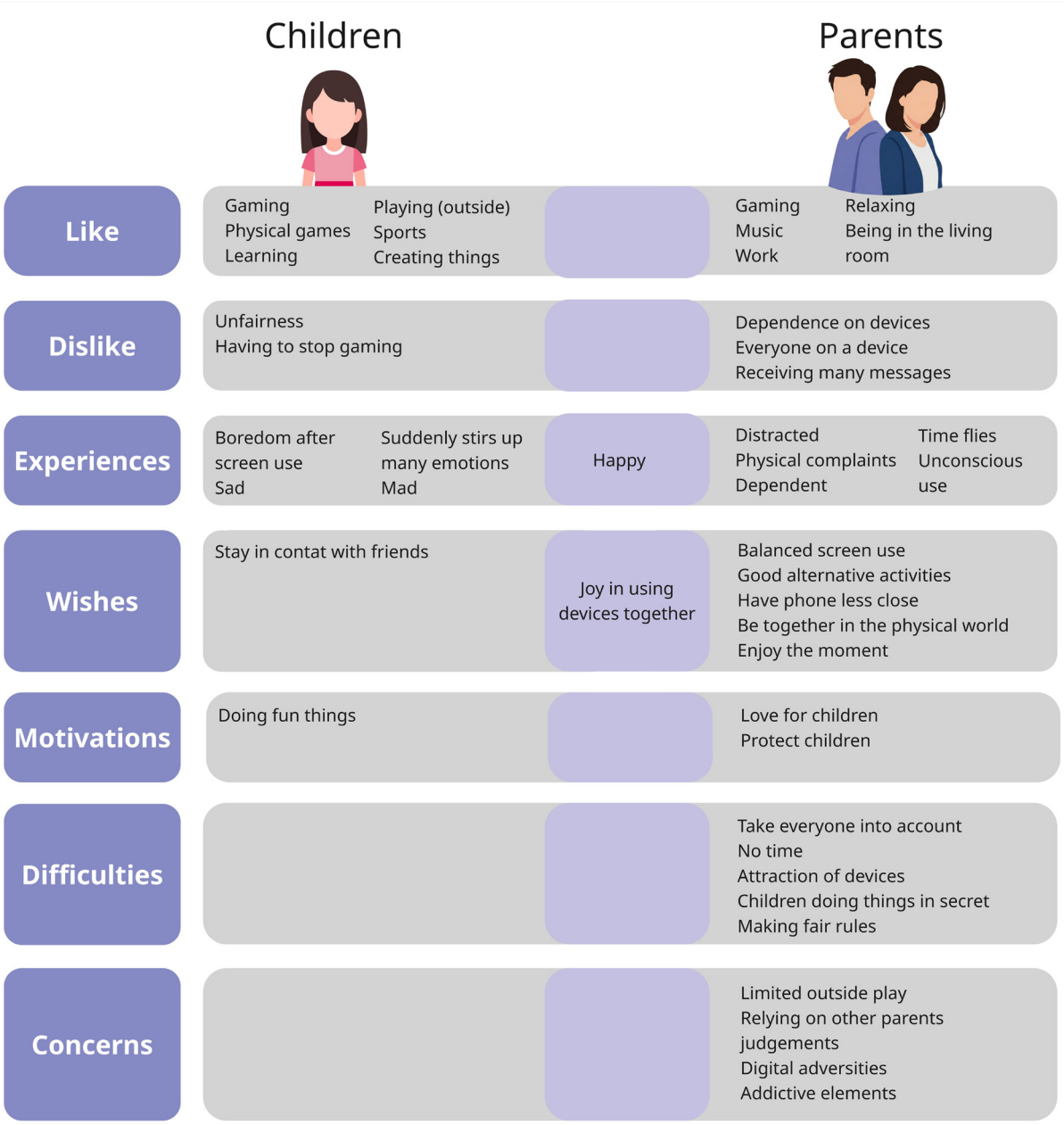


Figure 18: Parents' and childrens' experience of screen use

Communication about screen use

Context

Parents try their best to be involved with their children's screen use, but they do not see or know everything. Sometimes families communicate about content, mostly when it is watched together. However, as parents do not see everything, there is also a part that is not discussed. Furthermore, most families have some screen rules, mostly about when and how long children can use a screen. Parents often make these rules, sometimes with their children's input. They think about the rules consciously and also explain their reasoning to their children. Children say they are fine with these rules, however from other stories it also appeared to cause discussion sometimes. Rules did not appear to be about content at first, however when talking about it, it appeared that some rules are made about this, mostly after parents and children encountered something problematic.

"I have to be honest, we leave a lot of freedom in what they watch." - father

Parents and children's experiences

Children are mostly frustrated when parents don't stick to their agreements or rules are unfair. They would like their parents to be more available.

Parents do not always understand what their children are talking about when they talk about the digital world or use words from the digital world. Parents would like more time to talk about it. They find this hard because the days are busy. A recurring topic is that parents find it hard to know what is going on in the heads of their children. Sometimes they see something is going on but the child does not want to say what, or does not know what or can not explain it. It is also hard to understand why they do not tell their parents. Parents would like to have conversation techniques that help them with this. They also want to be able to better understand what their children are doing on the screen devices. Furthermore, they would like to make rules more together and teach their children how to recognize danger. Lastly, they would like to be more available for their children and be less dependent on their phones.

'Do you ever think I would like to play a game with mom, but she is on the phone?" - mom "yes" - daughter

"It is not always easy to see what they think" - father

'I would like to speak the same language, to have a good conversation" - mother

Conclusion

From the results multiple barriers and opportunities within the parent child relationship can be found, see Chapter 4.5

Key insights

Whereas children use devices only for fun parents also use them because they have to this can cause a tension in experience

Parents find it hard to discover what is going on in the heads of their children

Parents do not see or know everything their children do on a screen

4.4 Synthesis

In this Chapter the insights from the different methods are synthesized.

Creation of persona

The first aim of the user study is to understand the target group, including their values, needs, context and experiences around screen use. The insights are translated into three personas (Figure 19, 20 & 21. Building this 'story' makes it easier to empathise with the user group and inspires the design phase.

Name: Marian & Geert
Age: 43 & 46
Work: Official at municipality & project manager
Family status: Living with 2 sons (10 &12)
Ethnicity: Dutch

"I wish I could look inside their head to see what they think"

Screen activities

- Work
- Movie/serie
- Keep contact
- Information
- Music
- Shopping
- Hobby
- News

Devices

Smart-phone | Laptop Computer | Tablet/ Ipad | TV

Bio

Marian and Geert are living together with their 2 sons. The boys spend a lot of time gaming. They love their children an they would like them to spend more time in the real world, but it is hard to motivate them, especially in the hussle of the day, where they themselves are also often distracted by their phone.

Motivations

- Want best for their children

Concerns

- Children don't play outside often
- Addictive aspects of games
- Device use can stir up many emotions in their children

Frustrations

- Having many responsibilities and tasks with two children in the house
- Having little knowledge about the online world
- Being distracted and dependent on devices
- Not knowing what is going on in the head of their children

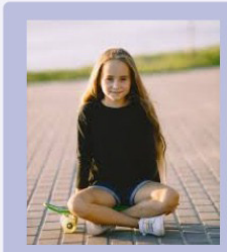
Likes

- Being together
- Relax
- Work

Needs

- Clear guidelines
- Help in raising their children with devices

Figure 19: Persona of parents



Name: Sarah
Age: 11
Education: Primary school
Family status: Living with parents, 2 older sisters
Ethnicity: Dutch

"Sometimes I like to play games on the screen but sometimes I just want to draw, it depends"

Screen activities

Jeugdjournaal

Klokhuis

Movies

Dance videos

Poki

Bio

Sarah lives with her parents and 2 sisters. She often asks for a phone like her sisters have and some friends in her class, she also want to text her friends. She likes watching movies together but also playing outside and she has many other hobbies.

Motivations

- Fun
- Learning
- Doing things together

Frustrations

- Unfair treatment compared to siblings
- Not being allowed to have a phone
- Sometimes get tired from screens

Likes

- To stay in contact with friends
- Sports
- Playing (outside)
- Creating something

Needs

- To stay in contact with friends
- Sports
- Playing (outside)
- Creating something
- Calm sometimes

Devices

Tablet TV

Figure 20: Persona of daughter

Name: Sjoerd
Age: 9
Education: Primary school
Family status: Living with parents and one younger sister
Ethnicity: Dutch

"I love playing Minecraft, it makes me angry when my mom tells me to stop"

Screen activities

Jeugdjournaal

Klokhuis

Nintentdo sports

Movies

Minecraft

Bio

Sjoerd is a 9 year old boy. He lives together with his parents and younger sister. During the day he goes to school. In the afternoon he plays with friends. Before dinner he plays games on the Ipad and in the evening he watches tv together with the family. He doesn't talk about the games with his parents because they don't understand it. only with his friends.

Motivations

- Games
- Having fun
- Earning something
- Sees devices as something fun
- Likes to learn

Frustrations

- Having to quit the screen in the middle of a game
- Being bored when not allowed on the screen
- Parents not sticking to their agreements

Likes

- Likes doing things together
- Using screen
- Sports

Needs

- Clear rules
- Understanding reasoning behind rules

Devices

Ipad TV Nintendo switch

Figure 21: Persona of son

Barriers and opportunities

From each method barriers in the communication about the digital world between parents and children are found. These are shown in Figure 22. These barriers can be turned into opportunities. Other opportunities that could have a beneficial effect are shown in the opportunities section in Figure 22.

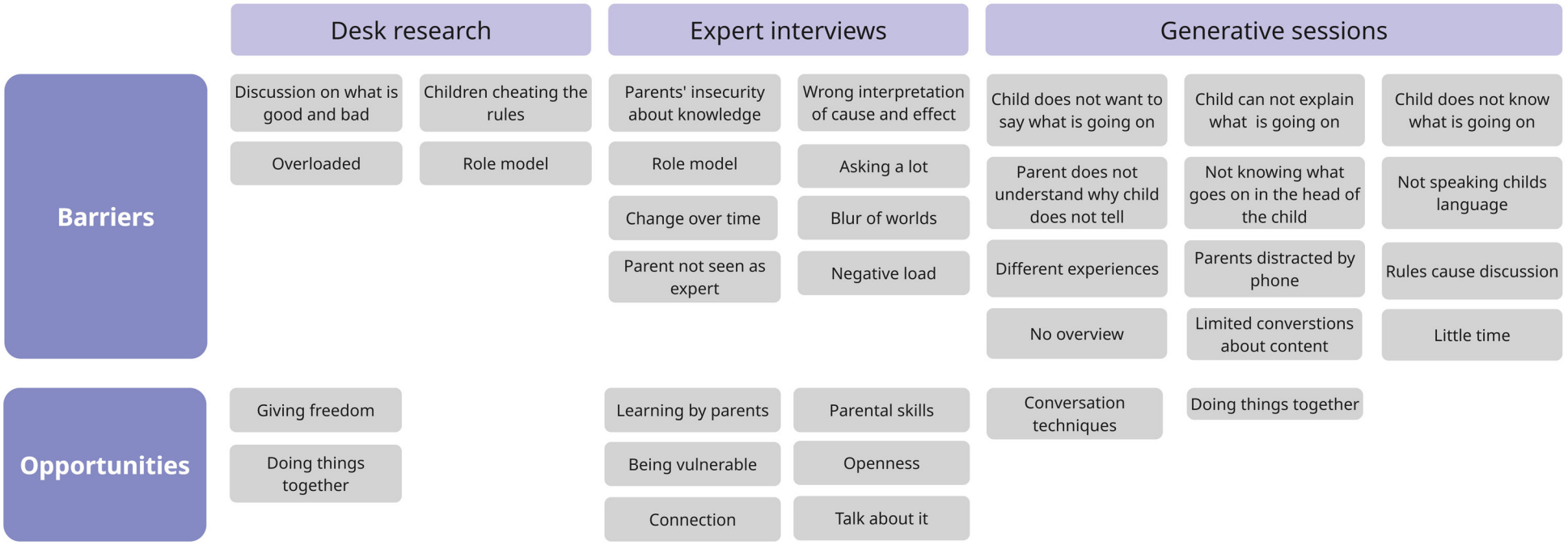


Figure 22: Overview of barriers and opportunities in communication about the digital world between parents and children

4.5 Conclusion & discussion

The most prominent outcome is that there is limited communication between parents and children about the digital world. They talk about screen rules, like time constraints, but often limited about activities and experiences. Parents mention it is hard to know everything. This has several reasons.

Tension in experience

In the generative sessions it is found that the motivation for using a device is different for parents than for children. Children use it for fun while parents also use it because they have to, for work and tasks that are dependent on a device. This may explain the tension in experience that parents and children have. Children often experience screen use as fun, while for parents it also gives frustration and worries. Because they have to do it and they look more at the long-term and see more risks. The literature mentions parents often have a negative judgemental approach in conversations about the digital world. Parents' own frustrations and worries might shine through in their communication with the child about the digital world. According to expert a negative approach can also be caused by the negative load in the news.

Understanding

In the generative sessions it was found that parents sometimes do not like talking about digital activities, because they do not understand what the child is talking about. From the interviews it became clear that children experience a blur between the physical and digital world, they see it as one, whereas parents see it as two separate things. Because parents and children do not understand each other, they may be reluctant to talk about the digital world.

Sharing

Parents mention they find it hard to find out what their children think. In the generative sessions it is found that children do not always share their thoughts. They find it hard to give words to them, do not want to share them or do not know themselves what they think, according to their parents. Another reason may be the negative attitude of parents, as mentioned before. The literature review found that children may not talk about the digital world, because they feel like their parents do not understand it and they are scared to get punished. This may be the reason, a key issues to consider in developing tools is safe exposure (Chapter 3.5).

Finding time

Next to that, the generative sessions found that having a conversation about the digital world is not easy as the days are busy, a barrier that was also found in literature. Furthermore, it requires both parents and children to be in the right mindset.

Missing conversation skills

In the generative sessions parents mention they feel like they miss the skills to have a good conversation and start a conversation. This is in congruence with the finding in the literature that mentions an inability of parents to act and a lack of trustable, clear, customisable guidelines and tools. The literature suggests creating an open atmosphere by showing interest, being involved and giving space is important.

Synthesis of causes

Figure 23 shows the synthesis of these underlying causes found in literature as well as in user research.

Key insights

Limited communication is a big obstacle in the parent-child connection to building digital resilience, as Chapter 3 concluded that communication is essential in all four elements of the reactive approach of

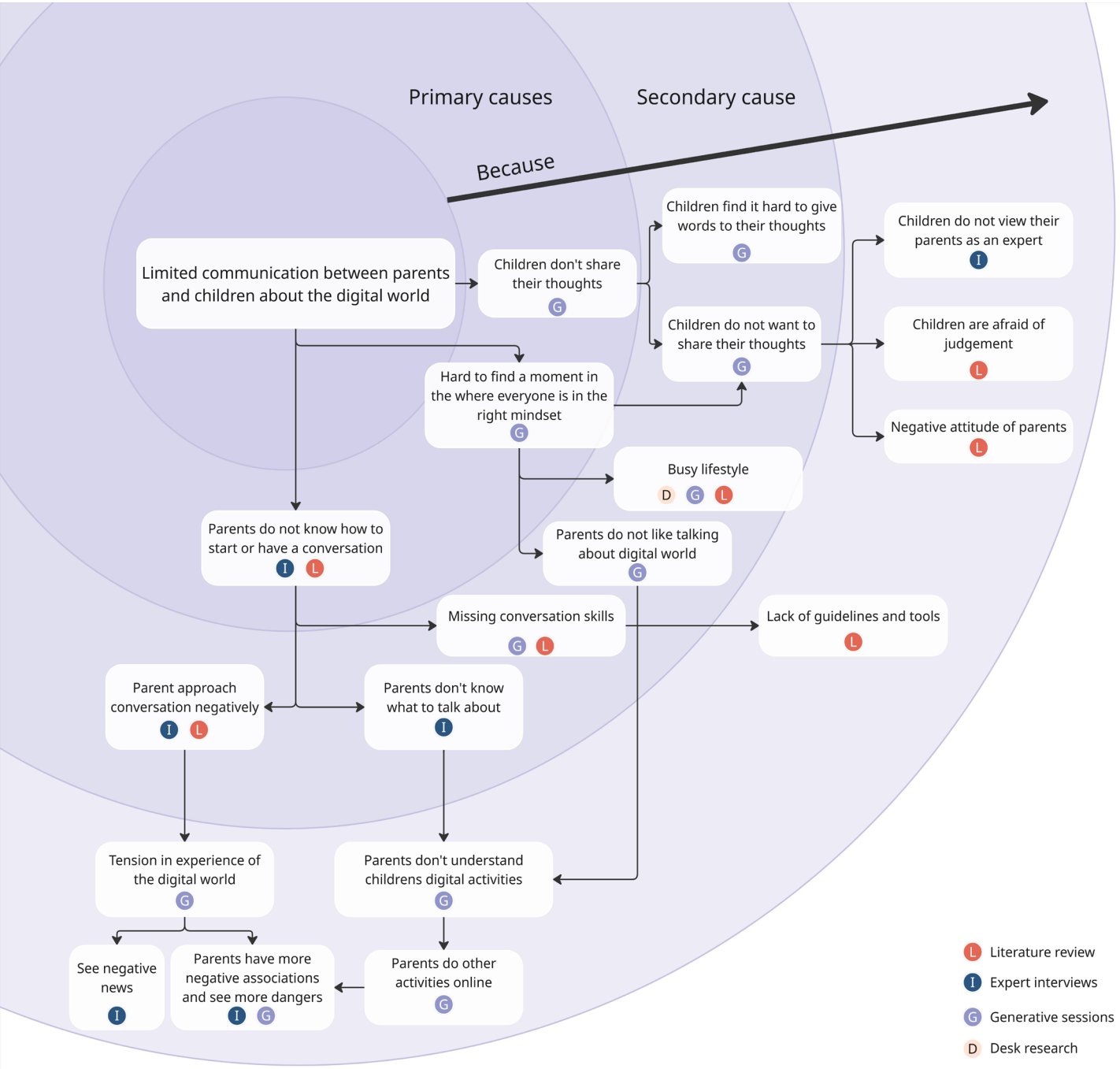


Figure 23: Synthesis of underlying reasons for limited communication

building digital resilience. Therefore, it is essential that communication about digital activities and experiences increases to foster digital resilience.

Moreover, due to limited communication parents do not know what their children are doing and experiencing on their screen. In this way, they can not see danger coming and prevent harm. Limited communication also makes it hard for a child to approach a parent when they experience a problem as they are not used to talk about it. They have not developed the trust needed to share difficulties, while trust is an essential factor in the parent-child relationship according to the literature.

All in all, increasing communication about each other's digital worlds, including activities and experiences, could help both parents and children to understand each other's digital worlds better. This could help create a shared understanding needed to have conversations about the digital world. Gaining these insights could provide a more realistic image of each others screen use and better understanding of each other's behaviours. Talking about the digital world regularly in a positive, non-judgemental way could lead to more trust and normalisation of these conversations. This could foster children's digital resilience. Next to that, it could serve as a basis to talk about negative experiences, which contributes to the building digital resilience and helps to prevent extreme harm.

5

Creation of design

The previous Chapter zoomed in on the communication between parents and children about the digital world.

Based on the insights of previous Chapters, this Chapter reframes the initial problem stated in the introduction. Based on this a design direction is established. The Chapter continues with the development of a tool for Monimentor based on a list of requirements and wishes. Lastly, the final design, the Cloud Surfers game, is presented.

5.1 Design direction

Based on the reframed problem this subChapter describes the goal of the prospective design, the design vision of the desired interaction and the mechanism that makes the design desirable to use. It ends with a list of requirements.

Problem reframing

In the story of Raveleijn (a book, series and show from the Efteling) five brothers and sisters go through a gate in the forest seen in Figure 24. When they walk through it, they enter another world in which they become knights with superpowers and the ravens become their horses (Figure 25). They fight for the independence of the people from an evil count. In their real world no one knows about the existence of this other world. Their parents see the portal, but do not ask about it, as they think it is just an old building. The children do not tell their parents about the adventures in the other world because they enjoy their adventures and they fear their parents will not understand them or they will not be allowed to go back again.

Figure 24: Gate to other world (Akim stripspeciaalzaak, n.d.)

Figure 25: Brother as knight with his horse (Thomas From Raveleijn on His Horse, n.d.)

The difference between the digital world and the physical world

The digital world can be seen as the world behind the portal in the story of Raveleijn. A screen serves as the gate to this world. Only, in the case of the digital world the parent also has one. The digital world of the child is not the same as the digital world of the parent. The gate is one where other people can not easily look through to see what is on the other side. Next to that, these digital worlds are different from the physical world, which parents and children share.Figure 26 shows a visual representation.

Parents and children are not always in the same physical space, but they know more about each other's physical worlds than their digital worlds. The reason for this is that the physical world is easier to see and it is easier to take elements into a shared physical space, like taking your friends from school to play. The digital world is harder to see or to take elements from to the physical space. Therefore it is important to talk about it, however, as concluded in the previous Chapter current communication about the digital world is limited. Normalising communication about the digital world in a positive, non-judgemental way can help children to approach their parents to discuss negative digital experiences and build digital resilience.

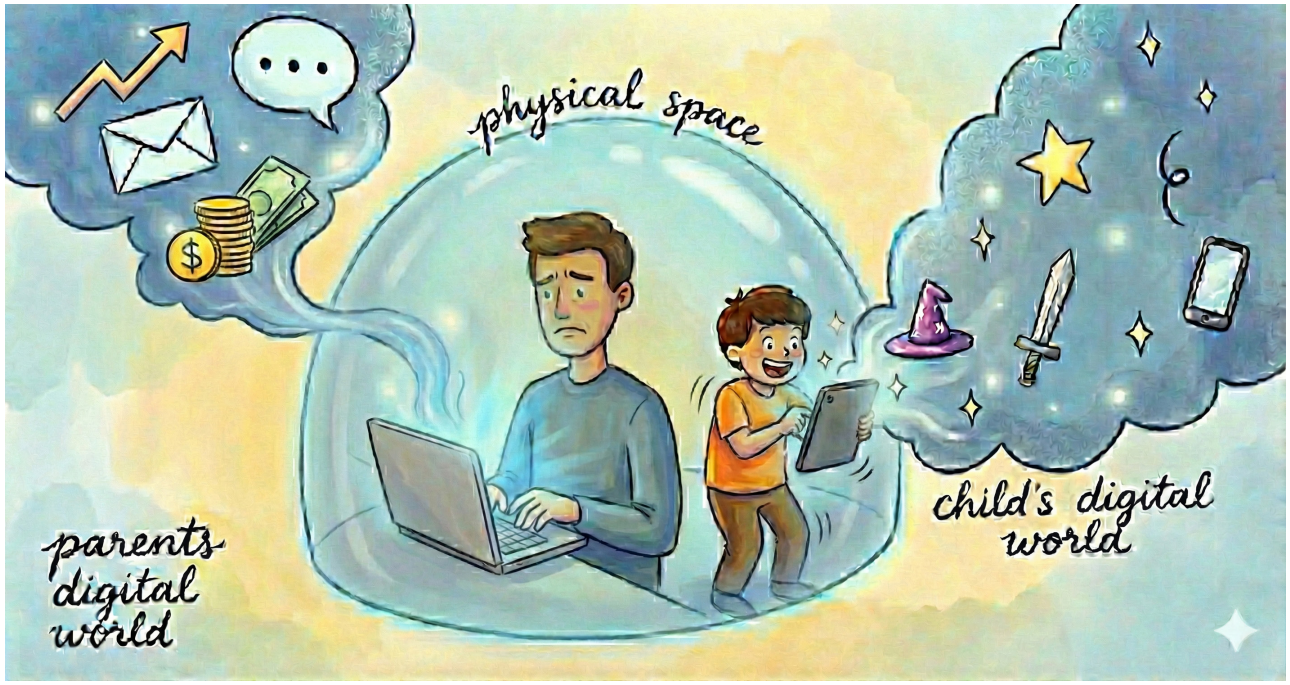


Figure 26: Visualisation of reframed problem (generated with Gemini)

Design goal

The following design goal is set up to guide the ideation phase:

The solution aims to facilitate parents and children in talking about their digital activities and experiences regularly in their daily lives in a positive way to normalise talking about the digital world and adversities by means of a tool for the physical world.

Design vision

The design vision explains the qualities of the prospective design and interaction based on a metaphor. The metaphor is a fire drill (Figure 27). In case of a fire drill people practice the procedure they would go through in case of a fire. A fire drill creates a basis of preparedness to be used in case of an emergency.

The product qualities of a fire drill are repeatability, creating understanding and practice in a safe space. A fire drill is repeated regularly when there is no fire to make sure people are up-to-date about the plan and know what to do in case of an emergency. This makes people prepared. This gives them a sense of security and trust. They see it as normal to prepare for fire because the fire drill is repeated regularly. Due to this, people perceive it as normal to stay calm and go to the meeting point, which is the interaction quality.

The prospective design should have these product and interaction qualities.

Product qualities
- Repeatability
- Up-to-date understanding
- Practice in safe space

Interaction qualities
- Preparedness
- Trust
- Normalisation

Figure 27: Fire drill (generated with Gemini)

Design mechanism

Figure 28 shows the design mechanism, this is what makes the design desirable to use. It starts with the values identified for both children and parents. Connected to those are their needs. These needs serve as motivators to use the prospective design. For parents the motivator to use the design is care for their children and therefore, wanting to understand them better. Children want approachable parents but due to their age they might not take action towards this themselves. Both parents and children like doing fun things together. Therefore, embedding talking about the digital world in a fun activity to be done together can be a motivator to use the design regularly. This can support normalisation.

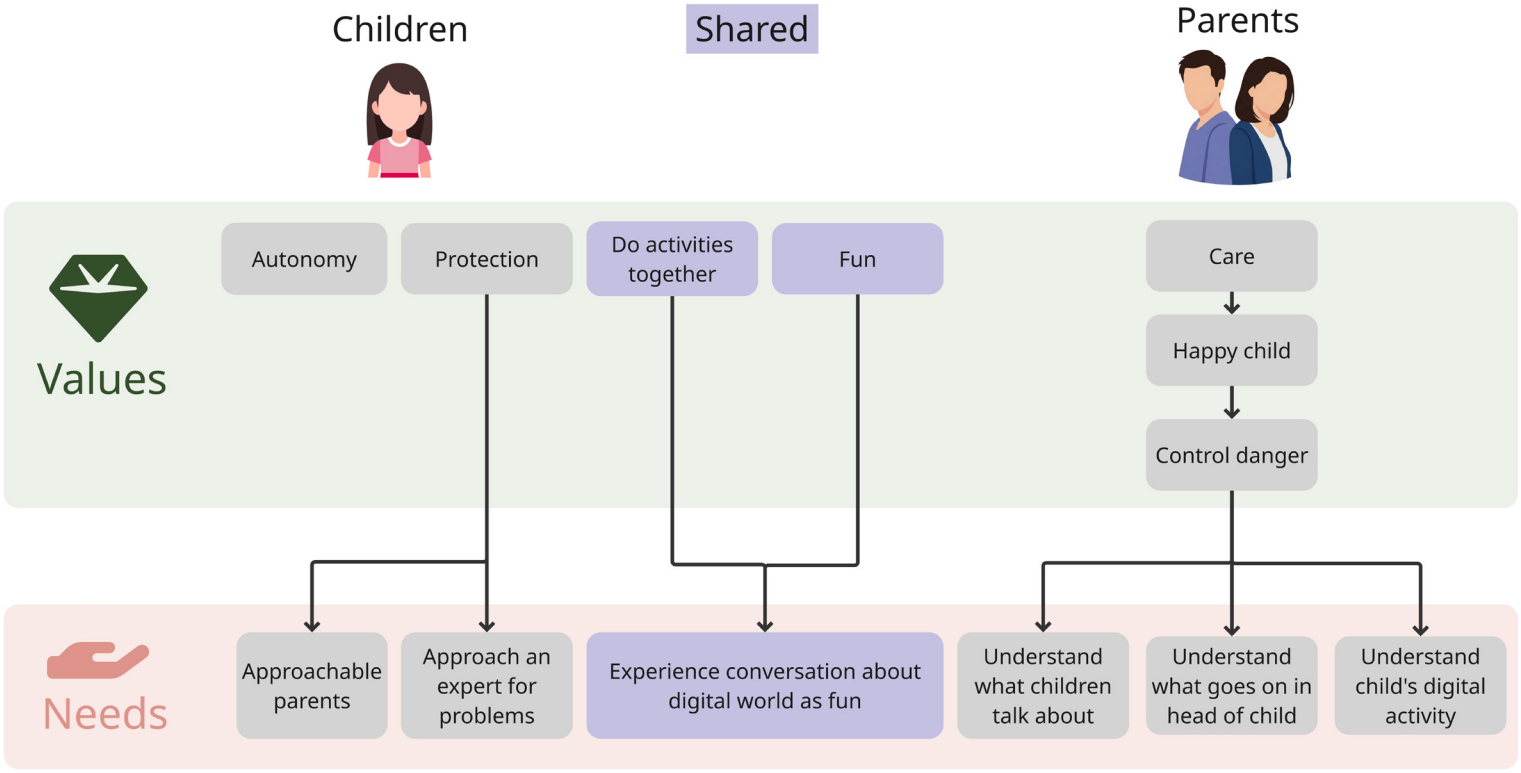


Figure 28: Design mechanism

List of requirements

A list of requirements is set up during the project. This list is based on the design goal and insights from research. The legenda shows from which research the insight originates. Wishes are in italics.

