

# *Learning sufficiency through play*

*A participatory playground transformation with children in Gothenburg*



Ghazal Shakiba  
Chalmers School of Architecture  
Department of Architecture & Civil Engineering  
Architecture and Planning Beyond Sustainability  
Society, Justice, Space  
Master Thesis 2025

Supervisor: Emiline Elangovan  
Examiner: Liane Thuvander



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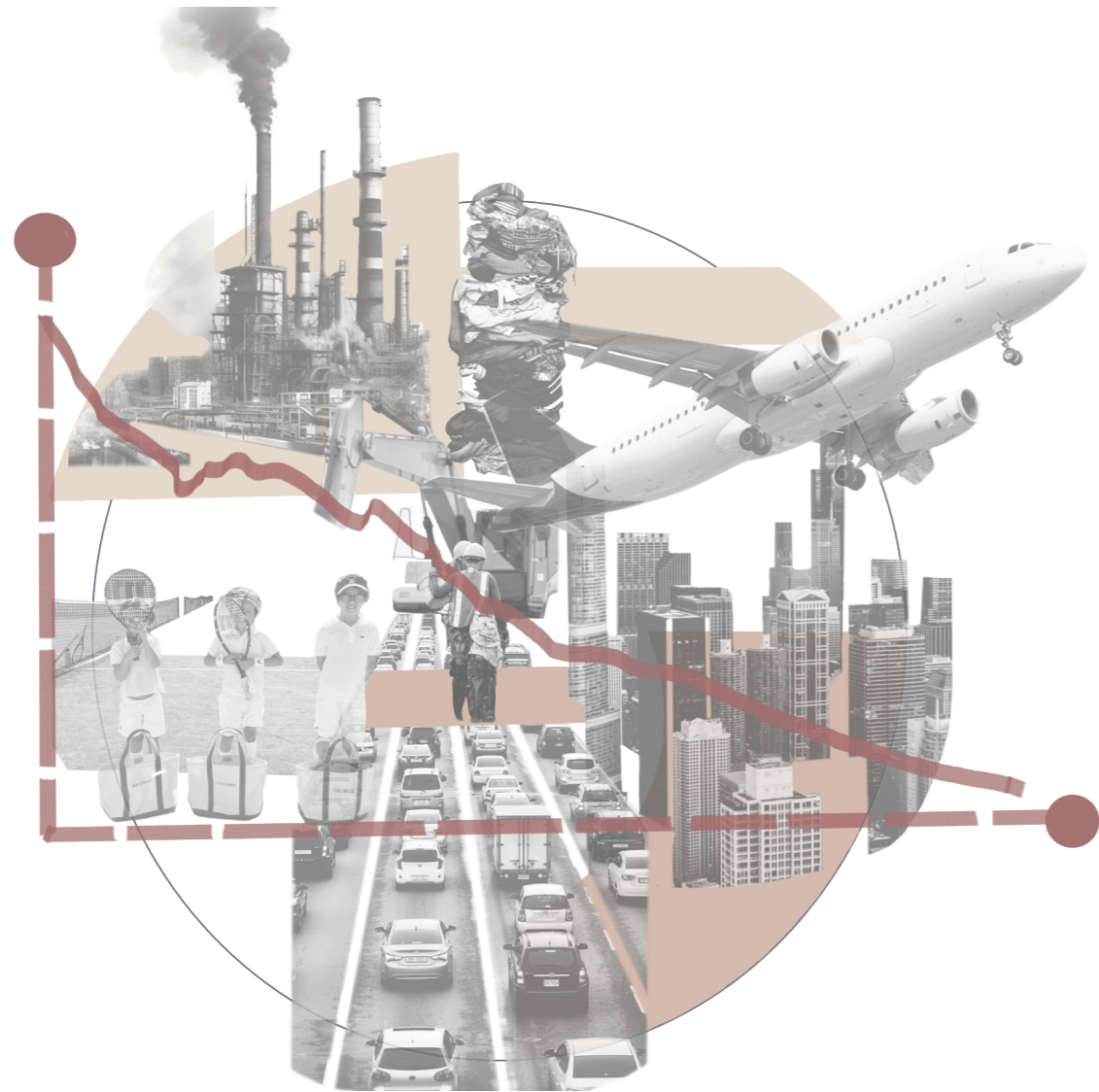
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*“The solution to today’s environmental crisis requires a different mindset from the one that contributed to creating it” (Rigolon, 2009)*

## Abstract

Environmental crises have become a defining challenge of our time. While technological efficiency is often the first solution that comes to mind, sufficiency, the practice of consciously reducing resource use, is crucial for achieving true sustainability. Addressing sufficient behavior is essential for a long-term sustainable future. Moreover, cultivating this mindset among future generations, particularly children, can have a lasting impact. Experiential learning, which emphasizes direct interaction, experimentation, and reflection, provides an effective way for children to internalize sufficiency as a lived practice rather than abstract knowledge. Play, as a powerful learning tool for children, makes it a meaningful approach to engage them in understanding sufficiency. Thus, This thesis explores how the transformation of playgrounds can help children learn sufficiency through experiential learning.

The research investigates how playgrounds can go beyond recreation to become tools for teaching sufficiency principles. Through different play experiences, children can face resource constraints and learn to make thoughtful decisions about energy use and material consumption. The focus is on engaging children with the concept of sufficiency, emphasizing learning through experience rather than formal instruction.

To understand how sufficiency is currently incorporated into public initiatives in Gothenburg, an interview with the municipality was conducted. The findings highlighted the importance of focusing on Gothenburg due to Sweden’s high consumption rates. While there are plans addressing the technical aspects of sufficiency, the social dimensions remain underexplored, making this research both timely and significant.

Literature studies on sufficiency principles, experiential learning, and playground design formed the thesis’s theoretical foundation.

Reference project analysis also contributed to the data collection. The findings demonstrate that play-based public spaces can effectively introduce children to sufficiency principles through low-tech, interactive features that require physical engagement and decision-making. The thesis argues that embedding sufficiency into playgrounds can complement formal education by offering hands-on learning environments.

An initial round of participatory workshops with children was conducted to gather insights into how children of different ages perceive sufficiency. Collage techniques and storyboards were used to communicate with students in the 1st, 3rd, and 5th grades.

To better understand how children engage with resources and learning, interviews with teachers were conducted. These confirmed that children engage more deeply when learning is hands-on, interactive, and rooted in real-life experiences.

A second workshop was organized to co-design the playground with the children, allowing them to take an active role in shaping their play environment. The goal was to explore how sufficiency principles could be integrated into play spaces from the children’s perspectives.

Finally, this thesis develops design strategies for transforming playgrounds through a participatory design process grounded in sufficiency principles. It emphasizes how involving children in the creation of their own play environment becomes a form of experiential learning. Rather than offering a fixed design, the outcome is a flexible, replicable model that allows communities to adapt and co-create based on local materials and needs. Ultimately, this project contributes to both sustainability discourse and participatory design by showing how sufficiency can be made tangible, engaging, and transformative through play.

Keywords: Sustainable future- Sufficiency- Children- participatory approach- experiential learning

## Position



2023-2025  
M.Sc. Architecture and Planning  
Beyond Sustainability  
Chalmers University of Technology  
Gothenburg, Sweden

2022-2023  
Intern Architect  
LSB architetti associati  
Torino, Italy  
Main: interior designer

2019-2022  
B.Sc. Architecture  
Polytechnic of Turin  
Turin, Italy

2020(7 month)  
Intern Architect  
Arghavan pazh studio  
Mashhad, Iran  
Main: Renovation, Transformation Project

2016-2018  
A.A.S Architecture  
Al-Zahra University  
Mashhad, Iran

## A short story of my life

Ever since I decided to study architecture, I've always questioned its true meaning. I often felt conflicted about the role of an architect, despite having the power to create something from scratch, it seemed like architecture was often reduced to a tool for satisfying luxurious and market-driven desires. This made me wonder, Is this all architecture can be? Is it only a means of serving materialistic needs?

Through my journey as an architecture student, I slowly began to realize that architecture is far more than a title for me, it's a responsibility. Architects have the power to create environments that don't just fulfill desires but truly improve people's lives. Architecture can inspire, connect, and support the needs of individuals and communities alike. It can go beyond aesthetics to address deeper questions about inclusivity, justice, and sustainability.

When I began my studies at Chalmers, I was introduced to the social and environmental dimensions of architecture. This changed the my path as an architect. I came to understand that architecture isn't just about buildings it's about people. It's about designing spaces that make connections, bring people closer together. I found my passion in inclusivity and justice. I wanted my designs to reflect a world where everyone is included, regardless of their background, age, or status. My dream was to create environments that aren't just functional or beautiful but meaningful places that make people feel valued and connected to one another.

Then I asked myself, How can we create environments that not only serve people today but also nurture the future? How can we include the next generation to care for the planet and grow up with sustainability as a way of life?

This is what led me to focus on children. In my view, children aren't just part of the community, they are individuals with unique perspectives, personalities, and potential. Yet, they are often excluded from conversations about sustainability. I wanted to explore how we can design spaces that include children, help them to learn the value of the environment. My goal became clear, to create a space where children can learn about sustainability in a way that is playful and memorable.

When I first chose this topic, it felt like an instinctive decision. But as I started working on it, I realized how deeply it connected with my values. Designing a sustainable future is not just about solving environmental problems, it's about shaping habits, values, and behaviors. By focusing on children, I hope to plant the seeds of environmental care early, so that sustainability becomes second nature for future generations.

This project combines everything I care about as a designer, creating inclusive, addressing sustainability in practical and meaningful ways and making connections between children and their environment.

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# The Future is Watching !

## **Introduction**

- problematization and background
- purpose + aim
- questions
- delimitations
- method and tool



Fig. 1.1. The journey of this thesis

## Problematization + Background

The current ecological crisis, overuse of resources, pollution, and the disruption of Earth's natural systems are connected with what and how much is produced and consumed (Bengtsson et al., 2018).

The principles of efficiency have been the focus of many efforts to reduce the effects of unsustainable production and consumption in the past and present (Bengtsson et al., 2018). This means that reducing environmental impacts is achieved by optimizing energy and resource use in the process of production, primarily through technological advances (Schneidewind & Zahrnt, 2014). However, despite these advancements in technology, global energy and material use is still increasing due to economic growth, urbanization, and high-consumption lifestyles (IPCC, 2023). Accordingly, while efficiency-based solutions have helped reduce emissions per unit of production, total environmental impact continues to rise, making it clear that efficiency alone is not enough (UNEP, 2023).

The country of Sweden is a valuable case due to its long-standing history of claiming and portraying itself as one of the most progressive, modern, equal, environmentally friendly countries in the world, also ranked the third country in Europe leading in sustainable development actions (Hult, 2017; SDG report, 2025). Despite its leadership, it still has major challenges with sustainable consumption, production patterns, recycling, and waste. At the same time, Sweden's carbon and ecological footprints are still far from sustainable levels due to its high consumption levels (WWF, 2020a). Thus, as in many other affluent countries, moving towards long-term sustainability needs technological innovation that is coupled with sufficiency for behavioral change (Fanning et al., 2022). So to say, without

sufficiency, efficiency postpones rather than prevents environmental crises (Reduction Roadmap, 2024).

Since behaviors are shaped early in life, introducing sufficiency at a young age is crucial (Di Giulio & Fuchs, 2014). Studies show that childhood is a critical period for forming long-term habits related to consumption and sustainability (Gifford et al., 2024). However, it's important to mention that most formal education focuses on efficiency (e.g., recycling, saving water) rather than sufficiency behaviors like questioning consumption and reducing material use (DiSalvo et al., 2017).

Public spaces, particularly playgrounds, play an essential role in shaping children's understanding and learning of new concepts. Research in experiential learning shows that children learn best by interacting with their surroundings, rather than through passive instruction (Kolb, 1984). Studies confirm that hands-on engagement with natural and built environments enhances children's ability to understand sustainability concepts (Chawla, 2020).

In an age where technology influences child development, playgrounds offer crucial opportunities for interaction and personal growth (Yılmaz & Ozdemir, 2008). Playgrounds serve as essential spaces where children engage with their surroundings, offering more than just leisure and contributing to the development of responsible environmental behavior (Titman, 1994). Outdoor play promotes not only physical growth but also social and emotional development, providing valuable experiences beyond physical activity (Yılmaz & Ozdemir, 2008).

Additionally, playgrounds hold educational potential and value as hands-on learning environments

(Kaplan, 2017). By incorporating scientific themes into play materials and activities, children can explore and understand scientific concepts while playing. This shows how playgrounds can serve as multifunctional spaces that combine play, education, and personal development (Kaplan, 2017). As a result, playgrounds can be used differently to provide an opportunity to introduce sufficiency through direct experience, making it more intuitive and memorable.

To summarize, sustainability efforts often emphasize efficiency, while sufficiency or rethinking consumption itself, remains largely overlooked. Meanwhile, playgrounds are designed for recreation, not as spaces where children can engage with sustainability in a meaningful way. If play is how children naturally explore the world, then playgrounds could become a powerful tool for engaging with sufficiency firsthand. However, this connection between sufficiency, play, and children remains underexplored.

