Respecting children's rights and ownership in the design process: Towards guidelines for co-designing with children

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Abstract

Increase of digital fabrication and makerspaces have made it possible to bring designing into education in new ways. At the same time, companies have started to show interest to co-designing with children and schools have shown interest in making and selling commercial products co-designed by children. In these rapid new developments, children's rights have received too little attention. There are no established practices for how children's rights and ownership issues should be considered in co-design projects.

For this thesis study, interviews were carried out with adults who have experience of digital fabrication and making projects with children. The interviews were then transcribed and analyzed with content analysis methods. The aim in this qualitative study was to formulate guidelines for respecting children's rights and ownership in co-design. The topic was approached through two research questions, the first of which examined the current state of co-design practices and the second of which aimed to give recommendations for future.

The findings suggest that adults working with children are generally well informed about children's rights but lack knowledge about ownership questions. The most common way to address ownership issues was making written agreements, which clearly stated who owns the intellectual property rights and the end-products of the co-design projects. The agreements were made typically either between school and the company or signed by parent(s)/guardian(s) on behalf of the child. Children's rights were addressed similarly to regular schoolwork, which majority of the co-design projects were part of. The findings also suggest that while teachers are used to respecting children's rights, it is not necessarily the case with external business partners.

The guidelines formulated in this thesis aim to provide support for addressing children's rights and ownership questions in co-design projects. They are aimed for practitioners planning to conduct co-design projects with children. The guidelines are by no means comprehensive or sufficient by themselves for facilitating a co-design project. This topic would benefit from further research, especially considering the children's views of co-design and further development of guidelines for co-designing.

Keywords
Co-design, children's rights, UNCRC, ownership

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Foreword

Writing this master's thesis was a long project and I must admit that I'm quite happy that it's over. The seed for this thesis was planted in 2021, when I was doing my internship for Make-a-Difference project (http://interact.oulu.fi/mad). I would like to thank everyone involved in that project, especially professor Netta Iivari and university lecturer Tonja Molin-Juustila who later agreed to supervise my thesis as well. Thank you both for your patience and guidance throughout the project. I was not left unsupervised even though my shirt says otherwise.

I would also like to thank all my informants for the interviews and your valuable outputs. Even though making the transcriptions was quite laborious, I was happy with the results. I hope you find the guidelines useful or at least interesting!

Lastly, I would like to thank postdoctoral researcher Heidi Hartikainen for agreeing to review this thesis.

Tapio Moilanen

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Abbreviations

CCI	Child-Computer Interaction
NCC	National Core Curriculum: Contains the objectives and core contents of teaching for all school subjects, and describes the mission, values, and structure of education. It also describes the conception of learning and goals for developing the learning environment, school culture and working methods.
PD	Participatory Design
UNCRC	United Nations Convention on the Rights of the Child: A legally binding international agreement setting out the civil, political, economic, social, and cultural rights of every child, regardless of their race, religion or abilities.

Contents

1. Introduction

Since the 1970s, people have been given more room for participating in different design phases. According to Sanders & Stappers (2008) designing is moving away from the traditional designing of products to designing for people's purposes. Traditional design was made by expert designers and was focused on new features, but as technology matured, the user experience became more important than technical features. This increased complexity of design needs cannot be addressed with user-centered design approaches alone. The evolution of design research from a user-centered approach to Participatory Design (PD) has changed the roles of the designer, the researcher, and the one formerly known as the user. (Sanders & Stappers, 2008).

Within the scope of PD, there has been emerging trends of co-creation and co-design. Sanders & Stappers (2008) define co-creation as any act of collective creativity, and co-design as a specific instance of co-creation, where this collective creativity of designers and non-designers is applied to a design process. They claim, that in co-design, the traditional designing roles of user and designer are mixed up, and the end-user becomes an expert of their own experience, playing a larger role in knowledge development, ideating, and concept development. The designer's role is to lead the process since they have the expertise and skills that are relevant to the scope and complexity of design. Professional designers provide the domain specific knowledge and facilitating tools to help non-designers express themselves in a meaningful way. (Sanders & Stappers, 2008).

Using co-design as a method requires skills in facilitating, listening, and observing from designers. The intention is not to replace designers with users, but to translate the information coming from the users into requirements and inputs for design. (Mazzone, 2012). According to Sanders & Stappers (2008) the role of the participants in co-design depends on their level of expertise, passion, and creativity. The designers need to act as a facilitator to provide scaffolds and guidance to non-designers to encourage the creativity and increase the knowledge required to participate in the design process. This is especially important when co-designing with children. (Sanders & Stappers, 2008).

As technology continues to proliferate and become more ubiquitous, it is likely that the number of children who are involved in technology design processes will increase (Guha et al., 2010). Benton & Johnson (2015) posit that the minimum expectation is that the participation in co-design activities will be a positive and enjoyable experience for the children. The continuum of possible positive impacts includes initiating positive emotions, such as feeling of empowerment or pride, and encouraging positive behavior, for example demonstrating increased responsibility or engagement. Finally, participation may have a more prolonged impact on children providing them with opportunities to develop skills or abilities, such as creativity, teamwork, or technical skills. (Benton & Johnson, 2015).

Involvement of children also helps acknowledging their particular needs, brings different perspectives and new ideas, and gives them a sense of ownership of the process (Wake, 2011). One objective of co-design is to support children's skills in terms of designing and reflecting on technology, and learning these skills empowers children to make more informed choices about technology and design (Iversen et al., 2017). Paracha et al. (2019) claim that participating in the co-design activities made the children feel empowered to know that they had a voice in the world and believe that they could make a difference, and Knudtzon et al. (2003) found that working in a design team gave the children ownership and pride about the projects they were participating in. Van Mechelen (2016)

emphasizes that giving children a voice in the design of technology will ultimately have impact on their lives. The main principle is that co-designing with children may offer a chance to change technology, but more importantly it might change the life of a child, which is why co-designing with children should be properly planned and executed (Druin, 2002). All these ideas resonate with the United Nations Convention on the Rights of the Child (UNCRC, 1989).

Co-designing is often introduced to children through makerspaces and digital fabrication. Smith et al. (2015) claim that digital fabrication in education is tied to rise of the maker movement and the evolution of digital fabrication technologies becoming more affordable. This allows consumers to tinker and create with digital technologies (Smith et al., 2015). Digital fabrication of various commercial products has led to discussions about ownership rights and possible copyright issues in schools. The increase of Fab Labs, small-scale workshops offering access to digital fabrication processes and equipment to the public, has contributed to democratization of these tools, bringing them to schools and universities. In Oulu area, there has been a growing interest in digital fabrication in education since opening of Fab Lab Oulu in 2015 and its collaboration with local schools. (Milara et al., 2020). According to Steam in Oulu (2022) -webpage, there are now seven makerspaces in schools around Oulu area.

Children's participation in co-design projects is oftentimes done in collaboration with schools and teachers. In general, teachers should understand that adults working with children must consider children's rights in all phases of the process. UNCRC is mentioned in the Finnish National Core Curriculum (NCC) as it provides the legal basis for basic education (Perusopetuksen opetussuunnitelman perusteet, 2014). The convention states everyone working with children is obligated by its general principles, which include equity and non-discrimination, devotion to the best interests of the child, child's right to life, survival and development, and the right for expressing their views, and these views to be heard and respected (Perusopetuksen opetussuunnitelman perusteet, 2014).

However, in co-design activities, there are sometimes parties involved that are not necessarily experts on working with children, for example company representatives. Companies can collaborate with schools and children to co-design new products or services, and thus provide real-life projects for children. The collaboration can be, for example, designing keychains, decorative items, jewelry, or mobile applications. Correspondingly, teachers are not necessarily experts on copyright or ownership issues or other business-related questions. It is important to remember that doing something correctly according to law, is not always enough when working with children. Children have the right to be protected from abuse and the best interests of child should be considered in all actions regarding children (UNCRC, 1989). It is the shared responsibility of all members of society to uphold and protect the rights of all children. (Wake, 2011).

UNCRC (1989) proclaims that children are entitled to special care and assistance and defines the rights of the child in its articles. There are some general ideas for respecting these rights in co-design projects with children, for example, children have the right to be recognized and involved in co-design as social actors and competent design partners, and adults have the duty to pay attention to children and their views through participation in co-design (Lomax, 2015). Adults should also make sure that the content and information children access during the design sessions is appropriate for their age. It must be considered what children have to offer at different ages and understand what kind of contribution can and should be expected. It is the responsibility of adults to choose the suitable and age-appropriate methods (Druin, 2002). The responsibility of the adult

participants in co-design is to make sure that children's well-being is maintained throughout the sessions and that all children have the opportunity and encouragement to participate if they want to. Adults should also provide the necessary support and safe environment for children to feel empowered, learn and have an overall positive experience (Benton & Johnson, 2015). Even though some of the children's rights are mentioned in co-design literature, there are currently no established practices for how children's rights and ownership questions should be addressed in co-design projects. Bridging this gap in the research is the main motivation of this thesis.

This thesis focuses on respecting the rights of the child in co-design processes, especially the best interests of child regarding the ownership of ideas and the right of the child to express their view, be heard and respected. This thesis uses qualitative approach, since it addresses broad questions dealing with why or how certain things occur (Lichtman, 2013). The empirical data was collected with semi-structured interviews and analyzed using methods of content analysis. The informants were adults from Oulu area, that have participated in co-design with children as facilitators or researchers. The informants were chosen to represent viewpoints of teachers, companies, and researchers in co-design with children.

This thesis has two main research questions. The first research question is answered based on the interviews, and it addresses the topic on a very general level:

> **RQ1: What kind of practices are currently used in co-design with children to address children's rights and ownership issues?**

RQ1 aims to describe the role of the children in co-design activities, and the general characteristics of the co-design process itself, as well as grasp the status quo of children's involvement in co-design.

The second research question focuses on the ideal situation and is addressed based both on the interviews and previous research.

> **RQ2: How should children's rights and ownership be considered in co-design with children?**

RQ2 is answered by analyzing the suggestions of ideal co-design situations provided by both the informants and existing literature. The answer to second research question includes the guidelines for respecting children's rights and ownership when co-designing with children.

Chapter two sets up the theoretical background regarding the topics of PD, co-design, children's rights, and ownership. Chapter three introduces the semi-structured interview research method and the content analysis process in more detail. Chapter four presents the main empirical results from the collected data with authentic citations to support the data interpretation. Chapter five gives answers to the research questions and presents the guidelines that were formed based on the interview data and previous research. Chapter six draws conclusions of the implications, discusses limitations of this work, and offers possible future research topics about this subject.

2. Theoretical background

This chapter presents existing literature relevant to the topic of this thesis. It includes research involving co-design with children, and addresses children's rights and ownership questions.

For my search of literature, I used the key publications of the Child-Computer Interaction (CCI) field, International Journal of Child-Computer Interaction, CHI: Conference on Human Factors in Computing Systems, and IDC: Interaction Design and Children. In my query I used relevant keywords like "children's rights" and "ownership". From these search results, only a handful addressed co-design or seemed relevant in the context of digital fabrication and/or making. However, these few publications pointed me towards the seminal work of Druin (2002) regarding the roles that children can play in the different phases of co-design processes, and Mazzone (2012) who has written her doctoral thesis about co-designing with children. Searches for ownership questions in this context yielded even fewer results.

Later I expanded the search to other papers that cited Druin (2002) and Mazzone (2012), and the sources that were cited in the previously found literature, to form a more complete view of the subject. Majority of the literature used in this chapter is from the CCI discipline, but some issues, for example, the questions of ownership are complemented with insight from psychology. Also, the topic of children's rights is supported with materials from United Nations and UNICEF.

Chapter 2.1 provides a brief theoretical background for PD and co-design. Chapter 2.2 presents brief overview of digital fabrication, since digital fabrication was the type of co-design most of the informants had experience on. Later in this thesis, digital fabrication and making and tinkering in makerspaces are both addressed under the broader concept of co-design. Chapter 2.3 presents critical factors of facilitating successful co-designing sessions with children, and chapter 2.4 offers some insight into benefits of co-design. Chapter 2.5 examines the perspectives of children's rights according to the UNCRC, and chapter 2.6 addresses questions about ownership and ideas in co-design.

2.1 PD and co-designing with children

Paracha et al. (2019) claim that PD is the most common way to include children in the design process. Mazzone (2012) highlights, that even if it is not the main objective of PD, the participation in design activities should also be considered as beneficial for the children, whether it is educational, developing new skills or improving children's self-esteem. Co-designing with children should not be seen merely as a mechanism to inform the developers, but instead focus on what value the children gain from the experience. (Mazzone, 2012).

The basic assumption of PD is that knowledge is realized through participation, and values emerge from the dialogical process between users and designers (Iversen & Dindler, 2013). PD regards users as critically contributing to the design, since they are considered as experts of their daily activities and therefore capable of recognizing needs and problems from their own experience (Mazzone, 2012). According to Iversen & Dindler (2013) PD should also be emancipatory in the sense that it challenges assumptions about what technology should and could be. PD researchers and designers should use their curiosity and creativity to question mainstream products, and not only

focus on designing future technology, but help people realize that they have a choice. (Iversen & Dindler, 2013).

Mazzone (2012) identified two aspects of determining the suitability of methods used in co-design sessions with children: management and engagement. First aspect, management, relates to carefully planning and facilitating the sessions with clearly defined roles of the participants. The second aspect, engagement, refers to ways of enabling children's active participation with methods that are fun and engaging for the children.

Druin (2002) sees four main roles for children in design process: user, tester, informant, and design partner. The increasing involvement between different roles is illustrated in Figure 1.