- Monimentor
- Literature review
- Expert interviews
- Generative sessions

Design goal

1. The design should facilitate communication about digital activities and experiences between parents and children.
2. The design should help normalise conversations between parents and children about negative digital experiences in the long term.

Function

3. The design should be a conversation starter for parents and children.
4. The design should help children and parents share their thoughts.

Mechanism

5. The design should be fun to use for parents and children.
6. The design should be used together as a family
7. The design should have a positive approach.

Product experience

8. The design should give children autonomy instead of feeling controlled.
9. The design should make parents and children feel like they can support each other.
10. The design should create a safe space for sharing.

Target group

11. The design should fit the target group: parents in the awareness stage, with children between 8 and 12 years old.
12. Child should have the opportunity to give his input.

Usability

13. The design should be suitable to changing age.
14. The design should be adaptable to changing digital activities and technologies.
15. The design should be low-effort to use

Context

16. The design should be used every month.
17. The design should take max 45 minutes to use
18. The design should be optional to be used, but there should be an element that reminds them to use it (evaluation)

Ease of implementation & scalability

19. The design should have the possibility to extent its influence to the community and societal level

5.2 Development

This subChapter describes how ideas are generated that could fulfill the design goal and vision according to the requirements. The process starts with ideation. Then the conceptualisation phase is described which results in three concepts that are evaluated. One concept is chosen for the detailed design phase.

5.2.1 Ideation

In this phase the goal is to generate as many ideas as possible in order explore a broad range of ideas. This subChapter describes this process and outcomes.

Ideation process

Individual sessions

Brainstorming is done in individual sessions using various design methods. First of all, throughout the whole project ideas that popped up are gathered in a notebook. Furthermore, How to's, brainstorming and brainwriting are used.

Group sessions

In addition to the individual sessions, conversations with peers, supervisors and colleagues of Monimentor sparked ideas. Next to that, a brainstorm session with the Design for health motivation group from the TU Delft is done to gain ideas from experts in a related field.

Idea directions

The ideas from the ideation phase are clustered into 5 main categories. Based on each of these themes an idea is developed (Appendix G).

1. Boundary object

Artifacts that exist fulfill a bridging function in bringing things across (Akkerman & Bakker, 2011). They make it easier for people to talk about a topic. This direction is based on this theory and existing concepts making use of this. The developed idea is a world map to track digital experiences on.

2. Learning from each other

Ideas based on the belief that parents and children can learn from each other due to the generation difference and therefore the difference in knowledge. The direction is based on peer-education mentioned in literature as having potential and learning from parents life experiences as mentioned by experts. The idea is a knowledge game.

3. Look inside someone's head

Ideas that help someone gain an insight in what someone else thinks and experiences. This direction is based on existing concepts. The idea is a diary to write down experiences.

4. Empathy experience

Ideas that make it possible to experience what another person experiences. This direction is based on existing concepts. The idea is a personal avatar showing the experience of another person.

5. Conversation starter

Tools that trigger people to start a conversation, for example by asking a question. This direction is based on existing concepts. The idea is a box with questions as conversation starter.

The results are discussed with Monimentor and my supervisors. The evaluation resulted in some key insights, requirements and ideas. Appendix G shows all of these. Based on the strengths and weaknesses of the ideas three concepts are developed.

5.2.2 Conceptualisation

Ideas from the ideation phase are turned into three concepts and evaluated. One concept is chosen to develop into detail.

Development process

Co-creation

To get a new perspective on the design challenge and inspiration to boost the existing concepts a co-creation session with 5 IDE students is executed (Figure 29). The session is facilitated by an IDE student. The session plan is based on the method used in Roadmap for creative problem solving techniques (Heijne & Van Der Meer, 2019). The session resulted in many ideas which are clustered and turned into 3 concepts. See Appendix H for session plan and results.

Key-insights

The generated concepts combined digital elements with a physical setting. Thus far, concepts were completely offline. However, to facilitate talking about the digital world, there is a lot of potential in using digital elements. It was an eye-opener that to make a prototype for the physical world does not mean it should be completely offline. On the contrary, including digital elements from a person's own digital world would make it more personal. Next to that, it provides the opportunity to stay relevant by being able to keep up with trends and change with age (requirement 13 & 14).

Concepts

Based on the ideas from the ideation phase and the insights from the co-creation session three concepts are developed using various brainstorming techniques. These three concepts are discussed with Monimentor. Based on this an iteration of the three concepts is done (Appendix I for concepts evaluation and iterations). The three new concepts are presented on the next page.

Figure 29: Co-creation session

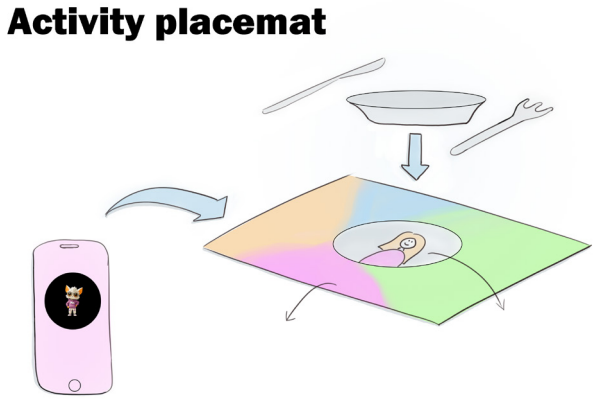


Figure 30: Concept 1: Activity placemat

Figure 30 shows concept 1 the ‘activity placemat’. This is an interactive placemat used during dinner. Each family member has their own placemat. Based on the data collected by the Monimentor app the placemat gives a visual representation of how time is spent throughout the day. This serves as a visual cue to ask questions to family members about their screen use.

User value

Personal data gives insight and serves as a conversation starter in an already existing ritual. As the data does the analysis, the design is low-effort to use.

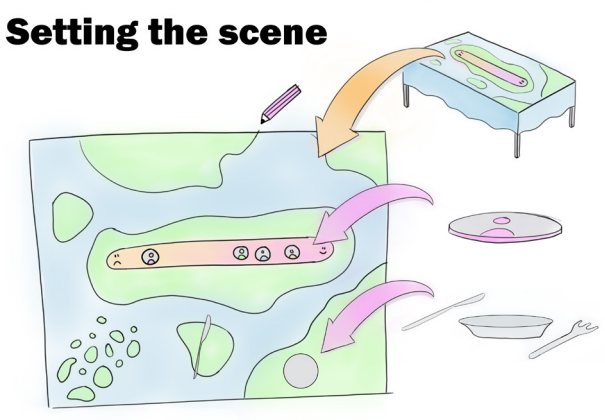


Figure 31: Concept 2: Setting the scene

Figure 31 shows ‘setting the scene’. This concept is a table cloth serving as a conversation starter. Children set the table on the cloth according to their experience of the digital world. When dinner starts the table should be rearranged by asking for plates, knives etc. This evokes questions about why object are placed at a certain positions.

User value

The concept is a conversation starter by doing a funny activity before an already existing ritual, serving as motivator and reminder to use it.

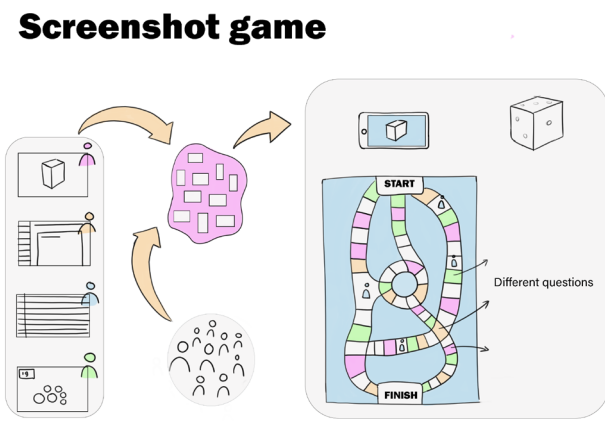


Figure 32: Concept 3: Screenshot game

The ‘screenshot game’, uses screenshots of every family member as input for the game (Figure 32). Players answer questions about the screenshots to earn points. This way, both parents and children gain insight into what each other digital activities. This can trigger questions and thus conversation.

User value

Personal screenshots show a literal representation of each other’s digital worlds and can serve as a conversation starter. Talking motivated by game elements can help to keep using the design.

Concept evaluation

A harris profile is made for the 3 concepts (Appendix I). This is done to facilitate comparing the concepts based on the requirements. Next to that, the concepts are discussed with Monimentor and my supervisors. This resulted in an overview of the limitations, strengths, questions (How to's) and suggestions for each concept. All insights from both making the harris profile and the evaluation are gathered in Figure 33.

Based on the insights concept 3 'the screenshot game' is chosen to continue with. This concept has the most potential to fulfill the design goal for several reasons. First of all, compared to the other concepts it is explicit about the digital world because it shows screenshots. This is presumably easier for children to start a conversation with. Next to that, it is personal, making it adaptable to each person's own experience, fitting Monimentor's belief in personalisation (Chapter 2). Furthermore, conversation is embedded in a fun activity, which fits the design mechanism (Chapter 5.1). Moreover, due to the constant updating of screenshots the game stays relevant. It is possible to keep up with technology, trends and change with age (Requirement 13 & 14). This changeability provides potential to keep being used (Requirement 15). Lastly, the concept provides an opportunity to extent to a bigger community and therefore as Monimentor have a bigger influence in the system (Requirement 18).

The biggest challenge in this concept is dealing with privacy and feasibility of taking screenshots. However after research (Appendix J) it is concluded that most of children's screen activity can be screenshotted. Privacy can be ensured by asking permission from players. Regarding the third concern, it is assumed parents are probably willing to share screenshots for this intended positive goal.

	Activity placemat	Setting the scene	Screenshot game
Limitations	- Limited change in input - Prone to being forgotten	- Prone to chaos - Prone to being forgotten - Food goes cold	- Taking screenshots can be invasive - Uncertainty in willingness to share screenshots - Not all streamingservices allow screenshots
Strength	- Limited change in input - Prone to being forgotten	- Low-cost - Easy to make (no electronics) - Fun - Use when wanted - Makes children enthusiastic about setting the table	- Game element is fun - Feasible to keep up to date - Possibility to extend influence to larger community - Personal screenshots have potential to open conversations about personal experiences - Possibility to stir the conversation - Screenshots serve as reminder to play - Fun for all age groups
How to?	- Transfer data to placemat - Manufacturing for convenient use - Keep it low cost - Working of interaction	- Keep using	- Create willingness to share screenshots

Figure 33: Overview of concept evaluation

5.2.3 Design detailing

This Chapter describes how the chosen concept is detailed. First, some background needed to detail the concept is explained. Based on this an iterative approach is used in which lo-fi prototypes are quickly developed, tested and analysed. At the end a hi-fi prototype is developed.

Background

First, theory about game design is covered. Next to that, theory about the previously established problem is explored to ground the ideas in scientific knowledge. In addition, two experts are interviewed. Both have experience with talking with children about difficult situations. The first one is a psychomotor therapist. Here physical exercise is used in therapy with children. The second interview is done with someone who does sessions with children and teenagers about difficult topics.

Games for behaviour change

Persuasive games are games that transport users' experiences in the real world to a motivational game world. This facilitates players a realisation of transfer effect in the actual world (Siriaraya et al. 2018). Siriaraya et al. (2018) propose a method to design persuasive games, called a cookbook. The design process consists out of 4 dishes (steps):

1. *Transfer effect:* aimed for effect. It is often more educational. The fun part of the game is the motivation for the player to play the game.
2. *User's world*
3. *Game design*
4. *Evaluation*

For each dish the method provides ingredients (components) and utensils (tools).

Game elements

A commonly used theory to understand how games are built up and where design is therefore based on, is the MDA framework. It breaks down a game in three components, three ways of looking at the game:

1. *Mechanics:* components of the game, like rules and actions. They form the dynamics
2. *Dynamics:* behavior of the mechanics over time responding to players inputs and each other outputs. They create the aesthetic experience.
3. *Aesthetics:* desirable emotional response of a player, the reason players find the game fun to play.

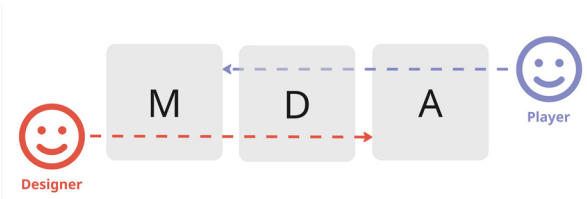


Figure 34: MDA framework. Style adapted from (Hunicke et al., 2004)

The interaction of the three components can be seen in Figure 34 (Hunicke et al., 2004).

Characteristics of a children's game

After analysing various board games and talking to children and fathers some important characteristics of family games are discovered. Children like games with an appealing storyline. Also bringing the story to life with 3D elements is appreciated. Regarding the game mechanics, games rely more on luck than strategy to give everyone an equal chance. Lastly, children like to have funny elements in the game. A parent's reason for playing is mostly doing something fun with the child and their requirements to the game are low.

Parents attitude in conversation about the digital world

The following characteristics are found to be important for parents in talking with their children about the digital world:

- Positivity
- Interest
- Supportive
- Warmth
- Attention
- Non-judgemental
- Involved
- Trust (in choices)
- Be right role model (sticking to rules and giving attention)

(Koning et al, 2025)

From the second interview additional to this is the fact that being vulnerable can help. Parents can share with their children that they do not know something. Children often find it fun to explain.

Motivational interviewing is a method used to help patients adopt positive lifestyle behaviors. The first step of this method is engaging. Here the OARS method is used to ensure empathic communication and therefore foster trust and rapport. The four letters in OARS stand for the four core skills:

O Open questions
→ promote trust to enhance communication
A Affirmations
→ validate positive attributes
R Reflections
→ demonstrate active listening and invite exploration
S Summaries
→ bundle conclusions and reflections
(Cole et al., 2023)

Talking with children about difficult experiences

A key insight from the first interview is that it helps to do something together when talking about difficult experiences, because it is easier when people do not look each other in the eye. Next to that, it helps to seek connection via a relaxed atmosphere, for example by having fun together. Lastly, it is important that the child is willing to collaborate and the parent is prepared to have the right mindset.

From the second interview it appeared important to start with a bond, with building trust, because only then will people share certain information. Furthermore, talking is good, but doing is necessary. This can be done for example by discussing scenarios. Next to this, as also mentioned by the therapist it is important to establish behaviour rules beforehand. Next to that, it is important to not make it a big thing, out of nowhere. It is better to create a safe situation, for example while doing something fun and keep it short.

Process

To develop the persuasive game the cookbook method is followed. This Chapter describes this process.

1. Transfer effect

The determined transfer effect is shown in Figure 35. It is based on the research and the subsequent design goal.

Effect type:
Parents and children start talking about their digital activities and experiences which in the long-term encourages talking about digital adversities.

Change type: Encourage new behaviour.

Domain: Home family context

Point of impact:
1x play: Players are aware that talking about the digital world is fun and insightful
4x play: Players have built a shared understanding needed to have fun conversations about the digital world. This has created a more realistic image of each other's screen use. They start to experience talking about the digital world as normal.
8x play: Players have also talked about negative experiences in the game. The safe space and trust established in the game can be used in the real world as well.

Figure 35:Transfer effect

2. User's world

The user's world is investigated and described in Chapter 3. More insights are gained through testing the different prototypes.

3. Game design

To get inspiration for the game design existing games are analysed and played. The different elements are written on post-its and clustered. This serves as help to create various concepts. Based on the requirements one concept is chosen. A quick iterative approach is taken to incorporate insights and feedback quickly. This is suitable as predicting dynamics is hard and it is easier to test it.

4. Quick prototyping & testing

Nine lo-fi prototypes are developed and tested. Appendix K shows these and the main insights of the tests. During the tests with families they were also asked to give design input for the game. Due to availability and limited time, tests of game mechanics were mostly done with peers.

5. Hi-fi prototyping

Once the lo-fi prototype reached a sufficient level, a hi-fi prototype is developed using 3D printing techniques and graphic design for all other elements. This will be presented in Chapter 5.3.

Key insights

Along the process the theory and iterations gave insights into key-insights for the game.

Mechanics

- The game should be played individually allowing there to be a winner.
- Blocking mechanisms should come from the game and not from individual players to prevent quarrels
- There should be a clear ending and thus goal of the game.
- The game should be simple to explain (max 10 min) (Requirement 16)

Dynamics

- A player of every age should be able to win to keep it fun

Aesthetics

- It should facilitate an atmosphere for sharing (Requirement 1)

Look

- Should have an appealing storyline
- 3D elements (analysis of games)
- Should feel as a whole with the Monimentor app

5.3 Final design: Cloud surfers

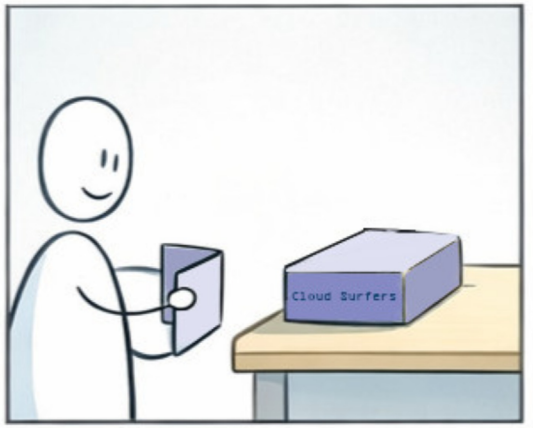
Figure 36:Cloud Surfers box

This subchapter describes the final design of the persuasive game: Cloud Surfers. It is a game that facilitates conversations about experiences of the digital world between parents and children.

5.3.1 Scenario of use

The scenario in Figure 37 describes how the design is used by a family.

Mom sees she can buy Cloud Surfers in addition to the Monimentor app. She thinks it might be useful and buys it.

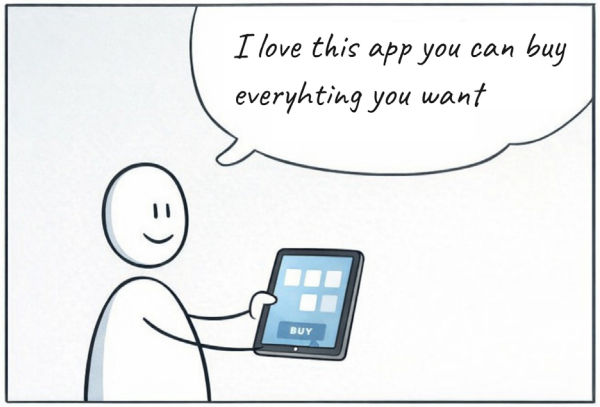


She receives the game and reads the guidebook for parents which explains her the aim of the game and advices for parents

She unlocks the game function of the Monimentor app by filling in the code she received in the guidebook.

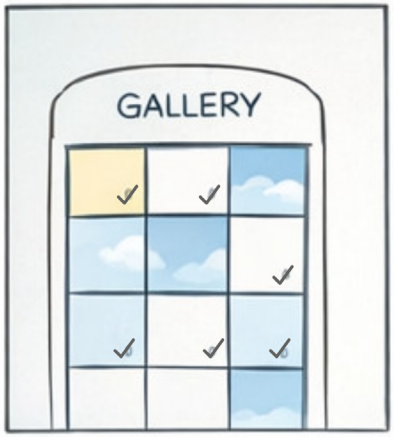
All family members follow the onboarding in the app, which explains them how to take screenshots during their screen use.

Each week the Monimentor app gives them a task to take screenshots off.

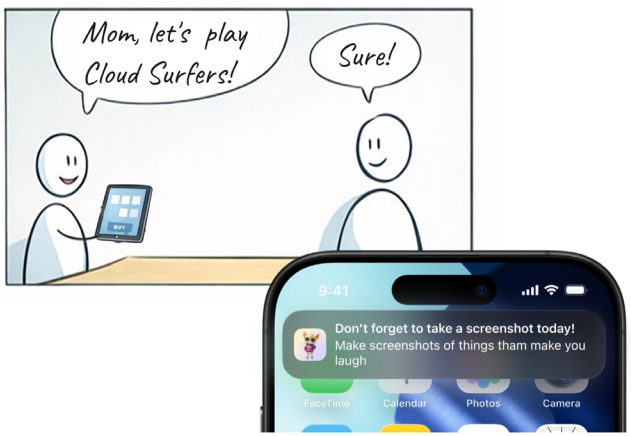


It makes them think more conciously about their screen use.

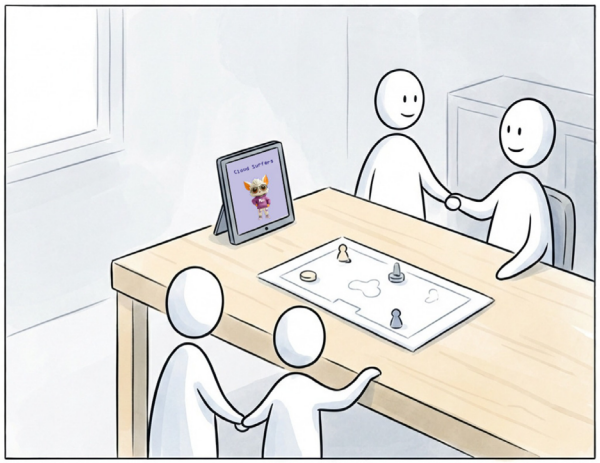
Figure 37: Scenario of use Cloud Surfers



They choose themselves which screenshots they upload to the family time capsule. This is where the Monimentor app stores all screenshots.



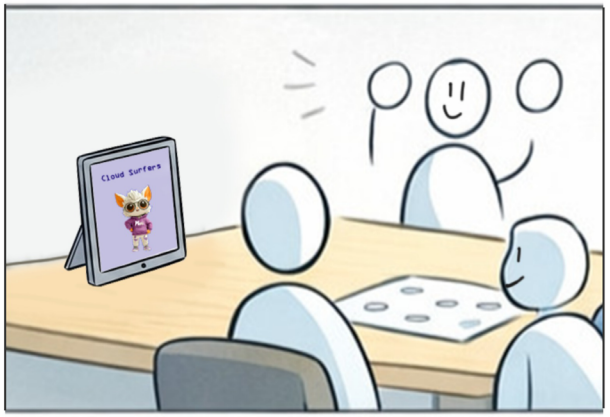
Receiving the notifications reminds them to play Cloud Surfers.



Moni introduces the game and explains the rules. Before the start Moni asks them to agree on a positive, open and curious mindset by shaking hands.

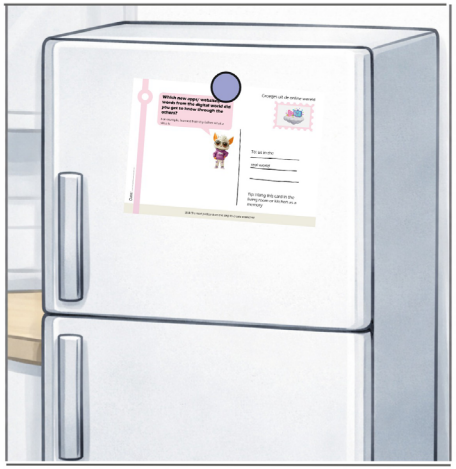
In the game they see each others screenshots and answer questions about it.

In a fun way they learn what kind of activities every family member does. It also opens conversation about their experiences.

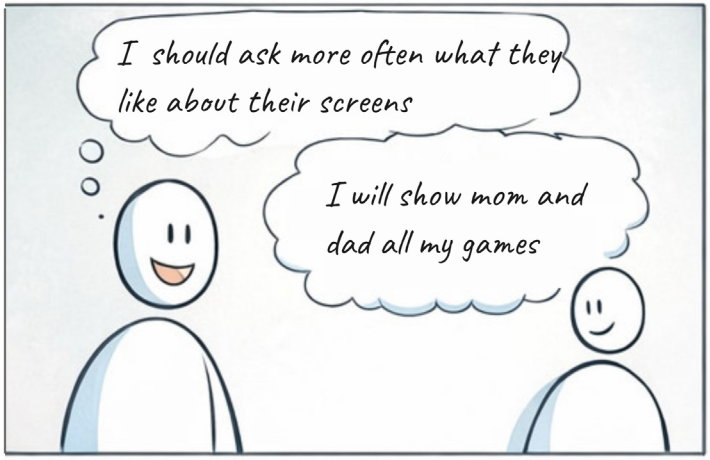


At the end of the game the app guides them through the score counting and the player with the most points wins.

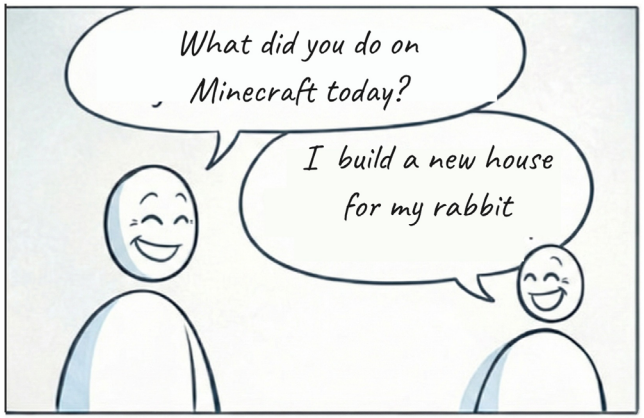
Moni asks them to write a postcard with their experiences from the game, guided by reflective questions.



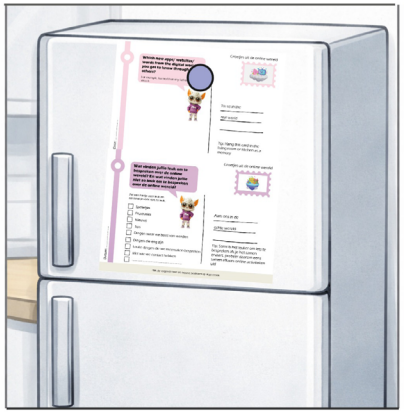
They put the postcard on the fridge. It reminds them of what they have learned.