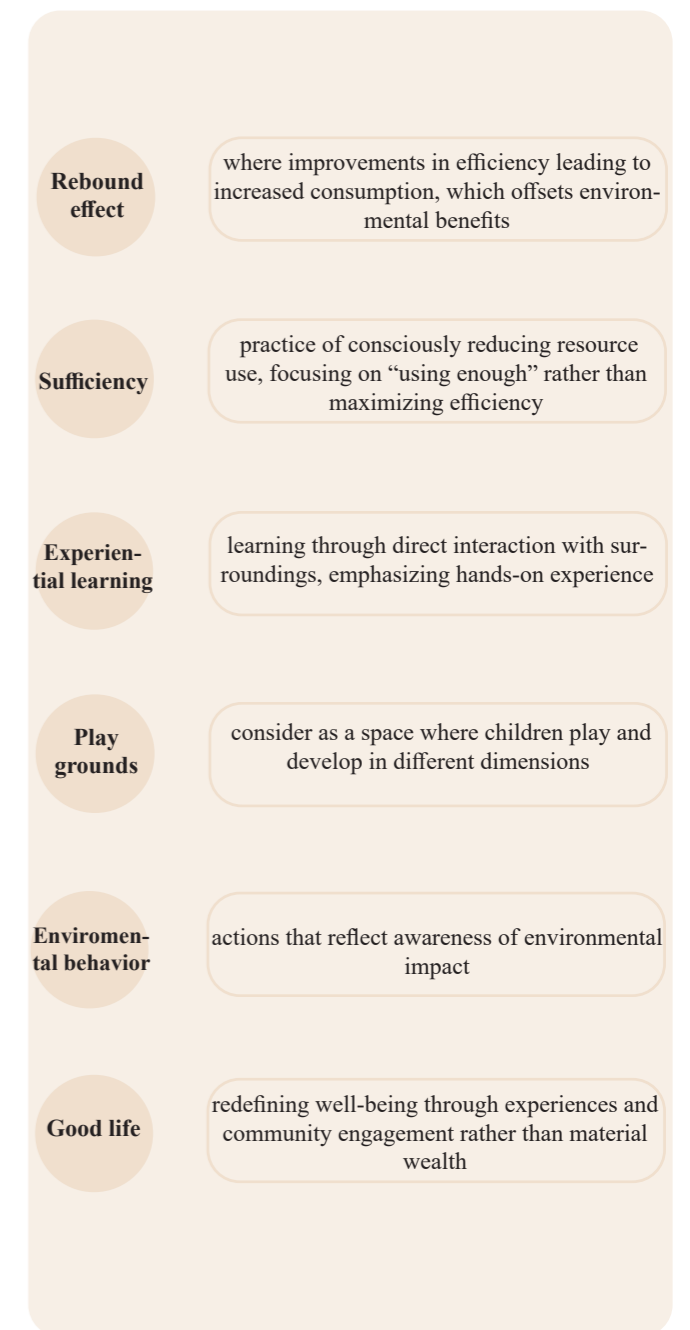


Fig. 1.2. glossary of key terms

## Purpose + Aim

The purpose of this thesis is to explore how the transformation process of playgrounds can encourage children aged toward sufficiency. While sustainability is often approached through technological efficiency, this research shifts the focus to sufficiency in terms of using less, making conscious choices, and redefining the meaning of a good life. The thesis investigates how playgrounds can become environments where children discover and internalize the concept of sufficiency through hands-on experiences and play, rather than formal instruction and education.

The playground in Masthugget (Gothenburg) is chosen for its current function as a go-to play space for children during school breaks or outdoor classroom activities. This connection makes the playground a natural setting for informal learning. By collaborating with students in this area through participatory workshops, the thesis aims to bridge the gap between children as users and as co-designers, giving

them an active role in shaping the playground.

The age group (7–12) is targeted because children at this stage begin to reflect on their choices and actions while maintaining a playful curiosity. Engaging them in the design process not only fosters creativity but also helps them internalize new concepts in a memorable way.

The outcome is a design proposal that integrates sufficiency as a core principle, creating a space where children can explore and engage with sufficiency in a way that feels natural, fun, and meaningful. Developed through a participatory design process, the playground reflects the ideas and perspectives of the children themselves. While it remains a space for gathering and connection, its design encourages curiosity and self-initiated exploration of resourcefulness and care, making sufficiency a lived experience rather than a formal lesson.

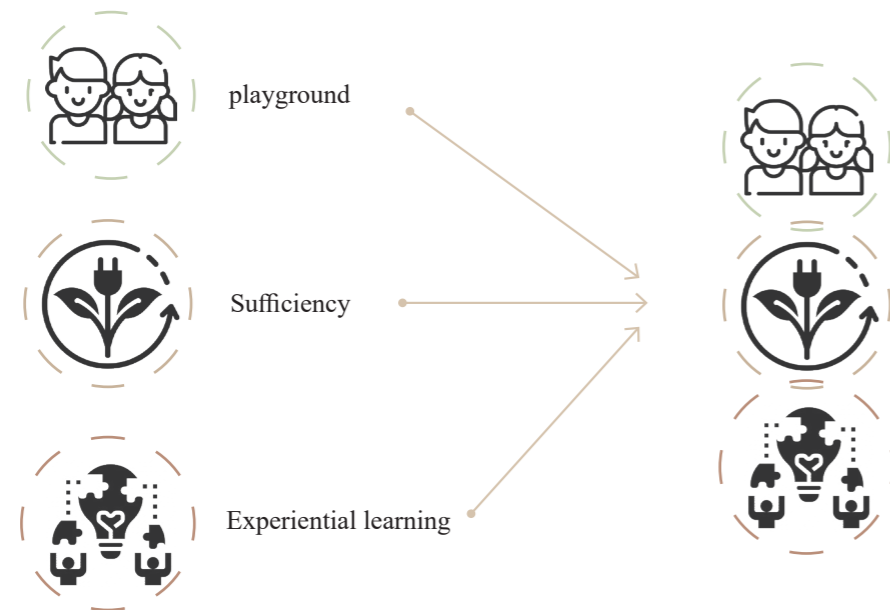


Fig. 1.3. bridge the gaps, use the playground to learn sufficiency through experiential learning among children.

## Research question

### Main Question:

How can an existing playground be transformed to support children's learning of sufficiency?

### Sub-Question:

- what are sufficiency principles?
- what design strategies align with sufficiency?
- how can experiential learning be incorporated into playground desing?

### Main research question

The main research question directly reflects the core aim of this thesis. It frames the study around the potential of playgrounds as active learning environments. By focusing on sufficiency, this question ensures that the research moves beyond traditional playgrounds, instead explores the how playful environments can help children to think about resource use, energy, and making mindful choices through direct engagement.

### 1st sub-question

Before integrating sufficiency into playground design, it is essential to understand what sufficiency means in practice. This question focuses on identifying key sufficiency principles, such as using only what is needed, valuing resources, and avoiding excess, to form the foundation of the design approach.

### 2nd sub-question

Once the principles are defined, the next step is to explore how design can actively support sufficiency. This involves identifying spatial strategies,

materials, and interactive elements that support children to engage with sufficiency concepts. The aim is to find ways for design to make sufficiency visible and part of the play experience.

### 3rd sub-question

Experiential learning is a key approach in this thesis. This question analyse the importance of experiential learning also examines how playground design process can create opportunities for hands-on experiences where children explore sufficiency in action instead of passive learning.

Each of these questions builds on the other, guiding the research towards a design framework that makes sufficiency a natural part of children's play environments.

## Delimitation

This thesis focuses on how playground design can introduce sufficiency to children through play, specifically in Gothenburg. While sufficiency is relevant in many contexts, this research explores how playgrounds can help children understand sufficiency rather than addressing solutions at other scales.

The study is limited to children aged 7–12, as this is a key stage where play remains a primary learning tool, but they also begin to reflect on their choices. The research does not extend to younger or older age groups, as the methods and design strategies are focused on this specific phase of development. However, while the design targets this age group, the playground remains a public space usable by all ages. The results may therefore offer insights applicable to other users as well.

Geographically, the focus is on Gothenburg, examining how sufficiency principles can be integrated into local playgrounds. While the findings could inspire broader applications, the study does not attempt to create a universal model.

In terms of methodology, the thesis relies on literature studies, participatory workshops, interviews, and reference project analysis. It does not include long-term behavioral studies or quantitative impact assessments, as the goal is to explore design possibilities rather than measure long-term effects.

The final outcome is not a finalized architectural proposal, but a conceptual design framework that explores how sufficiency principles can be integrated into playgrounds. Developed through participatory processes, it offers strategies and spatial ideas that can inspire future implementations. Rather than presenting a fixed solution, it provides adaptable design directions that reflect the voices of children.

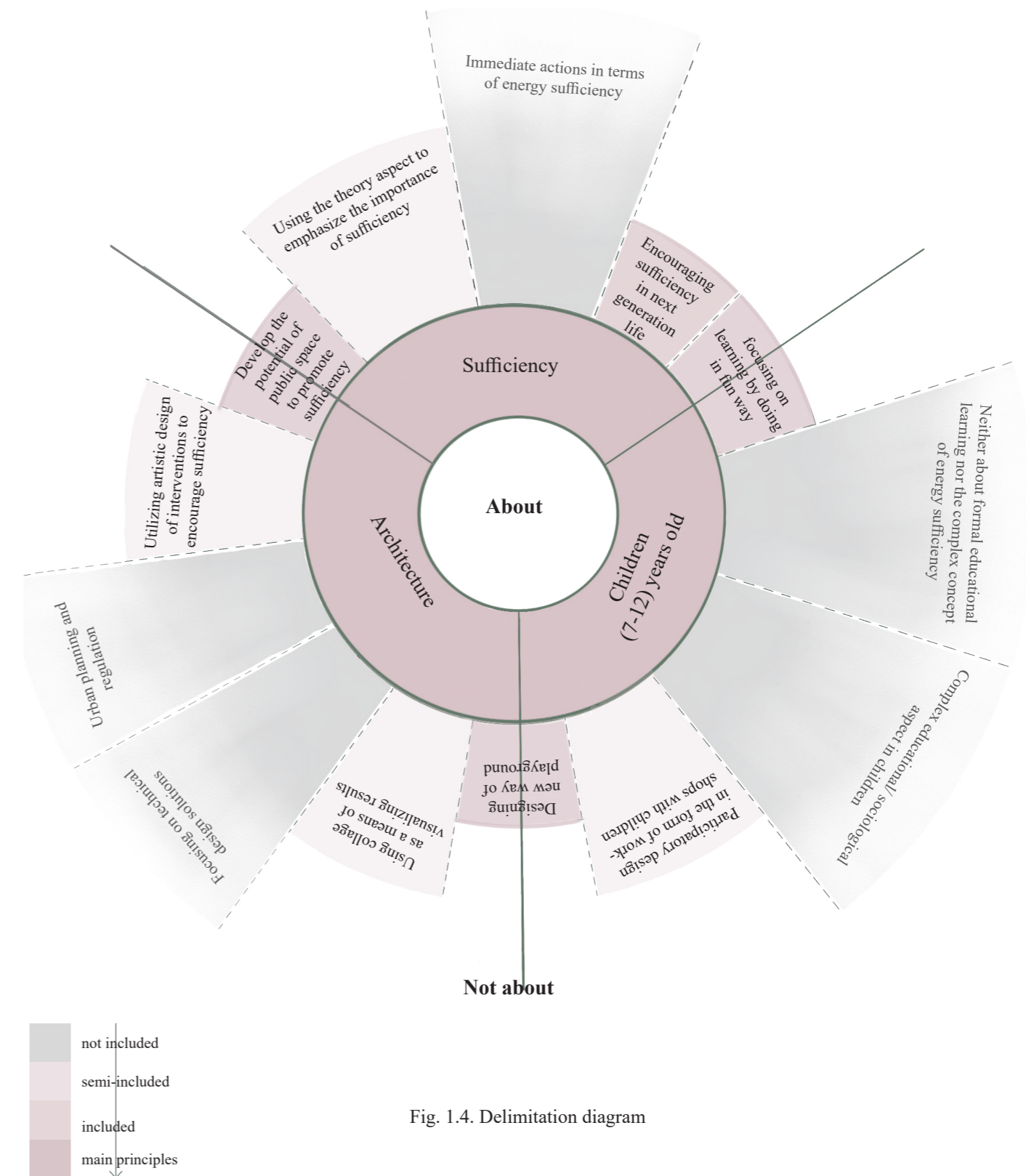


Fig. 1.4. Delimitation diagram

## Methods

According to the research question, which involves different parts that need to be investigated separately, combine theoretical explorations and participatory practices to investigate how a playground can foster sufficient behaviors in children. The selected methods align with different phases of the thesis, leading to a proper design solution. The process begins with analyzing the background and localizing the problem within the context. After identifying gaps, the research continues with interviews, communication with target audiences, and co-design.