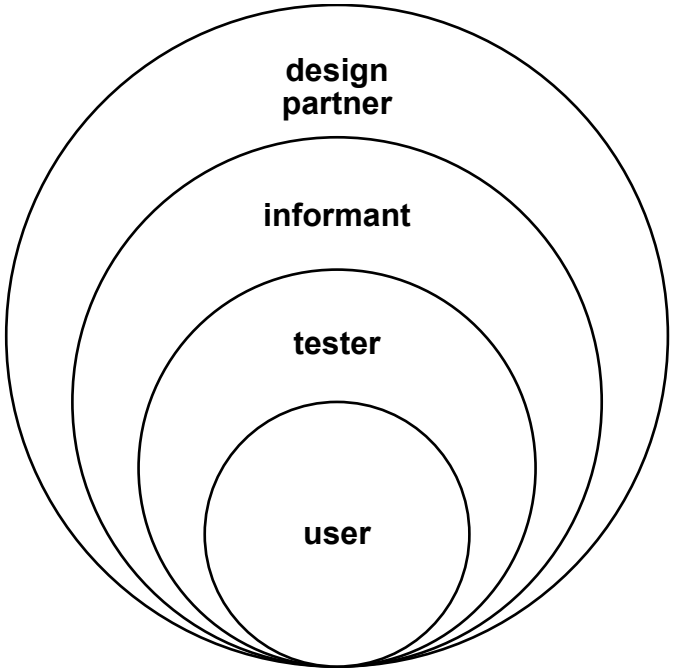

Figure 1. Druin's onion model (Adapted from Figure 1 in Druin, 2002).

According to Druin (2002) in the role of user, children's contribution to design process comes from being observed using existing technology to gather information for future projects. In the role of tester, children test prototypes or early versions of the product, and their feedback is used to further develop the product. In the role of informant, children's contribution is asked in different stages of design process. They may give input or feedback to early sketches, prototypes, or final design, but the initiative comes from people in charge of the design process. In the role of design partner, children are considered as equal stakeholders in the design process throughout the project. As partners, children can have an equal opportunity to contribute in ways that are appropriate for children and the design process. (Druin, 2002).

According to Guha et al. (2013) the difference between informant design and design partnering, is that while informant design involves children in the design process only at specific points when their input is considered the most valuable, design partnering, on the other hand, involves children at all stages of the design process. Design partners are

considered equal stakeholders throughout the process (Guha et al., 2013). As design partners, children can learn about the design process, how to respect the design partners, how to communicate and collaborate in a team, along with new technology skills and knowledge. (Van Mechelen, 2016).

Iversen et al. (2017) offer the role of protagonist as an additional category to extend the "onion model" by Druin (see Figure 1). In this role the design process is arranged primarily to help children develop their competences and abilities to reflect critically on the role of technology, instead of aiming merely to develop good products. To achieve this role, children need to be motivated and have a sense of ownership of the design process. The role of protagonist involves children as the main agents, as users, testers, informants, co-designers, and co-researchers. This places children at the center of the design process as they engage with real-life design problems. (Iversen et al., 2017).

2.2 Digital fabrication in education

Smith et al. (2015) define digital fabrication in education as "*a hybrid learning environment that combines digital fabrication, design thinking and collaborative ideation and innovation to solve (complex) societal challenges*". This definition highlights the creative process from ideation and design all the way to the finished product. Utilizing makerspaces and digital fabrication in education provides children with understanding of digital technologies and supports their ability to design and create with digital materials. It also provides access to general understanding of the society mediated by digital technology (Smith et al., 2015). According to Guha et al. (2013) this understanding is crucial, because the technological complexity and richness of the society for today's children is vastly different than the environment today's adults grew up in. Children today are internationally aware, independent, interactive, and information active. Today's children are the experts of being child in today's world, which is why involving children in design processes is so important. (Guha et al, 2013).

The concept of digital fabrication relies on design thinking, which Smith et al. (2015) define as the "*ability to thoughtfully engage in design processes, knowing how to act and reflect when confronted with problems"*. Ideas of co-design and PD draw on design thinking when suggesting methods for engaging children in the design process (e.g., Druin, 2002 and Read et al., 2014). Wake (2011) claims that including children in the design process has potential to empower children by giving them an opportunity to influence the decision making. Children need to be empowered to share their ideas by truly hearing and appreciating their contributions. Children possess unique knowledge of the places they inhabit, but they lack the skills or influence to make big changes by themselves. (Wake, 2011).

Despite the reported benefits of digital fabrication in education, it is not yet widely integrated in formal learning contexts (Milara et al., 2020). Smith et al. (2015) claim that the potential of digital fabrication is not just to bring fabrication technologies into education, but to create engaging and interesting learning environments for children. These new technologies and makerspaces enable the co-design activities that can provide collaborative and meaningful context for learning, utilizing children's imagination and possibly producing something new (Smith et al., 2015). McMellon & Tisdall (2020) found that examining participatory spaces, for example makers spaces or Fab Labs, could encourage children to claim the spaces they require to participate. This community development approach sees children as one diverse group of design partners amongst

others, and advocate for the importance of creating structured opportunities for children to participate.

2.3 Facilitating co-design sessions with children

Mazzone (2012) highlights some extra efforts that must be accounted for when children are involved in co-design: gaining access to the children with proper ethical clearances, facilitating the design sessions, and interpreting the children's contribution in a meaningful way. Designing with children might be difficult, because children may use different conceptual frameworks and terminology, which makes it difficult to interpret their exact meaning (Mazzone, 2012). Therefore, Van Mechelen (2016) claims, that children should be facilitated in the design process, because adults experience the world differently and they do not have the same insights into the world as children do, and vice versa. According to Mazzone (2012) involving children in the design process is crucial to understanding and interpreting their needs and shortening the gap between adult designers and children users.

Mazzone (2012) identifies five critical factors for successful co-design session with children. The first factor is setting the right expectations, which means that expectations should be realistic and within the practical constraints of the co-design sessions. The second factor is adopting the children's perspective to achieve proper engagement. The third one is managing practical constraints since everything happens in a real-world context and has some limitations regarding time and other resources. The fourth factor is avoiding unexpected situations. They should be mitigated by planning for flexibility and adaptability. The last factor is collecting and analysing the outcomes, since successful analysis of the outcomes is related to clear definition of objectives and the data collection methods. (Mazzone, 2012).

Mazzone (2012) reminds that co-design facilitators should have realistic expectations and keep an open mind towards the outcomes of the design sessions to embrace the potentially different and/or unexpected results from the ones initially sought for. Companies participating in co-design with children should also remember that the outputs from co-design sessions are not usually ready to be implemented straight away (Mazzone, 2012).

All the activities should be considered from children's perspective. When planning co-design sessions, it is important to make sure that the right level of children's abilities, skills, attention, and fun is addressed properly in the selected activities. This increases children's motivation and interest, which is crucial for getting useful outcomes (Mazzone, 2012). According to Gennari (2013), enjoyable and fun co-design activities tend to be more productive and idea rich. Mazzone (2012) claims that children are enthusiastic on using physical objects and creating tangible prototypes. Making children create things, instead of only telling their opinion, will take designer to a deeper level of the children's way of thinking and understanding. (Mazzone, 2012). Also, Druin & Fast (2002) claim, that hands-on experiences where children participate into making something concrete yield most successful results. According to Van Mechelen (2016) children's knowledge is often difficult to tease out because of its tacit nature. However, the process of making artifacts can enable children to reflect upon and express their deeper levels of knowledge. Older children can tackle more complex problems with a greater depth than younger children, but they may require some additional brainstorming facilitation and encouragement to think outside of what seems possible. (Knudtzon et al., 2003).

Guha et al. (2013) points out that even when acting as design partners, adults should maintain some typical adult responsibilities throughout the design process, for example, providing structure to the design sessions and facilitating the process. Occasionally, adults may need to maintain the caregiver role and ensure that the children's basic needs are met, and possible conflicts are solved. Children should not have any other preconditions than committing to participating in the design process. (Guha et al., 2013).

One challenge that Knudtzon et al. (2003) found during their design sessions, was that especially the older children seemed concerned about what has already been done and possible limitations of technology. Younger children did not seem to worry about limitations, and they came up with wilder ideas when brainstorming. Children also seemed to be ingrained in the ways of school, and sometimes they had difficulties to understand that there are not necessarily correct answers. (Knudtzon et al., 2003).

Mazzone (2012) found that using variety of communication channels will allow children with different abilities to express themselves. It is important to have a feedback loop in the design process with children. Children also need to see that their input is being valued, and that their ideas are considered in the process (Druin & Fast, 2002). Guha et al. (2013) reminds, that it is also important that we treat children with the same respect we would treat adults with. For example, Guha et al. (2013) offered a small gift to the children participating in their design processes to show the children that they are valued contributors. Mazzone (2012) claims that being acknowledged for participating in designing of a computer game engaged the children by giving them some sort of responsibility. Children need to feel ownership of the project to truly feel like equal design partners (Knudtzon et al., 2003).

According to Mazzone (2012) running design sessions in school is ideal, since it provides access to a wide number of children in their natural environment. Teachers or adults that know the child participants well can provide useful information on the planned co-design activities and useful strategies to manage the social dynamics of the group, but their presence should not influence children due to the existing power relations. Druin (2002) claims that whenever teacher's involvement is needed, it might be hard to find time for any activities outside the curriculum. According to Mazzone (2012) teachers valued most the activities that positively engaged the children, were appropriate for children's level of abilities, and fitted in the class curriculum. Druin (2002) also reminds, that it might be difficult to even find professionals who want to involve children, or it might be hard to find the right time to bring children into the design process.

In their study, Knudtzon et al. (2003) noticed, that loose organizational structure was causing frustration, so they switched their focus on team building activities and activities that promote listening. They also had some challenges in eliminating the power structures that typically exist between adults and children. They wanted to make sure children's voices and opinions are heard and respected. Team building and feeling comfortable in the design situations is crucial for beneficial collaboration. It is important to have a team that can express themselves and listen well to others, this concerns both adults and children. Every participant should also be comfortable having non-traditional roles (Knudtzon et al., 2003). Druin (2002) points out, that treating children as partners might be challenging for teachers, too, since the teachers are still responsible and accountable for their students regardless of the design project.

Schepers, Dreessen & Zaman (2017) found that through participating in free play together with the children, it was possible to diminish the traditional roles and power structures between children and adults. They believe, that by opening the structure of the design

process, rethinking the traditional roles, and allowing children to take the role of co-designer, understanding and communication between adults and children can be enhanced towards genuine forms of participation. Characteristics of genuine participation are presented later in Table 2. Mazzone (2012) points out that interestingly traditional power relations of school do not have that much effect when talking about technology, since children might feel as, or even more, expert than adults.

Facilitator of co-design sessions should also keep in mind that children might have difficulties to articulate why they have made certain design choices. According to Vaajakallio et al. (2010), children do not have yet built up a mature ability for constructive feedback and negotiations, which usually means that presentations of the designs and discussing and reflecting does not need as much time in the design sessions compared to the prototyping or building phases. The lack of negotiation and teamworking skills can easily lead to unexpected situations (Druin, 2002).

Mazzone (2012) claims that children's sense of privacy and security is not as developed as in adults, and therefore children might be overly trusting and vulnerable. Children might, for example, disclose private and sensitive information without regard to possible consequences. It is adults' responsibility to avoid these situations and ensure the safety of data. When children participate with ideas for design, there might be some concerns about data, but the policy of asking consent often considers only taking part to the activity (Read et al., 2014). Shaw & Nickpour (2021) remind that adults facilitating co-design with children should remain cautious about the views and biases of other stakeholders being pushed forward as the children's own, especially when children need support expressing their views.

The co-design process with children has a lot of variables, for example age, abilities, and group dynamics, which makes is difficult to foresee and avoid unexpected situations. Druin (2002) highlights some of the characteristics of children which might turn out to be challenging, for example, children can be brutally honest and tend to have little patience. Children are also very good at challenging adults by asking "Why not?".

Druin & Fast (2002) found in their study, that keeping journal helps children to develop and structure their thoughts as well as create meaning out of the design process. It also helps the organizer to see sides of the children and their learning that could be easily missed in the design sessions. Analysis of journals showed that children can move from learning about the design process to contributing to the project (Druin & Fast, 2002). Also, Mazzone (2012) noted that recording children's explanations during the co-design sessions turned out to be useful for a clearer interpretation of the session's outcomes.

2.4 Benefits of co-designing with children

Co-design involving children should not be evaluated merely in relation to tangible outcomes, but also in relation to children's learning gains and the values of the projects (Iversen et al., 2017). A core value in co-designing with children is to represent and respect the interests of children in the design process (Van Mechelen, 2016). According to Iversen et al. (2017) the objective of PD with children is the education and encouragement of children to actively participate in the design of technology through a mutual learning process. Active engagement of children in the design activities gives children a voice in the design process and helps development of better technologies. (Iversen et al., 2017).

Many researchers emphasize the multiple benefits of the involvement of children in design practices. For example, Wake (2011) claims that engaging children in design process leads to deeper meaning and learning about the design topics and results more likely in permanent behavior changes. Participation of children in design provides children cross-disciplinary learning opportunities, communication, teamwork, and research skills during the process of planning, designing, and cooperating in the project. (Wake, 2011).

For designers PD can offer a low-cost, useful approach for design, and increase in the potential success of the developed product (Paracha et al., 2019). Designers also learn about the children's needs, behaviors, and practices, and both the children and the designer can have a rich, meaningful learning experience (Mazzone, 2012) Paracha et al. (2019) claim that children can also make valuable design contributions. Engaging children in the design process benefits both the developer and child participant, when children develop design-thinking skills to become better problem solvers and designers in the future. (Paracha et al., 2019).