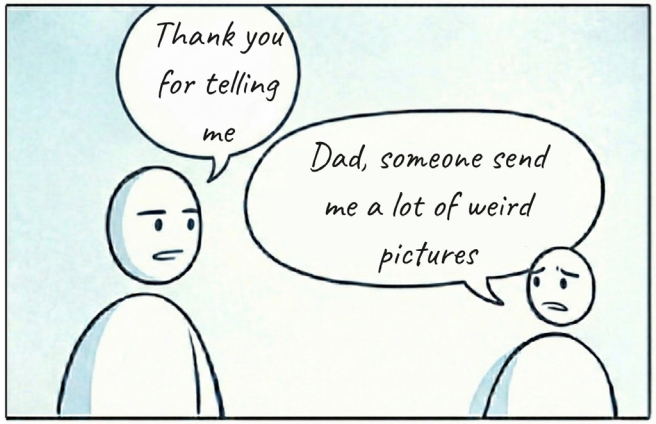
Parents and children have created a shared understanding of their digital world, gotten a more realistic image of each others online worlds and build trust in the game



This serves as a foundation to talk about their (negative) online experiences in their daily lives.



The next time they play they update their foundation. They write a different postcard with deeper reflective questions to add to their timeline.



Due to their regular practice in their daily lives and in the game children and parents can more easily approach each other in cases of a negative experience.

5.3.2 Cloud Surfers game

The design consists of four main parts. The first part is the guidebook for parents. The second part is the onboarding in the Monimentor app which is used once by every family member at the start of use. The third part is a task system in the app that guides people to take screenshots during their screen use. The last touchpoint is the game which is a combination of a physical board and a game function in the Monimentor app. The game function consists of three parts. Figure 40 shows the touchpoints and how they are used over time.

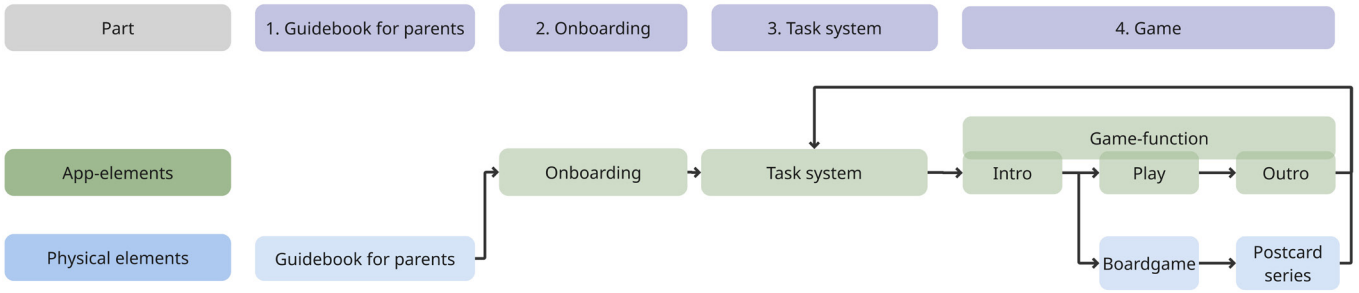


Figure 40: Touchpoint use over time

Part 1: Guidebook for parents

When parents receive the game it includes a short guide for parents. It explains the goal of the game, the influence over time and tips about approaching conversations with their children (Figure 38 for looks and Appendix L for readibility).

Figure 38: Guidebook for parents

Part 2: The onboarding

The parents guidebook also includes a code to unlock the game function in the Monimentor app where all family members go through an onboarding flow. The flow explains how to collect screenshots and for what purpose. Figure 39, the QR code and Appendix M shows the onboarding.

Click here or scan the QR code for the onboarding flow.

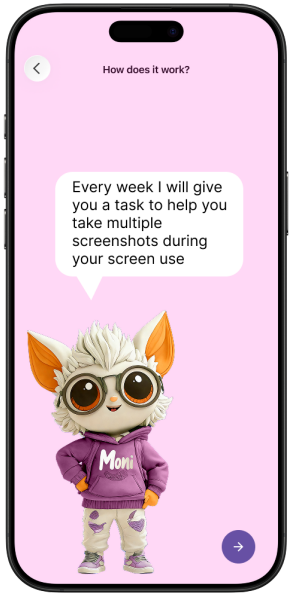


Figure 39: Example frame from onboarding

Part 3: Task system

The task system aims to help family members collect screenshots. Each week a new task is posed to them. The family members receive a different task in the same week. A difference in task can facilitate conversation. The aim of the question is to stimulate parents and children to think about their screen use and to gather various screenshots as input for the game. Figure 41 shows the questions. When all questions are used they are repeated.

Tasks

Make screenshots of things that:

- made you laugh
- apps you like to use
- make you sad
- taught you something new
- apps you do not like to use
- made you happy
- websites you do not like to use
- apps or websites you used for the first time
- made you angry
- gave you new ideas
- websites you like to use
- scared you

Figure 41: Tasks in task system

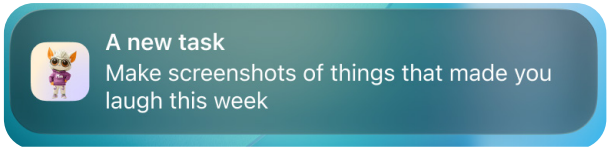


Figure 42: New task notification

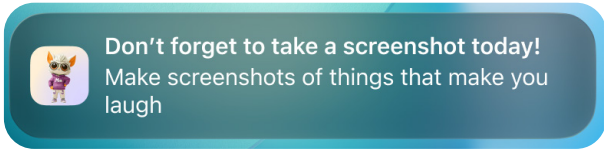


Figure 43: Reminder notification

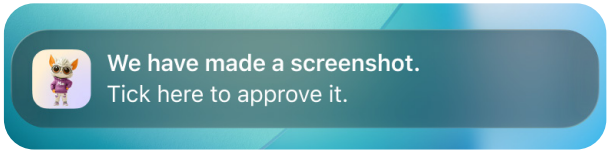


Figure 44: Automatic screenshot notification

Every Monday, the task changes. This is shown by sending a notification the first moment of screen use of the week (Figure 42).

The task can also be found in the Monimentor app to look back to in case someone has forgotten the question (Figure 43).

When people forget to take screenshots a reminder will be sent to them (Figure 44).
In the gallery app they can upload the screenshot to Monimentor's time capsule, where they are stored. For people who still forget to take screenshots an automatic screenshot will be made and people are asked whether to keep or delete it (Figure 45).

Figure 45: Task in Monimentor app

The screenshot can be taken with the screenshot function of the device or with the camera of the device in case of a television. Lastly, the Monimentor app removes the top bar from each screenshot in the time capsule to make it unidentifiable which kind of device has taken the screenshot.

Part 4: Game

Storyline

The storyline of the game is based on the metaphor of going on holiday. Together the family travels to the digital world through a portal. Here they explore different clouds where they collect souvenirs. Along the way they come across challenges with which they can earn stamps for their passport. Exploring this digital world is fun, but they have to make sure they are back at the portal before screen time (7 rounds) is over or they will get minus points. The player with the most souvenirs and stamps wins and is the best explorer.

Use

The game consists of three phases each with their own goal (Figure 46). The game consists of a physical board game and a guiding function in the Monimentor app.

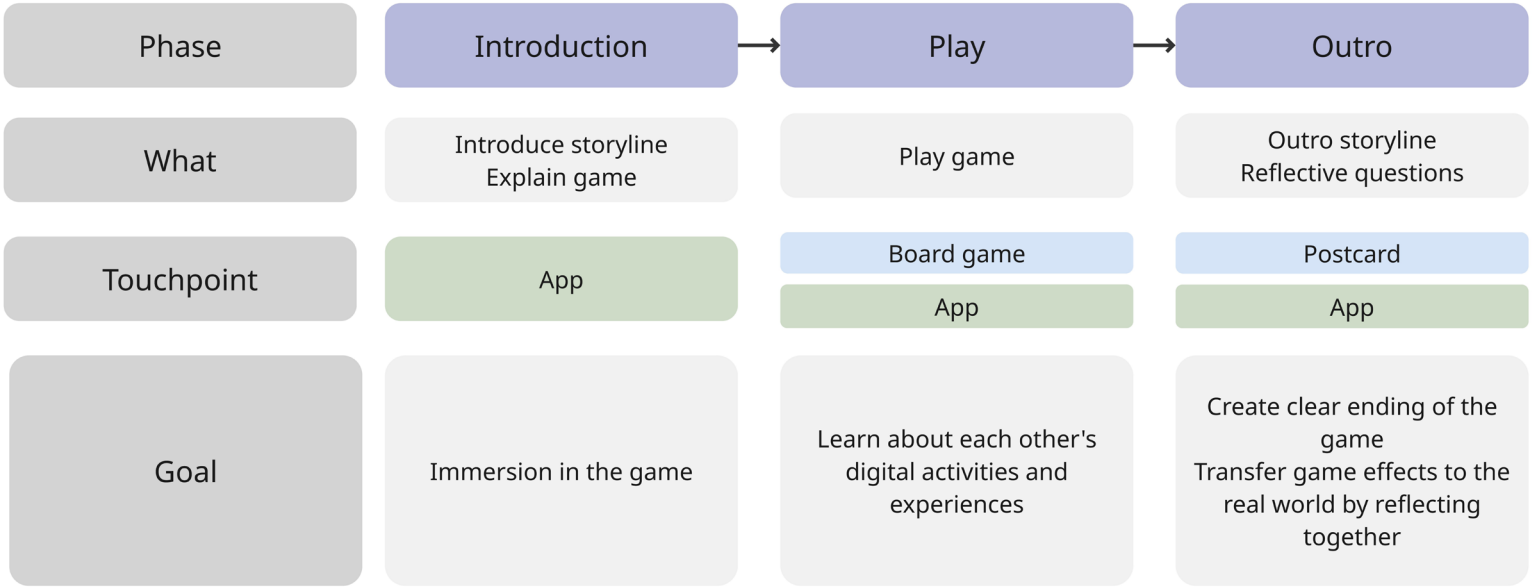


Figure 46: Three phases of the game

Introduction to the game
The game is started in the Monimentor app. Moni guides the family through the story of the game and explains how the game works to immerse the players in the story. The introduction ends with an explanation video. Figure 47, QR code and Appendix N

Figure 47: Part of introduction to the game

Figure 48: Boardgame

Click here or scan the QR code for the prototype of Moni's guidance (introduction and outro)

Play
Figure 48 shows the complete board game.

Mechanics
Players take turns throwing the dice. They take the amount of steps on the board. When ending on a cloud they receive a souvenir (Figure 49). When ending on a coloured square they tick the matching square in the app (Figure 51).

A screenshot appears with a question depending on the colour of the square (Figure 50 & 52). The player who made the screenshot determines whether the answer is right. In case of a correct answer the player earns a stamp for his passport (Figure 53.

Players can also end on one of the squares in Figure 54. When players get to see their own screenshot or when they end up on a cloud, they move one of the two scroll buttons (indicated with the red arrow in Figure 55). This changes certain squares in the playing field, just like the digital world continuously changes. This works with a mechanism of gears also shown in Figure 55. See Appendix O for all rules of the game.

Click here or scan the QR code for the prototype of the game

Figure 49: Souvenirs

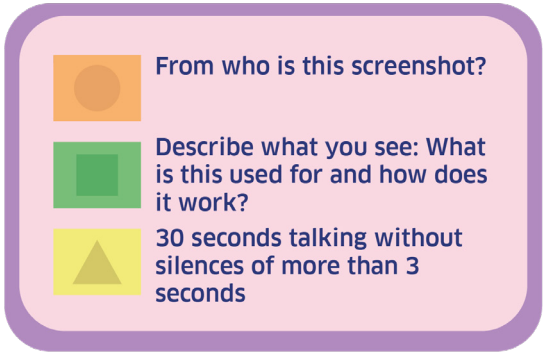


Figure 50: Kinds of questions

Figure 51: Tick coloured square in the app

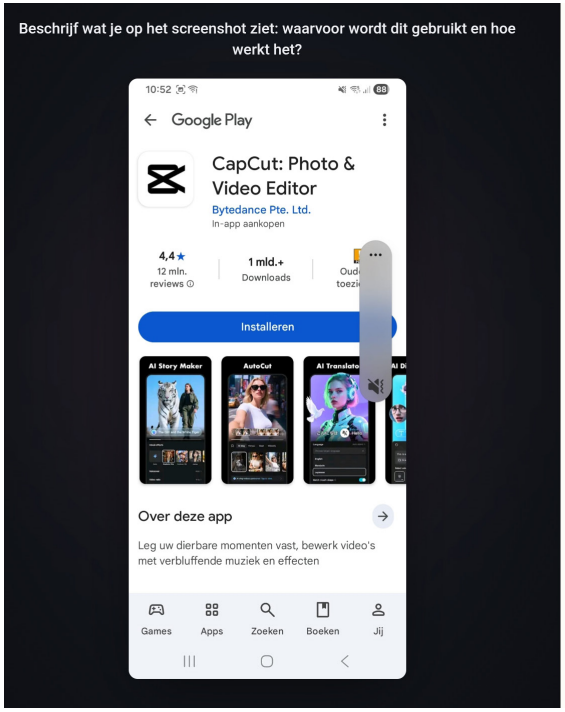


Figure 52: Random screenshot with green question

Dynamics
In a game bad luck elements are essential. These are created by throwing the dice, changing squares with the gears and the difficulty of a received screenshot.

Aesthetics
Based on the MDA-framework several types of fun can be found in this game. There is a challenge to gather points. There is a fellowship element of sharing a digital experience and talking about it. This may also lead to expression, as reflecting together may lead to self-discovery. Next to that, it evokes a sense of discovery as players discover the digital world and each other's experiences.

Figure 53: Player putting earned stamp on passport

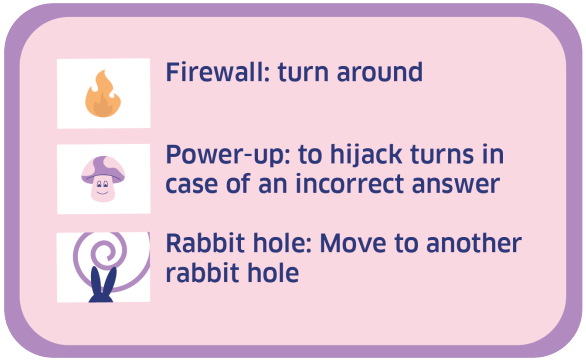


Figure 54: Additional rules

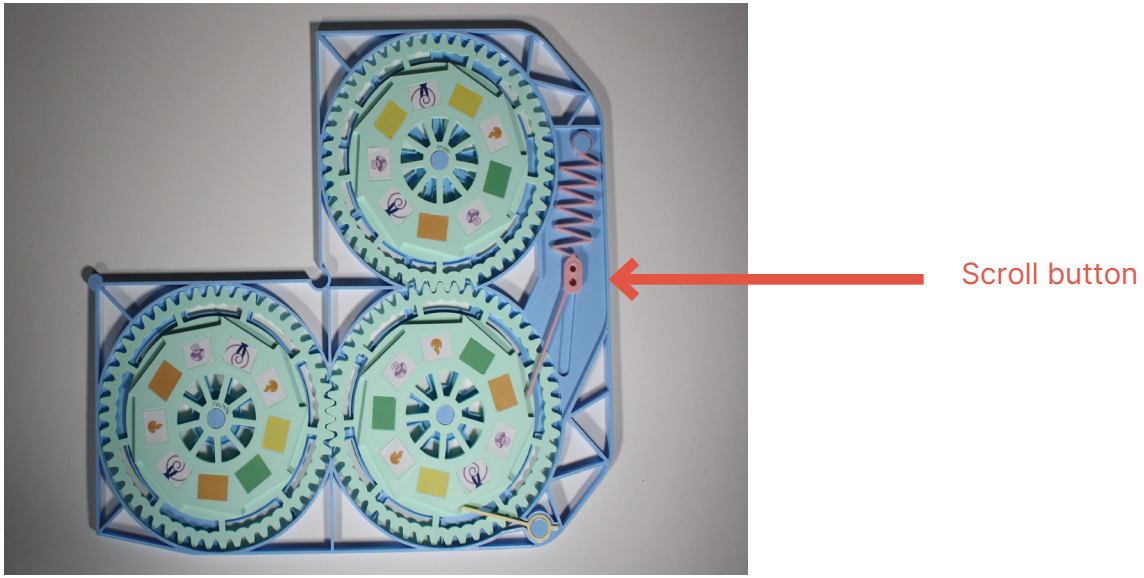


Figure 55: Scroll button mechanism

Outro

When players have played 7 rounds the game is finished. In the app they click on the button ‘end of game’. Moni guides them through the score counting (See QR code or Appendix P). After this he asks the winner of the game to take a postcard from the stack and a pen (Figure 56). Moni asks the family to dicuss their experiences in the game, based on a reflective question on the postcard. Each time the game is played a different question is posed. The questions build up in depth moving from questions about shared understanding, to change of image and trust. See Appendix Q for the complete postcard series.

Click here or scan the QR code for the prototype of Moni's guidance (introduction and outro)

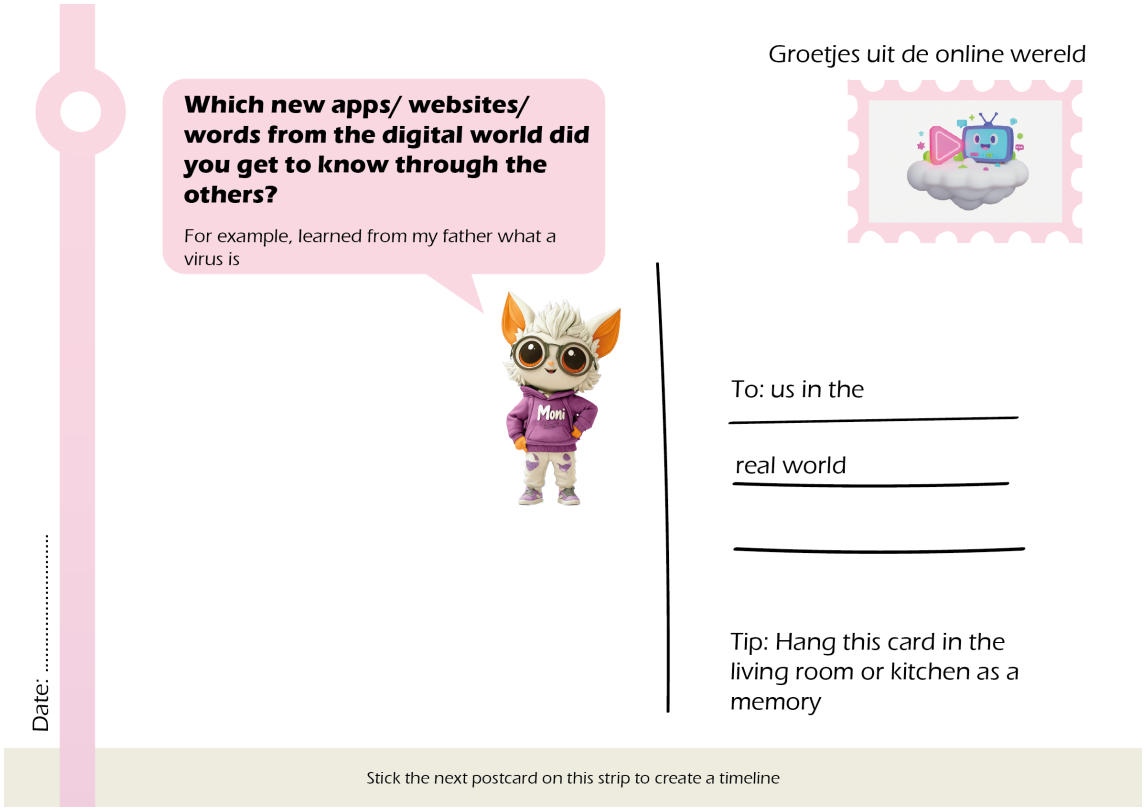


Figure 56: First postcard

The postcards are bundled in this specific order (Figure 57). The postcard can be hung up in the living room or kitchen as a reminder. The cards can be attached to each other to form a timeline (Figure 58). The aim of the postcards is to reflect on the game experience and transfer the in game effects to the real world. Lastly, Moni ends the story by bringing players back to the real world (Figure 59).

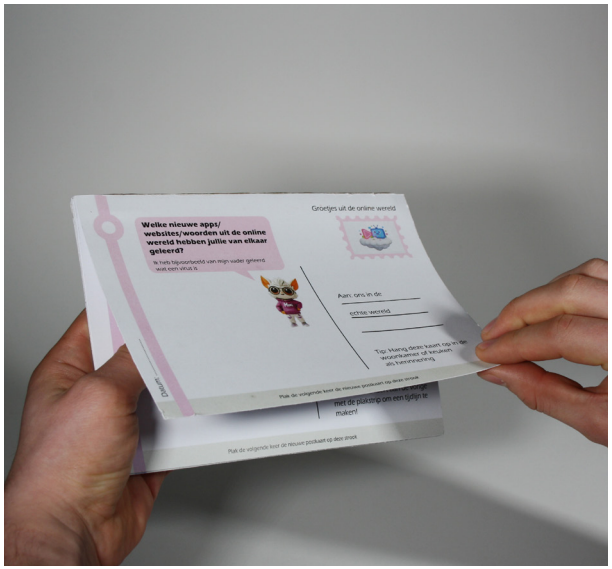


Figure 57: Bundle of postcards

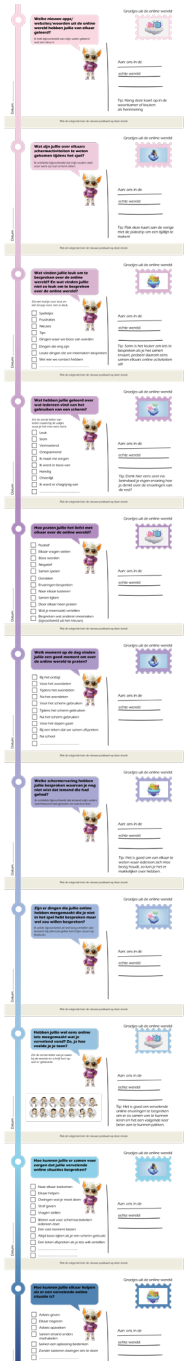
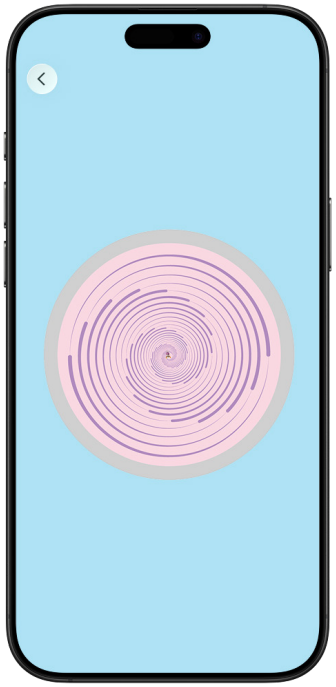


Figure 58: Postcard timeline

They travel back through the portal to the real world

Figure 59: Return to real world



5.3.3 User journey

During the game families build a shared understanding leading to a more realistic image of each others screen use and trust. In the after-game they reflect on theis in order to transfer the effects to the real world. This serves as a foundation to practice talking about the digital world. By normalising conversation, the foundation developed can be applied by a parent or a child when a digital adversity is encountered. Figure 60 explains the complete user journey.

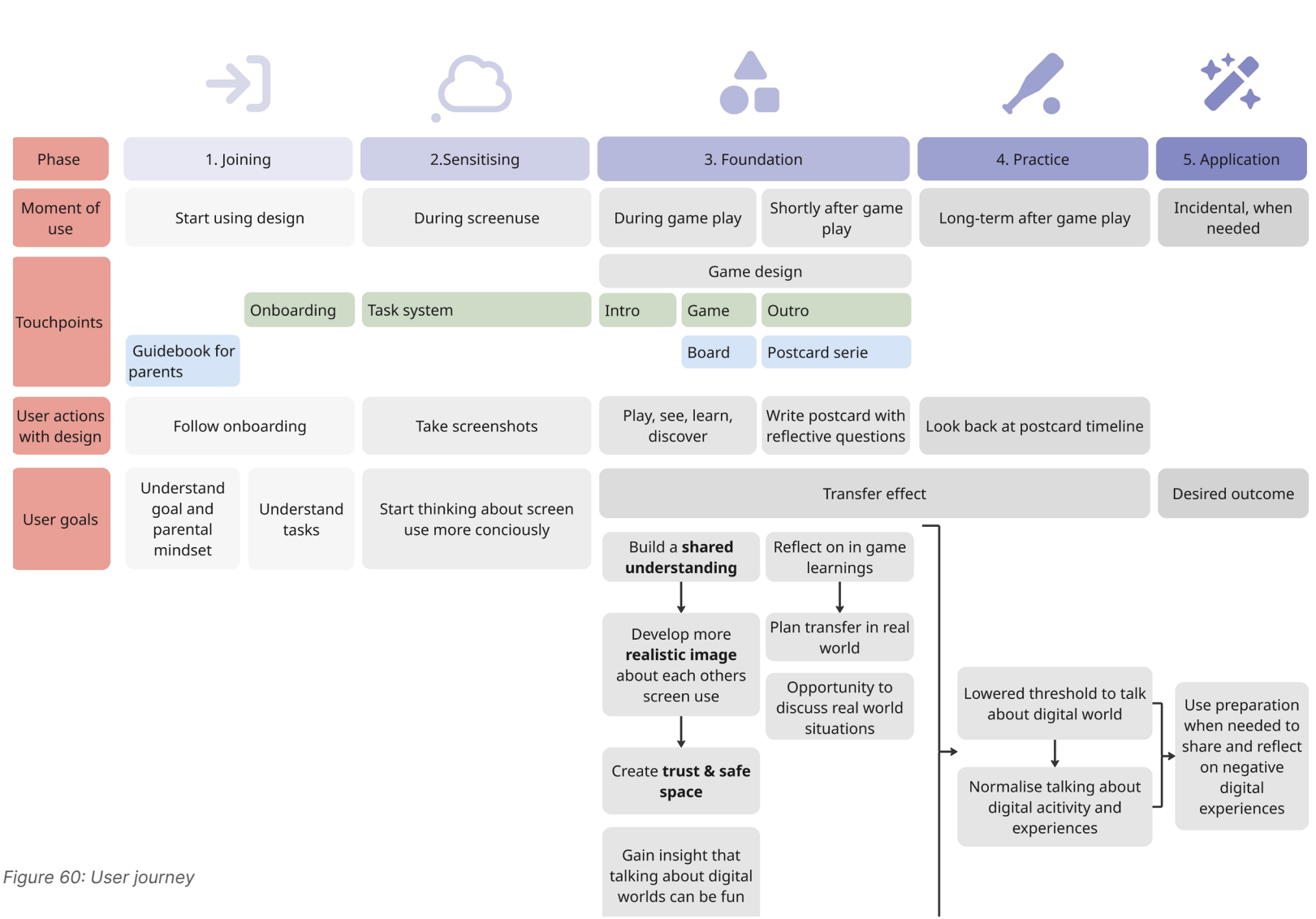


Figure 60: User journey

5.3.4 Design choices

This subChapter explains the reasoning behind the most important choices in the design

Establishing the mindset

Expert interviews highlighted the importance of establishing a shared mindset before starting the game (Chapter 5.3.2). Therefore, the introduction in the app includes a dedicated step where parents and children formalize this mindset. Moni offers a suggestion (be positive and ask each other questions) and then asks the players to give an high-five to seal their agreement. This suggested mindset is based on the insight of Chapter 5.3.2.

Questions

The game includes three different kinds of questions. These are chosen after ideating on possible questions and evaluating them in different versions of the game. Challenges, questions and scenarios are considered. However, it is chosen to only incorporate questions based on screenshots to ensure gathering the input stays clear and low-effort (Requirement 14). In this way, players only have to give screenshots as input and Monimentor also does not have to give additional input. Next to that, the chosen questions are found to work best in the game mechanics and fit best to the transfer effect.

Storyline

A metaphor of travelling is used because metaphors can help children understand and learn new concepts (Vosniadou, 1987).

Mechanics

To limit the time spent on a game and therefore increase the likelihood of repetition (Requirement 16), a game with limited rules and options is created. Also steps are built on already familiar elements to decrease learning time (like fire and power-ups). Lastly the gear mechanism and input of screenshots ensures variation with through minimal effort (Requirement 15).