### Literature studies

Beyond the practical elements, literature studies played a crucial role in establishing the theoretical foundation for subsequent applied work. The first part of the literature studies focuses on energy use in Swedish communities.

The second round of literature studies focus on finding the appropriate definition for sufficiency and sufficiency principle while understanding why it is important. These studies informed the structure of the workshops.

The last part of the literature studies emphasizes experiential learning and how children learn through their connection with the environment specifically playgrounds. Connecting these theoretical insights enabled the formulation of sound conclusions and guided design decisions.

### Reference project analysis

Four reference projects were chosen for their unique approaches to play design. Each project was critically analyzed to extract lessons on resource-conscious behavior and playful engagement, highlighting both valuable insights and aspects to avoid in the design process. Although the reference projects were not

completely aligned with the thesis's aim, they were essential for gaining a better understanding of different perspectives and concluding with an informed design approach.

### Interviews (municipality)

Interviews were conducted with representatives from the Gothenburg municipality to understand existing sustainability strategies and gain insights into how social interventions can complement technical solutions in Gothenburg.

### Participatory workshop

Workshops with children aged 7 to 12 in an elementary school were conducted to understand how they perceive concept of sufficiency in their routine. Collage techniques and storyboards were used to facilitate communication and idea generation.

### Interviews (teacher)

The second interview Conducting with elementary school teachers (one from third grade and one from fifth grade) gather insights on children's behavior, motivation, reactions to learning and playing in a deeper way.

### Codesign workshop

The second workshop focused on involving children directly in the design process through co-design activities. Using collaborative brainstorming and model-making, children were encouraged to propose ideas for a playground. The aim was to gather their perspectives on how to integrate sufficiency into play spaces in a way that feels engaging and meaningful to them. This workshop provided practical design input by reflecting the children's creativity and priorities, ensuring that the final design proposal.

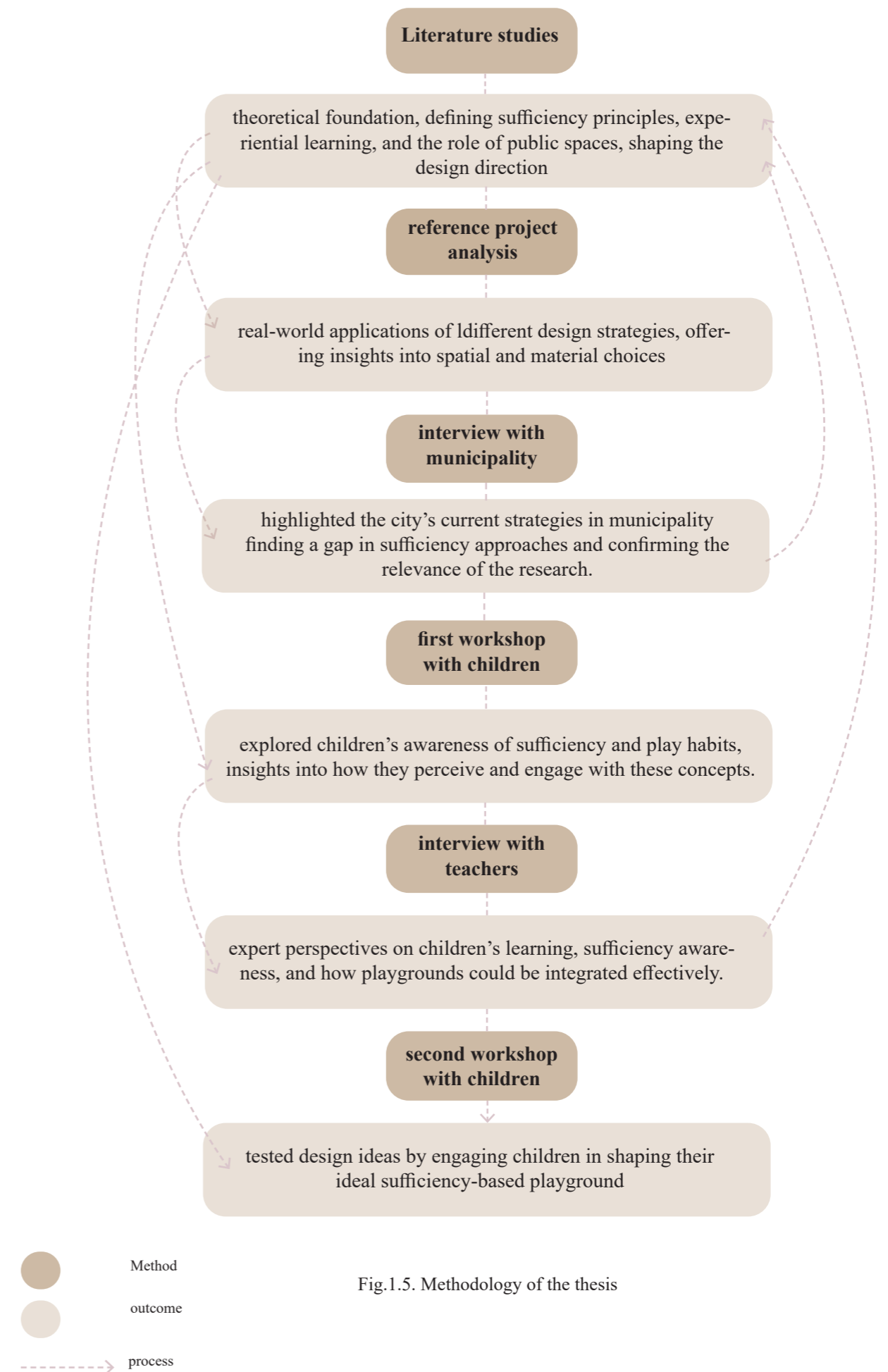


Fig.1.5. Methodology of the thesis

where?!

### **Context**

- about majorna-inné district
- masthugget district
- relation between school and playground

## About Majorna-Linné district

Majorna-Linné is an expansive district known for its rich cultural life, mixed architecture, and inclusive social atmosphere. It stretches from the Göta River in the north to the Slottsskogen park in the south, covering various sub-districts including Masthugget, Stigberget, Majorna, and Linné.

This district is home to approximately 30,000 residents, and it's one of the more densely populated areas of Gothenburg. The population is relatively young and well-educated compared to the city average. The area has a high share of people aged between 25-45 years, which contributes to its dynamic and urban feel (Source: Göteborgs Stad Statistik och Analys, 2024).

The social makeup is diverse. While most residents are Swedish born still there is a growing multicultural presence as well. Income levels and employment rates in Majorna-Linné are slightly above average for Gothenburg (Göteborgs Stad Socioekonomisk Indikatorer, 2024).

### Masthugget district:

Masthugget, where the school (Fjällskolan) and the adjacent playground are located, is a centrally placed neighborhood on the slopes west of Gothenburg's city center. The neighborhood is close to the river and has a mix of old stone buildings, newer housing, and a vibrant public life. It is mostly known for its compact structure, and strong local character (Göteborgs Stad website).

Masthugget is a sub-district located within Majorna-Linné and can be described as one of the more historically layered areas of central Gothenburg. It borders directly to the inner city and offers a

dense urban structure with a clear identity. The area consists of early 20th-century housing, steep streets, and public stairways, which give it a special spatial character. The population is mixed, with students, elderly, and families living side by side.

Masthugget was one of the earliest areas to be part of urban renewal programs in the 1960s and 70s, which replaced older wooden housing with modern apartments and pedestrian-friendly spaces (Plan- Och Byggprojekt I Göteborg, 2023).

While Masthugget does not appear as a separate district in some official statistics, it is clearly defined in everyday usage and planning documents, such as the city planning maps. As it is located within Gothenburg's central urban fabric, Masthugget benefits from the city's long-term focus on walkability, reduced car dependency, and accessible green public spaces (Plan- Och Byggprojekt I Göteborg, 2023)

Age	Majorna-Linné %	Masthugget %
0	1,2	1,2
1-5	4,8	4,3
6	0,8	0,7
7-9	2,4	2,1
10-12	2,5	2,3
13-15	2,6	2,4
16-18	2,2	2,2
19-24	6,5	7,6
25-29	9,4	10,4
30-44	27,4	25,9
45-64	22,9	22,1
65-74	10,2	10,9
75-84	5,4	5,9
+85	1,6	1,9

Fig.2.1 age percentage in majorna-linne district and masthugget district (Göteborgs Stad, 2024).

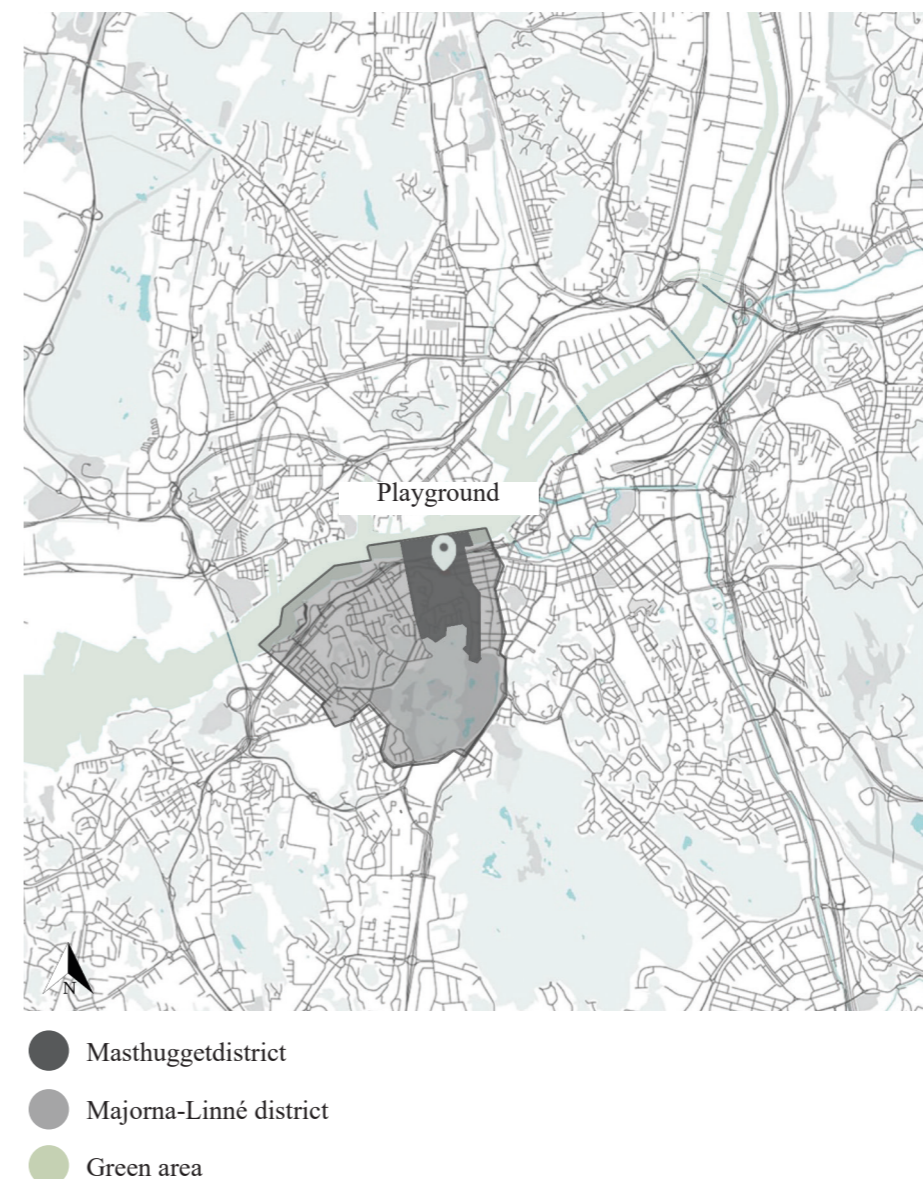


Fig.2.2 Map showing Gothenburg and the playground is situated within the Masthugget district

## Relation between school and playground

The selected school for this thesis is Fjällskolan, located on Fjällgatan in Masthugget. Just a few minutes' walk from the school lies the Lekplats playground near Kjellmansgatan, which serves as the main site of observation and intervention in this study. Although the school has its own yard, this nearby public playground is complementary in offering more open-ended and unstructured play opportunities.

After having conversations with children and teachers, it became clear that the playground is a space for children from school to gather and play after school time. Also children who live close to the park have a close connection about this area which after workshops with them became evidence.

This playground can become space for children to play and learn unconsciously and at the same time it can suggest a broader idea of the learning landscape where children's daily routes and surroundings can be activated as part of their social and learning experience. The fact that the playground is accessible to the school means that any design intervention, particularly those grounded in sufficiency principles, can have extended usability for both spontaneous visits and organized school activities such as outdoor classroom or workshops.

This alignment between school and playground became more evident during the participatory workshop with the children, where several ideas proposed by the children reflected their real-life experiences moving between these two spaces.