Gennari (2013) claims that children are natural partners for co-design, since they are interactive, information active, socially aware, and highly mobile. According to Guha et al (2013) children tend to come up with fantastical, but unusable, ideas. Children's ideas may also turn out to be unworkable because of technical difficulties or conflicts with pedagogical goals (Van Mechelen, 2016). However, the imaginations of children are valuable because they can remind the adults of the obvious solutions and teach adults to consider the seemingly impossible ones. When designing products for children, the contributions from the end users to the design are critical, since children differ in cognitive development and communities of practice from adults, who typically design and build the products that children use (Gennari, 2013). Participating in co-design stimulates ethical reasoning, reflection, and empathy in children (Paracha et al., 2019). Children's participation in design practices helps their development of a sense of ownership and emancipation, when children gain awareness of their potential and develop creative thinking (Mazzone, 2012). A summary of these benefits from different sources are compiled in Table 1 by the author.

Table 1. Benefits of co-designing with children

Benefits for the children	Benefits for the design project
Learning opportunities: Communication and collaboration skills (Druin, 2002) Research, planning and designing skills (Wake, 2011) Ethical reasoning, reflection, and empathy (Paracha et al., 2019) Deeper understanding of the topic (Wake, 2011)	**Learning opportunities:** Better understanding of children as users (Druin, 2002) Learning about children's needs, behaviors, and practices (Mazzone, 2012)
Improved idea generation: Increased creativity, confidence, and motivation to participate (Druin, 2002) Awareness of their potential and development of creative thinking (Mazzone, 2012)	**Improved idea generation:** New ideas and perspectives, out-of-the-box thinking (Gennari, 2013) Increased potential success of the product (Paracha et al., 2019) Lower development costs (Paracha et al., 2019)
Improved product: Feeling of pride about the product (Knudtzon et al., 2003) Increased sense of ownership and empowerment (Druin, 2002)	**Improved product:** Higher user satisfaction (Paracha et al., 2019) Valuable design contributions (Paracha et al., 2019)

As seen from the Table 1, co-design can benefit both the children and the company by providing learning opportunities, improved idea generation and improved products. Learning opportunities for children can be seen as main incentive for schools to participate in co-design activities.

2.5 Children's rights in co-design

Children's rights and ethical issues are a priority for working with children. Christensen & Prout (2002) suggest that the starting point for ethical relationship between researcher (or designer) should be the same whether they are collaborating with adults or with children. They call this "ethical symmetry", which means that any differences between collaborating with children or with adults should be allowed to emerge from this symmetrical starting point correspondent to each situation, rather than being assumed in advance. However, ethical symmetry does not require social symmetry in power relationships between adults and children, or even between children themselves. (Christensen & Prout, 2002).

Researchers who are focused on involving children in co-design processes have emphasized the importance of studying the impact on children who participate in the design processes (Guha et al., 2010). The impact is related to the level of participation or involvement in the co-design process, as well as to the specific role played by the child (Benton & Johnson, 2015).

Lansdown (2001) defines some principles for democratic participation of children. First, children must understand what the project is about and what is their role in it. Also, the power relations and decision-making structure should be transparent as well. Second, children should be involved in the project as early as possible, and ground rules need to be established with all the children right from the beginning. Third, all children should be

treated with equal respect, and they should be entitled to respect for their views and experiences as well. Lastly, participation should always be voluntary, and children should be allowed to stop participating at any stage. (Lansdown, 2001).

Children's rights are defined in the United Nations Convention on the Rights of the Child (UNCRC). It has 54 articles that cover all aspects of a child's life (UNCRC, 1989). There are four articles in the UNCRC (1989) that are considered as general principles: rights apply to all children (Article 2); the best interest of the child must be a top priority (Article 3); right to life, survival, and development (Article 6); and right to be heard (Article 12). Together these four principles substantiate how UNCRC should be interpreted and put to practice (Kalliomeri et al., 2020). UNCRC was ratified as part of Finnish legislation in 1991. The obligations contained in the Convention apply to states, municipalities, children's parents, and those who work with children (OPH, n.d).

According to McMellon & Tisdall (2020), UNCRC has multiple articles that can be considered as participation rights, for example Article 13 (freedom of expression), Article 14 (freedom of thought, conscience, and religion), Article 15 (freedom of association and peaceful assembly) and Article 17 (access to information). Article 12 (right of the child to be heard) has been identified as a general principle for children's participation.

The full text of UNCRC Article 12 reads:

> *1. States Parties shall assure to the child who is capable of forming his or her own views the right to express those views freely in all matters affecting the child, the views of the child being given due weight in accordance with the age and maturity of the child.*
>
> *2. For this purpose, the child shall in particular be provided the opportunity to be heard in any judicial and administrative proceedings affecting the child, either directly, or through a representative or an appropriate body, in a manner consistent with the procedural rules of national law*. (UN Committee on the Rights of the Child, 2003)

Although UNCRC does not use the word "participation" in the Article 12, UN Committee on the Rights of the Child (2003) defines and explains it in its General Comment as follows:

> *The concept of participation emphasizes that including children should not only be a momentary act, but the starting point for an intense exchange between children and adults on the development of policies, programmes and measures in all relevant contexts of children's lives.*
>
> *This term has evolved and is now widely used to describe ongoing processes, which include information-sharing and dialogue between children and adults based on mutual respect, and in which children can learn how their views and those of adults are taken into account and shape the outcome of such processes.*

The General Comment (UN Committee on the Rights of the Child, 2003) also reminds, that the views expressed by children may add relevant perspectives and should be considered in decision-making.

According to Lansdown (2001) the UNCRC has inspired a lot of discussion and action about child's right to be listened and taken seriously, and even though there are no blueprints that would fit to every situation, there are some characteristics that successful initiatives have in common. These characteristics of effective participation by Lansdown (2001) are compiled to table 2.

Table 2. Characteristics of effective and genuine participation (Lansdown, 2001, p. 11).

Category	Characteristics
The project	Issue is of real relevance to children themselves
	Capacity to make a difference
	Linked to children's direct day-to-day experience
	Adequate time and resources made available
	Realistic expectations of children
	Clear goals and targets agreed with children
	Addresses the promotion or protection of children's rights
Values	Honesty from adults about the project and the process
	Equal opportunity for participation by all groups of interested children
	Equal respect for children of all ages, abilities, ethnicity, social background
	Information is shared with the children to enable them to make real choices
	Children's views are taken seriously
	Voluntary nature of children's involvement
	Decision-making is shared
Methodology	Clarity of purpose
	Child-friendly meeting places, language, and structures
	Involvement of children from the earliest possible stages
	Training provided to help children acquire necessary skills
	Methods of involvement developed in collaboration with children
	Adult support provided where needed
	Strategies developed for sustainability

Achieving the effective and genuine participation needs a lot of work. Welty & Lundy (2013), claim that greater awareness is needed for the fact that respecting things stated in this Article 12 is not just "a model of good pedagogical practice" but a legally binding obligation. Lundy (2007) points out two key elements in this Article: the right to express view, and the right to have the view given due weight. These two elements can be further expanded to four different elements: space, voice, audience, and influence. These concepts and their relationship to Article 12 are represented in Figure 2.

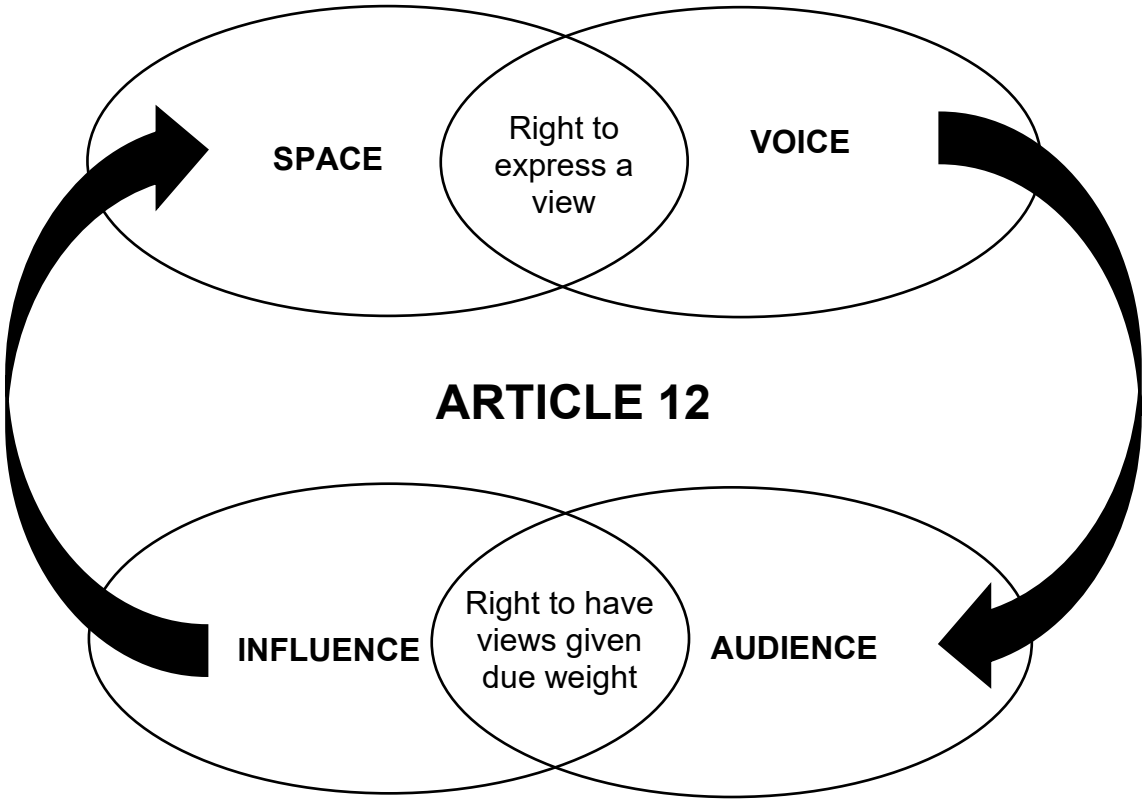

Figure 2. Conceptualizing Article 12. (Adapted from Figure 1 in Lundy, 2007).

The two topmost elements in Lundy's model (Figure 2), **space** and **voice**, are related to right to express view, and the lower two, **audience** and **influence**, are related to the right to have views given due weight. A prerequisite for the meaningful engagement with children is a *space*, in which children are encouraged and allowed to express their views. The use of word "assure" in the Article 12, indicates a positive obligation to encourage children to express their views and give input (Lundy, 2007). This space also needs to be safe and inclusive (Welty & Lundy, 2013). Having a *voice* means that children are allowed to express their views freely, and this right is only dependent on their ability to form that perspective, mature or not (Lundy, 2007). Children might need help of other to form a view, and they have a right to receive guidance for this from adults (Welty & Lundy, 2013).

Article 12 requires children's views to be given due weight, which means that children have a right to have their views heard by those who make decisions (Welty & Lundy, 2013). It is not possible to ensure any specific outcomes, but it is possible to prescribe the formal channels of communication for the children's views – to provide an *audience* (Lundy, 2007). While the *influence* of these views cannot be guaranteed, children should be told how their views are considered and what decisions were made based on their views (Welty & Lundy, 2013). Keeping these processes as open and transparent as possible, creates conditions where it's uncomfortable for adults to solicit children and then ignore their views. Figure 2 illustrates that these elements are interrelated and there is significant overlapping between space and voice, and audience and influence. It also depicts that Article 12 has chronology; the first stage is ensuring the child's right to express a view, and second is giving the view due weight. However, since decision-making processes are rarely static, the process may begin again. (Lundy, 2007).

The UNCRC (1989) emphasizes that all activities that affect children's lives must build on seeing children as human beings and as active citizens. It promotes the idea that children should be involved, informed, consulted, and heard (Christensen & Prout, 2002). Children's participation should also always be meaningful to avoid meaningless superficial engagement (Kalliomeri et al., 2020). In addition to including children in co-design processes, the design processes itself can be considered as agent of children's rights, since the co-design process allows children to participate and fulfill their rights. It is important to remember, that the children's rights presented in UNCRC are just the baseline, or minimum viable product, of what the co-design should be striving to facilitate. (Shaw & Nickpour, 2021).

2.6 Ownership and ideas in co-design

According to Neary & Friedman (2013) people are usually free to use their own belongings and they require permission to use someone else's property. This indicates that recognizing and heeding **ownership** is important for socially acceptable behavior. To respect ownership in this sense, people must have ways of judging whether the objects are owned, and by whom. Also, to heed and respect ownership in this legal sense, people must have awareness of ownership rights, the owner's entitlement to control their property. (Neary & Friedman, 2013).

Olson & Shaw (2011) define ideas as creative products of the mind, for example, stories, designs and works of art. Adult understanding of ideas involves attaching a sense of ownership to one's own and other people's ideas. Ideas can even be bought and sold, which is why ideas are sometimes referred to as intellectual property. (Olson & Shaw, 2011). Shaw et al. (2012) believe that children do not only judge who owns physical properties, but also make ownership judgements about ideas and intellectual property. Ownership of an idea can be understood as a bundle of rights, that include opportunities to voice an opinion and make decisions about the use of the idea (Druin, 2014).

Guha et al. (2013) claim, that one of the most important aspects of co-designing with children is idea elaboration, where both children and adults seek inspiration from each other's ideas. This inspiration is then used to create new ideas or design directions, and in the end it's next to impossible to tell whose ideas they were originally. However, this does not rule out the possibility of feeling ownership of the idea. When children feel ownership of an idea, it means they have had a personal stake in the creation and use of that thought (Druin, 2014). McNally et al. (2016) found out in their study, that child participants believed their ideas were valued and understood. The potential to have an impact on the design was both exciting and motivating for the children.

According to Guha et al. (2004) children wanted to know and understand how their ideas were used. For example, children seemed upset if their ideas were not used or they stopped collaborating with the researchers if they perceived that their ideas were not listened to. Therefore, to have a successful co-design session, participants need to believe that their ideas are valuable and likely to be used. Read et al. (2013) also emphasize, that during a design activity children need to know what they are doing and how their contributions are used to consent and participate appropriately. For example, how the intellectual property and the children's ideas will be used, how the children will be credited from their contributions, and what happens if there will be monetary gains or other rewards.