Dynamics

The game can be won by any player as the game combines elements of strategy (turning the wheel, power-ups, preventing firewalls and using rabbit holes), luck (dice and turning the wheels) and knowledge (screenshots) (Requirement 5).

Look

For the look a representation of the digital world is chosen to make the digital world come to life in a shared physical space. The digital world is often visualised as something in the sky. Therefore, a cloud theme with matching colours is chosen. Each cloud has a theme associated with digital activities done by parents and children according to the generative research (Chapter 4.2.3).

Game world to real world

The first step (dish) of the cookbook for persuasive game design is establishing the transfer effect. The transfer effect is determined in Chapter 5.2. The goal is to encourage talking about the digital world which in the long-term encourages talking about negative adversities.

During the game players see each other's screenshots and answer questions about them. In this way they learn what kind of screen activities everyone does and the accompanying vocabulary. Seeing the screenshots and hearing the answers, gives players an incentive to be curious and ask each other questions, like 'why did you choose this screenshot?'. This encourages conversation among others about experiences. This creates a shared understanding between parents and children. This can lead to a more realistic image of each others screen use. They also gain an insight that it is normal to talk about the digital world. Lastly, trust is developed as they have a more realitic image and in the game they can safely discuss their experiences, due to the fun activity and pre-defined mindset.

After the game players are helped to transfer these effects to the real world by reflecting on their experience together with the use of a postcard. The cards are bundled in a booklet so that they are used in a predetermined order. The questions increase in depth in correspondance with the determind transfer effects. They begin with the topic shared understanding, moving to change of image, and finally, trust. The cards have open space to give possibility for own input, as was deemed important in the literature. This physical element can be kept in the shared space to remind the whole family of what is learned. Moni also summarises the key take-aways from the game at the end.

Shortly after play, the play may raise more questions. Family members can now use the mindset, understanding and trust developed in the game. In the long-term this helps to talk about negative digital experiences as family members have normalised talking about this topic.

Contribution to digital resilience

The design helps in all four elements of digital resilience defined by the UK Council for Online Safety (n.d.). Screenshots open conversation about activities and experiences. This provides opportunity to learn from them to adapt future choices. Building trust and safe space in the game teaches children how to seek help and recover from digital harm by receiving support.

Unique Selling Points

Based on a market analysis the USP's of Cloud Surfers are identified.

- **Family approach:** the game is played with the whole family.
- **Personalised:** By using screenshots of each family member's digital activities the game creates a personalised experience.
- **Repeatable:** The continuous addition of screenshots keeps the game interesting and makes it attractive to keep playing the game over time.
- **Combining digital and physical:** Physical and digital elements are combined to be used in the physical world.

6

Evaluation

In the previous Chapter the final design of Cloud Surfers is explained.

This Chapter evaluates the developed prototype on usability, experience, shared understanding, change of image and trust. With this it aims to find out to what extent the design goal is reached with the Cloud Surfers game. Based on the insight from the evaluation and insights from the project the Chapter ends with recommendations for Monimentor.

6.1 Evaluation study

Research aim

The aim of the evaluation is to evaluate the usability, play experience and extent to which a shared understanding, change of image and trust is created.

Method

Participants

Purposive sampling was used to gather participants. The screening criteria were: participants are a Dutch family with at least 2 children between 8 and 12 years old. Acquaintances within the screening criteria were contacted through an information letter, explaining the goal and expectations of participation.
4 families participated in an evaluation session. In total 8 children and 6 parents participated. Appendix R shows the composition of the family and whether they played the game before. It was chosen to test with one family that played the game before to gain insight on the effects of playing the game a second time. Due to limited availability of parents two families participated with one parent.

Procedure

In the two weeks before the evaluation participants were asked to gather 7 screenshots based on a task per week. The tasks were designed to closely mimic the task system of the actual app. Every week participants got a task via the contact person (one of the parents). Half way through the week a reminder was sent. The tasks were:

1. Make screenshots of apps and websites that you like to use
2. Make screenshots of things that you encountered during screen use which gave you a negative feeling (sad, mad, grumpy, etc.).

As participant did not do the onboarding and there was less time than normally the task were adapted slightly to ease collection of screenshots.

The evaluation was further prepared by the researcher by uploading the screenshots in the app and sending the guidebook for parents to the parents.

During the evaluation participants were asked to play the game as if they had just bought it. Therefore, they had to act as if the researcher was not there. During the game observations were written down. After playing the game, an interview and questionnaire followed (Appendix R).

The observations, interview and questionnaire aimed to evaluate the following topics:

- Usability
- Experience
- Transfer effect: Shared understanding, change of image and trust

A pilot was first done with peers to practice. Minor modifications were done to the questionnaire. The first evaluation was used to modify the questionnaires to children's capabilities. The amount of and difficulty of questions is therefore kept at a minimum. Words were simplified. During the process some questions were added to the questionnaire.

The interview and observation data was analysed and clustered into themes. The questionnaire data was visualised to be interpreted.

Materials

Prior to the test one of the parents received the guidebook for parents digitally and the assignment to collect screenshots. The personal screenshots were uploaded in the app on the researcher's tablet. During the evaluation participants received the box with the game and the tablet for the app-prototype.

Results

Observations

Struggles with board

When preparing the game it could be seen that many participants struggled slightly with placing the clouds. In 2 of the 4 tests there was confusion on whether a coloured square on a cloud was also providing a souvenir. Some participants struggled using the scrollbutton as the board had to be held or it was hard to move it.

Struggles with app

Some participants were confused about how to go back to the start screen. Sometimes they clicked twice by accident.

Unclarities in rules

Some questions popped up during the game about the rules:

"Should we land on a mushroom or go over it" - mom

"Can you go up and down?" - son

Power-ups were used only a few times in all games. Not all families explained their screenshots after another player had answered the question.

Positive response to look

When setting up the game participants responded positively to the appearance of the game. Many children were excited to click on the buttons.

"This is social media gaskar" - daughter
"This is gameria' - mother"
"There I would like to live" - son

"Look what a cool board" - mother

Game elements of clicking in the app and scrolling the buttons made children enthusiastic.

"This is a fun game, can I buy it in the store? "- son

Barriers in user flow

Three of four families read the rulebook first before proceeding in the app (which included an explanation video). Going through the set-up and explanation took around 15 min. Playing the game took around 35 minutes. In one family participants started tidying up during the after-game.

Children's skills

Sometimes children asked what words meant, like 'push', 'judge' and 'hijack'. The magnifying glass souvenir has a hole in it, which some children put around their fingers.

Happiness

Players could often be seen laughing, for example about giving a high-five at the start of the game, about screenshots, explanations and bad luck for other players. Receiving a souvenir or stamp made participants happy.

Engagement

When explaining screenshots other players listened attentively most of the time. figure 61 shows a family engaging in the game. When only one parent participated it was easier for children to give the right answer.

Disappointment & frustration

Children experienced some disappointment when a wrong move was made. There was some frustration when they forgot to go back to the start island.

Talking about activity and experience

When answering the questions participants explained the activity they saw. In 2 of the 4 families they also talked a lot about their experience, why they used it or why they did not like it.

"This was when it was loading, that was super frustrating" - daughter

Evoking conversation
Talking about these activities sometimes sparked other conversations.

"Actually we have the rule that we don't do that" [about paid games] - mother

It also evoked additional questions.

"So the whole world can see this?" - daughter
"yes, in principle yes"- mother

"Very cute, but you have to pay" - daughter
"Can you tell me a bit more about it?" - mother

Learning new things
Parents and children learn something new from the descriptions and conversations.

"I didn't know that was all in there" [about functionalities of Minecraft] - mother

"Apparently,[] doesn't play this game, than I know that now" - father

Analysing screenshots
Participants are analysing the screenshots to answer the questions.

"Mum do you know what is not so smart?"
"your photo in the corner"- son

Figure 61: Family playing Cloud Surfers

Interviews

Fun
Participants experienced playing the game as fun. They liked to guess the other's screenshots and they experienced it as fun to share their screenshots. One mother mentioned she found it fun to see that their children know a lot. The scrolling mechanism and board were considered fun.

Seeing activities is insightful
Parents mentioned they find it good to see what their children do. It gives more insight and seeing the screenshots makes you think more consciously. One parent mentioned she now knows quite well what the children do but she can imagine that changes when they start using more social media. Participants mentioned they learned which apps others use, or what kind of videos the other watch. They also mentioned learning about how certain apps work. One of the parents mentioned she learned that the children mostly play on the Nintendo and she thought that could be more varied. Children mentioned they learned their parents use smaller screens and often use a phone as device.

Starting conversation
One parent explained that it helps as a conversation starter because when she asks questions during their screen use her children do not feel like answering.

Learning new things

Participants learned what other participants like to use. One of the children mentioned her parents do way more stuff that is boring and she felt pity. One mother mentioned even though they try to talk about digital activities a lot, she still learned new things.

Mixed feelings about sharing screenshots

Children mentioned they found it fun to show what they like as their parents might better understand why they like it. They thought it might help them be allowed to do other things. One other child mentioned she liked it because her parents could help see if there were no strange people. One of the children did not like it as she found that her parents did not need to know all her games.

Understand others actions

One son mentioned that his mom uses the mobile phone often and he now understands better why;

> *"because she has a lot of fun things to do" -son*

Willing to share adversities

Most children would share with their parents if they had a negative digital experience. Most children already thought this before playing the game.

Survey

Willing to replay

All participants would like to play the game again (Figure 62). Most children would like to play it every week. Their motivation was liking the game and one child indicated as reason learning about what the others like. Parents would like to play it less frequently. They like playing the game and find it useful to keep seeing what children do, but they think it stays too similar to play it frequently.

Mixed emotions

Parents indicated mainly a feeling of joy. Next to that, they mentioned excitement, curiosity and satisfaction. One parent indicated tiredness. Children indicated the same emotions and sadness. Children were neutral or disagreed on the statement 'I found it nice to talk about screen activities together'.

Learning something new

Most parents and children learned something new about what their parents or children do on their screen Figure 63. Parents learned something new about the opinion of their children about screen activities. For children this was more divided (Figure 64. Most parents and children indicated they felt like they got to know each other better, parents a little more than children.

Safe space

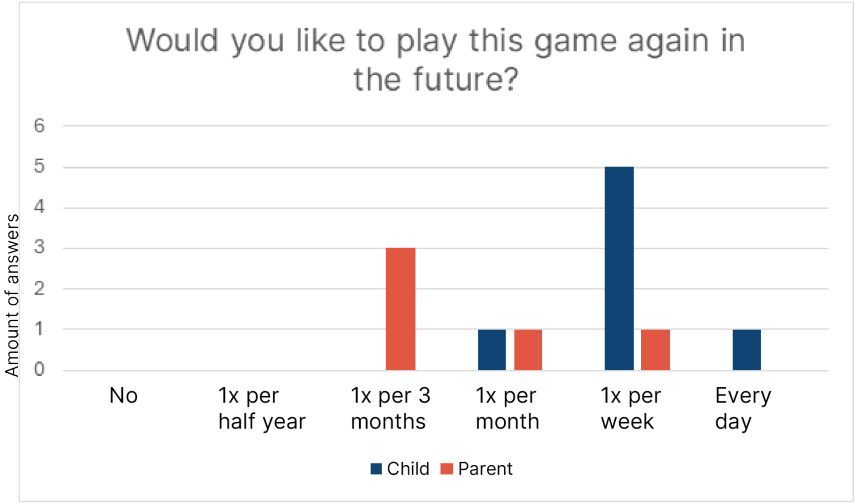


Figure 62: Response to 'Would you like to play this game again in the future?'

Most parents shared something new about themselves, while most children did not (Figure 65). All participants indicated they dared to say everything in the game, except one participant who doubted.

Changed image of children

3 out of 4 parents indicated the image they had of their children's screen use changed due to the game.

Parents change future actions

Half of the parents were neutral about being able to better have a conversation with their children about screen experiences, while the other half agreed. All parents indicated they were more likely to initiate a conversation about digital experiences. They also were more likely to share something about their digital activities with their children.

Uncertainty about children's future actions

Most children did not know if they were more likely to go to their parents to talk about the digital world after playing the game. 2 children indicated they were more likely to discuss something bad and 1 indicated no.

Additional results can be found in Appendix R.

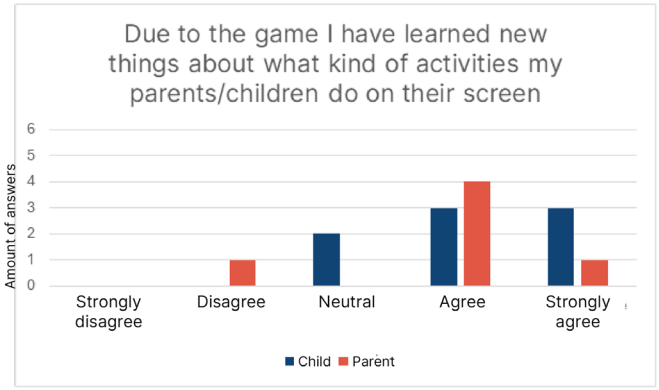


Figure 63: Response to learning new things about activities

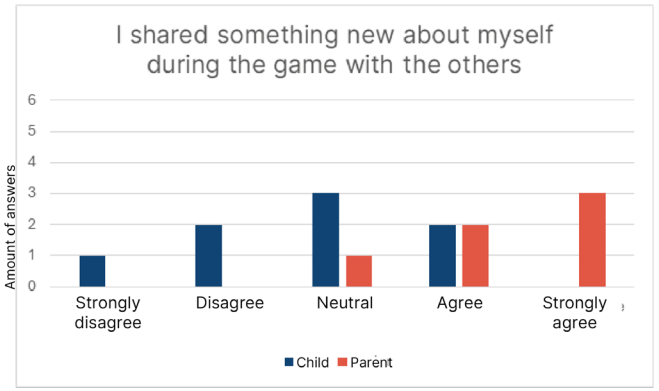


Figure 64: Response to sharing something new

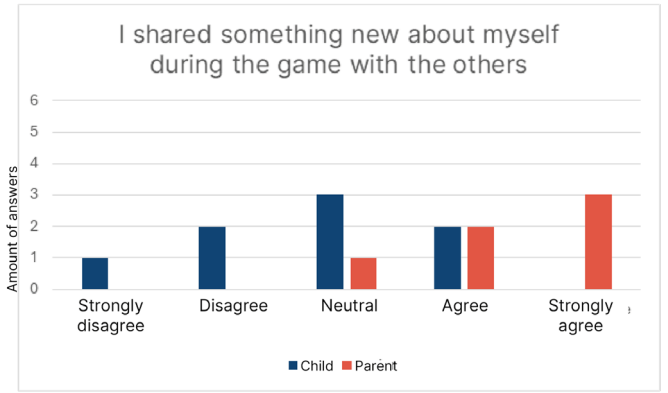


Figure 65: Response to sharing something new about yourself

Conclusion & discussion

The results provide insights on the evaluated topics: usability, experience, shared understanding, change of image and trust.

Usability

All participants wanted to play the game again. This indicates that there were no serious usability issues. Besides minor struggles with the app, the board, user flow, rules and child-friendliness, no major issues were observed or mentioned by participants. Despite this, most parents would like to play the game once per three months in contrast to the intended once per month (Chapter 5.1). They fear the game may stay too similar if played more often. Furthermore, as the different generations have different interests it was seen that game is most effective when played with at least two parents and two children. All in all, the game is usable despite minor obstacles and little willingness of parents to play once every month. However the willingness may increase when using the developed task system instead of the prototype, as the different tasks may evoke more varied screenshots.

Experience

According to the observations and survey players had fun playing the game. For children the game also evoked frustration and disappointment due to bad luck in the game. Participants indicated they found it interesting to see what others do. Sharing screenshots is considered fun by most participants, however some did not like it. All in all, despite mixed emotion emerging the overall feeling was happy.

Shared understanding

The screenshots and questions facilitated participants to talk about their activities. In some families it also evoked conversation about experiences. It was observed that the screenshots sparked questions. This explains why it was observed and found in the survey that participants learned new things in the game, for example about activities, working of apps, likes and dislikes of others. Thus, it can be concluded that the game helps to develop a shared understanding of digital activities between parents and children. Digital experiences are discussed as well, however the extent depends on the family.

Change of image

As participants learned new things and described seeing activities as insightful it is plausible that the image of the others has changed due to the game. One child mentioned he better understood after playing the game why his mom uses her phone a lot. Additionally, the majority of parents indicated in the questionnaire that their image of their children's screen use changed due tot the game. Therefore, it can be concluded that the game contributes to creating a more realistic image of the screen use of other family members.

Trust

All participants except one indicated they shared everything they wanted to. Parents indicated sharing something new in the game. Most children are willing to share adversities they come across. Consequently, the game must have felt like a safe space for sharing. However based on this study, it is difficult to determine whether this was a direct result of the game or existed prior to the study.

Transfer effect

As the game was experienced as fun and insightful, the '1x play transfer effect' (Ch 5.2) has been reached. Although time constraints prevented direct testing, the '4x play effect' appears attainable as participants learned about digital activities and experiences during the game. One family played the game for the second time, they again learned new things. This study did not measure real-world behavioral changes; consequently, it is difficult to determine whether the '8x play effect' can be reached. Whether conversation about

the digital world becomes the ‘new normal’ therefore remains an open question. Participants’ willingness to share openly from first time play is promising, however this may be seen in this specific test group only. Parents indicated that the game served as a conversation starter and motivated them to share their own digital activities more frequently. Parents were divided on whether the game would help to have better conversations in the future. In contrast, children expressed more uncertainty regarding whether the experience would influence their future actions.

Potential for developing learning skills and strategies

An interesting finding is that participants could be seen analysing screenshots together. This may contribute to building digital resilience as group based learning was found to be an effective strategy (Chapter 3.5). Next to that, learning skills and strategies were mentioned as key issue to consider in developing tools. This observation suggests parents and children could learn skills and strategies in the game besides the aimed for transfer effect.

6.2 Recommendations for Monimentor

It would be impactful if Monimentor could extend its impact beyond the home level. As a future vision Monimentor should become a player at all levels that influence digital resilience (individual, home, community, society) in 2036. The roadmap in Figure 66 shows the next steps (horizons) Monimentor should take to reach this goal.

	Horizon 1	Horizon 2	Horizon 3	Future vision
	Launch	Extended version	Community building	Extended influence
Goal	Facilitate connection	Improve conversations and learning	Community learning	**Monimentor extends influence to all levels**
Time period	2027	2028	2033	2036
Trends	Awareness on digital adversities		Need for ethical corporations	
Product service	Cloud surfers is launched and sold 	Extended version of the game incorporating learning and conversational approaches 	Allowing to connect to friends with your personal time capsule and play Cloud Surfers with them 	Collaborate with big tech as they feel the need to do ethically well. For example streamingservices allow taking of screenshots or give input for learning 
Level	Home		Community	Societal
Resources	App development Production chain Marketing Sales Communication	Research & development App development Production chain Marketing Sales Communication	Research & development App develment Production chain Marketing Sales Communication	Research & development App development Communication

Figure 66: Roadmap for Monimentor

Horizon 1

Horizon 1 focusses on creating a viable prototype for launch. To reach horizon 1 it is based on the insight of the evaluation, recommended to:

- Make minor improvements on the app, board, user flow, rules and child-friendliness
- Develop app based on user preferences
- Viability: work out production methods and business model
- Evaluate with more families and a varied group of families, as different mindsets, personalities and engagement levels can affect the outcomes.
- Evaluate the effect of the actual task system and developed app.
- Evaluate whether once per 3 months usage is sufficient to reach the desired transfer effects. If needed the game can be modified for more frequent play by for example increasing variation and difficulty.
- Evaluate the long-term influence of frequent play to find out to what extent the transfer effects are reached and whether the game effectively fosters trust and normalises conversation over time. Next to that, a longitudinal study could provide insight in engagement over time and fun factor after repeated pla. In addition to this the after-game experience with postcards should be evaluated and optimised.

Marketing mix (4P's)

Figure 67 shows based on the 4P method how Cloud Surfers should be brought to the market. The game can be sold as an addition to the Cloud Surfers app or bought seperately.

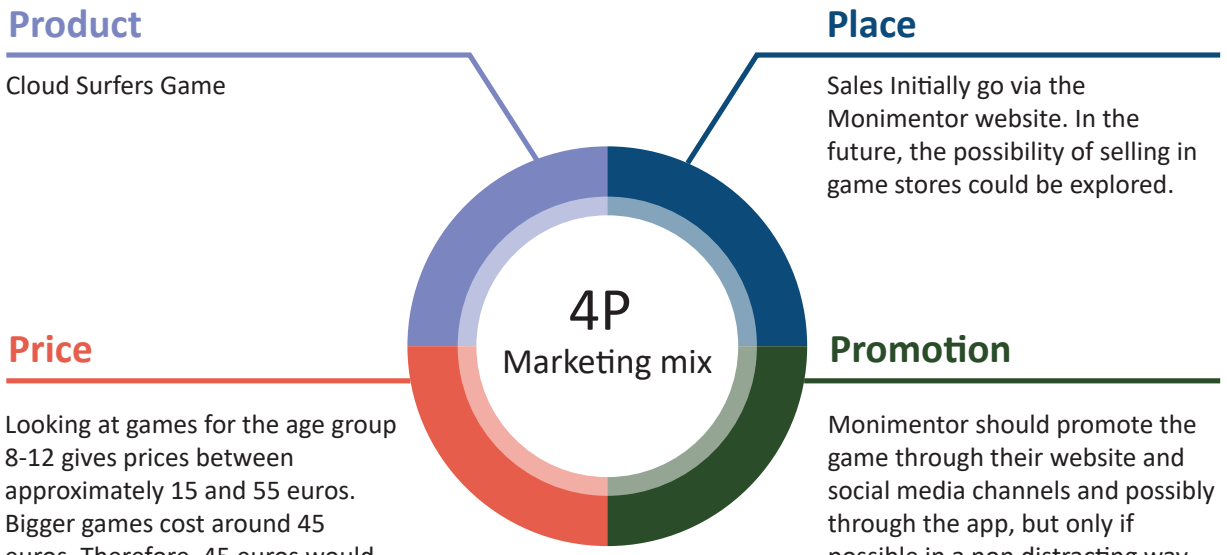


Figure 67: 4P marketing mix

Horizon 2

Horizon 2 focusses on creating an extended version of Cloud Surfers based on the insights of the evaluation. It was found that there was a difference in extent to which experiences were discussed per family. Next to that it was found that parents are neutral about being able to approach the conversation better. Lastly, an opportunity for peer learning was found. Therefore, to reach horizon 2 it is recommended to

- Add value by stimulating sharing of experiences even more.
- Add value by designing to help parents approach conversations about the digital world, especially about negative or difficult topics.
- Add value by exploring the opportunity of peer-learning within the game

Horizon 3

In horizon 3 Monimentor starts to reach beyond the home level by creating a version of the game that can be played with other players in the community, like friends and peers. Each players has their own personal time capsule. By connecting these Cloud Surfers can be played together. This provides new insights and more learning.

Future vision

In 2036 Monimentor becomes a player at the societal level. As pressure from society on big tech increases they will become more willing to collaborate. They may share input for learning. Streaming services may allow people to take screenshots just for use of the game.

7

Discussion & conclusion

Previous Chapters described how the problem of limited communication between parents and children arises. Based on this the Cloud Surfers game is developed. The evaluation provided recommendations for the next steps for Monimentor. This Chapter concludes the research and describes the limitations, implications, future directions, and personal reflections.

7.1 Discussion & conclusion

Today's children grow up with screen devices. Children in the age group of 8-12 start to seek connection outside the family going along with peer pressure and more risk seeking behaviour. Next to that, their brains are not completely developed yet. This poses many risks while using the digital world. To protect children from this, children should build digital resilience.

This thesis aims to answer the question: How can a product for the physical family context be developed for Monimentor to help Dutch children (8-12) to build digital resilience?

In order to answer this question, a theoretical model of the process of building children's digital resilience was created. This shows that building digital resilience must occur at various levels, including the home context. Within this context, parents play a key role in buffering children's digital risks and learning from them. Therefore, the connection between parent and child is crucial in building digital resilience.

Zooming in on the parent-child relationship through a user study showed that the main barrier in their connection is limited communication about each other's digital worlds. Factors playing a role in this are: busy lifestyle, limited sharing of thoughts by children and parents not knowing how to have a conversation. The findings regarding a busy lifestyle is in congruence with what is found in the literature. Not knowing how to have a converstion aligns with the findings in literature of an insecurity of parents to act. The user study found reasons for limited sharing by children: finding it hard to give words to thoughts, unwillingness to share and not seeing parents as experts. Literature did not identify these, but mentioned fear of judgement and negative attitude of parents.

Based on this, potential is seen in developing a solution that facilitates parents and children in talking about their digital activities and experiences regularly in their daily lives in a positive way to normalise talking about the digital world and adversities by means of a tool for the physical world.

The developed tool is a persuasive board game for families: Cloud Surfers. It is a physical addition to the Monimentor app. The tool fits the company by taking a family-centred, positive approach. With the Cloud Surfers game players are motivated by notifications with tasks to take screenshots during their screen use. These screenshots are the input of the board game, in which players answer questions about the screenshots to earn points.

By answering questions, parents and children learn about each other's digital activities and experiences. This contributes to developing a shared understanding. With this they also gain a more realistic image of each other's screen use. Next to that, they experience that talking about the digital world is fun, insightful and normal. This helps to build trust to share. In this way, families build a strong foundation in the game to talk about (negative) digital experiences in their daily lives. Normalising these conversations helps children and parents to approach each other for help and reflection. This is needed to learn from experiences and adapt future choices to this, understand when you are at risk and make decisions about online use, know how to seek help to recover from digital harm. This contributes to building children's digital resilience

The evaluation of the Cloud Surfers game gave positive results about the usability and experience. Determining the long-term impact was not possible due to time constraints. However after first time play development of shared understanding was already seen. The study also pointed positively towards the gaining a more realistic images, the building of trust and change in future behaviour.

All in all, to answer the main, question Cloud Surfers is a persuasive game that fosters connection between parent and children to strengthen children's digital resilience.
Based on the evaluation insights and insight throughout the project conclusions can be drawn on the feasibility, viability and desirability of the game.

Desirability

As found in the literature and user study screen use is a much-discussed topic these days among parents. As mentioned in the literature, parents are longing for a tool that helps them in raising their children responsibly with screen devices. Cloud Surfers could help them in this.
All participants of the evaluation would like to play the game again. However, parents did not want to play the game monthly as intended. This could change however when the app is developed and collecting screenshots becomes part of the game. Still, the game can be considered desirable. Children are excited to play the game more frequently than parents. The look of the game was highly appreciated and could be a reason for this. Parents recognise the use of the game, such as seeing children's screen activity and helping to initiate conversations.

Feasibility

Cloud Surfers is a proof-of-concept prototype that can be built using (3D) printing. When Monimentor launches the product, it is necessary to work out how it can be produced on a larger scale with printing and injection molding techniques. Next to that, the app should be developed.

Viability

Cloud Surfers does good to the world by improving families lives by raising digital resilience. In the long term this is also beneficial for society as a whole. From the evaluation it becomes clear that the game reaches the goal of creating a shared understanding. This indicates that it might help to discuss future negative experiences and thus build digital resilience. Therefore, it is viable for Monimentor to bring this product to the market. Next to that, it is a good addition to the Monimentor app as Cloud Surfers is more focussed on the whole family and is used in the physical shared space. This helps to build digital resilience with another approach as the app itself uses. Next to that, it adds to their value proposition by providing support in the physical world where effects are actually experienced. After determining the production method, decisions on simplification of the product and price can be made to determine the business model.

Limitations

While this study provides valuable insights, several limitations were identified mostly due to the project's constrained timeframe.