Fig.2.3 Map showing location of the playground and surrounding

# Learning from existing knowledge

## **Investigation**

- sufficiency
- playground
- experimental learning
- participatory design
- children's rights

## Sufficiency

### Efficiency vs Sufficiency

Most actions to address environmental and sustainability issues focus on the concept of efficiency since it is more commonly understood. The initial idea of efficiency is to achieve goods and services with less environmental impact. It is built on two principles: market logic and technological optimism (Jänicke, 2008), which means that technology is the solution for sustainable consumption and that consumers can buy sustainable products (Lorek & Fuchs, 2013).

Focusing only on the efficiency approach is always problematic for two reasons. First, efficiency emphasizes technology and economic growth while failing to take social justice into account (Fisher & Freudenburg, 2010). Second, the efficiency approach can cause the rebound effect, which is a phenomenon describing the relationship between energy efficiency and behavior. When efficiency increases in production, consumption volumes often increase as well. This happens because when something becomes cheaper, people can afford more of it, leading to greater demand (Sanne, 2002; Reduction Roadmap, 2024).

Rebound effects can also be observed across a wider range of societal dimensions, where ideas about what is considered normal and technically possible change over time, such as the widespread use of personal computers. This clearly shows that what is today considered necessary and normal for everyday life has evolved with technological advancements (Reduction Roadmap, 2024).

Sufficiency means “enough” (Reduction Roadmap, 2024), and by enough, it refers to defining limits for human well-being, environmental sustainability, and ethical responsibility (Princen, 2005). Daily practices should minimize the demand for energy, materials, water, and land while ensuring well-being for all humans within planetary boundaries (Reduction Roadmap, 2024). It is possible for everyone to live safely within planetary boundaries if a shift toward sufficiency occurs.

Sufficiency is both a strategy and an important concept that can meet human needs while preventing ecological overshoot. The concept of

sufficiency sometimes aligns with degrowth, as it supports human needs inside ecological boundaries instead of endless economic development (Hickel, 2020). Sufficiency can refer to both individual commitments, choosing a lifestyle that minimizes environmental impact (Speck & Hasselkuss, 2015; Heindl & Kanschik, 2016, in Persson, 2022) and a social commitment, ensuring fairness and social justice (Princen, 2005).

In liberal societies such as Sweden, sufficiency is based on the moralization of actions, and it can be perceived as defining the boundary conditions for social justice, particularly the duty not to harm anyone (Müller, 2009).

In summary, sufficiency is not about maximizing efficiency, but rather, the two must work together. It has a strong bond with environmental protection and social justice

### Why is sufficiency important?

As Samuel Alexander said, “Efficiency without sufficiency is waste.” To be effective and avoid rebound effects, efficiency strategies must be coupled with sufficiency (Lorek & Spangenberg, 2019).

But this is not the only reason sufficiency is essential. According to Princen (2005), sufficiency is connected to a broader ethical concept of the “good life,” which is important for sustainability in an unpredictable world. It is also linked to the precautionary principle, meaning that when facing complex and unknown risks, resistance and caution become necessary.

Supporting sufficiency is key to addressing current crises. It must be carefully planned, rooted in justice, and offer a clear framework for reducing destructive activities, directing financial resources toward what is truly needed (Reduction Roadmap, 2024).

### Sufficiency meaning for a western, urban Middle- or Upper-Class individual

In liberal societies such as Sweden which this thesis base on swedish community, while sufficiency is a positive concept, it often becomes a matter of personal choice.

When left to individual discretion, efforts to promote sufficiency risk being ineffective, and policies promoting sufficiency may remain weak.

According to Müller (2009), for middle- and upper-class individuals, an energy-sufficient life means:

- Consuming what is enough, Using only the necessary amount of energy, avoiding overconsumption.
- Understanding their needs, Recognizing what is essential for a good life and avoiding unnecessary overconsumption driven by convenience or luxury.
- Realizing the impact of energy use, Being aware of the environmental and social effects of consumption, such as excessive resource extraction.
- Taking responsibility for actions, Acknowledging the global consequences of consumption choices and adjusting behavior accordingly.

### Sufficiency principles

The following sufficiency principles were first introduced by Persson & Klintman (2022), providing a framework for sufficiency approaches. However, they have been further explored and conceptualized in Persson (2022), who expands their application in sustainability discussions.

#### 1. Reducing the Amount of Energy and Material Use:

Instead of only focusing on efficiency, sufficiency pushes for a real reduction in material and energy use. This shift is about choosing to use less, rather than just finding “greener” ways to consume the same amount.

#### 2. Upper Limits and Lower Thresholds:

Sufficiency is about staying within the planet’s resource boundaries while ensuring that basic needs (such as healthcare and education) are met for all. It’s about finding the balance between not taking too much and ensuring no one has too little.

#### 3. Empowering Social Justice:

Since overconsumption is largely driven by wealthier groups, sufficiency highlights the need for reducing excessive consumption and leaving resources and environmental space for others. The goal is to create a more balanced and just distribution of resources.

#### 4. Beyond Materialism:

A big part of sufficiency is redefining what a good life looks like. Instead of measuring happiness through material wealth, it emphasizes community, engagement, and experiences as key to well-being. This challenges the idea that more material possessions equal a better life.

(Based on Persson & Klintman, 2022; further conceptualized in Persson, 2022).

*sufficient material, put well-being  
in center and social inclusion  
keep the balance  
efficiency and sufficiency need to  
work together  
It's not just about limits, it's about  
redefining what a good life looks  
like beyond material things*

## Playground

### Design features of an engaging playground

Good design in playgrounds is crucial for giving children hands-on learning experiences, allowing them to learn and play at the same time. Well-planned spaces encourage exploration and creativity, which enhance children's learning experiences (Kuo et al., 2018). Natural play areas spark children's imaginations and promote activity, which is essential for child development (Fjørtoft, 2004). By creating engaging environments, good design helps children connect with their surroundings and develop a sense of responsibility for the environment (Ernst & Theimer, 2011).

Space can be intentionally designed to transfer information to people. Two design strategies are proposed: first, transferring information directly through explanatory posters and signs (Mason, 2009); second, a subtler approach is using design elements to trigger curiosity, encouraging children to ask questions and explore—an approach that can be more effective for learning.

### Linking learning and playgrounds

Children interact with objects, materials, and tools to assist their thinking and expression. They respond to surfaces, lighting, temperature, colors, and acoustics to create a sense of safety and calm. When thoughtfully assembled, spaces can support encountering new ideas, extending knowledge, practicing skills, and receiving feedback (Gonzalez et al., 2023).

Spaces that support positive learning outcomes are designed for optimal stimulation. Variations in colors and architectural elements provide visual complexity (Cox, 2018; Tanner, 2008), and different materials create a variety of sensory experiences, enhancing tactile learning (Davies et al., 2013).

Designing a playground as a learning environment requires principles that enhance both learning opportunities and play activities. According to Gonzalez et al. (2023), several qualities of space, objects, and materials support learning experiences, including in playgrounds.

**Contrasting:** When spaces, objects, or materials break familiar patterns, they capture attention and

curiosity. Unexpected design elements or mixed-use environments can encourage exploration and engagement.

#### Contrasting

When spaces, objects, or materials break familiar patterns, they capture attention and curiosity. Unexpected design elements or mixed-use environments can encourage exploration and engagement.

- **Incongruity:** When objects and spaces feel unfamiliar or undefined, they encourage children to take the lead in their learning, creating their own meanings and uses. Non-standardized, open-ended play spaces challenge children in ways that spark curiosity and exploration (Jelic et al., 2020).
- **Sense-scaping:** Engaging multiple senses enhances curiosity, awareness, and interaction. Carefully balanced sensory stimulation can improve focus and learning experiences.
- **Spotlighting:** The ability of spaces and objects to direct attention. Learners can be given predetermined focal points, or spaces can offer multiple choices for directing attention. Well-designed lighting can redirect focus, encouraging exploration and engagement.

#### Flowing

Allowing learners to configure, control, and adapt their environment fosters creativity and new explorations.

- **Curving:** Curved pathways slow movement, making people more aware of their surroundings. Ergonomic, curved shapes can also impact psychological comfort.
- **Pausing:** Designing pause-spaces can influence behaviors by encouraging users to slow down and explore.
- **Moving:** Flexible and movable play elements create dynamic environments, supporting different types of activities and making spaces more interactive and adaptable.

#### Closeness

Spaces that foster closeness and connection promote relationships with the environment and among users.

- **Inclusivity:** Co-designing spaces with children fosters ownership and belonging, encouraging deeper engagement (Levy & Adjapong, 2020; Szatek, 2020).
- **Visibility:** Designing for eye contact and visual connections creates a sense of belonging and engagement with the space.
- **Compactness:** More compact spaces can encourage socialization, fostering new connections and interactions, which contributes to social well-being.

### Key themes in playgrounds

To link playground design with different activities that support sufficiency learning, Rigolon (2012) identified several key themes that enhance ecological literacy and sustainable behaviors in children.

- **Respect and love the natural environment:**

To foster a meaningful connection with nature, playgrounds should integrate natural elements. Studies show that early exposure to nature enhances emotional development, promoting a deep respect for the environment.

- **Conserve resources and energy:**

Playgrounds can mirror natural ecosystems, where resources circulate without waste (Capra, 1998, in Rigolon, 2012). At the same time, exposing children to waste culture can help develop a critical perspective on consumption.

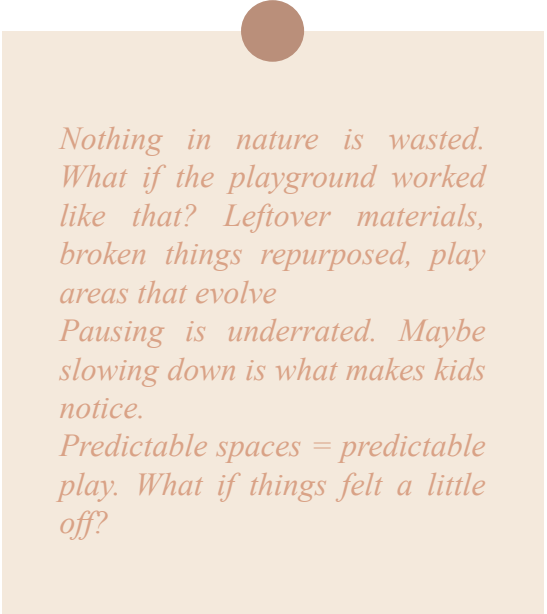
- **Create a sense of responsibility and care:**

Hands-on involvement in maintaining and caring for a space, such as gardening and plant care, builds long-term engagement and responsibility (Desmond et al., 2004, in Rigolon, 2012).

- **Connecting actions to consequences:**

Teaching cause-and-effect relationships between human actions and the environment is key to ecological literacy. Capra (2007, in Rigolon, 2012) emphasized the importance of systems thinking, which can be integrated into playground

design through interactive features that demonstrate sustainability principles. which can be integrated into playground design through interactive features that demonstrate sustainability principles.



*Nothing in nature is wasted. What if the playground worked like that? Leftover materials, broken things repurposed, play areas that evolve. Pausing is underrated. Maybe slowing down is what makes kids notice. Predictable spaces = predictable play. What if things felt a little off?*

## Experiential learning

### What is Experiential Learning?

In simple terms, experiential learning means “learning by doing” and involves reflection-in-action to construct meaningful knowledge (Chae, 2024). It’s a process that emphasizes active participation, reflection, and real-world application (Chae, 2024).

The experiential learning process is naturally continuous (Dewey, 1938) and is more process-based rather than focusing solely on outcomes. This aligns with the idea that learning becomes meaningful when one learns from personal experiences (Geh, 2014). Therefore, experiential learning encourages questioning, thinking, and applying knowledge in daily activities (Bibi et al., 2022).

Learning can occur both individually and collectively, as personal learning is often shaped by the surrounding environment. Furthermore, learning is largely motivated by hands-on experiences, where direct interaction with real-world scenarios leads to a deeper understanding (Yardley et al., 2022).

### Kolb’s Theory

One of the pillars of this thesis is the experiential learning process based on Kolb’s theory. Kolb (1984) explains experiential learning as an ongoing process where knowledge is developed through the transformation of experience. His model includes four interrelated stages: concrete experience, reflective observation, abstract conceptualization, and active experimentation.

The cycle starts with direct engagement, where learners actively participate in an experience. They then move to reflective observation, analyzing and making sense of what happened. This leads to abstract conceptualization, where broader patterns and theories emerge based on reflections. Finally, learners enter active experimentation, applying their insights to new situations and testing different approaches. This process continuously integrates both practical engagement and theoretical thinking, requiring emotional involvement (Kolb, 1976).