According to Van Mechelen (2016), **feeling of psychological ownership** is a core motivation to participate in the design process. Some signs that indicate ownership are that children are willing to contribute, children can and do take initiative, and children feel proud and responsible for the results. Also, Druin (2014) claims that feeling of ownership can increase motivation and duration of the participation in the design sessions.

From the viewpoint of psychology, Shaw et al. (2012) claim that by age of 6 children understand ideas as entities that can be owned just like physical objects. Children might develop the concept of idea ownership through learning that ideas are valuable, and valuable things are more likely to be owned. This view suggests that ideas are signals of creativity and thus a valuable resource. According to the research by Shaw & Olson (2015), children also dislike plagiarism (at least partly) because they understand the reputational benefits of good ideas. Copying an idea without crediting steals valuable credit from the person who had the original idea. This indicates that ideas both can be owned, and they have value. Understanding how children view the ownership of ideas helps adults to understand how to motivate children to create and share their ideas. (Shaw & Olson, 2015).

Lomax (2015) refers to various research which suggest that children want to have their contributions recognized. According to these studies, children might express frustration when they are subjected to anonymization processes or can feel disappointed when their work is uncredited. However, McNally et al (2016) found that the participants found receiving public and individual credit unnecessary. Their findings suggest that instead of attributing individual team members, the whole team should receive credit for the contribution.

This chapter aimed to provide a brief theoretical background for co-design and present some common approaches. It also addressed some of the benefits of co-design, to provide some reasoning why co-designing is done with children. This chapter also defined children's rights and ownership, as they are core concepts in this thesis. The following chapter will present the research methods and data collection and analysis process.

3. Research methods and process

This chapter presents the data collection and analysis methods used in this thesis. One of the goals of this chapter is to facilitate trustworthiness of this research by opening the research process and motivating how and why certain decisions were taken (Graneheim et al., 2017). The aim of this thesis is to formulate guidelines for respecting children's rights in design processes based on previous research and interviews, which guided the selection of data collection and analysis methods.

The reasons for choosing the research approach are presented in chapter 3.1, and data collection methods used in this thesis are addressed in chapter 3.2. Demonstrating the link between the results and the data is one way to increase the reliability of a research (Elo & Kyngäs, 2008), which is why the data analysis is described in as much detail as possible in chapter 3.3.

3.1 Research approach

One difference between qualitative and quantitative research is that quantitative data deals with numerical data, and there is little room for interpretation, and qualitative research deals with symbolic material, for example verbal data, which leaves much more room for interpretation (Schreier, 2012). According to Blackstone (2012) qualitative and quantitative research takes different approaches when it comes to hypotheses: quantitative research typically aims to empirically test hypotheses generated from theory, and qualitative approach aims to develop or construct a theory. Quantitative study is more likely to look for generalizations across groups of people, while qualitative study focuses on understanding the topic through individual cases (Blackstone, 2012). This study has relatively small group of samples, and it is not aiming to generalize the results. Instead, aim of this research is to understand the process of co-designing with children.

Qualitative research is also interpretive in terms of research questions. Qualitative research questions often explore personal or social meanings of experiences (Schreier, 2012). The research questions of this thesis address informants' personal experiences of co-designing with children and ideal co-designing situations based on those experiences. This research is qualitative in nature, since it addresses broad questions dealing with why or how certain things occur (Lichtman, 2013). The qualitative research approach also suits this study better than quantitative approach because of its flexibility regarding data collection and analysis. Qualitative research allows adapting and changing all aspects of research while collecting the data, for example selecting new interview cases based on previous interviews. Qualitative research is also situational in a sense that context is always considered, and the focus is on individual cases in their entirety, which suits this type of research. (Schreier, 2012).

3.2 Data collection

The data for this thesis was collected by semi-structured interviews of various adults that have participated in co-design and/or facilitated design activities with children. The informants were chosen to represent the field of co-designing with children from different points of view. Some of the informants were contacted based on the suggestions from the thesis supervisors, and others were found using snowball sampling technique which involves gaining access to new informants from previous informants (Lichtman, 2013).

Semi-structured interview was chosen as data collection method for its suitability for research, that is aiming to collect informants' views and opinions, and since it is more flexible than structured interview. Semi-structured interview follows predefined themes and questions which are complemented by follow-up questions. The chosen themes are based on the framework of the research and the goal of the interview is to get meaningful answers for the research questions (Tuomi & Sarajärvi, 2018). Semi-structured format allows a dynamic interview situation where predefined questions rather guide the interview than strictly limit it, but at the same time the structured aspect makes it possible to compare results between interviews. Other benefits of interviews include freedom to choose participants that might know something about the subject, flexibility to repeat questions or explain them to avoid misunderstandings and ask follow-up questions if needed. (Tuomi & Sarajärvi, 2018).

The themes in my interviews were children's rights in making and co-design, and ownership of ideas. The goal for the interviews was to both learn about the current ways of working with children and how children's rights are considered, as well as hear ideas how these things should be organized in an ideal world. Interviewing individuals is a good method for finding out what an interviewee thinks or feels about certain topics (Lichtman, 2013). The whole interview structure is available as Appendix A. Interviews were done following the responsible conduct of research about collecting the data by getting the informed consent from every informant (Tuomi & Sarajärvi, 2018). The consent form is available as Appendix B.

According to Graneheim et al. (2017) credible research requires participants who probably have experience of the topic and can talk about it. There should also be enough data to cover significant variations. The collected data consists of altogether nine interviews from teachers, principals, researchers, and city and company representatives. There were plans to include more company representatives, but due to tight schedules they were not available for interviews in this timeframe. Six interviews were conducted face-to-face, and the audio was recorded with a mobile phone using external microphone. Three interviews were held in Microsoft Teams and the meeting video was recorded. In the end, only the audio of all the interviews was used for transcriptions and analysis. The interviews took about 30–40 minutes each. Interviews were later transcribed by the author. More detailed information about the informants is shown in Table 3.

Table 3. Basic information about the informants

Interviewee: "Pseudonym"	Role	Co-design experience	Interview duration	Interview language
Informant 1: "Project worker A"	City representative	Coordinator in co-design projects	35.54	Finnish
Informant 2: "Researcher A"	Researcher	Facilitator in makerspace	35.57	English
Informant 3: "Project worker B"	Company representative	Project worker in a software project	29.14	Finnish
Informant 4: "Principal A"	Principal	Facilitator in makerspace	40.08	Finnish
Informant 5: "Teacher A"	Teacher	Facilitator in makerspace	26.25	Finnish
Informant 6: "Principal B"	Principal	Facilitator in makerspace	35.40	Finnish
Informant 7: "Researcher B"	Researcher	Facilitator in makerspace	26.00	English
Informant 8: "Teacher B"	Teacher	Facilitator in makerspace	37.21	Finnish
Informant 9: "Teacher C"	Teacher	Facilitator in makerspace	29.38	Finnish

As seen from Table 3, most of the informants have been facilitating co-design sessions in makerspaces. Some examples of the co-design projects that were mentioned in the interviews are designing jewelry and decorative items for commercial purposes, designing business gifts for the city of Oulu, and designing an augmented reality application. Most of these projects utilized digital fabrication tools, but there were also mentions of traditional forms of co-design, like drawing competitions that displayed the ideas of children. Project worker A also mentioned having some hands-on experience but has been mostly focused on coordinating co-design projects from the management level. Project worker B works in a software company that has done some co-designing with children. Principals and teachers had experience from facilitating co-design as well as organizing co-design projects with or without external partners. Researchers A and B are both from the University of Oulu, and both of them had experience from facilitating co-design projects in collaboration with teachers. All the informants are from Finland, specifically Oulu area. Children were not interviewed in this research, because the focus was on the processes and practices of co-design.

Two of the interviews were conducted in English on account of informant's request, and the rest were conducted in Finnish. Finnish language was chosen for the interviews to gain as much information from the interviews as possible from the native Finnish speakers, without risking the loss of important details because of language proficiency. The quotes from interviews conducted in Finnish have been translated to English by the author.

As the interviews are co-created between the researcher and the interviewee it is important to state that the author's pre-understandings as a researcher might have influenced to what questions were asked, how they were asked, what follow-up questions were asked and how the interviews are perceived and interpreted during the analysis (Graneheim et al., 2017).

3.3 Data analysis

Since the data was collected through interviews, the data analysis was started by reading through the transcriptions multiple times to obtain sense of the whole data. Then data was read word to word to derive codes by highlighting all the interesting parts from the text that captured key thoughts or concepts. This analysis method roughly follows the phases of qualitative content analysis (see Hsieh & Shannon, 2005 and Elo & Kyngäs, 2008).

Qualitative content analysis was a suitable method for this thesis, since it is a method for systematically describing the meaning of qualitative data (Schreier, 2012). The aim of content analysis is to acquire a condensed and broad description of a phenomenon without losing information. The outcome of the analysis is concepts describing the phenomenon (Elo & Kyngäs, 2008). The aim of analysis in this thesis is to use these concepts to form guidelines. According to Elo & Kyngäs (2008) successful content analysis requires that the formed categories reflect the subject of study, and the researcher can analyze and simplify the data in a reliable manner. Also, the used categories need to be conceptually and empirically grounded.

According to Elo & Kyngäs (2008) content analysis processes consists of three main phases: preparation, organizing, and reporting. Preparation phase in this thesis consisted mainly of the transcriptions of the interviews. Since only the manifest content was decided to be analyzed, the latent content, for example silence, sighs and filler words were not included in the transcriptions (Elo & Kyngäs, 2008). Latent content was left out,

because the research focused on what is said rather than how it is said. Using content analysis also helps with reducing the amount of material, and thus allowed focusing on selected aspects of meaning that were relevant to the research questions (Schreier, 2014). Other benefits of using content analysis are that it is a content-sensitive method and flexible in terms of research design (Elo & Kyngäs, 2008).

As the process continued, suitable labels, or codes, that emerged from the text were assigned for each of these quotations. Then the broader generic categories were formed, and they were divided into smaller subcategories under the broad main category and the categories were collected into Excel worksheets and color coded for easier data management. Using the broader themes as the starting point of the analysis might have guided the author's way of thinking, instead of the categories emerging from the collected material. However, according to Schreier (2012) one way of doing qualitative content analysis is to create main categories based on previous knowledge, in a concept-driven way and to add subcategories based on what is said about these topics on the material, in a data-driven way. Also, since the examination of the material was done according to the relevance to my research questions, combining concept-driven categories with data-driven categories counteracts the danger of looking at the material solely through assumptions and expectations (Schreier, 2014).

According to Schreier (2014) a strategy called subsumption is particularly useful for generating subcategories in a data-driven way after deciding main categories. Subsumption involves examining the source material with the following steps: The first step is reading the material until a relevant concept is encountered. Next step is checking whether there is already a subcategory that covers this concept; if so, this concept is "subsumed" under the respective category, if not, a new subcategory is created. These steps are then continued until a point of saturation is reached, that is until no additional new concepts can be found.

Since most of the interviews were done in Finnish, all the quotations were translated to English to have consistency in terminology with the previous research while doing the further analysis and writing the results. The key points are supported with authentic citations because authentic citations can be used to increase the trustworthiness of research and to point out from what kind of original data interpretations are formulated (Elo & Kyngäs, 2008). After translating the quotations, the data was revised, and some subcategories and keywords were refined for each quotation using the subsumption strategy. Taking a step back and revising the coding frame is part of the content analysis procedure according to Schreier (2014). This includes tying up any loose ends, collapsing overlapping subcategories or even conceptualizing comprehensive subcategories as main categories. Some of the subcategories started to look like a more logical way to approach and analyze the data, so the data was re-coded, combined, and rearranged into new Excel workbook, re-conceptualizing these subcategories as main categories. The assigned keywords remained the same since their main function was to help find relevant quotation faster from the tables. The re-conceptualized main categories are presented in table 4.

Table 4. Main categories of the data

Category	
Characteristics	descriptions of what children or teachers are or should be like
Roles	the roles of children, teachers, and companies in co-design process
Approaches & co-design	general practices and real-life examples of organizing co-design processes
Facilitating & NCC	things to consider when facilitating co-design process in school context and the viewpoint of National Core Curriculum
Participation & motivation	crediting and compensating the participation of children
Ownership & ideas	thoughts regarding ownership, copyright and (use of) ideas
Children's rights	anything related to children's rights and/or UNCRC

There are seven main categories presented in Table 4. The first category, characteristics, contains the descriptions of children and teachers generally at school and/or in co-design contexts, or what are the ideal characteristics of children and teachers from the co-design perspective. The second category, roles, defines the specific roles of different stakeholders in co-design process. The third category, approaches & co-design, contains the principles and practices informants have used when planning and organizing co-design projects. The fourth category, participation & motivation, includes different aspects of participation, giving acknowledgement and compensation from the participation, and motivating the children to participate. The fourth category, ownership & ideas, contains the informants thoughts about the feeling of ownership, ownership in a legal sense, and copyright issues as well as the aspects of using or owning an idea. The last category, children's rights, includes all the mentions of children's rights, respecting the children, or the UNCRC. These categories formed the compressed data from the transcriptions in the form of direct quotations, which were used to answer the research questions.

4. Results from the interviews

The following chapter introduces the main empirical results of the interviews. The views and suggestions presented in this chapter are the opinions of the informants instead of scientific research. The findings are divided into subchapters based on research questions. The first subchapter describes the roles of different stakeholders of the co-design projects, including children, teachers, and companies. The second subchapter addresses on a general level some characteristics of children and teachers in co-design context and presents some ideals and challenges of involving children to co-design, as well as introduces the viewpoint of NCC. The third subchapter presents real-life examples of different approaches used to facilitate co-design with children. The fourth subchapter addresses how acknowledging and compensating the participation of children are handled, as well as possible copyright and ownership issues that might emerge during co-design sessions. The last subchapter discusses how children's rights are considered in co-design activities.