- Due to the limited sample size in the user study external validity is limited.
- The evaluation was executed with four families, of which in two families only one parent participated. To generalise the conclusions, the game should be evaluated with more complete families from the target group. While the study targeted parents who are already aware of digital risks, but struggle with acting upon them, a selection bias may still exist. The participants were proactive in participating in the evaluation. Therefore, the results might not fully reflect the experiences of parents who feel more severely overwhelmed by digital risks.
- The long-term effect which is part of the goal of the concept could not be evaluated, only assumptions could be made.
- The project focussed on the development of the board game itself. Therefore limited time was put in the development and testing of the task system.
- The design is developed for Dutch families with children between 8-12. Therefore, it is questionable whether the concept would also work in other countries.

- The project focuses on the home context, however digital resilience is built on multiple levels and effects of the game might be dependent on the contributions on the other levels.
- The research identified multiple barriers within the parent-child relationship, like role model function of parents. These were not addressed in the design.
- The presence of the researcher during the evaluation or the vulnerable nature of the topic (parenting) may have led to socially desirable answers.

Theoretical implication & generalisations

This study contributes to the existing theory by identifying the difference in digital activities and thus experiences as a communication barrier. Furthermore, it highlights a previously underexplored obstacle: the difficulty of articulating thoughts for children. Moreover, Cloud Surfers' evaluation suggests that a persuasive game can help parents and children talk about digital activity and experiences. Next to that the insights in the importance of personalisation, using a fun activity to do together as motivator and lessons learned from development (Chapter 5.1 & 5.2) can be used in developing tools for parents and children on the topic of screen use.

Practical implications & generalisations

The development of a tool to enhance communication, is a start to fill the critical gap of missing tools for parents' insecurity to act. The tool may help children understand talking about digital experiences is normal. In this way building digital resilience and hopefully leading to early discovery and prevention of extreme effects. Parents may feel more supported in raising their children responsibly with screens.

Cloud surfers is a start to shift our system, however as stated in the introduction much more should be done at all levels by different stakeholders. For example, big tech should create responsible products and ask themselves the question: 'Do I want my child to be able to use this?' and therefore 'Should I want other children to be able to use this?'. Awareness raising should be done through the government and digital resilience should become a part of primary school education. Furthermore, rules and guidelines should be improved, and tools should be provided to implement them. Lastly, parents should stand still and reflect on their own screen-use and consider what they want for their children.

Future directions

Cloud Surfers

The next steps for Monimentor, based on the limitations of this study, are described in Chapter 6.2. These could also be interesting for future research. Next to these steps Cloud surfers could be evaluated by digital resilience and game experts.

Other barriers in communication

The overview of barriers and opportunities in Chapter 4.5 can be used as starting point for future research. It would be interesting to see if tools can be developed to personalise rules and guidelines. Next to that, it could be interesting to look at how knowledge sharing can be done in a low time intensive way. Lastly, a barrier in communication is parents' screen use, considering their role model function. Tools to help parents reflect and adapt their screen use could influence the connection with their children.

Application in other contexts

The design provides an opportunity to be used in other contexts as well. Testing with peers showed that the game can also be interesting to play with peers to share ideas, learnings and frustrations. Next to that, it could also be suitable for children in a later age category and their parents, as screen use is more individual and secret in

this age group, fun and the possibility to teach parents something may be a driver for them. Besides this, as concluded in the evaluation Cloud Surfers may have potential as group based skill and strategy learning activity. Lastly, the development of trust and safe space in the game might help in tackling other taboo topics.

All in all, Cloud Surfers is a persuasive game developed for Monimentor that helps Dutch children aged 8-12 increase their digital resilience. By answering questions about personal screenshots, parents and children gain a shared understanding and a more realistic image of each other's screen use. This builds trust and fosters the connection between parents and children, providing the necessary foundation to build digital resilience.

7.2 Personal reflections

In this Chapter I will share some of my personal reflections gained throughout the project.

Thoughts digital risk

Working for half a year on this project made it clear to me that the problems associated with the digital world are complex. Every day in this project I kept learning new aspects. Following the associated news, I saw new unthinkable examples every week. Therefore, I realise my project may only make a small contribution, however I am glad to have set a step in the right direction.

Thoughts on screen use

I have always been quite conscious of my screen use. I prefer to have interactions in real life and I dislike most things I have to do on my phone - so I thought. Doing this project made me realize that without notice there are many things I like about my phone and laptop, it is a magical thing that always gives you what you want; want to know something? google it. Lost? Go to google maps. But this is so integrated in my life that I did not notice it anymore.

I started this thesis with my thoughts about the context of the train. My initial thoughts were quite negative. I was quite sorry that the train is not a social place. However, carrying out this project and talking to many people about the topic made me adjust my opinion. It made me realize that people get a lot of fun out of their screen use and that, although in another way they, are often in contact with a lot of people through a screen, you hear people calling, sending WhatsApps and scrolling through their friends' posts. So, although I still think being aware of negative effects is important I do think I could look more at the positive sides and not take these for granted.

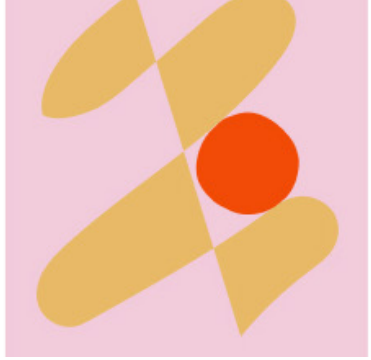
My designer resilience

I have been thinking about children's resilience for half a year now, but now it is time to bundle my reflections from the project about my own resilience.

I remember the first time I heard the term resilience. I was doing a big project which was sometimes quite rough sometimes due to time pressure and disagreements within the team. This also put me under pressure personally. When someone explained her project about resilience I remember thinking 'how nice must it be to be resilient' because I felt far off from thriving or even having high resilience at that point. Therefore, I think it is interesting to reflect on my own resilience now again doing a big project but this time with the challenge of doing it all on my own and see whether this has changed through the years.

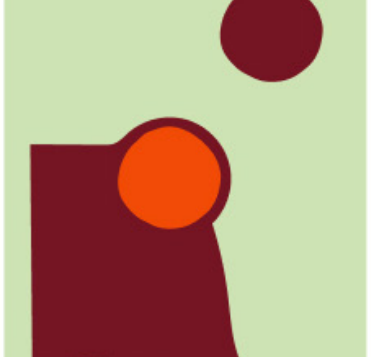
At the start of this project I read the book 'A resilient designer's handbook' (Price & Van Der Bijl - Brouwer, 2023). The book explains 10 principles that cultivate a designer's resilience. Throughout the project I recognised many of the principles in my own project. To evaluate my resilience, I bundled my reflections in Figure 68 to gain an overview of my current resilience.

From this reflection I think I can say I have becom more resilient over the years compared to the story from before. In this project, I learned the importance of not giving up when you belief in something. It also showed me that embracing the journey works, as I sometimes felt lost at the start but I am happy with the end result. I could still grow in liking to share my ideas and go more outside of my comfort zone.



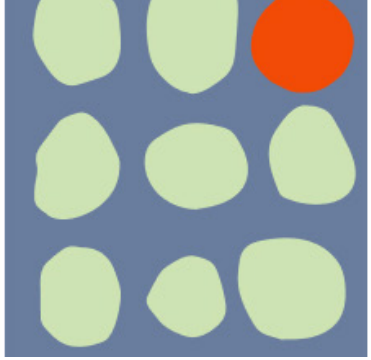
Find purpose by embracing the journey

Sometimes I felt stuck or drowned in the complexity of the project, as there were many directions to pursue. Sometimes it frustrated me, but I found that talking to peers of other people often gave new insights. Also telling myself to 'trust the process' helped.



Decisively go beyond your comfort zone

I knew I would like organising and carrying out the different sessions, but doing that all on my own with people I had never met was a small excursion out of my comfort zone. Next to that, although not a decision, it was a new experience to do everything on my own instead of with a group

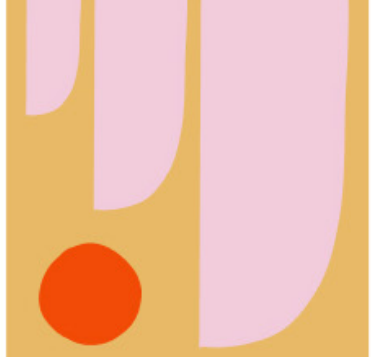


Be authentic to your identity and purpose

It took me quite some time to find supervisors for the project. This made me insecure about the relevance. but I am glad I proceeded, because after studying it for half a year I am well ware that this is a pressing issue. It showed me why not to give up if you belief in something.

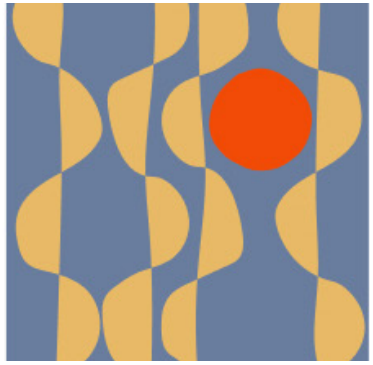
Fuel your appetite for change

As screen use is something we all experience and can be seen everywhere, the topic often stayed on my mind. I tried to slow the mind as this principle recommends by sporting three times every week. I saw it works to do other things and talk about other stuff to reset you mind and gain new insights.



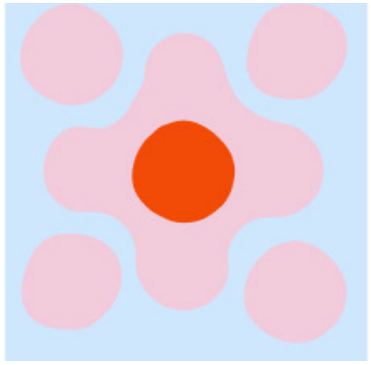
Share unfinished work

I noticed this is something I do not always like. Initially your ideas are never game changers and when criticised it can feel like being criticised yourself as if the ideas are a part of you. Luckily, I had people around me who gave feedback in a constructive way, which made sharing more fun.



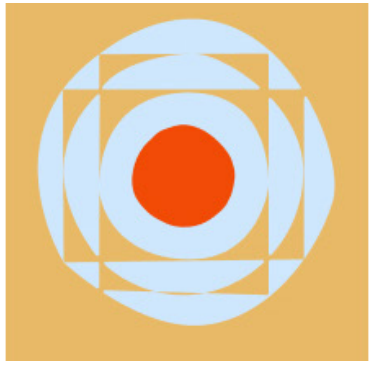
Be reflexive to performance culture

Sometimes I noticed I got stuck in a rabbit hole , working on something that was not actually not that important. Taking breaks helped me in realising this.



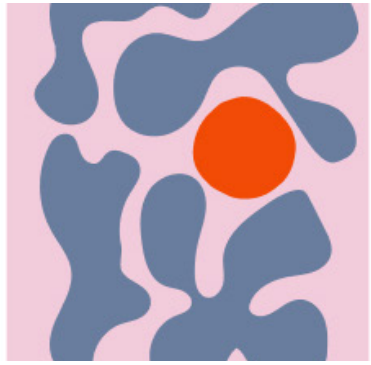
Form the right environments for feedback

I am happy to have worked with people that gave constructive feedback. I noticed it is important to ask questions when you do not understand critical feedback.



Trust and drive the process

I am quite perfectionistic and therefore I find it quite hard to accept perfection is an illusion. Sometimes, I wonder if our creative mindset gives us a lot of ideas and our development mindset makes us able and wanting to carry them out.



Embrace the messiness of pluralism

I really enjoyed the co-creation and generative sessions. Of course it did not go exactly go as planned but it gave a lot of new insights. So to remember for the future: embrace the messiness.

Shape community & collective resilience

I spend a lot of time at the second floor with other graduation students. Even though working on completely different projects we could often help each other out. So to keep in mind: stay in contact with the people around you.

Figure 68: Bundling of reflections on 10 designer resilience principles (illustrations from (Resilient Designers, 2025))

Reflection on goals

At the start of the project I set some personal learning goals. First of all, I wanted to gain knowledge on children's development and digital resilience. Although there is a lot more to it, I think this thesis shows that this goal was accomplished. Next to that, I wanted to learn in practice to design for and with children. This was an experience I truly enjoyed. I learned that when doing research with children you should always test your assumptions as children's actions are hard to predict. The project also provided me the opportunity to practice setting up and executing generative and co-creation sessions. I discovered that this is somehting that gives me energy. Furthermore, doing such a big project on my own helped me with improving my project planning skills. I learned that despite uncertainty it is good to plan activities and adapt goals later on if needed. I also gained an insight that it works for me to do tasks in steps as it helps to reiterate and see your work from a new perspective when opened again. Moreover, I wanted to learn to set priorities and let go of things I decide not to do in order to be less perfectionistic. And I wanted to learn to make decisions faster and trust them. Whereas in other projects I remember feeling more stressed about decisions in the project I did not experience stress about decisions in this project. Therefore I think I grew in this. However I think I am still quite perfectionistic and sometimes by hindsight I realised I did not set the right priorities.

Take aways

In the future I could again try to be less perfectionistic and learn to set the right priorities. Next to that I should try to go outside my comfort zone more often and fin da way to like sharing my ideas more.

All in all, although of course it was not all easy, I could not imagine a more interesting graduation project. The project combined my interests in designing for societal problems, designing for children, provided the possibility to organise different sessions and I had a wonderful team to work with.

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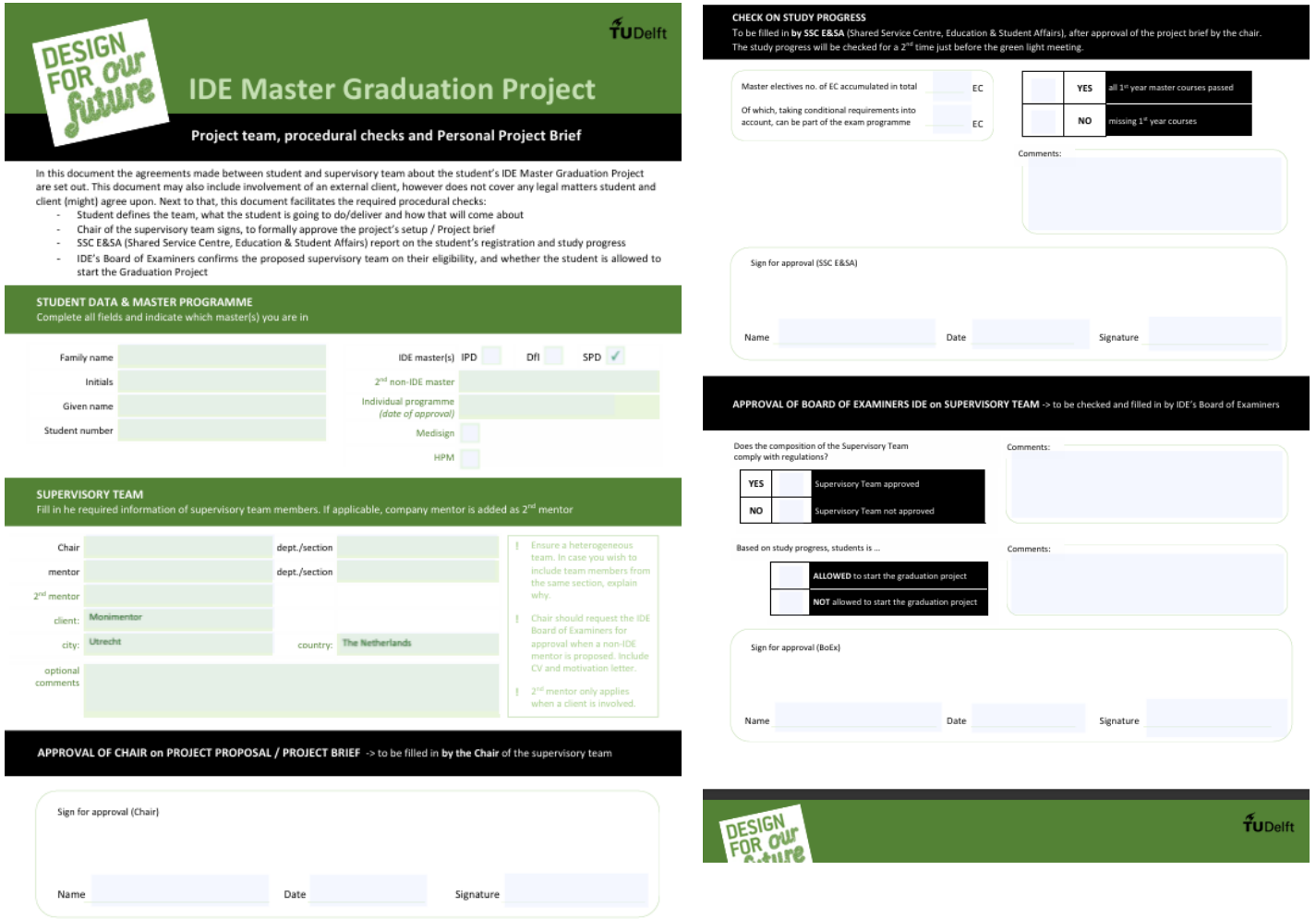
Appendices

A. Initial project brief



DESIGN FOR our future

TU Delft

IDE Master Graduation Project

Project team, procedural checks and Personal Project Brief

In this document the agreements made between student and supervisory team about the student's IDE Master Graduation Project are set out. This document may also include involvement of an external client, however does not cover any legal matters student and client (might) agree upon. Next to that, this document facilitates the required procedural checks:

- Student defines the team, what the student is going to do/deliver and how that will come about
- Chair of the supervisory team signs, to formally approve the project's setup / Project brief
- SSC E&SA (Shared Service Centre, Education & Student Affairs) report on the student's registration and study progress
- IDE's Board of Examiners confirms the proposed supervisory team on their eligibility, and whether the student is allowed to start the Graduation Project

STUDENT DATA & MASTER PROGRAMME

Complete all fields and indicate which master(s) you are in

Family name
Initials
Given name
Student number

IDE master(s) IPD Dfl SPD ✓
2nd non-IDE master
Individual programme (date of approval)
Medisign
HPM

SUPERVISORY TEAM

Fill in he required information of supervisory team members. If applicable, company mentor is added as 2nd mentor

Chair dept./section
mentor dept./section
2nd mentor
client: Monimentor
city: Utrecht country: The Netherlands
optional comments

! Ensure a heterogeneous team. In case you wish to include team members from the same section, explain why.
! Chair should request the IDE Board of Examiners for approval when a non-IDE mentor is proposed. Include CV and motivation letter.
! 2nd mentor only applies when a client is involved.

APPROVAL OF CHAIR on PROJECT PROPOSAL / PROJECT BRIEF -> to be filled in **by the Chair** of the supervisory team

Sign for approval (Chair)

Name Date Signature

CHECK ON STUDY PROGRESS

To be filled in **by SSC E&SA** (Shared Service Centre, Education & Student Affairs), after approval of the project brief by the chair. The study progress will be checked for a 2nd time just before the green light meeting.

Master electives no. of EC accumulated in total EC
Of which, taking conditional requirements into account, can be part of the exam programme EC

YES all 1st year master courses passed
NO missing 1st year courses

Comments:

Sign for approval (SSC E&SA)

Name Date Signature

APPROVAL OF BOARD OF EXAMINERS IDE on SUPERVISORY TEAM -> to be checked and filled in by IDE's Board of Examiners

Does the composition of the Supervisory Team comply with regulations?

YES Supervisory Team approved
NO Supervisory Team not approved

Comments:

Based on study progress, students is ...

ALLOWED to start the graduation project
NOT allowed to start the graduation project

Comments:

Sign for approval (BoEx)

Name Date Signature

DESIGN FOR our future

TU Delft

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TU Delft

Personal Project Brief – IDE Master Graduation Project

Name student Klaske Galema **Student number** 5,110,416

PROJECT TITLE, INTRODUCTION, PROBLEM DEFINITION and ASSIGNMENT

Complete all fields, keep information clear, specific and concise

Project title Raising digitally resilient children

Please state the title of your graduation project (above). Keep the title compact and simple. Do not use abbreviations. The remainder of this document allows you to define and clarify your graduation project.

Introduction

Describe the context of your project here; What is the domain in which your project takes place? Who are the main stakeholders and what interests are at stake? Describe the opportunities (and limitations) in this domain to better serve the stakeholder interests. (max 250 words)

Screens, once a novelty, are now deeply integrated into our daily lives, bringing both benefits and significant drawbacks. Problems often discussed include dopamine addiction, misinformation, polarization, data privacy and tech dependency. An American study found that in the COVID-19 pandemic screen time rose to an average of 5:33 hours for 8-12 year olds (Rideout et al, 2022). Excessive use can lead to physical impairments (Agarwal et al., 2022) (Mupalla et al., 2023) and cognitive problems. Especially for children, on whom this project focuses, screen use can have severe effects, as it can also impact their social-emotional growth (Mupalla et al., 2023).
The risks are known and realised by many, but solving them is not easy. Parents struggle with finding the right digital balance (Solomon-Moore et al., 2018) due to, for example, conflicting advice from different sources and impractical recommendations not fitting to their lives (Langton et al., 2025). Next to that, this complex problem involves many stakeholders (parents, siblings, nannies, friends, and school) whose approaches and priorities don't always align. Moreover, the tech industry (app developers, advertisers, and commercial companies) has financial incentives to make products addictive, working against the child's well-being. Lastly, the right approach also depends on a child's age and personality. So the key question is: how do we tackle these complex challenges?
This project is carried out for Monimentor. Monimentor is a start-up which develops an application that helps families with a family-centred approach to create digital resilience for primary school children (age 4-12). With various functions and the interaction of avatar Moni (Fig 1) responding to the child's screen behavior, they make the effects of screen use insightful.

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Personal Project Brief – IDE Master Graduation Project

Problem Definition

What problem do you want to solve in the context described in the introduction, and within the available time frame of 100 working days? (= Master Graduation Project of 30 EC). What opportunities do you see to create added value for the described stakeholders? Substantiate your choice.
(max 200 words)

So what if we can raise children so that they become resilient to screen devices?
Digital resilience can be defined as "the learning, recovery, and bouncing back process after having negative or adverse experiences online" (Sharma et al., 2022)
For adults it can be hard to resist the addictive design of apps and devices, like virtual rewards. Let alone, children who are much more susceptible to this, due to their immature impulse inhibition (Radesky et al., 2022). Tech companies design their products to keep us engaged for as long as possible — often letting the screen control us. But what if we could take that control back? What if we teach children from a young age how to handle devices and bounce back from negative online experiences?
As said before this is a complex problem with many stakeholders. Therefore, it is interesting to map out the context of the problem and define a strategic point to intervene to facilitate the end goal: digital resilient children. A physical intervention has potential to break the barrier between the online and the physical world.

Radesky, J., Hiniker, A., McLaren, C., Akgun, E., Schaller, A., Weeks, H. M., Campbell, S., & Gearhardt, A. N. (2022). Prevalence and characteristics of manipulative design in mobile applications used by children. JAMA Network Open, 5(6), e2217641. https://doi.org/10.1001/jamanetworkopen.2022.17641

Assignment

This is the most important part of the project brief because it will give a clear direction of what you are heading for. Formulate an assignment to yourself regarding what you expect to deliver as result at the end of your project. (1 sentence)
As you graduate as an industrial design engineer, your assignment will start with a verb (Design/Investigate/Validate/Create), and you may use the green text format:

Create a model of the context of children's digital resilience and develop a physical prototype for Monimentor to improve digital resilience for primary school children (4-12 years old) and their families.

Then explain your project approach to carrying out your graduation project and what research and design methods you plan to use to generate your design solution (max 150 words)

The project will consist of 4 phases: Discover, Define, Develop and Deliver. In the first phase, I will explore the topic and the context by doing a literature review, interviewing experts (like NJI, organisation Mediawijsheid, pedagogue), research the context with generative sessions with parents and children and executing a company analysis. In the define phase I will synthesize the data found to create personas and a contextmap. From here, I will define the future vision and design direction. In the third phase I will develop ideas with the help of a co-creation session with parents and if possible children. I will access them through Monimentor and my own acquaintances. I will iterate on the ideas to create a final design and evaluate it with potential users. In the last phase, I will deliver the report, poster, prototype and presentation.

Project planning and key moments

*To make visible how you plan to spend your time, you must make a planning for the full project. You are advised to use a Gantt chart format to show the different phases of your project, deliverables you have in mind, meetings and in-between deadlines. Keep in mind that all activities should fit within the given run time of 100 working days. Your planning should include a **kick-off meeting**, **mid-term evaluation meeting**, **green light meeting** and **graduation ceremony**. Please indicate periods of part-time activities and/or periods of not spending time on your graduation project, if any (for instance because of holidays or parallel course activities).*

Make sure to attach the full plan to this project brief.
The four key moment dates must be filled in below

Kick off meeting	8 September 2025
Mid-term evaluation	4 nov 2025
Green light meeting	16 Jan 2026
Graduation ceremony	13 Feb 2026

In exceptional cases (part of) the Graduation Project may need to be scheduled part-time. Indicate here if such applies to your project

Part of project scheduled part-time	
For how many project weeks	
Number of project days per week	

Comments:

Motivation and personal ambitions

Explain why you wish to start this project, what competencies you want to prove or develop (e.g. competencies acquired in your MSc programme, electives, extra-curricular activities or other).

Optionally, describe whether you have some personal learning ambitions which you explicitly want to address in this project, on top of the learning objectives of the Graduation Project itself. You might think of e.g. acquiring in depth knowledge on a specific subject, broadening your competencies or experimenting with a specific tool or methodology. Personal learning ambitions are limited to a maximum number of five.
(200 words max)

It has always bothered me to see children playing on an Ipad in a restaurant at dinner. For me as a child eating out was a big happening which I was very excited about. I see that devices can take away the joy of regular daily life. I think this is a pity and I would like to change this. Next to that, excessive screen use by children is a pressing issue with little working solutions and a severe impact. In addition, I think this is a complex problem with many stakeholders, fitting the SPD masters. Lastly, this topic follows my interests as a designer as I would like to move more to the social design domain.

In this project I want to gain knowledge on children's development and digital resilience. I am interested to learn about designing for and with children. I would like to enhance my project planning skills and learn to do generative and co-creation sessions. Lastly, as a personal learning goal I want to learn to set priorities and let go of things I decide not to do in order to be less perfectionistic. And I want to learn to make decisions faster and trust them.

introduction (continued): space for images

image / figure 1 Avatar Moni

Agarwal, R., Tripathi, A., Khan, I. A., & Agarwal, M. (2022). Effect of increased screen time on eyes during COVID-19 pandemic. *Journal of Family Medicine and Primary Care, 11*(7), 3642–3647. https://doi.org/10.4103/jfmpc.jfmpc_2219_21

Langton, K., Jayakumar, E., See, H. W., Archer, C., & Woodley, G. (2025). Balancing digital presents and futures: understanding first-time parents' practices, plans and perceptions of 'quality' and risk in young children's digital engagements. *Media International Australia*. https://doi.org/10.1177/1329878x251330298

Mupalla, S. K., Vuppalapati, S., Pulliahgaru, A. R., & Sreenivasulu, M. (2023). Effects of Excessive Screen Time on Child Development: An Updated Review and Strategies for Management. *Cureus*. https://doi.org/10.7759/cureus.40608

Rideout, V., Peebles, A., Mann, S., & Robb, M. B. (2022). Common Sense census: Media use by tweens and teens, 2021. San Francisco, CA: Common Sense

Solomon-Moore, E., Matthews, J., Reid, T., Toumpakari, Z., Sebire, S. J., Thompson, J. L., Lawlor, D. A., & Jago, R. (2018). Examining the challenges posed to parents by the contemporary screen environments of children: a qualitative investigation. *BMC Pediatrics, 18*, 129. https://doi.org/10.1186/s12887-018-1106-y

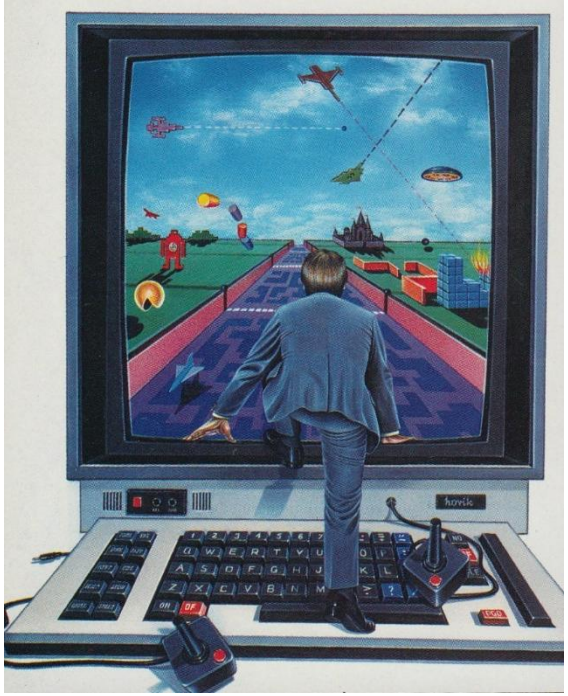
image / figure 2 References

B. Background research

To start of the project it was needed to understand the bigger picture and future directions. This appendix describes the research done for this. It maps the bigger context of the system, the current state of the practical field and where it is heading. This is done to determine leverage points in the system and predict future scenarios to server as a starting point for the project

This system analysis is based on elements of the VIP method (Hekkert & Van Dijk, 2021). VIP is an interaction and context driven design method. It looks at the future to ensure designs are relevant in the future. For this, a search domain is set first. Within this domain factors (trends, principles, developments and states) are gathered via expert interviews and desk research. The factors are synthesized in two ways. First, to create a context map of how children's screen time problems arise seen from a systems lens. Secondly, factors are clustered and used to develop a context structure with 4 possible future scenarios.