### Benefits of experiential learning

Experiential learning plays a fundamental

role in personal development (Dewey, 1938). Studies show that incorporating interactive and reflective activities significantly enhances engagement and learning outcomes (Chae, 2024). Additionally, using experiential learning strategies

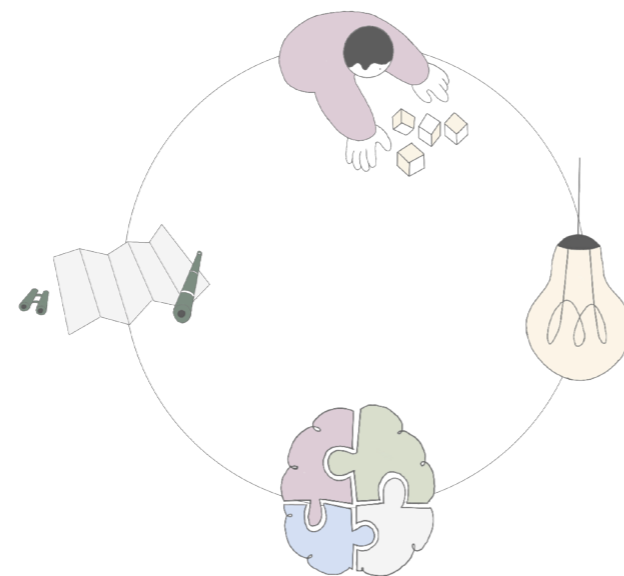


Fig.3.1 cycle of experiential learning based on Kolb's theory. Increases both interest levels and academic performance compared to traditional lecture-based methods (Bala, 2024; Bibi et al., 2022).

To conclude, hands-on learning experiences boost enthusiasm and critical thinking, reinforcing the importance of shifting from theoretical, traditional methods toward practical, experiential learning (Bala, 2024).

### Principles of experiential learning

Experiential learning is based on the continuity of experience and the interaction between experience and reflection (Chae, 2024). Learning follows a structured cycle where individuals engage in an activity (do), reflect on their experience and knowledge (reflect), develop theories based on those reflections (think), and apply their understanding to new situations (apply). This highlights the importance of experience in problem-solving, as learning is about actively applying knowledge in context (Bernik & Žnidaršič, 2012).

Another key aspect of experiential learning is the role of the body in experiences. When children physically interact with their environment, it provides “powerful, meaningful frameworks” for learning (Fairbrother et al., 2020, p.692). This fosters a sense of authenticity, making learning more impactful (Adams & Beauchamp, 2021; Evans et al., 2015).

Another key aspect of experiential learning is the role of the body in experiences. When children physically interact with their environment, it provides “powerful, meaningful frameworks” for learning (Fairbrother et al., 2020, p.692). This fosters a sense of authenticity, making learning more impactful (Adams & Beauchamp, 2021; Evans et al., 2015).

Finally, experiential learning is centered around hands-on activities and real-world applications, ensuring that concepts are not only understood but also experienced (Chae, 2024).

### The impact of experiential learning on Children

Children are self-directed decision-makers who choose what they learn, negotiate, and solve problems independently. This highlights how children are actively shaping the learning process rather than merely absorbing abstract concepts taught to them (Korfiatis & Petrou, 2021).

Experiential learning enables children to take charge of their learning through active participation and collaboration (Wainwright et al., 2020). The development of leadership skills and a sense of pride in their discoveries is a result of children being given agency (Berg et al., 2021).

### Connection between experiential learning and children’s well-Being

According to Ranken et al. (2023), experiential learning has a direct connection to children’s well-being. The study identified several key aspects:

- “Experiential learning positively affects a variety of well-being outcomes.
- It promotes socio-emotional skills, including empathy and emotional regulation.

- Repeated engagement in experiential learning fosters a sense of well-being.
- It enhances children’s scientific vocabulary and conceptual understanding”

### Children perceive about experiential learning

Children generally have positive experiences with experiential learning. Many describe feeling happy and excited, especially when learning takes place outdoors (Berg et al., 2021). Research also highlights that experiential learning can create feelings of calmness and reduced stress (Hammarsten et al., 2019). Additionally, many children express enthusiasm for participating in similar learning experiences in the future (Korfiatis & Petrou, 2021; Zyngier, 2017).

A randomized controlled trial involving 90 students found that 73% of children who engaged in outdoor learning enjoyed the experience, whereas only 38% of those who completed a similar science lesson on a computer reported feeling engaged (Aflalo et al., 2020).

To summarize, experiential learning contributes to children’s well-being by strengthening their socio-emotional skills, empathy, and emotional regulation. Sustained engagement in hands-on experiences creates meaningful and immersive learning environments, leading to long-term positive development (Ranken et al., 2023).

*The body plays a huge role in learning (physical interaction) Experiential learning can support emotional well-being. perfect combination! children are naturally curious, but are they given enough opportunities to explore? outdoor learning is kids favorite learning method!*

## Participatory Design

### What is Participatory Design?

Since the 1990s, the value of children's participation in shaping their environment has gained more recognition. Designers and planners are moving beyond simply observing children; they are now listening to them and acknowledging their creative capacities as different from adults (Iltus & Hart, 1994). Instead of adult-centric aesthetics, spaces should reflect the perspectives and priorities of children themselves. This approach not only results in more suitable design outcomes (Childhood City Newsletter, 1981), but also builds a sense of responsibility and connection to the space (Iltus & Hart, 1994).

Participatory design (PD) is rooted in the idea of involving users, here children as active contributors throughout the design process (Greenbaum & Kyng, 1991; Ehn & Badham, 2002). This method is also particularly rooted in Scandinavian design traditions, which aim to democratize participation and empower users (Mazzone et al., 2010). For children, this means shifting from being passive recipients to co-creators.

### Role of children in PD process

According to Druin (2002), children can take on several roles in participatory design processes. These include:

Users, whose behavior is observed to inform improvements. Testers, who try out early versions of a design. Informants, who contribute insights at key moments in the process. Design Partners, who are considered equal contributors in shaping outcomes.

Despite growing interest, children are still often seen only as users and rarely involved in evaluating or shaping the design itself (Landoni et al., 2016). Moreover, engaging children in longer, meaningful participation is not always easy (Barendregt et

al., 2016). However, when well-supported, this process gives children a voice and transforms their relationship with the spaces around them.

Since PD plays an important role in the process of this thesis, the diagram shows the level of children's involvement in the design process in terms of co-creating and co-designing, aiming to empower children and validate the design solution from their point of view (Fig. 3.2).

### Meta-Design

Meta-design builds on the principles of participatory design by enabling users to become designers themselves. In this approach, the role of the designer shifts from creating fixed solutions to scaffolding tools and frameworks that allow users like children to shape the outcome (Ehn, 2008; DiSalvo et al., 2012). In educational learning settings, this allows children to lead their own learning processes through flexible, adaptable systems.

Ehn (2008) outlines four infrastructuring strategies that support this:

1. Formats: flexible templates that can be adapted by the user.
2. Component Strategies: modular elements (like LEGO blocks) that users combine based on needs.
3. Design Patterns: recognizable configurations of problems and solutions that can be reused or modified.
4. Protocols: agreed-upon steps or rules that guide collaborative processes.

So, based on that, the methodology of this thesis pertaining to work with children, mostly work with design patterns and protocols through different workshops to sympathize with each other and have a platform to think, reflect, and design under supervision.

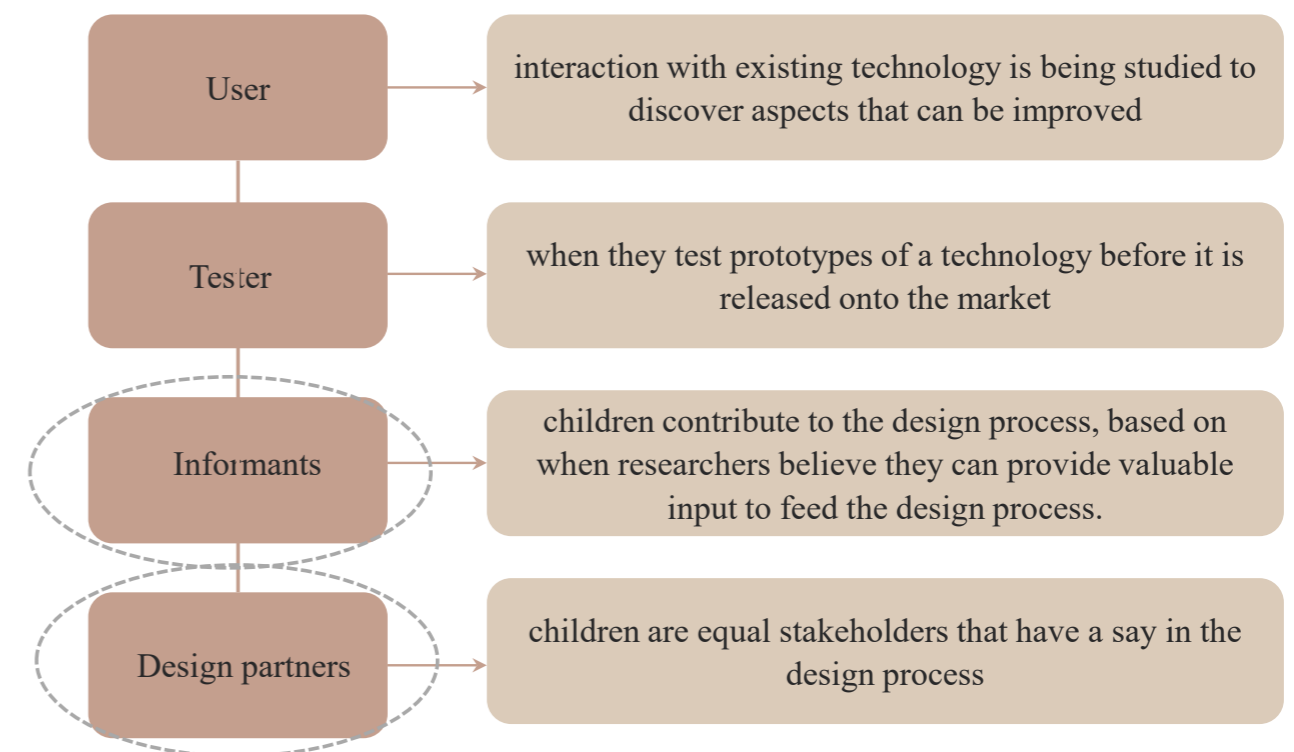


Fig.3.2 Different level of children's roles in participatory design process ( Druin, 2002)

### Ladder of participation

Hart’s (1992) “Ladder of Participation” provides a useful framework to evaluate the level of children’s involvement in design.

It ranges from non-participation (like tokenism or decoration) to full participation, where children lead and make shared decisions with adults. The highest levels of participation ensure that children are not just consulted but are part of shaping decisions and outcomes ( Hart,1992).

In this thesis, the level of participation is best described as “adult-initiated, shared decisions with children.” The structure of the workshops was guided by the researcher, but children were central in proposing and shaping ideas. Through this, the workshop not only collected ideas but built a sense

of agency and ownership, which is key to supporting sufficiency values. Given that the playground is already familiar to them, this approach strengthens their emotional and practical connection to the space.

In this thesis, participatory design is used not just as a research method but as a way to involve children in creating their own solutions within the framework of sufficiency. Both workshops were organized with this purpose. The first one introduced sufficiency and opened discussion, while the second used hands-on activities and material-based prototyping to let children shape the future of the playground directly. Their contributions were not decorative, they informed spatial layouts, activities, and design ideas. This participatory process builds not only better design outcomes but also stronger engagement with sufficiency values ( Fig.3.3).