4.1 Roles in co-design activities

According to the interviews, **children have the main role** in co-design activities, and almost all the ideas should come from children. Informants mentioned children are more creative than adults and can come up with ideas that adults would never think of. Teacher C agrees, that in co-design projects the focus should be that the child is creative producer of ideas and the adult's role is to act as a facilitator or instructor. Adults don't have to decide, or even know, what the end-product is going to be. Teacher A believes, that in the ideal situation the topic or the problem comes from the children:

> *"...that even the problem we start to solve comes from the children. That is the most fruitful and the best situation I have ever witnessed. Then the projects are usually the best, too."* (Teacher A)

Project worker A says that companies are surprised how rich the ideas of children are, even young children. Project worker A highlights that from schools' perspective, it is important the children have an active role in co-design projects instead of being involved merely as testers. Project worker B emphasizes the transparency and involvement of children regarding their role; when children know what their role is agreed to be, they can question if that is fair. Teacher C stresses that children should have clear assignments and roles in co-design projects:

> *"The progression should be organized and structured enough, but not in the way that it kills the original idea what we are doing, it should not guide the process too much. I mean, the assignments can be open to a certain point, but they must not be too open for the child to progress in the process."* (Teacher C)

The consensus among the informants is that **teacher's role** is to set the framework and the boundaries of the co-design processes and children have some amount of freedom within those boundaries. The amount of freedom depends on the project scope and the purpose of the co-design. Teacher is the pedagogical expert who knows what kind of projects are suitable for school environment. Therefore, companies and other stakeholders should always consult with the teachers before starting a co-design project with children. All the informants agree that learning should be one of the top priorities in co-design with

children. Principal A states, that teacher's role is to first plan the pedagogical framework around the co-design, and then go through the process, goals, and assessment criteria with children. Consideration of children's individuality is one part of the expertise of teachers:

> *"We have to admit, that learning happens mostly everywhere else outside the school, but the thing is, that at school there are professionals to guide the children individually towards the correct direction in their learning, and that does not really happen anywhere else."* (Principal B**)**

After the project is planned and started, teachers should stay in the background helping and guiding the process. They should not aim to give solutions to problems, but instead think together with children the possibilities and ask questions to help the children solve the problem themselves. Principal B states that sometimes teachers think that their role is basically to follow the textbooks, and that it's hard to get these "traditional teachers" to understand the value of practicing the future skills, like problem-solving and collaboration through co-design.

> *"This model where we challenge … we work together to solve students' problems; we act as a facilitator instead of broadcasters or distributors of knowledge. This change of roles … it is incredibly difficult, and it probably takes still some time to make that change."* (Principal B)

Researcher B also emphasizes the adults' supporting role regarding the available tools and materials. All the informants agree that teachers have the responsibility to ensure that learning objectives are met in the projects. Principal A reminds that the goal of primary school is not to produce commercial products or sell anything:

> *"In comprehensive school the main objective for the children should be finding the joy of learning and children's own strengths and stepping out of the comfort zone."* (Principal A)

Teachers also have the final say in co-design collaboration:

> *"If it seemed, that the company was not … or would not have operated as expected, the teachers would have of course the right to call the project off at any point."* (Project worker A)

Companies' role in co-design is to offer real-life projects for co-designing. Three of the informants mention, that it is positive public relations for all the stakeholders if the company is open about including children in the design process. Project Worker A agrees that the companies can benefit from co-designing with children from a marketing point of view. Researcher A reminds that companies always have some business secrets that prevents them being completely open, but they should at least be clear and transparent about the goals of the co-design activities. They should explain, for example, why they are engaging in co-design and what kind of results they expect out of the collaboration with children. Researcher B highlights the importance of making a clear agreement:

> *"If some, I don't know, company invite children to develop some apps or something, then they should, yeah, make some kind of agreement or they should discuss at least beforehand when they invite them. How they are going to use and how they, their contribution will be acknowledged in the future."* (Researcher B)

The companies also offer role models and real-life examples of future career possibilities. For example, Teacher B mentions that when they visited a software company they had collaborated with, the children were surprised how multidisciplinary the workplace was:

> *"...the students learned that, of course people think when it's a computer game or some mobile game, they think it's only technology. But as it turned out ... all kinds of different fields of study can lead to working in a game company."* (Teacher B)

Project worker B highlights, that it is important to consider the benefits of co-design projects for the teachers as well; what kind of learning opportunities teachers get from collaborating with companies. According to the interviews, providing positive role models and offering a glimpse of possible career options for children is an important learning opportunity that co-designing with companies can offer. Having these collaboration experiences is also seen as important future skill among the informants.

4.2 General characteristics of children's involvement in co-design

In all the co-design projects discussed in the interviews, there were multiple children involved. According to informants, it is natural to **work in groups**, but there are different views how the groups should be formed. Some informants prefer familiar groups to ensure fluent teamwork, others emphasize that getting along with everyone is an important lesson for the children. Teacher B aims to teach the children that they don't need to be friends with everyone, but they need to get along with anyone. Principal A reminds that it's not necessary to allow children to form groups with their friends, but the teacher should, however, ensure that the groups feel safe and there's trust among the peers. Teacher A thinks that there might not be a single right solution for forming the groups:

> *"...in life we must learn to work with many kinds of people, but then again, sometimes the most fruitful results, I mean, the process is most fruitful when the group is familiar and safe."* (Teacher A)

Also, informants mention, that group size should be considered carefully for each project. According to Teacher C working in small groups has the benefit of having clear roles and assignments for children. Project Worker B thinks that in a bigger group, there are more opinions and more versatile ideas, but it is more challenging to facilitate. Nevertheless, almost all the informants mentioned, that group working also needs to be practiced:

> *"The challenges in group work are things that, like I said, that needs to be practiced and practiced, to find the good system. The dynamics are different in every class and the teacher, since they know their students, can use their knowledge to form proper groups."* (Teacher A)

Informants mention different ways of **facilitating group work**, and they all agree, that group work must be facilitated by the teacher. Teacher A reminds, that the warm-up phase is important part of group work, and teachers should invest time for that. Group work has also other challenges, for example, project worker A believes that children are spontaneous in a way that they might say all kinds of things during the group work. To ensure that groups stay functioning, Teacher A suggests, that children should be taught that they should respect each other when making decisions in a group.

Researcher B thinks that children need some **concrete framework** to trigger their minds. Teacher C believes that children might be more creative if there are no preconceptions limiting their imagination, but on the other hand Researcher A warns about too much freedom:

> *"Too much freedom leads to not that good results in general, according to my experience. Because, well, it's very difficult for kids to start a project from a scratch, even taking the decision of what they need to do. So, you need to give them a theme, a topic or anything like that. And then based on that, yes, you can give them freedom to work and so on."* (Researcher A)

Children are not the only ones that need to practice **co-designing processes**. According to Teacher B, teachers might feel uncertainty about controlling the process if they give responsibility and freedom to children. Teacher A shares the same concern, that teachers might feel uncomfortable to give children decisive power in the fear of losing control. The fear of losing control shows also in the planning of the activities. Teacher B thinks that teachers tend to focus too much on the end-product:

> *"Teachers are really skilled to plan projects. And before the project starts, we kind of see the finished products somewhere. And we forget that we have those creative and inventive children there … we kind of forget to consider their interests, their uniqueness, and the power of collaboration."* (Teacher B)

> *"Teachers want to see fancy end-products, polished results, but that's something we should get rid of. I mean, the results should be allowed to look like they are created by children. Children created the products; they think they are great, and those products we need to compliment"* (Teacher B)

Teacher B reminds that the children nowadays are growing in a totally different world than the teachers used to live. Also, the principles for evaluating the students have changed over the years:

> *"It is not anymore that the end-product is the most important thing to be evaluated … now it's the process and the skills and the improvement compared to your previous level, how do you work in a group, how do you handle responsibility and so forth."* (Principal A)

Involving children in the decision-making process might also feel like a chore. Teacher A states, that oftentimes it would be easier to just make decisions between adults to quickly get something done. Sometimes teachers can feel that their expertise is at stake:

> *"I wish we would get rid of the challenge, that as an adult, I should be in control of everything. One challenge is the feeling that I should know how to do a certain thing before I have the courage to do it with children. But I don't have to."* (Teacher B)

Informants are aware, that **NCC guides all the schoolwork** and obliges schools to actively involve children in planning, executing, and evaluating the learning process.

> *"NCC states, that evaluation criteria, for example, must be clear when starting a new period … You must open the whole process, and if you*

> *are going to use co-design or making students need to know if it affects the evaluation. I mean like, do you get the grade based on the end-product or is the evaluation something else. Or, for example, from this project you will only get peer feedback, I mean, in the design process you get feedback and develop your product further. It depends on the situation, but children should know everything as early as possible. It's their right."* (Teacher B)

According to informants, following the NCC is important not only for the teacher who is responsible but also for the children. The main goal is that the children participating in co-design processes learn something, and because of NCC these learning outcomes are usually predefined. Principal B states that even when the projects are based on the content of instructions, the aim is that pupils can choose how they plan to solve the given task or challenge. Pupils begin to produce ideas from scratch, and the final product or result is completely determined by how the child has chosen to conduct the project. Teacher B thinks that ideally the NCC would be open, and children would participate in planning their curriculum in different subjects. Children's participation is also mentioned in the NCC:

> *"We talk about it [participation] in the NCC and it is one of the transversal competencies, which must be addressed, I mean, should be addressed in everything, almost in every activity and include the students."* (Teacher A)

Interviewees had some ideas about **facilitating an ideal co-design project** in schools. Researcher B thinks that ideally co-design project is aiming towards something real, something that the children can actually use and what they are interested in. Teacher C describes ideal co-design situation as follows:

> *"…that we somehow map out with children, whatever the project is, that what we are going to do, for example what kind of background knowledge do they have about the topic and after that the project is anchored to prior knowledge and we start thinking together what the goal is, and what are the sub-goals in the project. Ideally, children's creativity and strengths can emerge … and children teach each other in the process."* (Teacher C)

When facilitating a co-design session, Researcher B tries to talk with every child that is partaking in the session. Three informants mention that it is important that the children understand the project they are participating in, which means using language that children understand. Researcher A aims that all the children participate in co-design activities:

> *"We always give them the chance to participate, even if we notice that they are, let's say, a little bit outside, for example, that teamwork we tried to bring them, but we never force them to do something that they don't want to."* (Researcher A)

Informants also mention some **challenges regarding the facilitating** of co-design processes. Teacher B mentions both teachers' and students' insufficient know-how in design processes and design software as a challenge, which can hinder or even prevent the use of co-design. Another challenge mentioned by Teacher B is that how to bring the "outside world" into school in a good and educational way as a learning tool, and how to

utilize the existing skills of students. Project worker B brings up the problem with high expectations:

> *"Not all children's ideas are feasible, because they have as a point of comparison those ... games that has been developed with a budget of hundreds of thousands of euros. So, the expectations can be so high and big that it might already discourage them."* (Project worker B)

Many informants agree that when co-designing commercial products, you must be more precise. Project worker B underlines the importance of written contracts in commercial distribution, which state realistically what has been the children's contribution in the project. Multiple informants highlight that when the potential commercial products are concerning underaged students, the parents or guardians must be involved in signing the contracts on behalf of the children.

4.3 Approaches used in co-design projects

Project worker A worked in a project that had a goal of creating an approach, which allows schools and companies to co-design new products or services, which would be customer friendly and benefit the company by providing important information about the future users:

> *"The approach means on one hand the boundaries for co-design activities, but on the other hand the enabling factors how is it possible to co-design ... When talking about educational establishments, which are semi-public spaces and, in a sense, it is possible to collaborate, but since there are underaged children, there are certain laws and regulations."* (Project Worker A)

Project Worker A mentions **two different approaches** they used in co-design projects with various companies. In the first approach, the development targets or goals came from schools, and then the project workers searched for a company to co-design a solution with children. In this approach, the company was compensated for the development services they offered for schools as a solution for their needs. Project worker emphasizes that it was not the product that was being bought from the company, but the co-design experiment.

The second approach was gratuitous co-design experiments, where companies could offer their existing product or idea for further development with children, and then the project workers searched for a school that would be interested in collaboration with that project. According to Project worker A, the most important aspect of this approach was the genuine interest and motivation to engage in co-design with the company. In this approach, companies got to pitch their ideas for children, and they got feedback from children about their products or services even if their product didn't get selected for the project. Project Worker A states, that companies gave positive feedbacks from these projects.

Traditionally, schools have dealt with companies merely as buyers of products or services. Some informants claim that companies and schools see mutual benefits in co-design. Principal A sees it as a win-win situation, that companies want to do co-design with children, regardless of whether the market of the company is in the educational sector or in other commercial products. Two informants mention collaboration with companies

through design competitions, where pupils were co-designing some small items, such as keychains, to be used as business gifts or promotional materials. Some schools have also co-designed Christmas decorations or various jewelry for sale to raise money for field trips and such.