Domain



The domain set is: "Children navigating the online world"

Factors

Method of collection

The factors are a collection of trends, principles, developments and states from expert interviews and desk research.

Expert interviews

Three semi-structured interviews are conducted with experts from the field (Appendix FIXME for interview guide). One is conducted with a child psychologist, specialised in screen issues. One with a member of GGD Amsterdam and one with Nederlands Jeugd Instituut. Experts from different directions are consulted to ensure variation in point of view. Whereas one expert has experience from practice at the family level, the others work on the community and societal level. The interviews are audio recorded, transcribed and anonymised.

Desk research

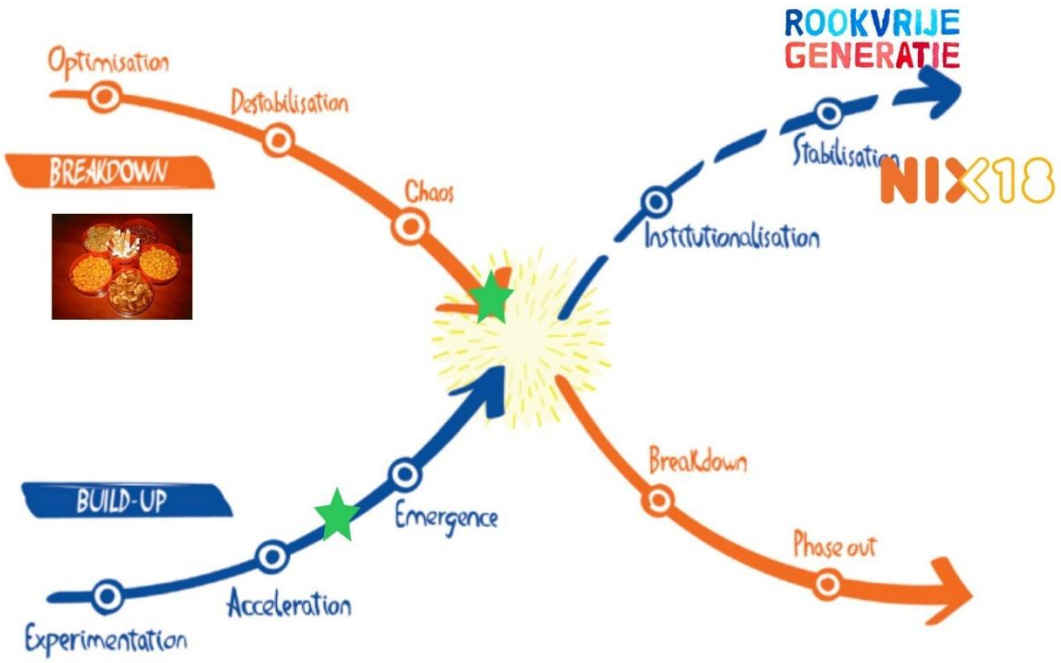
To ensure a broad exploration of factors additional desk research is done. Relevant domains from PESTEL and VIP method are used as search guides. The focus was on the political, legal, social and technological domain, as these are most relevant to the domain.

Results

The expert interviews lead to 173 factors. The desk research lead to 22 factors. All factors can be found in appendix FIXME.

Expert interviews and desk research lead to various factors. Based on this a context map and a context structure are developed. The context map is used to explain how children's screen time problems arise from a systems perspective. The context structure reveals possible future scenarios of the domain. This appendix shows the conclusions from this research

The norm of screen use is changing. It is a transition in our culture and practices. The x-curve model is a tool aimed at creating a better understanding of the transition dynamics within a specific context or society. Figure FIXME shows this x-curve model, with the stars indicating where the screen use transition is positioned based on the insights of interviews and desk research.



The x-curve model consists of two paths: breakdown and build-up. Showing that while the current norm is breaking down, new ones build up. Breakdown happens when exogenous factors change the landscape leading to tensions and unrest. In this case more research and appearance of longer-term effects lead to tensions and doubts about the long-term sustainability of the current norm. This brings us to the chaos stage, a stage with a sudden loss of security: there is awareness, but solutions are out.

At the same time build up happens; the shaping of alternative ways of

organising, thinking and working. A new norm regarding screen use is building up and experts see the need for alternatives. The first interventions are forming but they are not established yet, placing themselves between acceleration and emergence on the build up path (Silvestri et al., n.d.). The x-curve model shows this transition on a societal level.

Conclusion

All in all, the problem arises because there are people with bad intentions active on the internet and new technologies develop quickly. It is hard to keep up with rules and enforce those. And this while these people do not even play by the rules. From the literature (chapter 2.1) the fast changing environment was also found to be a barrier for parents. Risk might happen before parents are even aware of the possible risk. Next to that, there is a huge awareness gap among parents, as was also concluded from the literature. Among parents that are aware there is a lack of knowledge on how to take action. This is logical at the start of a transition. Next to that, a cause could be the findings from literature that there is a lack of trustable, clear, scientific, customised advice and limited practical tools for implementation.

Big brain	Knowledge institutions are currently doing a lot of scientific research on screen use and digital resilience.
Disturbed emotions	Screens can disturb dopamine regulation. This can lead to for example behaviour disorders and disturbed emotion regulation. For children this effect is worse because their brains are still under development.
Big brother is controlling	Technologogy, especially AI is developing quickly. Their economic incentives drives them more than there moral compass. But we are starting to see the problems as a society.
Easy fun?	People long for constant entertainment. But what is considered fun nowadays? AI gives possibility, but shouldn't we turn back to see fun in ordinary life?
Parental influence	Parents have a huge influence. In the real world they are more protective, but not in the online world.
Connectivity breaks connection we are longing for	People are more and more able to connect in the online world. At the same time this breaks real life connection, leading to increased loneliness and mental health problems
Disalignment	There is discussion on the topic, stakeholders are nog aligned.
From younger to older	Teenagers used to be the biggest problem, however this is shifting downward. However due to recent guidelines this may go up again.
Increasing online adversities	Online adversities are increasing
Escaping the real world	The crisis of these days are a reason for people to escape in the online world
Let's take action	Society is standing up against online adversities, with establishing guidelines and rules (top down). Parents are taking action (cottom-up). Schools are still in the middle establishing their position.
Bridging segregation	There are many differences in screen norms between groups. There are also differences based on age

What are possible future scenarios of the domain?

Method of synthesis

To gain insight in possible futures within the domain the factors are clustered according to the VIP method. These clusters are used to build a context structure. This is done by setting up a c-box with 2 axes after various iterations. The clusters are placed within the c-box. Each quadrant reveals a possible future scenario. Lastly, a possible challenge in this future scenario is identified.

Conclusion

The 12 created clusters are explained in figure FIXME.

Figure FIXME shows the developed c-box. The x-axis is based on the view of the online world. On the one side there is a trend of using the online world to escape, whereas on the other side there is a movement to tackle adversities in the online world. The x-axis is based on teaching approach. At the bottom is control, with adults controlling children's use of the online world. At the top is empowered, giving children the belief and tools they can do it themselves. Each quadrant represents a possible future scenario. In yellow the visual shows for each quadrant a problem that may occur in that scenario.

1. Big brain
2. Disturbed emotions
3. Big brother is controlling you
4. Easy fun?
5. Parental influence
6. Connectivity breaks connection
7. Disalignment
8. From younger to older
9. Increasing online adversities
10. Escaping the real world
11. Let's take action
12. Bridging segregation

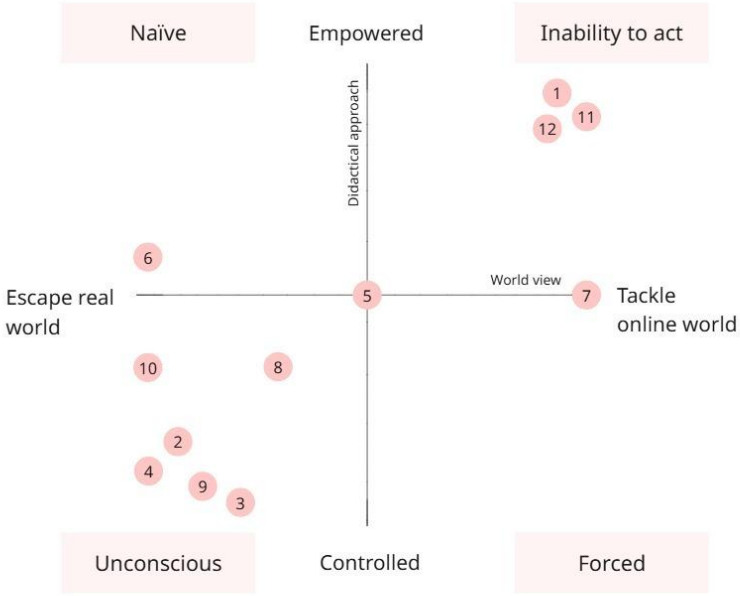


Figure FIXME describes the 4 possible future scenarios.

	Scenario
1	Children are empowered and keep on using the online world to escape the real world. This may lead to naivety towards problems in the real world.
2	Children are empowered to tackle the online world. A problem that may arise in this scenario is that there is an inability to act, an inability to empower children.
3	Children are controlled in what they are doing. They try to escape in the online world. Because they are controlled they are unconscious about the influence of their actions.
4	Children are controlled. The online world is tackled for them.

Defining the intervention point

Based on this research a societal future vision is established. This vision is used to guide the further design process. Based on the context map, this chapter identifies various leverage points within the system based on the societal future vision. It also defines a design opportunity from this to continue the process with. Lastly, the chosen target group is explained.

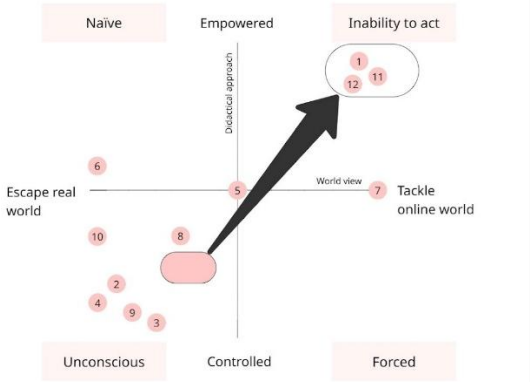
3.1 Societal future vision

For each of the scenarios established in previous chapter figure FIXME gives an argumentation about the desiredness of this future scenario.

	Argumentation
1	This is an unwanted scenario as unawareness of problems and unwillingness to act may lead to more problems.
2	This is a wanted scenario as children learn to use the online world in a good way. Inability to act is an overcomeable problem.
3	This is an unwanted scenario. As control does not work (Ch 2.1) and may create resistance. Next to that, escape causes unconsciousness about the real world ignoring possible problems.
4	Unwanted scenario. Control and tackling the online world do not go hand in hand. Exposure is needed to create digital resilience (Ch 2.1).

As can be seen in figure FIXME most clusters are placed in the third quadrant. However, from the insighst from the literature review it becomes clear that this is not a desired future direction. A few clusters emerge in the second quadrant. It seems as if the system is changing direction from the third quadrant to the second quadrant (figure FIXME). Next to that, this future scenario is in line with the findings from the literature review and the vision and mission of Monimentor as it is built on the belief that exposure to risk leads to

growth. This can be done with a positive empowering approach to learn children cope with digital adversities. Thus it would be wise to design for the second quadrant.



Conclusion

Based on the second quadrant's future scenario a societal future vision statement is developed. This shows where the system should preferably head towards. This is done to ensure relevance of the final solution in the system.

'I want children to feel empowered to use the online world'

A problem in this future scenario might be the inability of parents to act to facilitate this vision for children. This barrier is also mentioned in the literature (Ch 2.1).

3.2 Identifying a leverage point

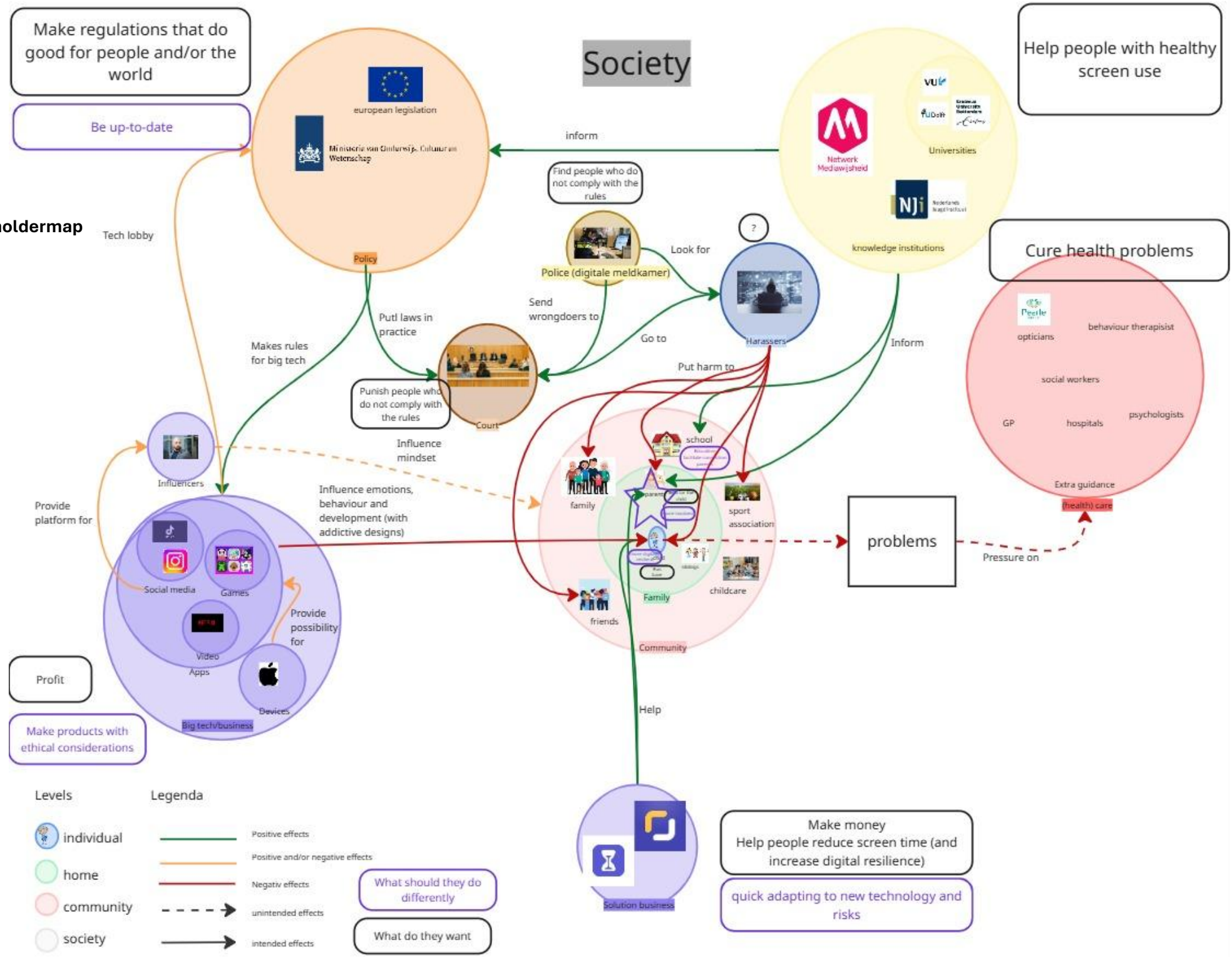
Based on the stakeholder map and the societal future vision, leverage points within the system are identified (purple boxes). A leverage point gives a suggestion what should change in the system to move the system forward.

Other stakeholders are already focussing on knowledge, awareness and guidelines. Next to that, these directions are less interesting for a design assignment. Chapter 2 concluded there is potential in developing tools to help parents and children strengthen their relationship to facilitate the moderator role of the parent. Monimentor is focussing on the family context (Ch 2.1). Therefore, focussing on the parent-child relationship is logical when developing an intervention for Monimentor.

3.3 Target group

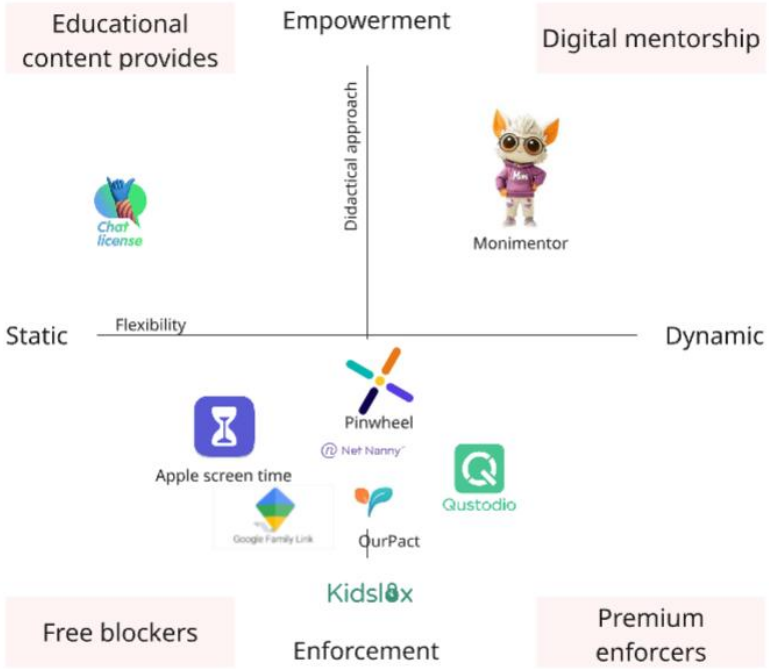
As concluded before, there is still a lot to be done in the awareness phase. However, this is not a fitting direction for Monimentor and more a government and institutional task. This project will therefore focus on parents that are aware of screen problems and trying to do something but can not reach the maintenance stage. Next to that, chapter 2 concluded that it is most impactful to focus on the age group 8-12 as this is the age group in which children get their own phone and want more autonomy. Lastly, the focus will be on Dutch families as this is the initial target group of Monimentor (Ch 2.2).

Stakeholdermap



C. Competitor analysis

In order to understand the position in the competitive landscape Monimentor is operating in, a competitor analysis is executed. Appendix FIXME shows the functionalities of each app. The C-box in figure FIXME is created by building on the analysis of Monimentor (n.d.). It shows that Monimentor is positioned in an empty area of the competitive landscape in the dynamic and empowerment quadrant. Most current apps focus on enforcing, with for example timers and app blockages. Monimentor is different by striving for empowerment and more dynamism. Being the only digital mentorship app gives them a competitive advantage in an unoccupied blue ocean, a new uncontested market space.



D. Screen effects

Advantages of screen use

Education: Information and skill training is accessible. This has educational value (Kumar et al., 2023) (Butorova et al., 2025), as it can enhance problem solving skills and cognitive development (Werner et al., 2024). Bhutani et al. (2024) found that educational value is only reached when content is watched with parents.

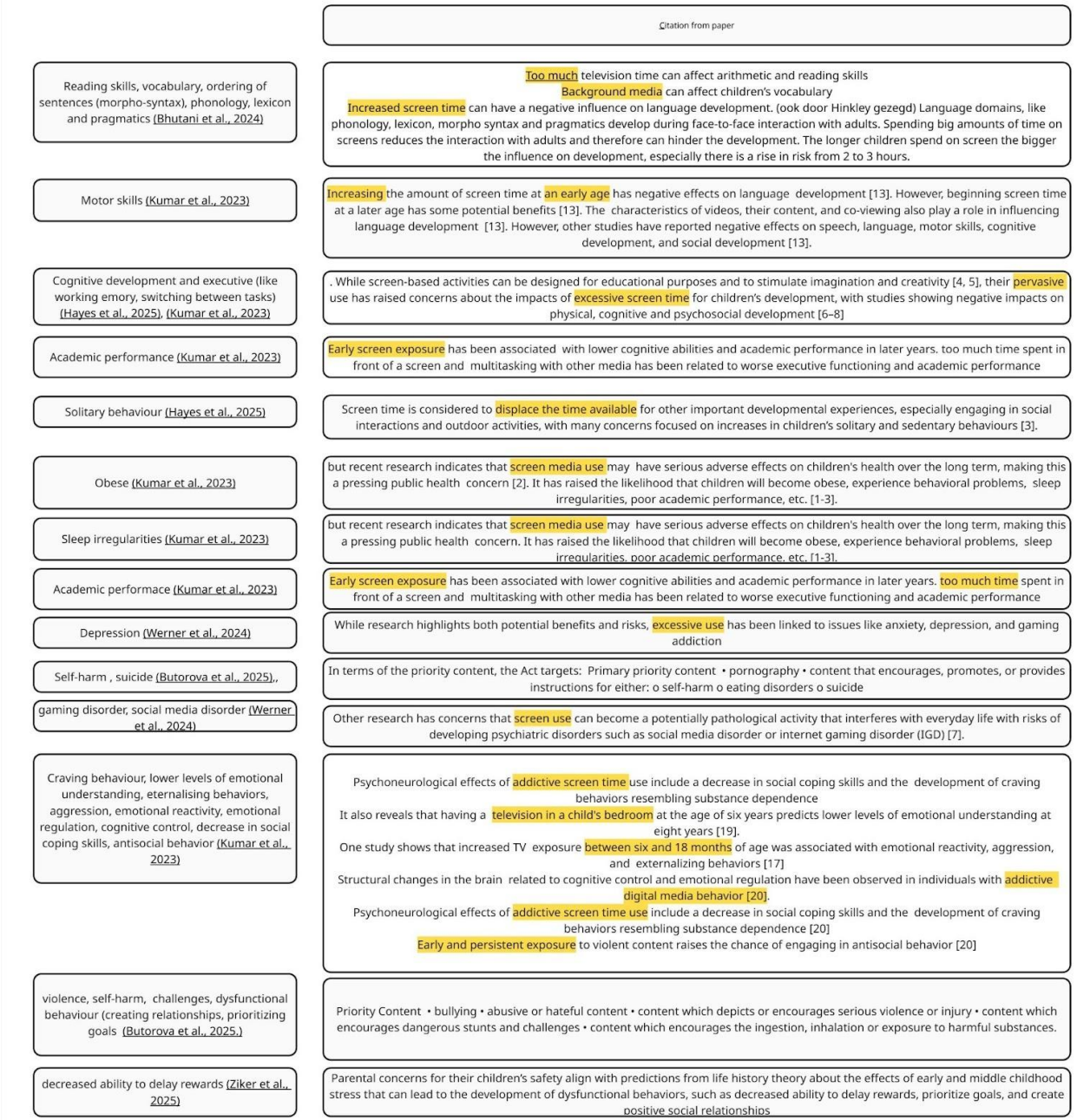
Language: Some studies show a positive correlation between children's screen time and language abilities, when viewed with a parent. Online books and learning to read applications can enable early reading skills (Kumar et al., 2023).

Creativity: Online books and learning applications can enhance creative capacity. It can also encourage imaginative play (Kumar et al., 2023).

Connection: Social media enables communication. This can foster connection and a sense of belonging (Werner et al., 2024).

Social skills: Media can lead to exposure to diverse experiences and cultures, prosocial content and promoting positive racial attitudes (Bhutani et al., 2024)

Analysis of underlying factors



E. Interview guide

This interview guide is used both to gain insight in the macro and micro-context. It also asks for feedback on possible ideas to get a sense of what kind of solutions could work.

Introduction

- Leuk dat je mee wilt doen aan dit interview
- Introductie + doel
- Toelichting informed consent
- Opnemen + transcriberen
- 3 onderdelen toelichten

Introductievragen (15 min)

1. Kan je wat vertellen over je achtergrond?
2. Kan je je werk nog wat meer toelichten?
3. Hoe zie je jullie rol in scherm problematiek?
4. Wat voor rol zie je voor jullie in de toekomst?

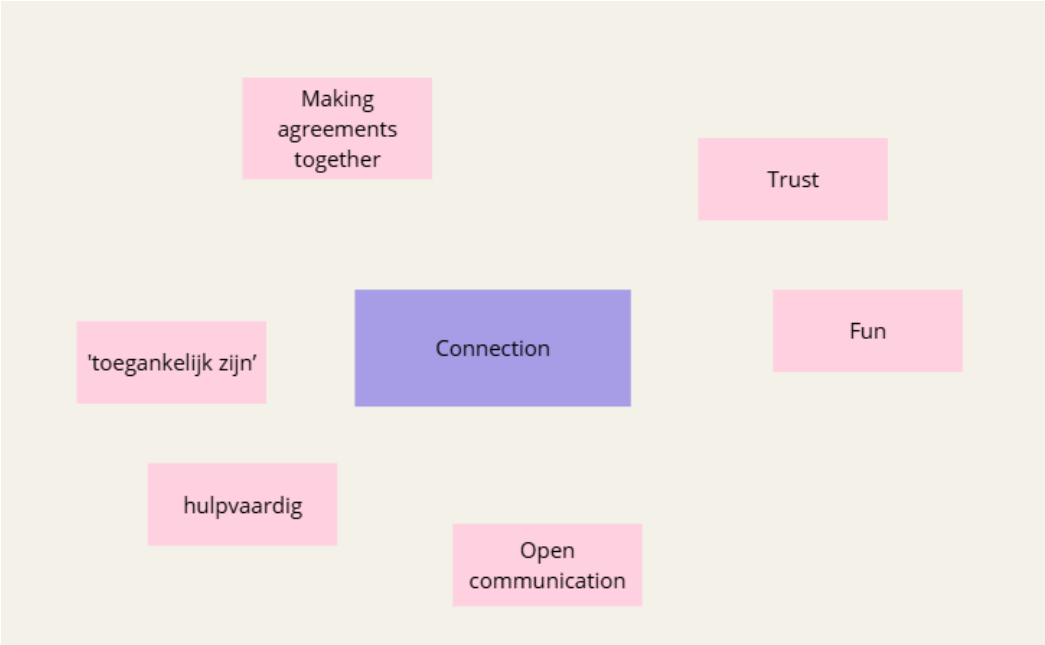
1. Wat zijn de meest voorkomende problemen die jullie tegenkomen?
2. Wat zijn de oorzaken van dit probleem?
3. Hoe zou dit voorkomen kunnen worden?
4. Wat is de grootste drempel tot digitale weerbaarheid?