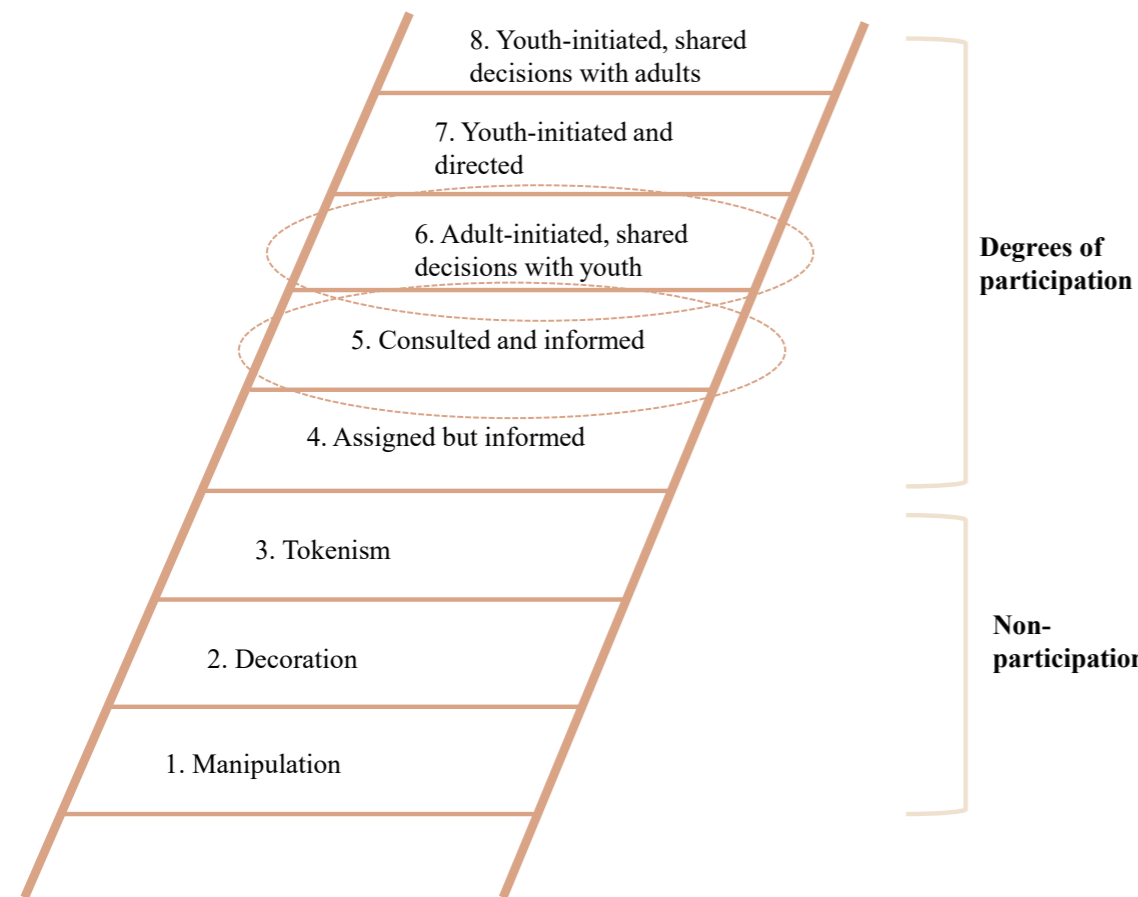


Fig.3.3 different level of children’s involment in design process ased on ladder of participation ( Hart,1992)

### Children’s rights

#### Children’s Rights and Play Environments

Children’s rights form an important foundation for this thesis, especially in relation to how children are seen and included in shaping their everyday environments like playgrounds. International and national frameworks highlight the importance of giving children a voice and making sure their needs are reflected in the spaces they use daily. This part reflects on how these ideas are connected to the approach of this thesis.

#### UN Convention on the rights of the child

According to the United Nations Convention on the rights of the child (UNCRC), children have the right to be protected, to express themselves, and to access spaces for play, rest, and learning (UNICEF, 1989). Article 3 highlights that the best interests of the child must be a primary concern in all decisions. Article 12 states that children have the right to express their

views freely and be taken seriously. Article 13 supports their right to share ideas in ways that suit them. And Article 31 confirms their right to play, rest, and take part in cultural and recreational life (UNICEF, 1989).

#### National Perspective (Boverket)

At the national level, Boverket, Sweden’s national board of housing building and planning, highlights the importance of including children’s perspectives early in planning processes. Their guidelines emphasize that children’s everyday environments should support physical, social, and creative development. Playgrounds should be safe, inclusive, and offer varied play possibilities (Boverket, 2022). Boverket also points out that children should be seen as active citizens in urban planning, and that their participation should be taken seriously, not treated as symbolic (Boverket, 2022).



(UN Convention on the rights of the child, 1989)

3. When adults make decisions, they should think about how their decisions will affect children. All adults should do what is best for children.

12. Children have the right to give their opinions freely on issues that affect them. Adults should listen and take children seriously.

13. Children have the right to share freely with others what they learn, think and feel, by talking, drawing, writing or in any other way unless it harms other people.

31. Every child has the right to rest, relax, play and to take part in cultural and creative activities.

# exploring different projects!

## Reference projects

- El Columpio de Oro, Recycling Playground, (Almeria, Spain)
- Wander wood(California Academy of Sciences, USA)
- Metabolic Lab (Amsterdam, Netherland)
- Jingyue Central Park (Changchun, China)
- Take way of refrence projects

This section examines a selection of reference projects that align with the goals of this thesis. These projects exemplify innovative approaches to sustainability, public space design, and community engagement. Each project is analyzed to uncover lessons that can directly inform the design of an eco-educational playground for children.

The red lines represent personal thoughts and critiques of each project, highlighting aspects that don't align with my vision and must be avoided in my design and key takeaways are collected in a collage on last page of this section

## Reference projects

### El Columpio de Oro, Recycling Playground, (Almeria, Spain)

Located in Almeria, this award-winning playground integrates recycling education with play. The project Aim to raise the awareness of children concerning sustainable development and respect for the environment. The theme of the playground is to address recycling processes in a fun interactive way. So all the playing equipment design based on fundamental aspects of learning recycling but still fun. (Proludic website, 2016)

In the project photos, it's clear that children are engaged with games, playing and learning simultaneously. The playground perfectly shows the concept of recycling process in simple way for children.



Fig.4.1 Trash truck (Proludic website, 2016)



Fig.4.2 Recycling steps (Proludic website, 2016)



Fig.4.3 sand extraction, transportation and transformation process (Proludic website, 2016)

*This playground theme is recycling, but recycling is a last resort, not a solution. By focusing only on sorting waste, it risk sending the message that consumption is acceptable as long as you recycle afterward. There's no conversation about reducing consumption in the first place.*

*rethinking what we use before we even need to sort it.*

### Wander wood (California Academy of Sciences, USA)

what is mentioned in California Academy of Sciences website is that sustainability is not enough, to repair our damaged ecosystems and climate, we need to redo what Earth got right the first time.

Wander Woods is an interactive outdoor exhibit at the California Academy of Sciences designed to teach children about nature through hands-on play. It provides a wild, physical alternative to screen-based experiences.

It shows how unstructured nature can be interesting for kids and wake up their sense of curiosity. As much as they feel curious, they want to explore more and it help to make a bond between kids and nature.

*This nature-based play space encourages unstructured exploration, which is admirable. However, its beauty cover a missed opportunity, there's no dialogue about resource limitations. It feels more like the design leans on the aesthetic experience of nature only.*

*The real challenge is to encourage children to care for nature, interact with it thoughtfully and understand its limits, not just roam through it passively.*

*Playing is great, but what happens when we're never asked to care for it?*



Fig.4.4 (California Academy of Sciences. n.d.)



Fig.4.5 (California Academy of Sciences. n.d.)



Fig.4.6. (California Academy of Sciences. n.d.)

### Metabolic Lab (Amsterdam, Netherland)

The Metabolic Lab at De Ceuvel's Cleantech Playground is a unique space where sustainability comes to life in a hands-on way. It's designed to show how energy, water, and nutrients can be part of a continuous loop instead of being wasted. (Metabolic, 2015)

As visitors move through the lab, they see visible systems that make abstract concepts more concrete and engaging. What stands out is how the space uses physical experiences to encourage exploration, curiosity.

While the lab's technical features differ from the focus of this thesis, its approach to making sustainability visible and learnable through interactive activities. Rather than replicating these systems, the design in this thesis draws on the same idea of using physical space to invite active participation and playful discovery helping children become more aware of their surroundings.



Fig.4.7. Aquaponics Greenhouse (De Ceuvel, n.d.)



Fig.4.8. Compost Toilets (De Ceuvel, n.d.)



Fig.4.9. Metabolic Lab (Metabolic, 2015)

### Jingyue Central Park (Changchun, China)

Central Park, often called the "ecological green lung" of the Jingyue High-tech Zone in Changchun, used to be an unused piece of municipal land. It had been left idle after the construction of river, and nearby residential and commercial buildings.

The site was filled with soil and onstruction waste. Through the design the site has transformed into an urban green park. The park's overall design prioritizes public experience, with social resources that are culturally appealing, specially to young people. It also provides practical base for university construction activities and practical opportunities. (shuishi, 2024)

What seems interesting in this project is how we can reactivate unused municipal lands on different scales. It's divided into various intervention activities. This kind of design can bring families together on a shared platform, where children can play and learn, either with or from each other. If public spaces become as attractive as this, they transform from just learning spots into places that are always used, connecting different parts of a neighborhood.



Fig.4.10. (Jingyue Central Park / SHUISHI - ArchitectureLab, 2025)



Fig.4.12. activities in different range(Jingyue Central Park / SHUISHI - ArchitectureLab, 2025)



Fig.4.13. form and color(Jingyue Central Park / SHUISHI - ArchitectureLab, 2025)

*It's good to see how this project addresses using smarter as a key to efficiency. However still, the question of how much we need to use at all remains.*  
*There's a silent assumption that technology will always solve our resource problems, but is that all?*

*Which one is smarter, technology or simply using less?*

*There's a feeling that something is missing. Children are mostly observers here, following paths without leaving a trace on the landscape. Nature in this park feels out of reach, that risks creating a passive relationship with environment.*  
*My belife is spaces should encourage children to dig into the soil, plant, shape, and even make mistakes while learning to care for nature. It's about experiencing the responsibility that comes together.*

*If children are following predefined paths, how will they ever learn to navigate their own eperience?*

Reference projects analysing in details



Fig 4.13. Key takeaways and ideas gathered from reference project analysis

# Lets talk to each other

## **Interviews**

- interview with municipality
- interview with teacher in school

## Takeaways from municipality interviews

### Who was interviewed?

A representative of Planning and Strategy manager of Gothenburg municipality

### Why was this meeting held?

To understand which areas of sustainability gothenburg's municipality is focusing on and identifying potential gaps to address

### The question were asked

It began with general questions about energy use in Gothenburg, focusing mostly on efficiency strategies. From there, the discussion shifted toward sufficiency, exploring whether urban design and public spaces, like playgrounds, could support more mindful habits. It also included questions about the role of children and possibilities for future collaboration.

### Interview format

The interview was conducted online and lasted around 30 minutes. Notes were taken manually by the author during the conversation.

The first interview was conducted with one of the representatives from the Planning and Strategy Department of Gothenburg Municipality. The main reason for the interview was to begin understanding what the municipality is currently doing in Gothenburg in terms of energy use, what their position is, and what they consider important. It is important to note that the information presented here is based on her answers and responses to my questions. It is not based on scientific facts, and as she is an individual, her responses may also reflect personal opinions.

The aim of the interview was to understand how the municipality approaches energy consumption and sustainability, especially in relation to behavior and everyday habits. Some questions explored the balance between technical efficiency and sufficiency, and whether urban design could play a role in influencing more mindful energy use. A key part of the discussion also explored whether the city has considered involving children in the design process and to what extent.

From this interview, I sought to identify the scope of my thesis by locating an existing gap in need of further investigation, and then combining this with my own interests to define the thesis focus.

### Current priorities and missing gaps

At the beginning of the interview, my focus was on understanding energy consumption in Gothenburg. The conversation quickly revealed that, while there are efficiency-driven policies in place, there is little attention given to the behavioral aspects of consumption. She expressed that the affluent lifestyles of Gothenburg residents naturally lead to higher consumption whether in terms of household energy, transportation, or material goods.

When discussing existing strategies, she emphasized their strong focus on efficiency measures for example, encouraging energy-efficient renovations and supporting technical solutions for reducing household energy use. However, it became evident that sufficiency as a strategy is not being considered

as thoroughly. Their policies remain centered around technological improvements.

### Design's untapped potential

I then shifted the discussion towards behavioral aspects of energy consumption, asking whether Gothenburg has explored urban design strategies to encourage people to using less for example and her response was while the city has invested in sustainable mobility solutions (such as expanding cycling infrastructure and improving public transport), they have not actively used design as a tool to shape behavior regarding energy consumption. While they recognize that people's habits directly affect consumption, there has been no structured attempt to study or influence behavior. Instead, she mentioned their policies continue to focus on technical upgrades because these offer measurable results compared to behavioral change.

### Finding the missing piece

As the conversation progressed, I started seeing a gap in the municipality's approach, a gap that influenced research direction. Initially, my focus was on energy sensitivity and efficiency, but this interview made me realize that sufficiency was the missing piece. From what I understood, Gothenburg's approach to sustainability is highly efficiencydriven, but there is almost no conversation about sufficiency, reducing consumption in the first place. This fact made it clear that this is an area worth exploring. Interestingly, the representative showed interest in the idea of integrating sufficiency principles into public space, even though they had not considered it before. They acknowledged that while behavior change is difficult to measure and implement, playgrounds could play a role in shifting consumption habits in longer time. From this discussion, it became clear that the thesis shouldn't focus only on energy consumption but rather on sufficiency as a whole and on how it can help children experience and internalize sufficiency principles.

So to summerizing the outcome:

1. prioritizing technological efficiency over other strategies.
2. Children are not currently a focus in energy-related municipal strategies, but there is an interest on that.
3. There is an admitted lack of social strategies for promoting sufficiency.
4. Sufficiency strategies seems challenging due to measurement of their success.
5. Interest exists in integrating sufficiency for children in public spaces, but no clear framework is in place.

## Takeaways from teacher interviews

### Who was interviewed?

Two elementary school teachers, one from third grade and one from fifth grade

### Why was this meeting held?

To understand the insight of the teacher, as they are the ones in daily contact with the children.