Project Worker B talks about a project where the company provided the idea with their mobile application and children's role was to create content for the application. The company representatives had a workshop with children, where they told what they expected from the children and provided the technical criteria for the content before the children started to produce content with their teacher. Project Worker B has also participated in some projects where teachers have noticed a need for some digital solution in the classroom and children have only been involved in the testing phase. Project Worker A, too, has experience of some project where children were only involved in the testing phase. For example, in one project teachers used some new teaching materials with children and gave feedback to the material designers how it worked in real-life situations, so the students were only indirectly involved in the design process. Teacher A has participated in a "Shark Tank" type of event, where students had made designs for the future makerspace and presented the plans for teachers and principal. Companies do not necessarily have previous experience on working with children, and teachers do not always have experience on working with companies. Principal B reminds, that bringing children to co-design is something that needs practicing:

> *"It won't do any good to bring a second grader if they have no idea what's going on."* (Principal B)

Multiple informants mention using design cycle as a tool for practicing and organizing co-design. An example of a design cycle is shown on Figure 3. It is adapted from a version of design cycle multiple informants made references to. According to the informants, design cycle benefits both the teachers and the children, when every project has a similar beginning and the process follows roughly the same steps every time:

> *"We use in our STEAM-project a lot this design cycle. It's a model which defines clearly how the design process goes and what's happening in each phase. I think that model as such takes quite well children's participation into account."* (Teacher A)

> *"It's the design cycle … where the assignment starts, and the clarity of the project and pedagogical safety comes from. … It's always clear how the process starts, and teachers know how it goes, and eventually the children get used to following the similar pattern in every design project. But inside that design cycle is some leeway."* (Principal A)

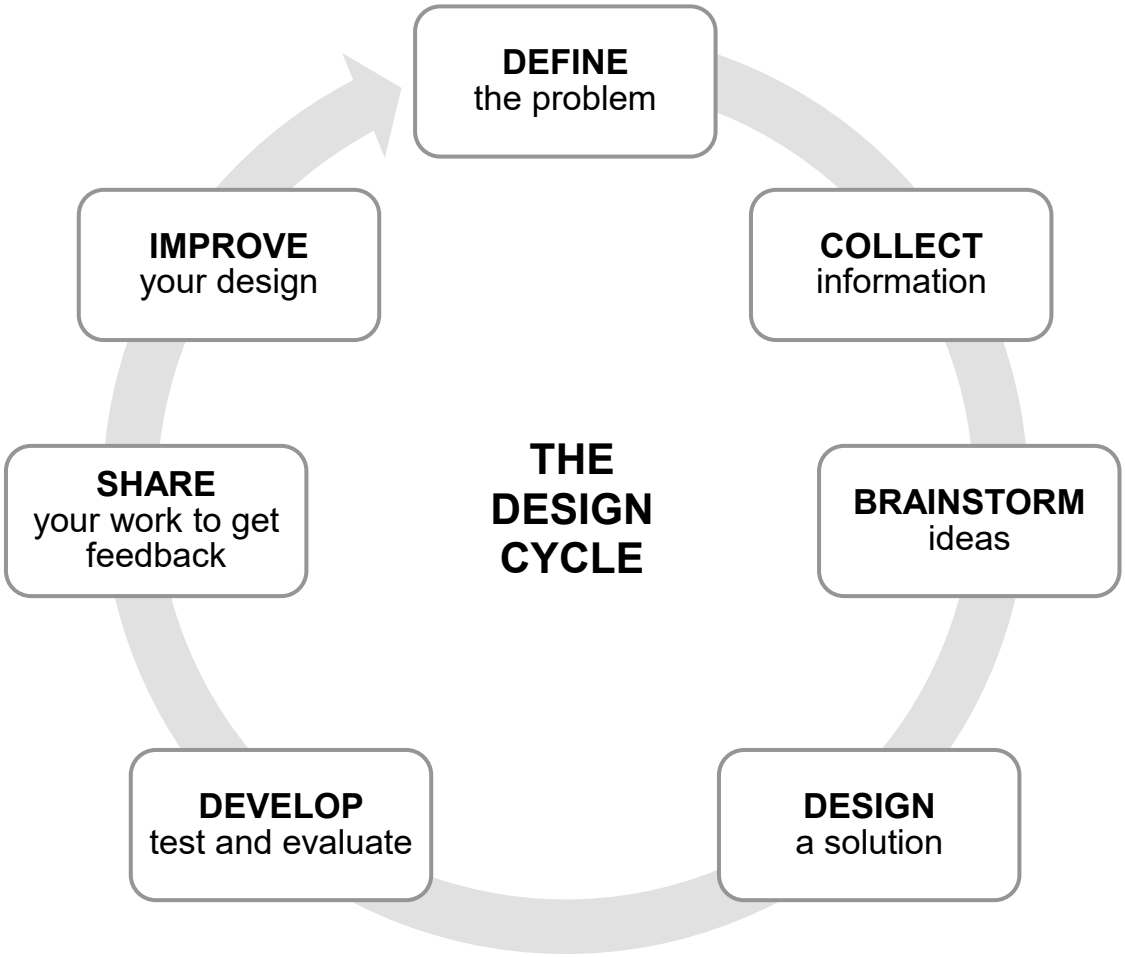

Figure 3. Design cycle (Adapted from Hintan Koulun Muotoilukasvatussuunnitelma, n.d.)

Teacher C thinks that using a design cycle makes the process systematic, and it ensures that important parts of design process are not accidentally left out. According to the interviews, Fab Lab Oulu has also utilized a similar design cycle for digital fabrication.

4.4 Addressing copyright and ownership issues in co-design projects

The concept of ownership in the context of co-design usually refers to either the feeling of ownership about something or owning something in a legal sense. The informants talk about ownership using both meanings. Teacher C sums up the first aspect of ownership as follows:

> *"When we get the ownership for the children and the children involved in the process, it, in a big picture, raises children to bearing responsibility and participating. And, that they understand what is shared and how shared things should be used. … That you don't saw off the branch you're sitting on by not maintaining the common workspaces or anything."* (Teacher C)

Principal B recognizes the same **feeling of ownership** that arises for students when they have designed the makerspace themselves, and it still shows in the way they take care of the equipment. Many informants agree that children will feel ownership about the project

when it starts from the students' own questions and problems. Teacher A believes that having the feeling of ownership about the project is important for learning. According to Principal B, selling things the children have designed themselves resonates a lot more than selling toilet paper for fundraising purposes.

Project worker B offers an example of **ownership in legal sense**:

> *"For example, in our project we had the idea of the application and children produced the video content for it. So that means we have the ownership of the whole product, but the children own the content they have produced. They made it."* (Project worker B)

According to Project worker A, generally the co-designed products or services have been existing products that were being developed further. In those cases, it was clear that the company owned the product and children were participating in co-designing a small part of it. Some informants have made written contracts with the school and the company that the product and all the intellectual property and copyrights belong to the company, including all the results of co-design made with children. Teacher C speculates, that if co-designing together with some company is done as a part of normal schoolwork, the children would have no legal rights to the final product. Teacher A feels that there should be more talk about copyright issues in school:

> *"I think there is still too little talk about copyright in school. It is an incredibly confusing jungle, and, at least for me, it's sometimes very hard to understand even though I have attended to some training on the subject. ... They [copyright issues] are sometimes overlooked in certain situations, at least in school."* (Teacher A)

Principal B, on the other hand, feels that co-design has increased the discussion about copyright and rights in general:

> *"Copyright is related to what we download from online, and in a way when we started to make our own products, it's easier to convey information about different rights. ... It has become closer to everyday life because children can mirror it through their own products. For example, is it allowed to take pictures of others, are we allowed to sell the products, what needs to be done before we can make commercial products and so on. That discussion has increased."* (Principal B)

Principal B thinks that if the children produce **commercial products** intended for sale there must be some kind of ownership. All the informants agreed, that when co-design projects involve money, there should be written agreements. One informant mentions having lawyers and finance people contemplating how to manage the monetary transactions and the ownership rights of the commercial products they are designing and selling. They resolved the question of ownership with written agreements of all intellectual property rights transferring to the parents' association which then owns the co-designed products as well as all the sales proceeds. For legal reasons these agreements need to be signed by a parent or a guardian of the child, since children don't have legal capacity to sign such contracts. However, Teacher B reminds, that regardless of the administrative level agreements the experience of ownership might be different for children.

Some informants have purposefully prevented ownership from personifying to a specific child to avoid legal issues regarding owning the end-product. This way, the product is made, and therefore owned, by a group of people instead of a single child:

> *"The process that we use is made on purpose the way that it does not personify to any particular pupil. The design process is planned together, and the process advances in a way that someone starts the design and then it is rotated so that everyone takes turns improving and modifying it, and then the end result is made by the whole class."* (Teacher A)

Project worker B mentions developing open-source software as an example of more open co-design and emphasizes that it is important to teach children about what it means if something is open-source, that it is for common good and that anyone can build on their contribution. Researcher B teaches children that if they make some Arduino code which they want to publish somewhere, they should write a comment in the beginning of the code to decide how they want their code to be used. Teacher A has some experience of sharing the results with Scratch:

> *"When we make games with Scratch it works pretty well in the way that we share the games for everyone … and the pupils don't mind. Maybe they are used to it in the gaming world … that they know that not everything is in commercial distribution only."* (Teacher A)

Principal A reminds, that the children have the same rights in digital environments and with digital tools and products as physical ones. Teacher B wants to emphasize the difference of collaboration and using someone else's idea:

> *"Then we must separate that if we work collaboratively and together design and make something, the output will be shared and collective product. … But if it's someone else's idea and you make it, then you must… I mean, in my opinion it's a matter of learning good manners and partly a copyright issue as well."* (Teacher B)

Informants have different opinions about **ownership of ideas**. Project worker B thinks that it's important to teach the children that if a contract is made between the school and the company, then all the ideas that come up in the project, regardless of whether they are from children or employees, they are part of the process and therefore owned by the company. Researcher A does not think that ideas can belong to anyone:

> *"No, I don't think that idea can be owned, because … the idea that you have, it can be, I mean, what do you imagine, it can be imagined by thousands of people at the same time. So, I don't think that the idea can be owned."* (Researcher A)

Teacher C, on the other hand, thinks that ideas can be owned in a sense, that someone has always thought it first, even if it arose from some previously existing idea, it might be new, original solution or approach. Teacher A reminds that even if simply having an idea is not protected by any copyrights, it is important to acknowledge whose idea it was in terms of children's self-esteem and such:

> *"Idea is just an idea, but idea is also a really important thing. I understand it well, and it's a thing that shouldn't be belittled, I think that child should get recognition for their ideas."* (Teacher A)

In general, informants do not see a difference whether the idea comes from a child or from an adult other than adults might understand better the questions of ownership.

4.5 Respecting children's rights in co-design projects

According to the interviews, all informants except one felt that they have enough knowledge about **children's rights**. All the informants had heard about children's rights and tried to actively take them into account in their actions. Principal A believes that child's best interest should guide all processes and planning of activities, and if possible, co-design projects should be subjected to child-right impact assessment (see UNICEF, 2013). Project worker A highlights the ethical aspect of working with children:

> *"Even if some detail is not specifically recorded in the agreement, it is really important to have a certain ethical approach. The researchers usually have it, but the company representatives do not necessarily recognize."* (Project worker A)

Project worker B lists some ways to respect children's rights in co-design projects:

> *"Children have been informed what the project is about, they know the background. … Children are asked for their opinion; they are heard, and their contributions are respected."* (Project worker B)

Most of the informants consider it important that all the children, regardless of their age, skills and background can participate in co-design processes according to their age level, and that all processes must be age appropriate. However, only one informant raises a concern about the possibility of inequality regarding children's participation in co-design projects:

> *"If we think that every student has the right to this type of learning at least from time to time. Even if we all implemented it, not all students in different classes can participate in it equally, let alone in the city of Oulu. It is still nowhere near equal."* (Principal B)

Principal A explains that the **participation** of the children depends on age level and experience level:

> *"…according to the age level, and what is interesting, that for children as well, it [participation] proceeds constructively: when they have some experience and own views, they can be brought to the next level, which can be, for example, taking care of the [makerspace] equipment or training and teaching of peers."* (Principal A)

According to Teacher B, children join in the co-design process more enthusiastically when they have decision-making power and influence, instead of teacher just telling them what to do. The informants generally consider it important that the children see the whole story behind the co-design processes. Principal B emphasizes the importance of practicing participation skills:

> *"If we think the skills that we need in the future, it is important to practice the skills that you know how to influence and you dare to influence. So, children should already, or at least in the future, be involved in matters concerning the child from the beginning. But children need to practice how they can take a stand on their own affairs. That we should go through more in class."* (Principal B)

All the informants think that children should participate actively in co-design projects. The informants also think that children participating in co-design processes should be openly told about the nature and purpose of the co-design. Principal B thinks that it is not possible to pay too much attention to children's participation in matters that involve children. Project worker A tells that children were really excited when they saw that their ideas were valuable and respected when co-design projects brought the ideas to life. Principal A agrees that the children should be allowed to participate and be proud about their contributions.

Many informants mention, that the projects in which the children were active participants were the most motivating for the children. Researcher B agrees that meaningful and real projects were the most motivating ones. Teacher B thinks that participation and having a say in their learning is crucial in terms of generating intrinsic motivation for the children. Some informants claim that it motivates the children when they know what their creativity, competence and working is used for, and when they understand the aim of the project. Project worker B also thinks that children are genuinely interested in co-design projects, and that they feel like their contribution is important and it makes a difference, and they want to get acknowledged for it.