Scope (15 min)

8-12 jaar

Oplossingsrichting: Hoe kunnen we connectie binnen gezinnen stimuleren? Het idee hierachter is dat wanneer er meer open communicatie en vertrouwen binnen het gezin is, kinderen makkelijker gebeurtenissen zullen delen. Hierdoor kan hier makkelijker over gesproken en gereflecteerd worden waardoor kinderen weerbaarder worden. Ouders krijgen hierdoor meer inzicht in wat hun kinderen online allemaal doen.

5. Is dit iets wat jullie terug zien komen? Wat vind je van deze richting binnen het onderwerp digital resilience?
6. Houdt je jezelf bezig met oplossingen binnen deze richting?
7. Hoe bevallen deze oplossingen?
8. Hoe zouden deze kunnen verbeteren?
9. Wat voor barrières zijn er in deze richting?
10. Welke effecten denk je dat het zou hebben als dit verbeterd wordt?
11. Welke van de volgende zie je als belangrijk?



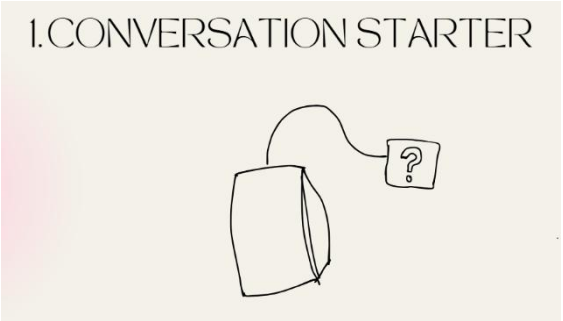
1. Making agreements together
2. Inleven in elkaars wereld
3. Parents response
4. Have fun together
5. Create structure/rhythm
6. Be the 'right' example
7. Be able to help
8. 'Image' of device
9. Solving boredom
10. Strengthen parental skills

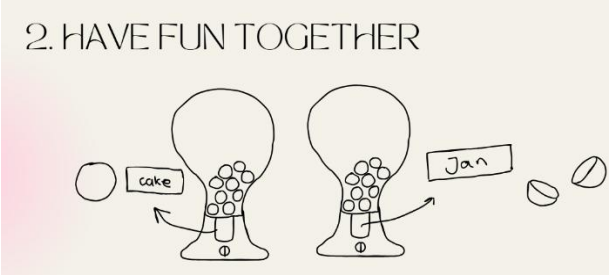
Concept directions (15 min)

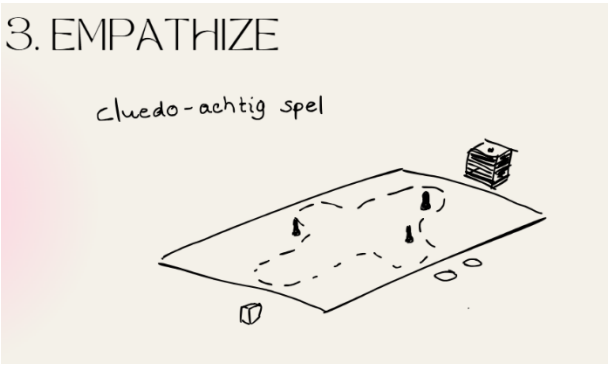
3 concepten worden toegelicht. Doel is niet om deze concepten te evalueren maar om feedback te krijgen en hier inzichten uit te halen.

12. Wat vind je van dit idee?
13. Wat vind je er goed aan?
14. Waar zie je valkuilen?
15. Denk je dat dit zou werken?

Ideeën







Extra

16. Waar denk je dat de meeste vooruitgang te behalen valt in het verbeteren van digitale weerbaarheid?

Heel erg bedankt voor je deelname

F. Generative sessions

Session plan

Research questions

1. How do parents and children experience their screen use?
2. How do parents and children experience communicating about screens?
3. What are barriers and opportunities within the parent-child relationship to building digital resilience?

Goal

Gain a deeper understanding of

1. The context in which parents and children (8-12) use a screen

a. What do they do on the screen?
b. Where do they do it?
c. When do they do it
d. With who do they do it
e. How do they experience using screens?

2. The context in which parents and children communicate about screens

e. What do they communicate about?
e. Where do they do it?
e. When do they do it?
e. With who do they do it?
e. How do they communicate? How is it approached

3. Parents and children's experiences around communicating about screen use

j. How do children experience using screens?
j. How do parents experience their and their child's screen use

l. What do children need when they come across digital adversities? (something bad happens online?)
l. What do parents need when they communicate to the child about screen use and screen content? (How would they like to experience it?)

Build-up

Sensitizing booklet: Context of screen use and communication

- Present and past
- Goal 1 and 2

Session: Current and wished experience (desires)

- Past and future
- Questions about sensitising booklet
- How is it currently experienced? collage
- How would they like to experience it? superhero

Sensitizing goals

Task	Goal
1. Introduction	To use to introduce ourselves
2. Screen mindmap	To get insight in their first thoughts
3. Timeline	To get insight in when devices are used
4. House plan	To get insight in where devices are used
5. Rules	To get insight in which rules are made

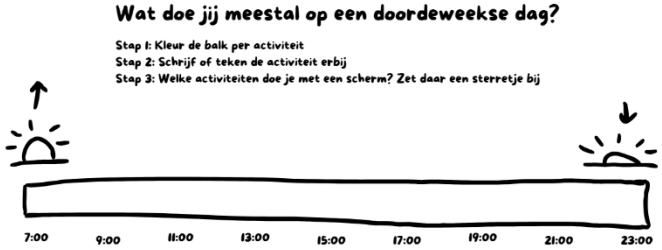
Session plan

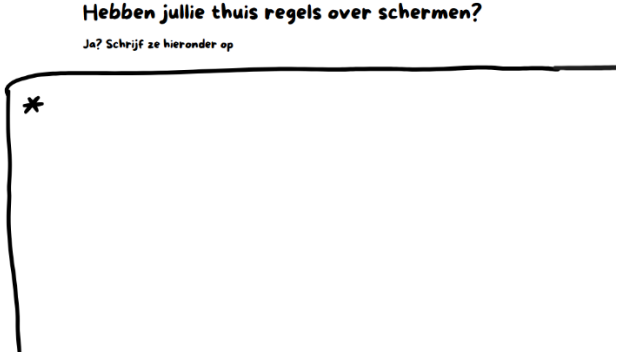
Time	Goal	What	!	Notes
		Send information	• Booklet • Informed consent	
		Set up	• Test audio (audio recorder + teams + phone)	
3		Introduction to parents	• What: do, objectives • Rights: happens with data, je mag ten alle tijden stoppen of verzoeken bepaalde data te verwijderen • Informed consents • Audio on	
10		Introduction	• Introduce with booklet	

			• What: do fun activities, ask some questions • Mindset: no wrong answers • Rights (don't have to answer, stop) • Personal introduction (page 1)	
15	1/2	(present) Go through booklet	• Ask questions, some for whole group → discussion? Some take turns	
30 min	3	Past	• Make collage • Use attributes, or creative freedom • What you think of when you think about using a screen and your child using a screen • 15 min • Discuss 15 min	• How do children experience using screens? • How do parents experience their and their child's screen use
30 min	3	Future	A. • Iemand zegt iets onaardigs tegen je via een spelletje (of doet iets anders wat niet leuk is) • Welke superkrachten zou je willen hebben in deze situatie? Kan je een superheld maken B. • Als je denkt aan het opvoeden van je kind met gezond schermgebruik • Welke superkrachten zou je willen hebben om dat te kunnen verbeteren	

			• 15 min discuss	

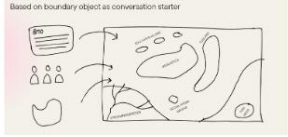
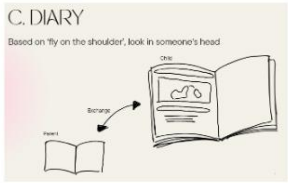
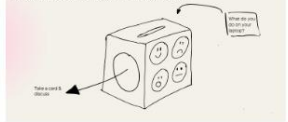
Sensitizing booklet





G. Ideation

Initially 5 ideas were developed and evaluated. The evaluation is shows here:

	Limitations	Strength	H2	Suggestions
A. EXPERIENCE MAP Based on boundary object as conversation starter 	- Dfference in what is said and done --> is that a problem? **- Stay relevant**	**- Boundary object as conversation starter**	**- Keep it fun?** **- Keep using it?**	- Experience map used in coache e.g. for stressed people --> get patterns out of it - put emotions because they change - other object every day to co-evolve - paiting that changes everyday per person
B. KNOWLEDGE GAME Based on peer learning + game fun 	- games are often temporary expecially if it doesn't have new elements - still a broad game, difficult to judge - after a while you have the knowledge --> fun gone	- interesting to ask each other questions - fun **- Learn from each other**	- keep up with trends - keep it fun	-combine 1 +2 --> end of week more knowledge --> build your own game - exchange cards with family - lives more when yo give your own input - like making things - knowledge, uitbeelden
C. DIARY Based on 'fly on the shoulder', look in someone's head 	- depends on child whether they will use it - might only use it when wanted **- willingness to use**	**- do something with what they see (something fun, photo)** **- catalysing jezelf uiten** - give insight - do something for yourself	- What do you want to get out of their head?	- think about what is the mechanisme, why does it work? - give something in a format --> finish sentence or picture
D. PERSONAL AVATAR Based on projecting experience on another object 		**- data is there to use** **- also incorporating parents** - coupling Moni to physical world		- e-print - Incorporate Cr and daily score - thermometer
E. CONVERSATION BOX Based on conversation starter + thought expression 	- is it challenging enough (clock, bell, fill in something) - depends on context	- could work because there is a starting point	**- attract people to it/**	- Statement cards - common enemy

H. Co-creation session

Revised problem statement: How can it be normal to talk about the online world in a positive way by means of a physical tool.

Developed concepts on the next page

Clusters

Emotions

Prevention

Anonymous

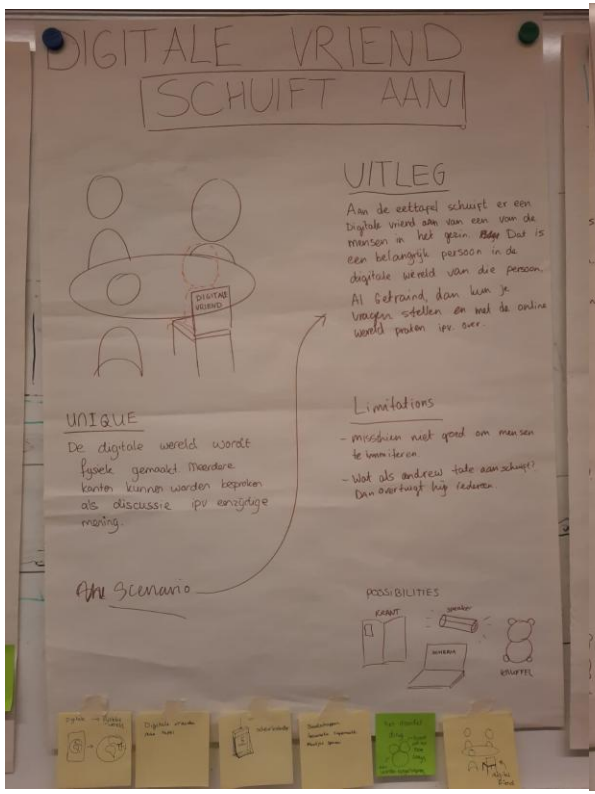
Intervention

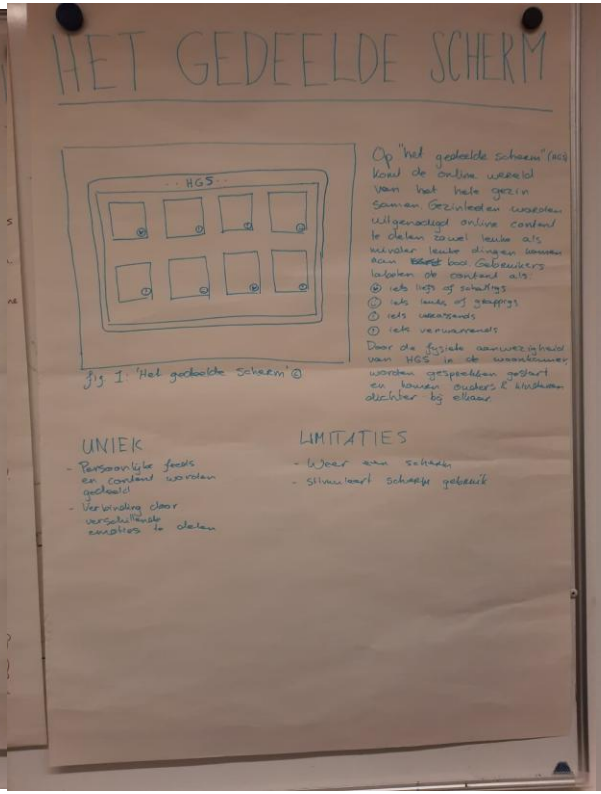
Game element

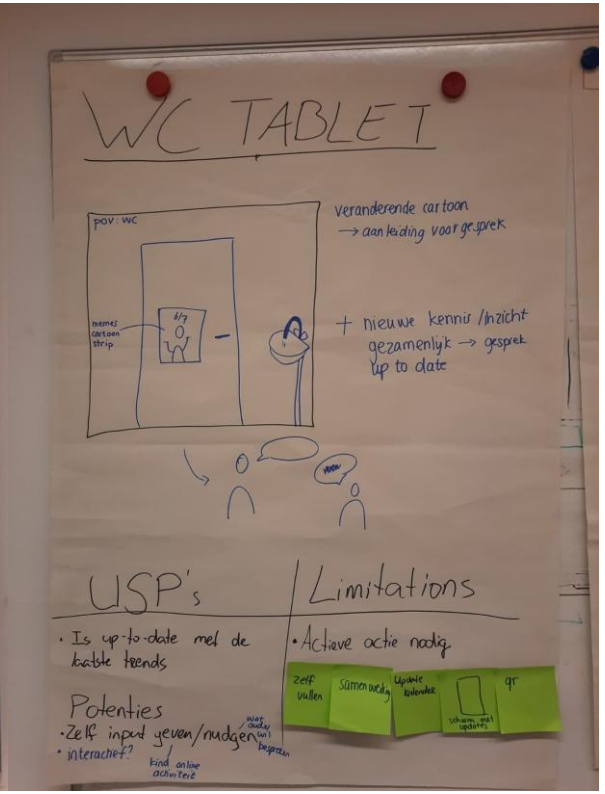
Conversation starter

Playmobil/lego

Shared content

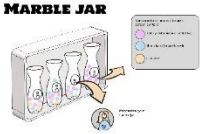
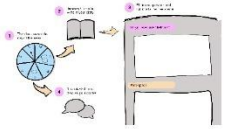
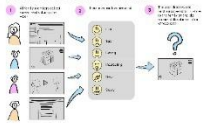

DIGITALE VRIEND
SCHUIFT AAN
UITLEG
Aan de eettafel schuift er een digitale vriend aan van een van de mensen in het gezin. Dat is een belangrijk persoon in de digitale wereld van die persoon. Al getraind, dan kun je vragen stellen en wat de online wereld posten ipv. over.
UNIQUE
De digitale wereld wordt fysiek gemaakt. Meerdere kanten kunnen worden bespreken als discussie ipv eenzijdige mening.
Limitations
- misschien niet goed om mensen te imiteren
- Wat als andrew tate aanschuift? Dan overtuigt hij iedereen
Als Scenario
POSSIBILITIES

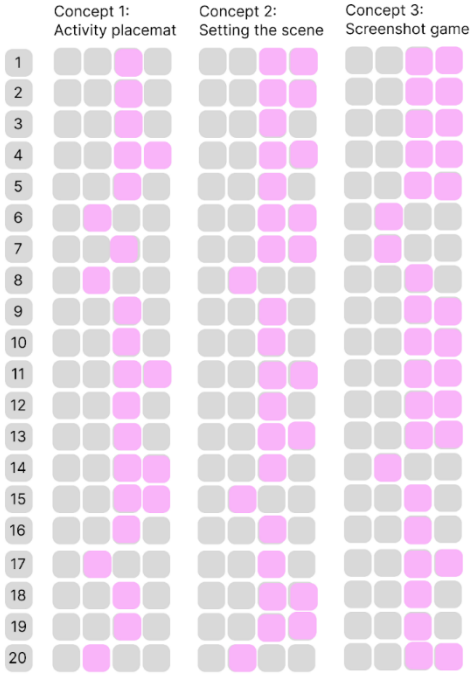

HET GEDEELDE SCHERM
HGS
fig 1: 'Het gedeelde scherm'
UNIEK
- Persoonlijke feeds en content worden gedeeld
- Verbinding door verschillende emoties te delen
LIMITATIES
- Weer een scherm
- stimuleert schaapjes gedrag


WC TABLET
pov: wc
meme/ cartoon strip
veranderende cartoon
→ aanleiding voor gesprek
+ nieuwe kennis /inzicht gezamenlijk → gesprek up to date
USP's
• Is up-to-date met de laatste trends
Potenties
• interactief?
Limitations
• Actieve actie nodig
zelf vullen
Samenvatting
Update kalender
QR

I. Conceptualisation

The overview shows the three initial concepts and the insight gained from discussing the concepts is shown on the left. The harris profile for the concepts shown in the report is shown on the right.

	Change Limitations	Keep Strength	Change H2	Suggestions	How to change it?	
MARBLE JAR 	- Parents might learn more than children	- It connects the online world to the physical world - It can be a trigger for conversation - Variable by basing it on data - It can be neglected - Could become a ritual - Input is facilitated --> low-effort	- Make the marbles (ligth) - How can you help parents approach conversation when child is in a different mindset (e.g. angry) - How to get to the deeper insights? - H2 place it at a dinner table efficiently?	- Which questions would you ask and how can you facilitate this. - Smart Iot lighting could be used	improvement round	combine
DIARY DAYS 	- Feels like homework and a lot of time (especially as parent) - not low effort. - Not easily ignored, but a have to	- Think for yourself for a moment makes sure they are not too much influenced by each other and gives insight in different experiences.	H2 share your own thoughts in a different way.	- What is a diary, how could it be put in another form?	combine	
SCREEN GUESSING 	- Screen at the dinner table	- game element is fun - easy to keep up to date		Facilitate to make it low-effort - Randomly taking screenshot and asking for permission - Sending reminders to take a screenshot - Game element: fade from blur to real,make it		

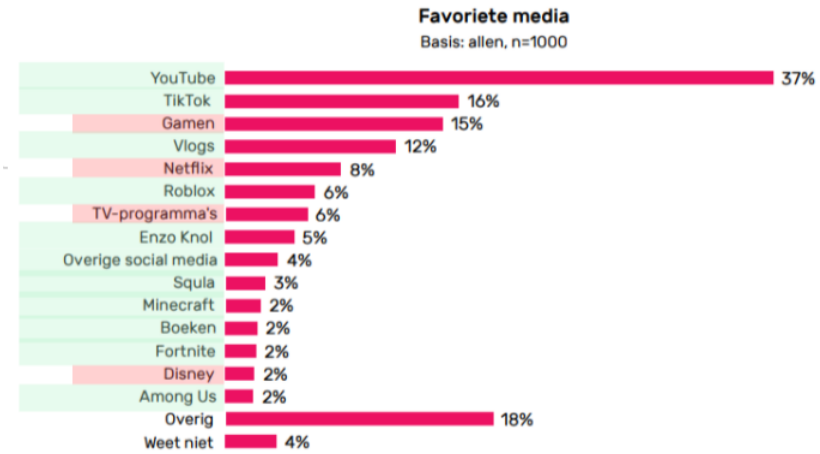


J.Research screenshots

What apps block screenshots?

Banking app and streaming services block screenshot for safety and privacy reasons.

What do 8-12 year olds do online?

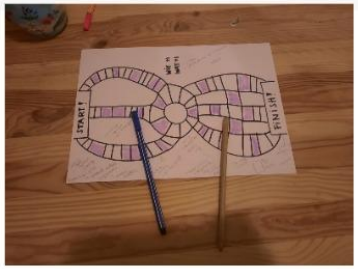


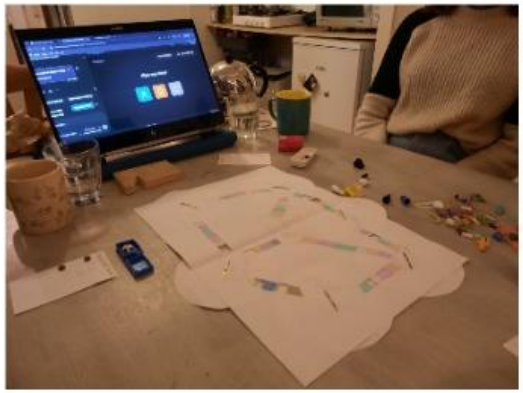
Modified from (*NM-monitor rapport.pdf*, z.d.). The apps that can be screenshotted are marked green, the ones that can't are red.

Conclusion

Even though some platforms block screenshots there are still many activities that can be screenshotted. Therefore, the concept is still feasible.

K. Lo-fi prototype tests

Version	1	2	3
Changes with regard to previous		3 kinds of questions storyelelment	Adapted point system makes the game longer Screenshot app prototype
picture			
goal of test	Is a game with personal screenshots indeed evoking conversation?	Is a game with personal screenshots evoking conversation between parents and children?	Game mechanics
tested with	2 peers + me	2 children (8-12) + 1 father + me	2 peers + me
Main strengths	- Participants experienced it as fun to see each others screenshots as they got insight in what others do. Also seeing their own screenshots was interesting as it shows what is important to you. - Participants analysed screen details to discover the	- getting points in different ways - move over the board -fun questions - fun to see your own screens - world map is fun	Fun to see each others screenshots
Main weaknesses	- What happens when you get your own screenshot? - Can be more exciting by adding tactics and blocking methods	- Game finished too fast - Difficult to take over from someone in the lead - Screenshots should be well mixed - Children don't know the word screenshot	- Seeing your own screenshot is unfair - Screenshots are not mixed - Not everything is an app - There is a lot of colour so changing the squares does not give a lot of benefit
Main insights	It evoked conversation that would otherwise probably not have happened Participants could be helped more to also talk about experience. Test with parents and children to see if it also evokes the intended effect and ask them for input.	It gave more insight in what activities everyone does - Screenshotss were an opener for questions - Experience was not so much discussed - Children seemed to have fun	Game board should be modified

Version	4	5	6
Changes with regard to previous prototype	More turning wheel creates more challnge in the game Game rules book	More coloured squares to be able to earn more points Revised questions	Rabbit holes, barriers to add strategic elements Power-ups to keep players engaged Minus points for squares in betwwoeen player and startisland
picture			
goal of test	Game mechanics and clarity of rule book	Test game mechanics and clarity of rule book	Game mechanics
tested with	nephew (40) + cousins (+/18)	My parents + sister + cousin	3 peers + me
Main strengths	-	The layout of the islands in combination with not awarding the first player on an island resulted in more fair play than previous version. Players had the idea they knew better what other do on their phone	- quite simple to understand
Main weaknesses	- Hard to get points - Hard to block tohers - Statement question are not interesting - Mistakes in explanation	- colours could be distributed better	- screenshots are small - Hard to go far - No incentive to go to a far island - Getting your own screenshot does not give opportunity for points - too many minus points - not always 2 rabbit holes present
Main insights	It is hard to get points and therefore the game takes too long	- Create an addition to keep playerss engaged even when it is not their turn.	It evoked conversation that would otherwise probably not have happened Participants could be helped more to also talk about experience. Test with parents and children to see if it also evokes the intended effect and ask them for input

Version	7	8	9
Changes with regard to previous prototype	3 kinds of questions storyelelment various ways to collect points more variation in routes Dice with 8 sides	Talking for 20 seconds, ehh is allowed cleare explanation of how to collect screenshots Change second questoin to fit better in case of few apps/websites	2 squares on one island More bridges Fewer power-ups
picture			
goal of test	Test if game mechanics fit children and parents skill level	Test game mechanics and if rule book is clear	Game mechanics + rule book
tested with	3 children + 1 father	Uncle, aunt, brother (20), nephew (27)	parentns + sister + boyfriend
Main strengths	- Parent discovered what Minecraft looks like - Children were excited to play the game - game took 30 minutes	- It is fun to talk about - You learn new stuff	- the amount of times an island was reached and the aount of paths was considered good
Main weaknesses	- Talking is hard for some children - explanation of collecting screenshotss could be clearer - One website poki was seen often. It would be more interesting to ask which game it is	- Game took 1 hour - Few players reached an island - Second questions is unclear - Top bar gives away the answer - Many power-ups were not used - Turning wheels used little	- Unclarities in explanation - Rabbit holes not used as there is little benefit in them
Main insights	How well the game works also depend on how fanatic players are	The existing rules shoulld be slightly modified	No scoreboard needed Game with minor modification is ready to develop into hi-fi prototype

L. Guidebook for parents

The guidebook is a flyer in A5 format, making it low-threshold to read.

M. Onboarding flow


Hoe werkt het?
Één keer was de vraag 'Wat was een leuk moment?' Ik maakte een screenshot van een spel dat ik won.
Moni


Hoe werkt het?
Moni


Hoe werkt het?
Alle screenshots van jullie gezin slaan we op in de tijdscapsule.
Moni


Hoe werkt het?
Alle screenshots van jullie gezin slaan we op in de tijdscapsule.
Moni


Hoe werkt het?
Zo kunnen we ze later gebruiken voor het Cloud surfers spel.
Moni


Hoe werkt het?
De vraag van deze week is: Maak een screenshot van een moment dat je iets nieuws ontdekte. Ga maar snel ontdekken!
Moni

N. Introduction game

Explanation video

O. Rulebook

CLOUD SURFERS

- SPELREGELS -

SPELREGELS

! Klik op de dobbelsteen in de app voor je de spelregels leest !

Vaak verkennen we de online wereld alleen, maar dit keer gaan we met de hele familie op ontdekkingstocht. Er zijn 7 rondes voor onze schermtijd op is en we naar huis moeten. Er zijn hier veel plekken te ontdekken, waar souvenirs als aandenken te halen zijn. Maar de weg ernaartoe zit vol met avonturen en uitdagingen. Overwin je deze, dan verdien je stempels. Maar let wel op! Zorg dat je voor de schermtijd voorbij is weer bij me bent om samen terug te keren naar de echte wereld. Wie verzamelt de meeste souvenirs en stempels en is de beste ontdekkingsreiziger?

Speelmateriaal

- 1 speelbord
- 6 reizigers (pionnen)
- 6 paspoorten
- 1 dobbeldsteen
- Stempels (vierkant, rond & driehoek)
- Power-ups (munt met paddestoel)
- Souvenirs
- Schermhouder
- Tijdteller
- Eigen scherm met de Monimentor app

Souvenirs

Tijdteller

Spelvoorbereiding

Plaats de twee delen van het speelbord in elkaar. Plaats de wolken op de juiste plaats op het bord (zie nummers). Iedere speler kiest een reiziger en krijgt een paspoort. Iedere speler plaatst zijn reiziger op het starteiland in het midden. Een device met de Monimentor app wordt op de standaard geplaatst naast het spelbord. Klik in de Monimentor app op de dobbelsteen om de spelfunctie te openen. De souvenirs, stempels, power-ups en tijdteller worden aan de rand van het spelbord geplaatst.

Doel van het spel

De speler die na 7 rondes de meeste reispunten behaald heeft, is de ultieme ontdekkingsreiziger!

Spelverloop

De speler die het langst geen scherm heeft aangeraakt mag beginnen. Deze speler houdt ook de tijd bij die jullie verblijven in de online wereld. Dit doet hij door aan het eind van iedere ronde de knop op de tijdteller in te drukken. Spelers spelen om de beurt met de klok mee hun beurt.

Een beurt

Wanneer een speler aan de beurt is mag deze de dobbelsteen werpen en het aantal vakjes in een gewenste richting vooruit zetten. Het vakje bepaalt de actie:

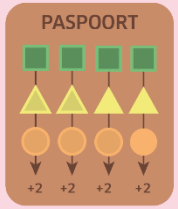
Voor oranje, groen en geel: tik op de kleur in de app. En beantwoord de bijbehorende vraag:

Van wie is dit screenshot?