### The question were asked

explored how children relate to the idea of using less, how they interact with play and materials, and how play can support learning about sufficiency. It focused on everyday behavior, creativity, and how learning through play might help children reflect on resources and collaboration

### What was the outcome of this workshop?

1. Children engage more deeply when learning is hands-on, interactive, and tied to real-life experiences.
2. Playgrounds should encourage problem-solving and resourcefulness rather than just providing fixed play structures.
3. Giving children a sense of ownership over their environment fosters responsibility and long-term engagement with sufficiency concepts.

### Interview format

The interview was conducted online and lasted around 30 minutes. Notes were taken manually by the author during the conversation.

The second interview was conducted with two school teachers, one from third grade and one from fifth grade. The main purpose was to speak with people who interact closely with children every day and have valuable insight into their behaviors and learning patterns. While both teachers are experienced in working with children, it is important to note that their views cannot be generalized to represent all children.

This interview played a key role in the thesis. It helped build a better understanding of children's behavior, how they respond to different learning methods, and the best ways to connect with them, which was essential for both the participatory workshops and the design phase. I also wanted to explore what children already know about the concepts of sufficiency and sustainability, and how to translate these ideas in ways that are clear and engaging for them.

In summary, this interview was a valuable method for deepening my understanding of children's learning styles, reactions, and prior knowledge especially in preparation for the co-creation process.

### Sufficiency through a child's eyes

The interviews made it clear that children's understanding of sufficiency is not instinctive it is shaped by their environment. Some children show awareness of waste and resource use, but this understanding is often superficial or inconsistent. Teachers explained that children's awareness depends largely on whether such topics are discussed at school or at home.

They also noted that energy use is particularly difficult for children to grasp, as it is not visible in the same way that food waste or discarded materials are. Children may understand that "wasting is bad," but they often don't connect this to the resources required to produce or transport items, or to broader environmental consequences.

However, when schools introduce hands-on activities like waste-reduction challenges, reuse projects, or class discussions, children begin making these connections. Still, this behavioral shift tends to be temporary unless the ideas are consistently reinforced

over time. start making connections. But this shift in behavior is often temporary unless these ideas are repeated over time.

### Children's behavior & perception of playground

The teachers pointed out that children engage with playgrounds differently depending on the level of personal connection they feel toward the space. When they are involved in shaping or caring for a place, they are far more likely to treat it with care and respect. In contrast, typical public playgrounds are seen as neutral and temporary, places they use, not places they are responsible for.

One notable insight was that when traditional equipment is lacking, children often become more inventive. They find ways to repurpose materials or objects, using sticks as tools or turning random items into play objects. This natural resourcefulness suggests that a sufficiency-oriented playground should leave space for creativity and exploration rather than over-structuring how children play.

Another key takeaway is the importance of ownership. If children do not feel a sense of connection to a place, they are less likely to engage with it meaningfully. This supports the need for co-creation and flexibility, encouraging children to help shape the space, not just use it.

### Learning by doing

The teachers strongly emphasized the importance of experiential learning, children learn best when they are actively doing. A sufficiency-oriented playground, they suggested, should make resource use visible and tangible.

They proposed including interactive features that create moments of reflection and decision-making, for example, stations where children build something using a limited set of materials. These play situations would help children encounter and respond to constraints in natural ways.

They also emphasized the need for balance: some children benefit from structured activities, while others thrive in open-ended environments. A successful design, in their view, should allow for both guided interaction and free, imaginative play, creating opportunities for all children to engage with sufficiency at their own pace.

### A playground with purpose

Teachers provided several valuable insights regarding what a sufficiency-focused playground should include. They were thinking that the theme can be interactive elements that make resource use visible in every elements.

They emphasized the importance of learning through experience. The playground should show sufficiency by setting up play situations where they naturally encounter limitations and make decisions about resources. Like Building stations where children must create something using a fixed set of materials.

Another point was that children engage differently depending on the structure of the activity, but open-ended spaces allow children to internalize these concepts at their own pace. They believe that final design should offer a balance between guided interactions and free exploration.

# Exploring with purpose !

## Workshops

- first workshop (observe& rethink)
- outcome of the workshop
- second workshop (from play to learn)
- outcome of the second workshop

**First workshop (observe & rethink)**



Fig. 6.1. summery of the first workshop

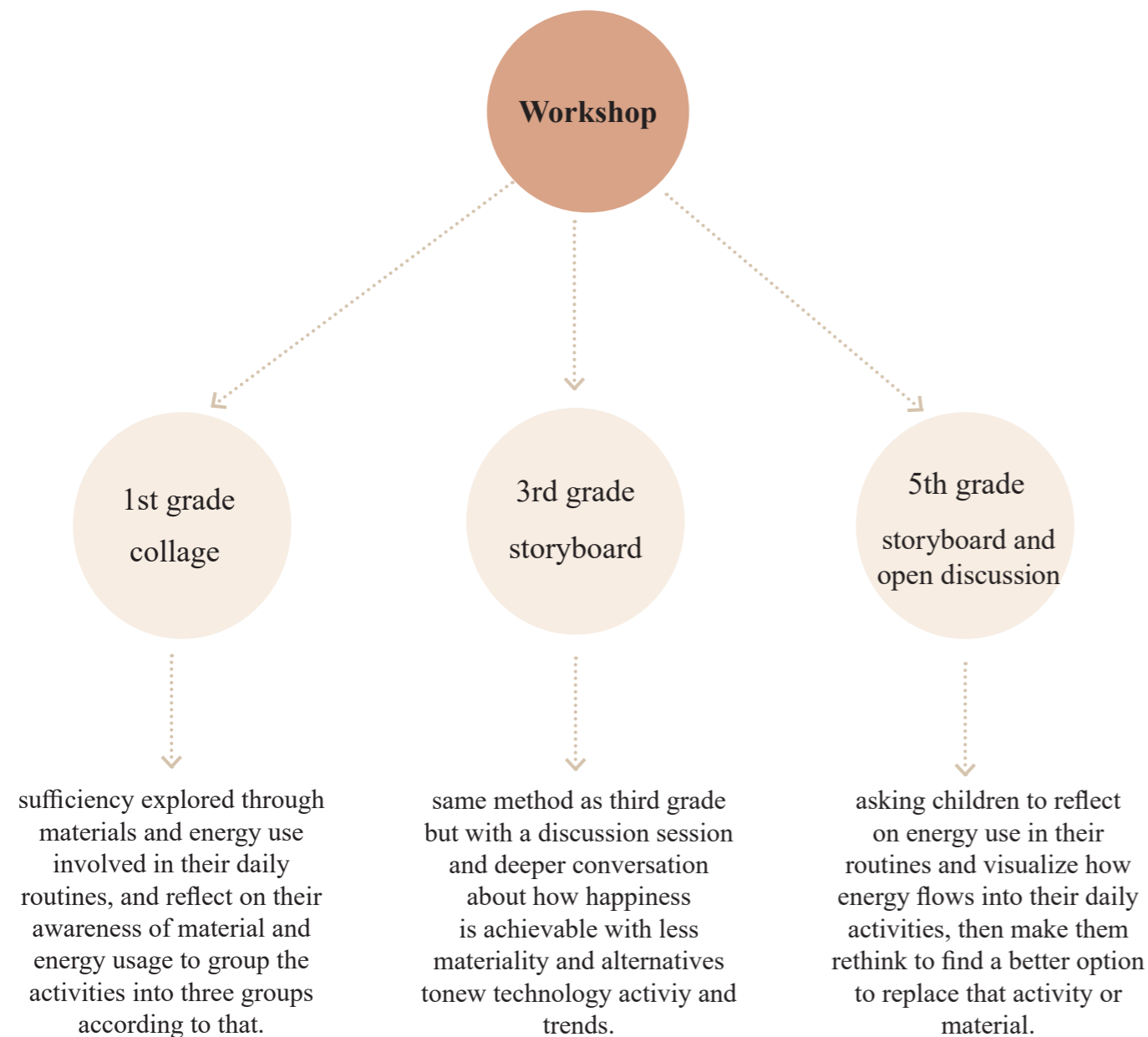


Fig.6.2 Method of the first workshop

## Workshop

When it comes to workshops, the most important thing is making sure children are actively involved in a meaningful way. If their participation isn't structured properly, they might not bring their own values into the process, which would make the whole experience less relevant. That's why the methodology has to be built on direct participation, where children don't just respond to a set plan but actually help shape the learning process itself.

This approach follows Value-Driven Participatory Design, as described by DiSalvo et al. (2017), applying two key principles:

Formative Participatory Design, which helps uncover the values and perspectives children already hold these then become the foundation for the next step.

Meta-Design Principles, used to create project-based learning activities which means the activities aren't fixed but adapt and evolve based on the way kids engage with them.

At the beginning of the workshop, the idea of sufficiency was introduced in a simple and age-appropriate way, using examples from their daily life such as choosing how to get to school, or what to paly. Instead of defining the word directly, I asked open-ended questions that invited them to reflect on their choices and then think about alternatives. This allowed sufficiency to emerge naturally through the conversation. The main aim was not to teach them the concept, but to see how much they already know about it consciously or unconsciously.

### how does these principles shape each workshops?

#### First workshop (1st grade):

The first workshop, designed for first-grade students, the focuses is on how children understand material use in their daily lives. Using collage as a visual tool (Schepers, Dreessen, & Zaman, 2018), the activity encourages them to categorize images of common objects and activities into different levels of material consumption and energy use.

Instead of giving them pre-defined answers, the workshop follows a formative participatory design approach, letting them group objects based on their own understanding. This not only reveals their existing perceptions of waste and reuse but alsoallows for flexibility some children may create new categories based on what feels most relevant to them. In this way, the meta-design principle is applied, as the activity adapts to their way of thinking rather than imposing solid definitions.

#### Second workshop (3rd grade):

The second workshop, targeting third-grade students, moves from material awareness in the first workshop to behavioral awareness. Using storyboarding as a participatory method (Schepers, Dreessen, & Zaman, 2018), children are asked to show their daily routines in one storyboard and then imagine an alternative smart day with less material and nergy use choses. This process aligns with formative participatory design, as it begins with their own habits and routines, making sufficiency relatable to their personal experiences. The meta-design principle is present in how the second storyboard is shaped there is no fixed definition of what a "smart day" looks like. Instead, children generate their own ideas.

#### Third workshop (5th grade):

This workshop followed a similar structure to the third-grade session but was adapted to suit older students by focusing more on discussion and questioning. Like before, students used storyboarding to reflect on their daily routines and then imagine a "smart day" with less material and energy use. However, this time, more emphasis was on explaining their choices, discussing more critically, and thinking through the reasons behind their alternatives. The workshop still aligns with formative participatory design by starting from their own habits, but here, conversations were used to push the ideas further. Meta-design also played a role, as children were not given a fixed model of sufficiency but instead challenged to define and justify it in their own way.

## Outcome of the first workshop



Fig.6.3 collage of the workshops result

The workshop showed that while children, especially in the older group were able to identify wasteful behaviors, they had difficulty defining sufficiency beyond the idea of simply reducing. Many associated using less or reusing materials and energy with limitation, rather than with making balanced or innovative choices. This highlights a gap in their understanding and reinforces the need for interactive and experiential methods in this context.

During the activities, children naturally repurposed materials and found alternative ways to engage with objects, demonstrating that play itself encourages resourcefulness. However, they were not always conscious of this behavior, which suggests that playgrounds can be designed to actively reinforce these patterns. By creating play environments that encourage reuse, sharing, and thoughtful consumption, children can develop a deeper connection to sufficiency through lived experience.

The hands-on collage activity showed that children engage more deeply when they can physically categorize and discuss their choices. It became clear that abstract sufficiency concepts are best communicated through interactive and visual tools. This supports the thesis's core idea that sufficiency should be introduced playfully, not through formal instruction.

These insights reinforce the importance of designing a playground that naturally integrates

sufficiency principles, allowing children to explore and internalize these ideas through play.

The workshops also confirmed that group work and shared play are effective ways to learn a new concept. Working together gave children the opportunity to reflect, express opinions, and engage with a unique topic collectively. While doing fun activities together, they also learned from each other, making the learning process both social and reflective.