According to Researcher B, when inviting children for co-design projects, companies should make some kind of agreement, or at least discuss beforehand, how they are going to utilize children's contributions and how their contributions will be acknowledged in the future. All the informants agree that children should get some **acknowledgement** for their participation. It's ethical to credit children when they have been part of a design project, even if it's just announcing the names of the participants. Principal B emphasizes, that whatever the form of recognition is, it should feel rewarding for the children. Teacher B sees acknowledging children as motivating:

> *"I personally feel that presenting the name, giving recognition to whoever did it, that's actually a pretty big deal too. And it can be, for example, an incredibly big deal for a child's self-esteem, and for school motivation as well."* (Teacher B)

Majority of the informants mention a project where the group of children were acknowledged as pupils of a certain school or a class instead of publishing the names of the pupils. Project worker B argues that children have a strong identity towards their own school. Children feel like they are part of the school as students, so mentioning the participation of the school instead of individual children might be enough acknowledgement. According to Project worker B, sometimes children themselves might want their names to be published, but the guardians might not approve that, or vice versa. Principal A states, that children don't need always to be motivated by external prizes:

> *"Children are content with even small credit and acknowledgement as for a prize. … Sense of accomplishment in the small things is the most important thing, in my opinion. It doesn't always have to be awards and big public recognition."* (Principal A)

Teacher B gives an example of immaterial prizes from design competitions: sometimes companies have invited the winner group to visit their company's facilities. Two of the informants suggest that teachers and company representatives should discuss with children how they would like to be acknowledged. It would be beneficial to always ask from the children and think together what kind of recognition is necessary:

> *"That would further increase the appreciation and respect towards objects, items, products, and services. Talking about it [recognition] would help children understand that behind the products there is always someone who has put in the effort. ... And then the children themselves would receive thanks and recognition for their contribution to the project."* (Principal B)

Three informants mention that companies could acknowledge children's participation in their co-design projects in their communication and marketing. It could provide positive public relations for them as well, and spark interest in customers if the product is co-designed with children. Teacher B reminds, that the companies are also motivated to put some effort in the co-design projects because it will be their name on the end-product.

All the informants agree, that when **co-designing for commercial use** you must be more careful. Project worker A speaks for transparency in every project that involves children, especially if it's a commercial product, and thinks that it is extremely important that also the guardians of the children know what kind of project it is, why it is done and how long it will take. According to Principal A, guardians need to be involved in decision-making if there are any agreements or permits needed:

> *"Working with children is made special by the fact that they are judicially considered underage, and they can't make legal decisions. That needs the guardian. Of course, child can express their opinion and the child must be heard, but adults are the ones making the decisions after hearing the child. That's the difference, child is not legally competent."* (Principal A)

Children's safety is a priority for all the informants, and it is adults' responsibility to make sure children's needs are met. Teacher C emphasizes, that there should always be a safe and familiar adult available for the children, and the conditions of the co-design project should be safe for the children:

> *"These are obvious things, of course, but for example, the meetings should not be too long, I mean, the little kids cannot manage meetings of many hours. You must plan what you do with them in such a way that they can manage it and take care of these basic needs that we all have. For example, children might not dare to ask to go to the bathroom, or they do not know where the bathroom is. It is concrete things like these that need to be taken care of when you start to do co-design projects with children."* (Teacher C)

According to many informants, safe environment is a prerequisite for any successful group activities. Principal A believes, that in secure environment children dare to throw ideas, state their opinion, and participate more freely. Teacher B wishes that teachers would keep on doing long-term work with children to encourage them to be open and creative about their learning. Project worker A highlights the importance of respect towards children:

> *"The most important thing, in my opinion, is that children and their ideas are respected, and they are received with respect, and that what the children say is seen as valuable. And that they will be heard and understood by adults. You do not see them just as little testers there, but that they really have something significant to say at this point. That the children are already significant, not just future users."* (Project worker A)

Respect throughout the co-design project among the children and all the participants is important for all the informants. According to Project worker A one point of view for respecting the original idea of the child is not to modify it too much during the process. Researcher A emphasizes that the ambience in co-design projects should be that everybody respects each other, both adults and the children. According to Teacher B, one way for adults to show respect to children is trying to understand the reality in the way children are experiencing it, and not trying to exclude things that happen outside of school.

Teacher C would also like to include talk about global children's rights to the school projects:

> *"If we talk about children's rights ... there should be consideration about the global aspect as well. When we are doing this kind of stuff now, at the same time it would be really important for the children participating in the process to talk about the global context of participation. Bring that concept into discussion as well."* (Teacher C)

Researcher A reminds that although we have universal rights of the child, the laws are different in different countries and therefore it is impossible to cover the whole spectrum with general guidelines for co-design processes. Few informants also mention some rights, that are not specifically children's rights, but more general rights or laws. For example, publishing photographs of children without their (or parent's/guardian's) permission, or things related to GDPR and other privacy questions.

These empirical results represent the excerpts from the interviews that were the most relevant to the research questions. The next chapter draws on these empirical results to answer the research questions and compares them with theoretical findings.

5. Discussion

This chapter presents the answers to the research questions as well as the guidelines for respecting children's rights and ownership in co-design processes with children. The first subchapter 5.1 contains answers to the first research question and its sub questions, and the second subchapter 5.2 has answer to the second question as recommendations based on the interviews and existing literature, and the guidelines for respecting children's rights in co-design with children. The guidelines for respecting children's rights are presented in Table 5 and guidelines concerning ownership in Table 6.

5.1 Practices used in co-design with children to address children's rights and ownership issues

The first research question was "What kind of practices are currently used in co-design with children to address children's rights and ownership issues?". In summary, informants agreed that children have the main role in co-design activities. Children's role is to be creative producer of ideas as well as active participant in the design process, while adult's role is to act as a facilitator or instructor and set the boundaries of the process. Children were usually involved in co-design projects as a part of a larger group rather than as individuals. The framework for the process was usually set by the teachers or other adults, and the main goal of the co-design processes was that the children learn something.

The most common form of co-design informants had experience on was from digital fabrication in makerspaces, either school's own or Fab Lab Oulu in the university of Oulu. Other examples of co-design projects mentioned in the interviews were software development and idea competitions. Most informants had experience of both commercial and non-commercial projects, as well as with and without external collaborators. According to Smith et al. (2015) utilizing digital fabrication tools in education provides children with understanding of technology and supports their ability to create and design with digital materials. This has the potential to empower the children by giving them tools and knowledge to influence the decision making (Wake, 2011).

Since UNCRC provides guidelines for NCC, schools inherently advocate children's rights in their daily activities. And since most of the informants had background in teaching or were otherwise associated with schools, they were generally quite aware of children's rights. Informants considered it ideal, that there is no discrimination in co-design activities and that everyone should be able to participate. However, one informant brought up, that not all the children have equal possibilities to participate in co-design activities. Teachers can promote equality among their class or within the school, but the differences between schools regarding resources and ways of working are more difficult to overcome. According to the interviews, children's right to be treated equally was addressed by trying to include everyone without forcing them to participate.

The best interest of the child was mentioned as a guiding principle to all processes and planning of activities which include children. The informants mentioned teachers and principals as decision-makers about which co-design projects are approved and how the projects are implemented. Teachers were trusted to make the decisions based on their expertise, and act as a representative of the children's views. Child right impact assessment was also brought up in the interviews as one way to further increase the realization of the best interest of the child. Child right impact assessment aims to make

children visible in the decision-making process and improve their wellbeing by taking potential impacts on children into account in policy, legislation, and other decisions (UNICEF, 2013). Guha et al. (2010) also emphasize the importance of studying the impact on children.

According to Article 6 child has also right to life, survival, and development (UNCRC, 1989). Informants agreed that it is adults' responsibility to ensure children's safety and basic needs in co-design activities. Secure environment is also a prerequisite for any successful activities. Another way to increase safety of children was making sure that the child's parent(s)/guardian(s) are aware of the participation in co-design activities. Children's right to development was addressed by making sure that the contents of co-design are age-appropriate and that the children are involved in the processes in ways appropriate for their age level. Once again, teachers were responsible for assessing the proper level of participation.

Child's right to be heard (UNCRC, 1989) was addressed by allowing children to participate in co-design activities, and keeping the processes as transparent as possible, so that the children know what they are participating in and how they are expected to contribute. For a child to truly be heard, merely allowing children to participate is not enough. The opinions and ideas of children need to be listened, respected, and valued (Christensen & Prout, 2002). According to the interviews, it increased motivation and engagement of the children to see their contributions respected. These ideas are in line with Lansdown's (2001) principles for democratic participation of children as well as Lundy's model for participation (Fig. 2).

According to the interviews one way of showing respect for children's contributions was to give them acknowledgement of their ideas and accomplishments. Respecting one's ideas is closely tied to the concept of ownership, which in context of co-design usually refers to either the feeling of ownership about something or owning something in a legal sense. The most common practice of addressing legal ownership issues was written agreements. For example, when co-design was done within the school or class and it resulted in commercial products, immaterial property rights of said products were transferred to parents' association, which then oversaw the monetary transactions and was owner of the product(s). In this case, the agreement was made between the parents' association and the parent(s)/guardian(s) of the children who were part of the class or group that made the original design.

In cases, where there were companies involved in the co-design projects, written contracts were made between the school and the company. In these agreements, it was stated clearly who will be the owner of the ideas, intellectual property, copyright, and possible products that are created in the co-design activities. In some cases, children were involved in further developing an existing product, which was already owned by the company. In this case it was clear that the company owned the product, because children were participating in co-designing only a small part of it. And in some cases, it was agreed beforehand, that all the ideas that children come up with in the sessions are owned by the company, just like the ideas of employees were owned by the company. If needed, the permission to participate in the co-design activities was asked from the parent(s)/guardian(s) of the children.

Addressing the feeling of ownership is not always simple, because regardless of the written agreements the experience of ownership is not that easily transferred. The ownership of an idea should not be belittled, since the feeling of ownership relates to being proud of one's ideas, and it can affect child's self-esteem. According to Van

Mechelen (2016) and Druin (2014) the feeling of ownership is also a key element of motivation. The most common way to address the feeling of ownership was to give credit to the original "owner" of the idea. Informants had many ways of acknowledging children from their contributions, for example announcing the names of the participants in front of the school or giving them small immaterial rewards, but the most important thing was that children were given at least some recognition in a way that is meaningful and feels rewarding for children.

5.2 Respecting children's rights and ownership in co-design process with children

The second research question was "How children's rights and ownership should be considered in co-design with children?". This question is answered with the combination of suggestions from the informants and the existing literature. These descriptions of ideal co-design situations are transformed into guidelines and compiled to Tables 5 and 6 by the author. Table 5 contains the guidelines regarding children's rights and Table 6 contains the guidelines concerning ownership.

Table 5. Guidelines for respecting children's rights

Addressed article of UNCRC (1989)	Guideline
Article 2 (non-discrimination)	1. Make possible for all children regardless of their age, background, and skills to participate in co-design projects.
	2. Treat all children with equal respect regardless of their individual factors.
Article 3 (best interests of the child)	3. Consult teachers before planning a co-design activity with children.
	4. Trust the expertise of teachers in matters regarding their pupils.
Article 6 (life, survival, and development)	5. Make sure children's basic needs are met in co-design projects.
	6. Maintain the safety of children throughout the project.
Article 12 (right to be heard)	7. Involve children in the planning as early as possible.
	8. Provide safe and inclusive space for children to express themselves freely.
	9. Take the children's views seriously and show how they are acknowledged in the process.
Article 13 (freedom of expression)	10. Be open about the details and purpose of the co-design so that children can make informed choices.
Article 16 (right to privacy)	11. Only collect personal data when necessary and protect children's privacy when reporting or publishing the results.
Article 18 (parental responsibilities)	12. Consult parent(s)/guardian(s) of the child whenever there is need for important decisions and/or written agreements.
Article 28 (right to education)	13. Make the project a valuable learning experience for the children.
Article 29 (goals of education)	14. Facilitate the development of new skills, insights, and abilities of the children.

Children's rights are defined in the UNCRC (1989), which was ratified as part of Finnish legislation in 1991 (OPH, n.d). Ratification means that the Convention is not just a model of good pedagogical practice, but legally binding obligation (Welty & Lundy, 2013). The obligation applies to states, municipalities, children's parents, and anyone working with children (OPH, n.d). According to UNCRC (1989) Article 2, child's rights apply to all children. Children may not be discriminated against based on their appearance, origins, opinions, or other characteristics (Kalliomeri et al., 2020). All children should also be treated with equal respect and allow them equal possibilities regardless of their individual factors (Lansdown, 2001). According to Mazzone (2012) using variety of communication tools will allow children with different abilities to express themselves. According to the interviews, ideally, all children regardless of their age, background and skills can participate in co-design projects, but in reality, it is still nowhere near equal regionally, or even within schools. Equality in co-design is nonetheless a goal worth pursuing within the participants. Respecting Article 2 forms a base for guidelines 1 and 2, which are presented with other guidelines concerning children's rights in Table 5.

Mazzone (2012) identified two aspects of suitable methods for co-designing with children: management and engagement. Management refers to careful planning and facilitating of the sessions, as well as clearly defining the roles of the participants. Engagement means the ways of enabling children's active participation with methods that are fun and engaging. In school context, management of the co-design projects is often the responsibility of the teachers. According to the interviews, teachers should set the framework and boundaries for the project, but as the process starts, they should stay in the background guiding the children individually towards the goal instead of offering their views and solutions. Teachers are the pedagogical experts who know what kind of projects and what amount of freedom is suitable for school environment. Therefore, teachers have the responsibility to uphold the best interests of a child. According to the UNCRC (1989) Article 3: The best interest of child should be a top priority in all decisions, actions and plans that affect children. Companies and other stakeholders should therefore always consult with teachers before starting a co-design project with children, since they have the best understanding of what's best for the children. Teachers also have the expertise to make the co-design situations engaging. The design process can offer children fun and interesting things to do. Enjoyable and fun co-design activities also tend to be more productive and idea rich (Gennari, 2013). These principles are summarized in guidelines 3 and 4.

In addition to facilitating and providing structure for the co-design process, teachers and other adults need to maintain the caregiver role and ensure that the children's basic needs are met (Guha et al., 2013). Informants also emphasized the importance of always having a safe adult available for the children. Children's safety should always be a priority, as it is stated in UNCRC (1989) Article 6: Child has right to life, survival, and development. Participation in co-design activities should never be harmful to the child (Kalliomeri et al, 2020). Guidelines 5 and 6 address to the Article 6.