Beschrijf wat je op het screenshot ziet: Waarvoor wordt dit gebruikt en hoe werkt het?

Beschrijf voor 30 seconden lang het screenshot zonder stiltes van meer dan 3 seconden. Let op! de timer loopt meteen wanneer je het scherm aantikt.

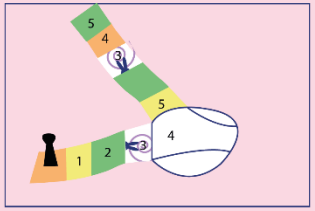
Wanneer het antwoord is gegeven legt de eigenaar van het screenshot uit wat er te zien is op het screenshot. Vervolgens beoordeeld deze of het gegeven antwoord correct is. Bij een correct antwoord verdient de speler die aan de beurt is een stempel. Plaats deze op de betreffende kleur op je paspoort. Per kleur kunnen maximaal 4 stempels worden verdiend (zie hieronder).



Groen heeft het maximaal aantal stempels bereikt.
Van geel kunnen nog 2 stempels worden verdiend.
Van oranje kan nog 1 stempel worden verdiend.

Overige vakjes:

Een rabbit hole: Transporteer jezelf naar een andere rabbit hole naar keuze. Dit mag wanneer een speler eindigt op het vak of er overheen komt.



De speler gooit 6. Hij zet 1, 2, 3 stappen. Op 3 komt hij een rabbit hole tegen hij mag nu kiezen om verder te lopen of naar een andere rabbit hole te gaan en vanaf hier verder te tellen.

Fire wall: Hier kun je niet langs. Keer om.

Power-up: Je verdient een power-up wanneer je op of over dit vakje komt. Deze kun je later in het spel inzetten om een beurt te kapen. Dit kan je doen wanneer je denkt dat een medespeler het foute antwoord geeft op een oranje of groene vraag. Dit doe je door je power-up op starteiland te plaatsen nadat je medespeler een antwoord heeft gegeven, maar vóórdat de eigenaar van het screenshot zich bekend maakt. Wanneer je je power-up plaatst mag je het volgens jou juiste antwoord geven. De speler met het juiste antwoord verdient de stempel. Een power-up mag niet ingezet worden bij een eigen screenshot.

Een wolk

Wanneer een speler exact op een wit vakje op een wolk eindigt krijgt deze een souvenir, behalve bij starteiland. Ook heb jij nu even de controle in handen. De online wereld verandert continu. Scroll één keer aan een van de scrollknoppen aan de zijkant om de vakjes te verschuiven om de wereld te veranderen.

Na het uitvoeren van de actie is de volgende speler aan de beurt.

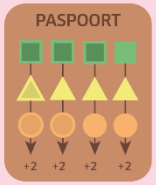
Overige regels

- Voor oranje en groene vragen: Krijg je je eigen screenshot te zien bij een vraag? Verander de wereld door aan één van de scrollknoppen te scrollen. Klik vervolgens nogmaals op de kleur van je vraag om alsnog een vraag te beantwoorden.
- Wanneer de beginspeler weer aan de beurt is, drukt deze op de tijdteller om de schermtijd bij te houden.
- Zorg dat je voor de 7 rondes schermtijd voorbij zijn weer terug bent op het starteiland in het midden om samen terug te keren naar de echte wereld. Heb je het niet gehaald binnen de tijd? Dit kost je 2 punten om door de raket opgehaald te worden en als nog mee te kunnen.

Eind van het spel

Wanneer de tijdteller op 7 rondes komt te staan is het spel afgelopen. Nu worden de punten geteld. Druk in de app op einde spel om Moni je te laten helpen met de puntentelling of volg de volgende regels:

1. Alle spelers die niet op tijd geëindigd zijn op starteiland moeten met de raket opgehaald worden. Ze krijgen twee minpunten als betaling.
2. Vervolgens wordt de rest van de punten geteld:
   - Souvenir: 2 punten
   - Iedere stempel: 1 punt
   - Voor elke verticale rij gevuld met stempels: 2 extra punten



Deze speler krijg +2 punten omdat de eerste kolom stempels in zijn geheel is gevuld. Dit komt dus neer op 8 punten.

De speler met de meeste punten is de winnaar!

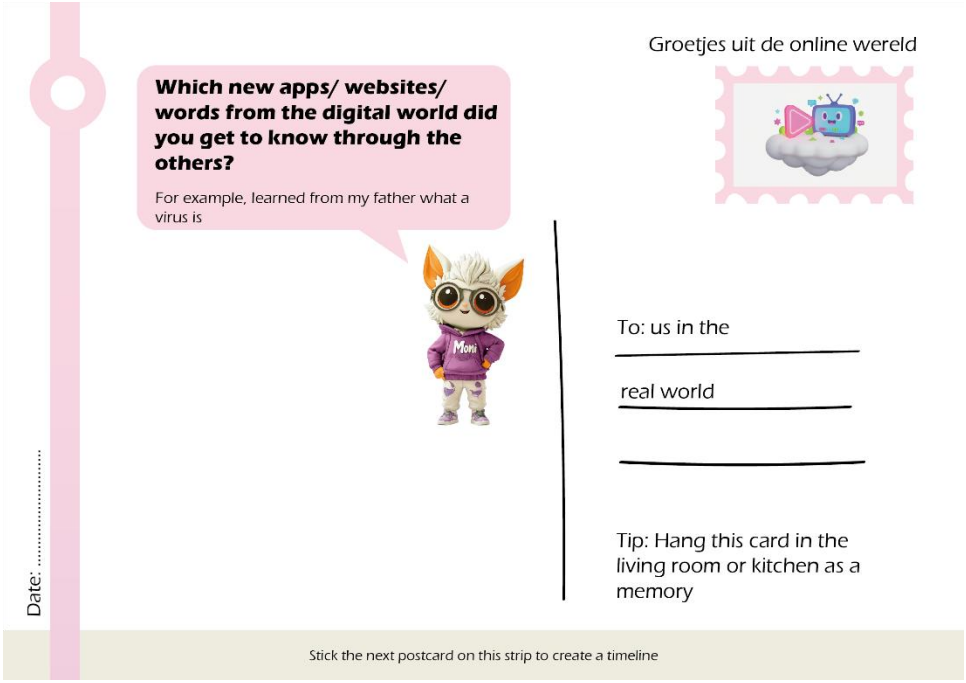
Voor we terugkeren naar de echt wereld staat ons nog één ding te doen. Op vakantie schrijven we vaak een kaartje naar onze familie. Laten we onze herinneringen vastleggen op een kaartje. De winnaar pakt het bovenste kaartje van de stapel en leest de vraag voor. Overleg samen over het antwoord en schrijf het op. Klaar? Hang hem in de woonkamer als herinnering! Heb je er al meerdere? Plak ze aan elkaar met de plakstrip om een tijdlijn te maken!

P. Outro game


De schermtijd is op! Laten we de punten tellen:
Stempel: +1
Kolom van stempels: +2
Souvenir: + 2
Wie niet op tijd terug is op het starteiland levert 2 punten in om met de raket opgehaald te worden.
Degene met de meeste punten is de beste ontdekkingssreiziger!
Voor we terugkeren naar de echt wereld staat ons nog één ding te doen. Op vakantie schrijven we vaak een kaartje naar onze familie. Laten we onze herinneringen vastleggen op een kaartje.
Pak een kaartje uit de doos en vul hem samen in.
Klaar? Laten we dan snel terug gaan naar de echte wereld.
Yaay we zijn weer terug! Hopelijk heb je door het spel ingezien dat het heel leuk kan zijn om samen over de online wereld te praten. Vergeet dit vooral niet te doen in het dagelijks leven. Tot snel!

Q. Postcard series

This appendix shows the 11 postcards to be used in the outro. They should be used in the order shown here, as the questions deepen along they way and build on each other.



Groetjes uit de online wereld

Wat zijn jullie over elkaars schermactiviteiten te weten gekomen tijdens het spel?

Ik ontdekte bijvoorbeeld dat mijn ouders veel voor werk op hun scherm zitten

Aan: ons in de

echte wereld

Tip: Plak deze kaart aan de vorige met de plakstrip om een tijdlijn te maken!

Datum: .....

Plak de volgende keer de nieuwe postkaart op deze strook

Groetjes uit de online wereld

Wat vinden jullie leuk om te bespreken over de online wereld? En wat vinden jullie niet zo leuk om te bespreken over de online wereld?

Zet een hartje voor leuk en een kruisje voor niet zo leuk.

- ☐ Spelletjes
- ☐ Frustraties
- ☐ Nieuws
- ☐ Tips
- ☐ Dingen waar we boos van worden
- ☐ Dingen die eng zijn
- ☐ Leuke dingen die we meemaken bespreken
- ☐ Met wie we contact hebben
- ☐ .....

Aan: ons in de

echte wereld

Tip: Soms is het leuker om iets te bespreken als je het samen ervaart, probeer daarom eens samen elkaars online activiteiten uit!

Datum: .....

Plak de volgende keer de nieuwe postkaart op deze strook

Datum: .....

Wat hebben jullie geleerd over wat iedereen vind van het gebruiken van een scherm?

Zet de eerste letter van ieders naam bij de vakjes waar je het mee eens bent.

- ☐ Leuk
- ☐ Stom
- ☐ Vermoeiend
- ☐ Ontspannend
- ☐ Ik maak me zorgen
- ☐ Ik word er boos van
- ☐ Handig
- ☐ Oneerlijk
- ☐ Ik word er chagrijnig van
- ☐ .....

Groetjes uit de online wereld

Aan: ons in de

echte wereld

Tip: Denk hier eens over na: beïnvloed je eigen ervaring hoe je denkt over de ervaringen van de rest?

Plak de volgende keer de nieuwe postkaart op deze strook

Datum: .....

Hoe praten jullie het liefst met elkaar over de online wereld?

- ☐ Positief
- ☐ Elkaar vragen stellen
- ☐ Boos worden
- ☐ Negatief
- ☐ Samen spelen
- ☐ Oordelen
- ☐ Ervaringen bespreken
- ☐ Naar elkaar luisteren
- ☐ Samen kijken
- ☐ Door elkaar heen praten
- ☐ Wat je meemaakt vertellen
- ☐ Bespreken wat anderen meemaken (bijvoorbeeld uit het nieuws)

Groetjes uit de online wereld

Aan: ons in de

echte wereld

Plak de volgende keer de nieuwe postkaart op deze strook

Datum: .....

Welk moment op de dag vinden jullie een goed moment om over de online wereld te praten?

- ☐ Bij het ontbijt
- ☐ Voor het avondeten
- ☐ Tijdens het avondeten
- ☐ Na het avondeten
- ☐ Voor het scherm gebruiken
- ☐ Tijdens het scherm gebruiken
- ☐ Na het scherm gebruiken
- ☐ Voor het slapen gaan
- ☐ Bij een teken dat we samen afspreken
- ☐ Na school
- ☐ .....

Groetjes uit de online wereld

Aan: ons in de

echte wereld

Plak de volgende keer de nieuwe postkaart op deze strook

Datum: .....

Welke schermervaring hebben jullie besproken waarvan je nog niet wist dat iemand die had gehad?

Ik ontdekte bijvoorbeeld dat iemand mijn vaders wachtwoord had gestolen en overal in kon.

Groetjes uit de online wereld

Aan: ons in de

echte wereld

Tip: Het is goed om van elkaar te weten waar iedereen zich mee bezig houdt, zo kan je het er makkelijker over hebben.

Plak de volgende keer de nieuwe postkaart op deze strook

Datum: .....

Zijn er dingen die jullie online hebben meegemaakt die je niet in het spel hebt besproken maar wel zou willen bespreken?

Ik wilde bijvoorbeeld al heel lang vertellen dat iemand mij allemaal gekke berichtjes stuurt op Roblocks

Groetjes uit de online wereld

Aan: ons in de

echte wereld

Plak de volgende keer de nieuwe postkaart op deze strook

Datum: .....

Hebben jullie wel eens online iets meegemaakt wat je vervelend vond? Zo, ja hoe voelde je je toen?

Zet de eerste letter van je naam bij de emotie en schrijf kort op wat er gebeurde

Groetjes uit de online wereld

Aan: ons in de

echte wereld

Tip: Het is goed om vervelende online ervaringen te bespreken om er zo samen van te kunnen leren en het een volgende keer beter aan te kunnen pakken.

Plak de volgende keer de nieuwe postkaart op deze strook

Datum: .....

Hoe kunnen jullie er samen voor zorgen dat jullie vervelende online situaties bespreken?

- ☐ Naar elkaar toekomen
- ☐ Elkaar helpen
- ☐ Dwingen wat je moet doen
- ☐ Straf geven
- ☐ Vragen stellen
- ☐ Weten wat voor schermactiviteiten iedereen doet
- ☐ Een vast moment kiezen
- ☐ Altijd boos kijken als je een scherm gebruikt
- ☐ Een teken afspreken als je iets wilt vertellen
- ☐ .....
- ☐ .....

Groetjes uit de online wereld

Aan: ons in de

echte wereld

Plak de volgende keer de nieuwe postkaart op deze strook

Datum: .....

Hoe kunnen jullie elkaar helpen als er een vervelende online situatie is?

- ☐ Advies geven
- ☐ Elkaar negeren
- ☐ Advies opzoeken
- ☐ Samen emand anders inschakelen
- ☐ Samen een oplossing bedenken
- ☐ Zonder luisteren dwingen iets te doen
- ☐ .....
- ☐ .....

Groetjes uit de online wereld

Aan: ons in de

echte wereld

Plak de volgende keer de nieuwe postkaart op deze strook

R. Evaluation

Research questions

The goal of the evaluation is to find out

1. Usability
2. How is playing the game experienced by families?
3. To what extent does the game create a shared understanding?
4. To what extent does the game change the image that parents and children have of each others screen use?
5. To what extent does the game build trust?

Composition families

Family	A	B	C	D
Parents	2	2	1	1
Children	3	3	3	2
Participating children between (8-12)	2	2	2	2
Played the game before	No	No	Yes	No

Questionnaire

Ouder

1. **Welke emotie(s) riep het spelen van dit spel bij je op? Schrijf er kort bij waarom.**

2. **Zou je dit spel in de toekomst nog eens willen spelen?**

   [] Nee

   [] 1 keer per half jaar

   [] 1 keer per drie maanden

   [] 1 keer per maand

   [] 1 keer per week

   [] elke dag

3. **Waarom wel of niet? En waarom kies je voor deze frequentie?**

4. **Had je het gevoel dat je alles kon zeggen?**

[ ] rood: Ik durfde niet alles te zeggen, omdat .....

[ ] oranje: twijfel, omdat .....

[ ] groen: ik durfde alles te zeggen

Kruis aan bij de onderstaande stellingen in hoeverre je het ermee eens bent

Stelling	Helemaal mee oneens	Mee oneens	Neutraal	Mee eens	Helemaal mee eens
1. "Ik heb door het spel nieuwe dingen geleerd over wat de kinderen op hun scherm doen."					
2. "Ik heb iets nieuws geleerd over de mening van mijn kinderen over schermactiviteiten."					
3. "Ik heb tijdens het spel iets nieuws over mezelf gedeeld met de rest."					
4. "Ik heb het idee dat we elkaar door dit spel beter hebben leren kennen."					
5. "Door het spelen van het spel is het beeld dat ik had van de schermactiviteiten en ervaringen van mijn kinderen veranderd."					
6. "Ik denk dat ik door het spelen van het spel beter in gesprek kan gaan over schermervaringen met mijn kind."					
7. "Ik denk dat ik door het spelen van het spel nu eerder een gesprek over de online wereld ga beginnen"					
8. "Ik denk dat ik na het spelen van het spel beter met mijn kind zijn/haar vervelende online ervaringen kan bespreken"					
9. “Na het spelen van het spel zou ik eerder iets met mijn kind delen over mijn online activiteiten dan voor het spel”					

Wat denk je dat de impact zou zijn als jullie dit spel vaker zouden spelen?

Kind

1. **Welke emotie(s) riep het spelen van dit spel bij je op? Schrijf er kort bij waarom.**

2. **Zou je dit spel in de toekomst nog eens willen spelen?**

   [] Nee

   [] 1 keer per half jaar

   [] 1 keer per drie maanden

   [] 1 keer per maand

   [] 1 keer per week

   [] elke dag

3. **Waarom wel of niet?**

.....
.....
.....

4. **Had je het gevoel dat je alles kon zeggen?**

[ ] rood: Ik durfde niet alles te zeggen, omdat
.....

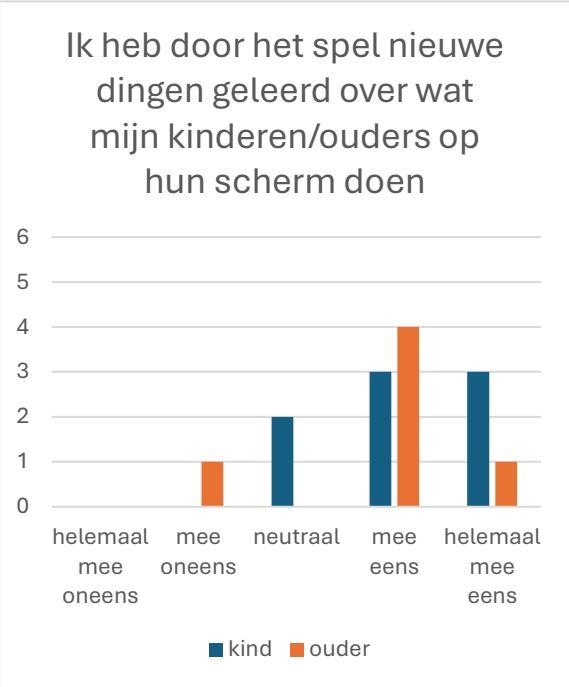
[ ] oranje: twijfel, omdat .....

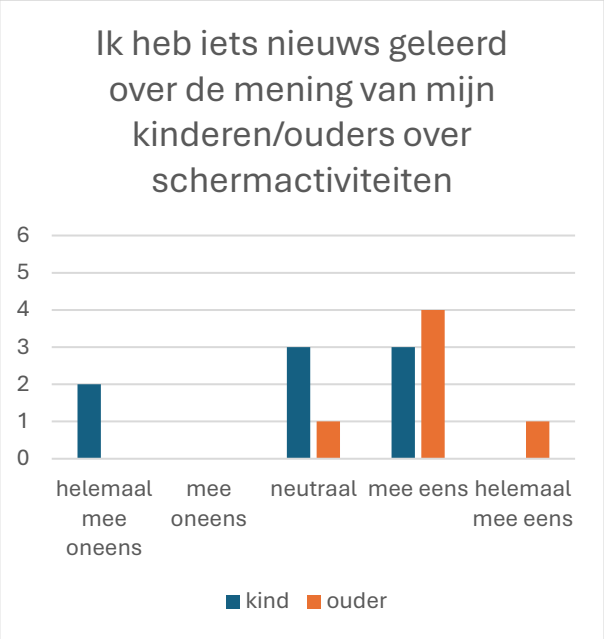
[ ] groen: ik durfde alles te zeggen

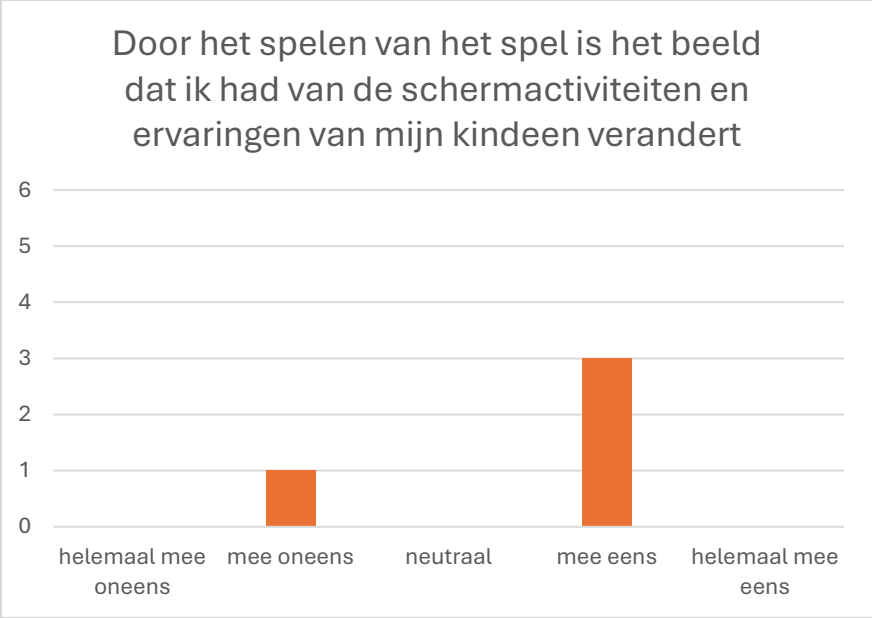
Kruis aan bij de onderstaande zinnen hoeveel je het ermee eens bent

Stelling	Helemaal mee oneens	Mee oneens	Neutraal	Mee eens	Helemaal mee eens
1. "Ik heb door het spel nieuwe dingen geleerd over wat mijn ouders op hun scherm doen."					
2. "Ik heb iets nieuws geleerd over wat mijn ouders vinden van schermactiviteiten."					
3. "Ik heb tijdens het spel iets nieuws over mezelf gedeeld met de rest."					
4. "Ik heb het idee dat we elkaar door dit spel beter hebben leren kennen."					
5. "Ik vond het fijn om het in het spel samen over schermactiviteiten te hebben"					
6. "Ik denk dat ik door het spelen van het spel eerder naar mijn ouders toe zou gaan om het over de online wereld te hebben"					
7. "Ik denk dat ik door het spelen van het spel eerder naar mijn ouders toe zou gaan als ik iets vervelends online meemaak"					

Results questionnaire



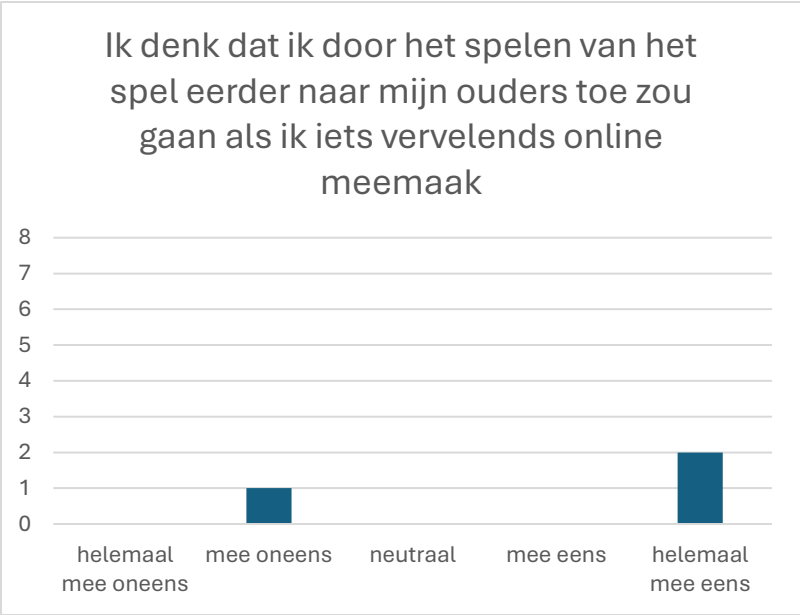


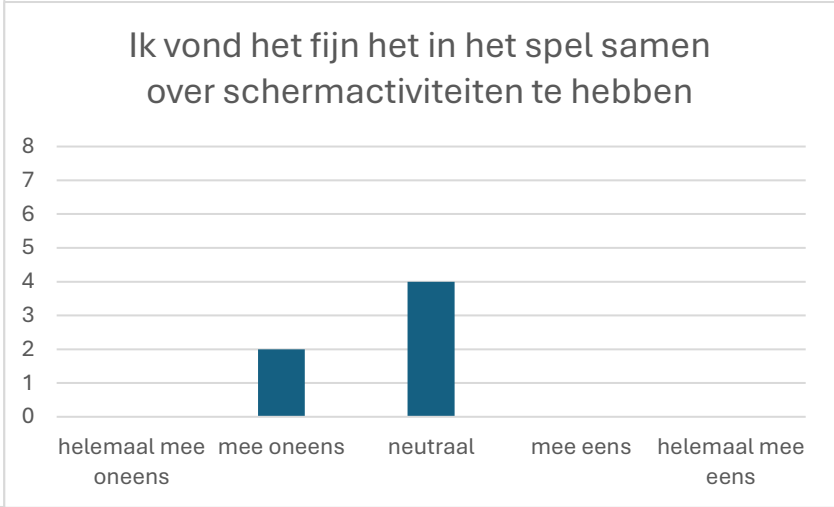

Door het spelen van het spel is het beeld dat ik had van de schermactiviteiten en ervaringen van mijn kindeen verandert
6
5
4
3
2
1
0
helemaal mee oneens
mee oneens
neutraal
mee eens
helemaal mee eens


ik denk dat ik door het spelen van het spel beter in gesprek kan gaan over schermervaringen met mijn kind
6
5
4
3
2
1
0
helemaal mee oneens
mee oneens
neutraal
mee eens
helemaal mee eens

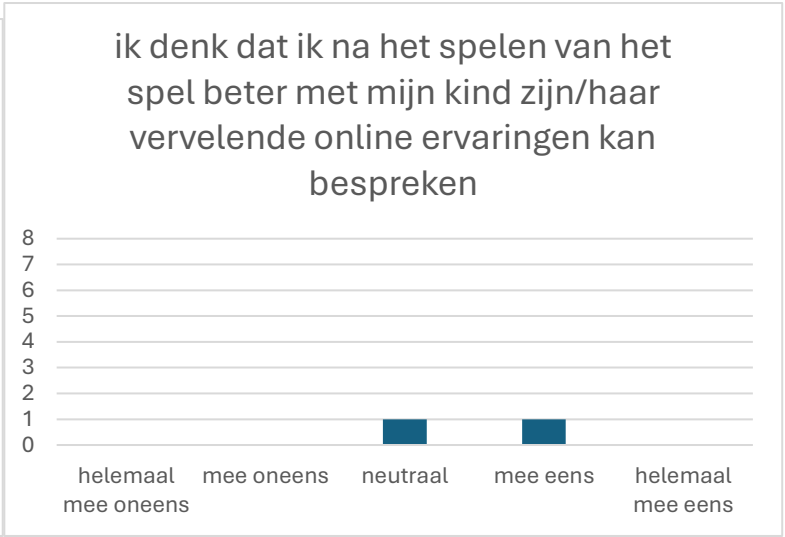

Ik denk dat ik door het spelen van het spel nu eerder een gesprek over de online wereld ga beginnen
6
5
4
3
2
1
0
helemaal mee oneens
mee oneens
neutraal
mee eens
helemaal mee eens


Na het spelen van het spel zou ik eerder iets met mijn kind delen over mijn online activiteiten dan voor het spel
6
5
4
3
2
1
0
helemaal mee oneens
mee oneens
neutraal
mee eens
helemaal mee eens


Ik denk dat ik door het spelen van het spel eerder naar mijn ouders toe zou gaan als ik iets vervelends online meemaak
8
7
6
5
4
3
2
1
0
helemaal mee oneens
mee oneens
neutraal
mee eens
helemaal mee eens


Ik vond het fijn het in het spel samen over schermactiviteiten te hebben
8
7
6
5
4
3
2
1
0
helemaal mee oneens
mee oneens
neutraal
mee eens
helemaal mee eens


Ik denk dat ik door het spelen van het spel eerder naar mijn ouders toe zou gaan om het over de online wereld te hebben
8
6
4
2
0
helemaal mee oneens
mee oneens
neutraal
mee eens
helemaal mee eens


ik denk dat ik na het spelen van het spel beter met mijn kind zijn/haar vervelende online ervaringen kan bespreken
8
7
6
5
4
3
2
1
0
helemaal mee oneens
mee oneens
neutraal
mee eens
helemaal mee eens