UNCRC (1989) Article 12 emphasizes that the child has the right to express their views freely in all matters affecting the child, and that those views should be considered in accordance with the age and maturity of the child. Generally, children should have the right to participate but not be forced to do so (Kalliomeri et al., 2020). According to Lansdown (2001) children should be involved in the planning from the earliest possible stage. The key elements in the Article 12 can be addressed by providing a safe and inclusive space for children to express themselves freely, providing appropriate information and support for children to express their views, taking the children's views seriously and showing that they have real effects where appropriate (Lundy, 2007).

According to the interviews, children's participation was important aspect of co-designing. Informants highlighted the importance of respect towards the ideas of the children, and that children's contributions are seen as valuable and significant. The emphasis of Article 12 is considered in guidelines 7, 8 and 9.

Article 13 states, that children have the right to seek and receive information to help them express their views (UNCRC, 1989). Therefore, adults facilitating the co-design project have the responsibility to be honest about the goals of the design and share the information with the children to enable them to make informed choices (Lansdown, 2001). It also came up in the interviews, that adults should be transparent about the goals and children's role in the design process. When children are openly informed about their role, they can question whether their role seems fair or not. Ideally, children will have a say regarding their role as well. Guideline 10 considers Article 13.

Mazzone (2012) argues that children might be overly trusting towards adults and disclose private and sensitive information without regard to possible consequences. It is adult's responsibility to avoid these situations and ensure the safety of personal data and protection of privacy as stated in UNCRC (1989) Article 16. As multiple informants reminded in the interviews, children are judicially considered underage and therefore they can't make legal decisions themselves. If co-design project needs to collect and/or disclose any personal information, parent(s)/guardian(s) should be the ones making the decision. UNCRC (1989) Article 18 underlines that parents have the main responsibility of bringing up a child. Guidelines 11 and 12 address to these articles.

According to the interviews, learning is one of the most important aspects of co-design with children. This is in line with the idea of children as protagonists by Iversen et al. (2017). In this role, the co-design process is arranged to help children develop new insights, skills and abilities, and a reflective stance towards designing, instead of focusing on the end-product. Literature brought up several learning opportunities potentially provided by co-design: communication and collaboration skills (Druin, 2002); research, planning and designing skills (Wake, 2011); ethical reasoning, reflection, and empathy (Paracha et al., 2019) and deeper understanding of the topic (Wake, 2011). This resonates well with UNCRC (1989) Article 28, child's right to education, as well as NCC. It is teachers' responsibility to make sure that the learning objectives of the NCC are met in the co-design projects. This is also relevant regarding Article 29 (UNCRC, 1989), which states that the education of the child shall be directed to the development of child's personality, talents, and mental and physical abilities to their fullest potential. Addressing Articles 28 and 29 is considered in guidelines 13 and 14 respectively.

Informants claim, that in ideal situation the children have the main role in co-design and almost all the ideas or problems should come from the children. The role of protagonist (Iversen et al., 2017) places children at the center of the design process and ideally allows them to engage in real-life design problems. Real-life design problems can be ideating a new design or service, designing a product using digital fabrication tools, or anything else related to design. According to the interviews, projects that were based on children's own questions and problems were the most motivating ones. Van Mechelen's (2016) and Druin's (2014) findings support the observation that the feeling of ownership increases motivation and duration of participation. Informants claimed that children felt more ownership of the projects that were based on their ideas. Druin (2014) had similar thoughts, that the feeling of ownership means that children have personal stake in the creation and use of an idea. Iversen et al. (2017) claim, that being motivated and having a sense of ownership are prerequisites for the role of the protagonist. The feeling of ownership can be cultivated with allowing children to have a main role throughout the

co-design process, making children feel that their contributions are valuable and giving children freedom, responsibility, and decisive power. These practices are addressed in guidelines 15 and 16 in Table 6 together with other guidelines concerning the subject of ownership.

Table 6. Guidelines for respecting ownership

Category	Guideline
The feeling of ownership	15. Use the ideas, problems, and questions of the children as a starting point for the co-design project whenever possible.
	16. Give the children freedom, responsibility, and decisive power to cultivate ownership of the project.
The ownership of ideas	17. Give children credit for their ideas when appropriate.
	18. Be sensitive when dealing with children's ideas, especially if they seem possessive about them.
Legal ownership	19. When in doubt, make written agreements.
	20. Avoid personifying the products to individual children when appropriate.

Shaw et al. (2012) claim, that children understand ideas as entities that can be owned just like physical objects. They suggest ideas are seen as signals of creativity and thus a valuable resource. Informants had different opinions about owning an idea, but if there's a possibility that a child thinks that idea can be owned, it does not matter what the adult thinks about it. The question of ownership should be addressed understanding the child's point of view. As one informant stated: idea is just an idea, but it shouldn't be belittled. According to Lomax (2015) children might feel disappointed or frustrated if their work is uncredited. Shaw & Olson (2015) found that children dislike plagiarism, and Guha et al. (2004) found that children seemed upset if their ideas were not used. All the informants also agreed that it is important to acknowledge children's participation somehow. These findings suggest that ownership of ideas should be considered carefully, as recommended in guidelines 16 and 17.

According to interviews, if the result of co-design is a commercial product, there will be ownership of sorts. All the informants recommend, that when co-design projects involve monetary transactions, there should be written agreements about the intellectual property rights and ownership of the products. Read et al. (2013) also emphasized the transparency of the ownership of the intellectual property created in the process, and what happens if there will be monetary gains from the project results. The safest way to address these questions is making written agreements, which state clearly all the necessary details about the intellectual property rights and ownership of products created in the co-design project. This is considered in guideline 18. Making the agreements does not eliminate the need to address the feeling of ownership as guided in the previous chapter. Even when there is no money involved, it is good practice to make an agreement or at least discuss beforehand how children's contributions are utilized and how they are acknowledged.

Some informants have purposefully prevented ownership from personifying to a specific child to avoid issues regarding the ownership of the end-product. In that case, the owner of the product is the whole group instead of one child, which might have an effect to the feeling of ownership. This practice bears resemblance to the findings by McNally et al. (2016), where participants found receiving individual credit unnecessary. Instead,

crediting the whole team was sufficient and preferred form of acknowledgement. Crediting participants as a group bypasses the problem of publishing children's names, and it might make the process of transferring intellectual property rights easier when the end-product doesn't personify to any individual child. Children can still increase the sense of ownership by naming their group and/or the products they co-design, and among the peers it will be known which individual child was in which group, so they will get the credit they deserve. Guidelines 19 and 20 address these questions.

The guidelines presented in Table 5 and Table 6 aim to provide support for respecting children's rights and ownership in the design process for design practitioners who plan on conducting co-design sessions with children. These guidelines are supposed to prepare practitioners for the co-design process rather than guide them through the process itself. It is good to remember that the co-design process itself can be considered as respecting children's rights, for its participatory and emancipatory nature. Just as talking about respecting children's rights is at the same time practicing the UNCRC, since Article 42 states that everyone should know about the Convention (UNCRC, 1989). The next chapter will conclude the thesis, address the limitations of this study, and offer some ideas for future research.

6. Conclusions

The primary goal of this study was to create guidelines for respecting children's rights and ownership in co-design projects. The research questions grasped the two aspects of the same phenomenon: The first one asked how children's rights and ownership are currently being addressed in co-design projects, and the second one searched for ideal situations or recommendations how they should be addressed. The guidelines were then formed based on the informants' descriptions of ideal situations and recommendations of previous research.

Answering RQ1 provided some good approaches for respecting children's rights and ownership that are already being used. Some of these practices were used to form the guidelines. Informants also had thoughts about ideal co-design situations, some of which reflected the ideal co-design conditions mentioned in the literature as well. Together these theories and interview results provided important issues regarding children's rights and ownership that need to be addressed in co-design activities.

Even though CCI literature rarely mentioned UNCRC, there were clearly similar principles especially regarding the participation of the child. CCI literature also addressed ownership issues only as the "feeling of ownership", but not in a legal sense or as "ownership of ideas". Tying these guidelines closely to the UNCRC provides new perspective for organizing co-design. This research produces new information about the collaboration approaches between schools and companies in co-design since there is not much previous research on that field. The concept of children's ownership is also a comparatively little explored area in this discipline.

This thesis may also benefit people who work with children. It provides insights to ideal co-design situations and offers concrete suggestions how to address children's rights and ownership. The guidelines formed in this thesis can be useful for anyone who is planning or facilitating co-design with children. The guidelines are simple enough to be used as a checklist, and general enough to be used as a baseline for planning co-design activities with children.

Reliability is addressed in this research by documenting the implementation of the data collection and analysis in detail. Also, the interview structure is provided in Appendix 1. Validity is considered by answering the research questions I wanted to study, and by addressing the possible limitations of this research. Probably the most notable limitation in this study is the number of informants. With such a low number, the results cannot be generalized, and the data is highly dependent on who happened to be selected for the interview. However, considering the scope and limitations of master's thesis the collected data is adequate.

Another limitation in this study is the possibility that the interviews and data analysis might have been influenced by my background and previous experiences with the subject. This might have given me certain lenses through which I formed the categories and analyzed the data. Another possible limitation might be that I conducted most of the interviews in Finnish, and then translated them to English myself. Every time interview data is translated, there is a danger of losing something authentic and valuable information. Another option would have been to translate all the interviews to Finnish and only translate the Finnish interviews to English after the analysis. Other limitations include that most of the informants were teachers or otherwise associated and familiar with the school environment and children's rights in general, there was only one

informant representing purely company's perspectives. In this study, all the viewpoints were analyzed as one, but for future research it could be meaningful to gather more information about the company's perspective.

There is definitely room for more research regarding this topic. In my study, I interviewed teachers, principals, researchers, and other adults who had experience on co-design. It would be interesting to also interview children and get their own views on the topic as well, especially regarding the ownership questions. It could also be beneficial to research the different co-design approaches from the perspective of children's rights and ownership in more detail. Another possible future research regarding the ownership of ideas could study how the children's age affects the acknowledgement or giving a reward from participation and what would be the age-appropriate way of crediting children.

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Appendix A. The interview structure

1. theme: **Children's rights in making and co-design**

Critical technology design and making aims to support children's maker identity. Co-designing is facilitated, collaborative designing and doing.

- Where do you work/what do you do?
- What kind of projects have you participated in? What kind of activities do you have? How are children involved in these activities/projects?
- What is the role of children in designing/making? In your activities and in general?
- Do you think children should be involved more in design, especially in things that concern children? What about in designing products/services for children?
- What kind of things you should take into consideration when involving children in the design process from the perspective of children's right and participation?
- What kind of good practices and policies do you have for involving children in activities? How do you take children's rights into account?
- In your opinion, how much should the children know about the nature of design, the purpose of design and/or future applications of the design? Why?
- What would be the ideal making/designing situation from children's (rights) perspective? What challenges there might be? How to pursue this ideal?
- Do you feel you have enough knowledge about children's rights and participation?

2. theme: **Ownership of ideas**

Ideas itself can't be copyrighted, but ideas often are associated with the feeling of ownership. According to my interviews with children, children tend to view the person who came up with the original idea equally as an owner as the person who made the implementation. Children also wanted to have some recognition from their ideas, for example their name in the credits or a free product, if their ideas are used in commercial products.

- Who owns an idea? Has there been need to acknowledge ownership of ideas and/or products in your projects? How have you handled these situations?
- How does children's ideas differ from adults' ideas? Is there a difference when using these ideas in commercial/non-commercial applications?
- In your opinion, how much should the children know about ownership of ideas or products? What kind of agreements should be made with children about using their ideas or products based on their ideas?
- What would be the appropriate way to give recognition/acknowledgement to children who present an idea that is used for some design/product? Have you had these situations? How have you handled those?
- Is there a difference between commercial and non-commercial design from the children's (rights) perspective? What about open source?

Appendix B. Consent form

This interview is a part of the Make-A-Difference (MAD) project of INTERACT research group from University of Oulu. The MAD project aims to understand and facilitate the emergence of critical designer and maker identities among children. This will be accomplished by exploring and engaging in critical design and making activities together with children.

Description of research project and research material

The purpose of this interview is to map out different views and good practices about taking children's rights into account in (co-)design/maker projects with children. This interview will be recorded in sound- and/or video format. The material produced in this interview will be used as a part of the master's thesis of Tapio Moilanen. Research material resulting from using different methods can be combined during the analysis phase. The material will be stored by INTERACT research group for a long-term research use. Research material can be used in scientific research and teaching. In publications and scientific papers material will be treated with respect to participants anonymity in a way, that participant cannot be recognized from the material.

I am asking for your consent to participate in this study and for the use of the research material produced in this interview. You may stop your participation at any point by informing the interviewer. You may also decide at any point of the research if you do not want to participate in some parts of or the whole research.

By stating my consent in the beginning of the interview, I will participate in the research, and I will consent to that the material produced in the interview can be used in research and teaching purposes. I have also read and understood the Data privacy notice.

The name and nature of the research and duration

Name: Digital technology in preventing and reducing bullying in schools

Cross-sectional study

Duration: Collection of the research material will be done by the end of the year 2021. The material gathered in research projects is processed and archived as it is for long-term use for the research unit's research and teaching purposes. The information is archived in the INTERACT research unit's facilities and with its devices. Personal data is processed on the following basis, which is based on Article 6(1) of the General Data Protection Regulation: participant's consent.

Participants of the project

This project is part of INTERACT research group and the City of Oulu collaboration, where INTERACT is in charge of the research materials. The results can be used by the university or city of Oulu representatives as well as the participating schools and teachers. Personal data is never published.

Interviewer: Tapio Moilanen (tapio.moilanen@student.oulu.fi), under INTERACT supervision.

Contact information: Tonja Molin-Juustila or Netta Iivari, (firstname.lastname@oulu.fi), INTERACT-research group, University of Oulu.

Please contact us if you want to have more information about the research or you wish to use your rights as a data subject.

Responsible leader of the study: Netta Iivari, INTERACT research group, University of Oulu.

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