## Second workshop



Fig. 6. 4 illustration inspired by atelier creatif ricolage

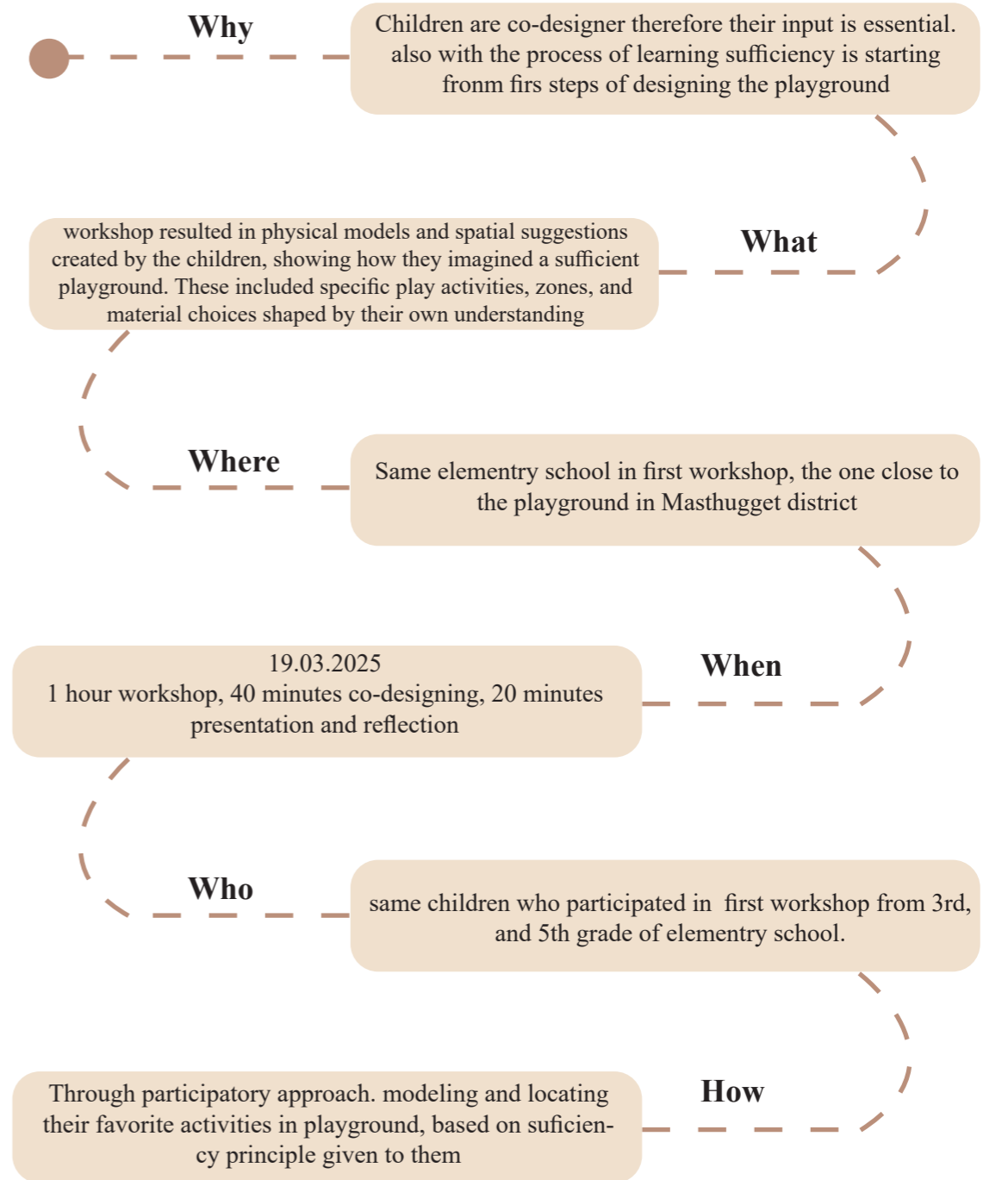


Fig. 6. 5 summary of the Second workshop

## Aim and objective of the workshop

The second workshop focused on hands-on participatory design with children, with the clear goal of co-creating playground interventions based on the principle of sufficiency. The workshop aimed to explore how children, as the main users of the space, could be involved in imagining and shaping their playground using limited, reused, or natural materials.

The idea behind this was to test whether a sufficiency-based approach that promotes doing more with less could actually stimulate creativity, ownership, and responsibility in design. The objective was to make the children think about the quality of space instead of quantity. Could a branch, a wheel, or some leftover rope become a valuable play element when imagined creatively?

This wasn't just about collecting their ideas. It was about activating their imaginations, making them feel heard and involved in the design of their own everyday environment leading to increasing sense of belonging.

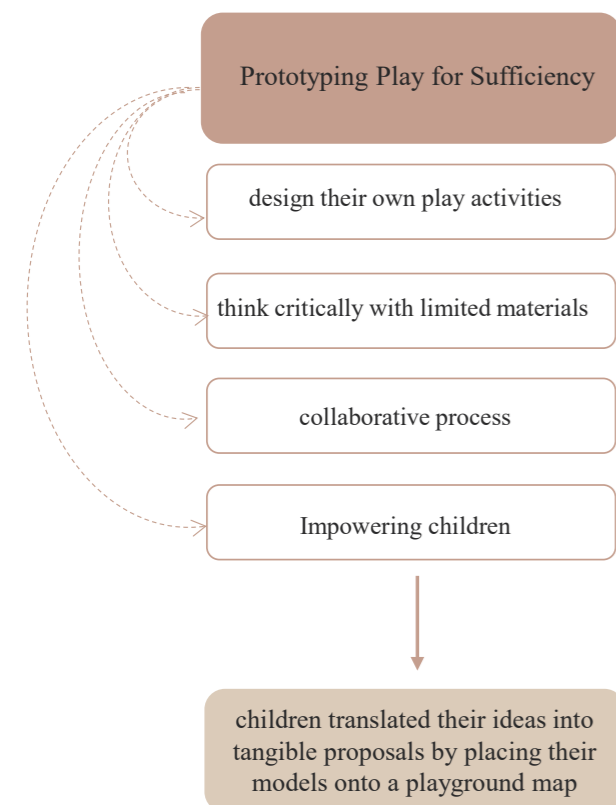


Fig.6.6 objectives of the second workshop

## Participatory design in this context

Children are the primary users of the playground, but often they are completely left out of the design process. This participatory approach gave them the tools and language to express their ideas visually and physically, rather than just verbally which worked especially well for this age group. Moreover, involving them directly also reflects the core idea behind sufficiency, that design doesn't have to be top-down or resource-heavy. It can come out from what we already have, whether that's leftover materials or lived experience.

This method also helped to break down hierarchies in design. I wasn't the designer in charge anymore, each child became one. We were all working together, shifting the power dynamic and opening up space for shared authorship.

Also, the fact that this playground is already a familiar and everyday space for these students made their participation even more meaningful. It's a place they use regularly, not just for play, but for meeting friends, resting, or releasing energy between lessons. So, when they're actively involved in shaping or imagining it, they start to feel a real sense of ownership. It becomes their space in a deeper way. That emotional connection often leads to more care, more responsibility, and more respect for the place, because it's not just given to them, they had a say in it.



Fig.6.7 children are brain storming and co-designing together

## Workshop organization and tools

The workshop took place at Fjällskolan, inside a calm, familiar classroom that the children were used to. That was very important, because feeling safe and comfortable helped them open up and engage better. There were 12 children participating in workshops. They were divided into two groups of 6.

Overall time of the workshop was 1 hour, groups had around 30-40 minutes, and then we had a short sharing session about 20 minutes at the end where the groups presented what they had made. Their models stayed on the maps, and I took photos and notes to document each idea.

The simplicity of the setup was key to the success of the workshop. The tools were intentionally low-tech and hands on:

- printed satellite map of the actual playground
- several colors of play dough for modeling their ideas



Fig.6.8 printed map to locating their models

- printed sheet showing a variety of repurposed and natural materials.



Fig.6.9 material list that given to them with some examples

- labeled cards with sufficiency principle that they have in their mind while creating activities.



Fig.6.10 structure and principles of the workshop that given to children.

Each group had 6 children, and they rotated around the stations, so everyone had space and enough time to build and discuss. The materials were laid out like an invitation to explore. There were no strict instructions.

I explained that they could imagine using old ropes from home, broken bicycle parts, branches from the forest, even old curtains or tarps. They could make swings, hideouts, climbing things, resting areas, whatever felt fun or useful. The activities can be simple but joyful and bring them together and trying to find happiness in play not things.

The idea was to make the children feel like real designers, but without drawing or writing, they could build directly with their hands. With one mission:

Use the materials we have, imagine creative ways to play, and help design a playground that is fun, smart, and made for everyone! Let's build together!

### How the children participated

Since the selected students also participated in the first workshop, they were aware of the aim and purpose of the thesis very well. From the very beginning, the children were curious and excited. At first, they spent time just touching and exploring the materials and the map. Then, slowly they began asking questions about which materials they considered sufficient and what kinds of activities were fun for them but still simple and material-sufficient, then small ideas started to grow.

The kids would press the play dough onto the map, showing where their structure should go, and talk about what it would do, how they would build it, and why it matters. I moved between the groups, asking:

- where would you find this material?
- why here and not there?
- what would you do in this spaces?

These conversations were short but meaningful. Sometimes, the children surprised me with their sharp, practical ideas. For example, one group came up with a Tic Tac Toe game that could simply be drawn on the ground with chalk or made using natural materials like small stones and sticks. This idea not only required almost no materials but also reflected their awareness of using what already exists. Another group suggested creating an obstacle course using items they could collect from their own homes, such as old desk, ropes, and unused furniture parts. They even described how they could assemble the course in the workshop space, showing they had imagined the whole process from concept to implementation. These ideas reflected their understanding of sufficiency not just as a design limitation, but as an opportunity for participation and ownership.

### Results

The result was much richer than expected. Across the two groups, there were clear themes:

- children understood sufficiency almost naturally, they reused and repurposed without needing much explanation
- their ideas were experience-driven, focused on movement, rest, hiding, community, and imagination.
- material use was practical and local, suggesting things they already had or could easily find.
- the activities imagined were fun and joyful for them was somehow different than what I was thinking they naturally could find happiness in simple things.

Examples of the final models included:

- a multi-use climbing and hanging station using bike wheels, ropes, and wooden sticks
- “secret corner” built from tarps, sand, and dry leaves, designed for quiet play or rest

What stood out the most was how children connected space with feeling, not just action. They wanted some places to feel peaceful, others exciting. They cared about softness, noise, and interaction.

The process showed that with the right tools, children can genuinely contribute ideas that are both poetic and practical. They didn't just imagine fantasy playlands, they created real, grounded ideas that reflect their daily needs, curiosities, and emotions.

This workshop clearly demonstrated that participatory design based on sufficiency can create deep engagement and meaningful design outcomes. The children were not passive receivers, they were co-creators. Their responses were rooted in imagination but always returned to what's possible with what we already have.

This method showed that by using just basic tools, maps, modeling dough, and reused ideas, a very rich design process can unfold, one that is inclusive, sustainable, and context-aware. This participatory and sufficiency-based approach is not only effective, but also joyful, grounded, and full of potential.



Fig.6.11 designing the playground in small scale through participatory design

## Outcome of the second workshop

Activity	Materials Used (Recycled/Reused/Natural)	Why Is It Sufficient?
Recycle bin game	Recycled bins and waste materials	Encourage waste sorting, reusing materials in the workshop, and reducing landfill waste
Workshop space	Reused wood, metal, and other discarded materials	Supports repair and reuse, minimizing material consumption and promoting a circular economy
Swing (energy-producing)	Reused metal frame, sensors, repurposed mechanical part	Generates renewable energy, reducing reliance on external power sources
Climbing tower with cable car	Reused metal pipes, cables, wooden planks	Repurposes existing materials, minimizing new resource extraction
Tic-tac-toe game	Drawn on the ground (no material needed)	Uses no materials, demonstrating sufficiency by avoiding unnecessary consumption
Hopscotch	Drawn on the ground (no material needed)	Eliminates material use while still enabling play
Basketball & volleyball courts	Reused bicycle tires, metal pipes, and old ropes	Extends the life of discarded materials, reducing demand for new sports equipment
Animal sculptures for play	Natural stones, wood	Uses natural, durable materials instead of synthetic alternatives
Obstacle course	Household waste items, repurposed wood and ropes	Repurpose existing objects, reducing the need for new production
Climbing wall	Reused tires	Extends the lifespan of discarded tires, preventing waste
Musical chair	Unused fruit boxes	Utilizes surplus materials creatively rather than discarding them
Tag area	Unused obstacles such as logs, wooden planks, or boxes	Use available materials creatively, avoiding unnecessary resource use
Sandbox	Natural sand, wooden frame	Uses biodegradable, natural materials, ensuring minimal environmental impact

The second workshop became more than just a co-design session, it was a moment where children took ownership of space, ideas, and materials. What I found most striking was how quickly they moved from asking for instructions to confidently creating on their own. Once the tools were in front of them, they didn't hesitate. They started building, testing, and imagining, without waiting for approval. This shift showed me that when we create space for trust, children step in with an agency.

Their ideas reflected a quiet but clear sense of sufficiency. They reused materials without question, shared tools naturally, and designed space for care, rest, and community. There was no need to define sufficiency for them, it came through in how they worked, simple, thoughtful, and grounded in what they already knew.

This workshop reminded me that sufficiency is not something to explain, but something to experience. Through making and reflecting together, children learned that design isn't only about new things, it's about noticing, adapting, and creating from what we have. And for me, it confirmed that participatory design isn't just a method, it's a space for learning and transformation.

# Where ideas take root

## Laboratory

- current situation
- site/ activities observation
- design principle
- activities/ zoning diagram
- new playground
- design strategy collages

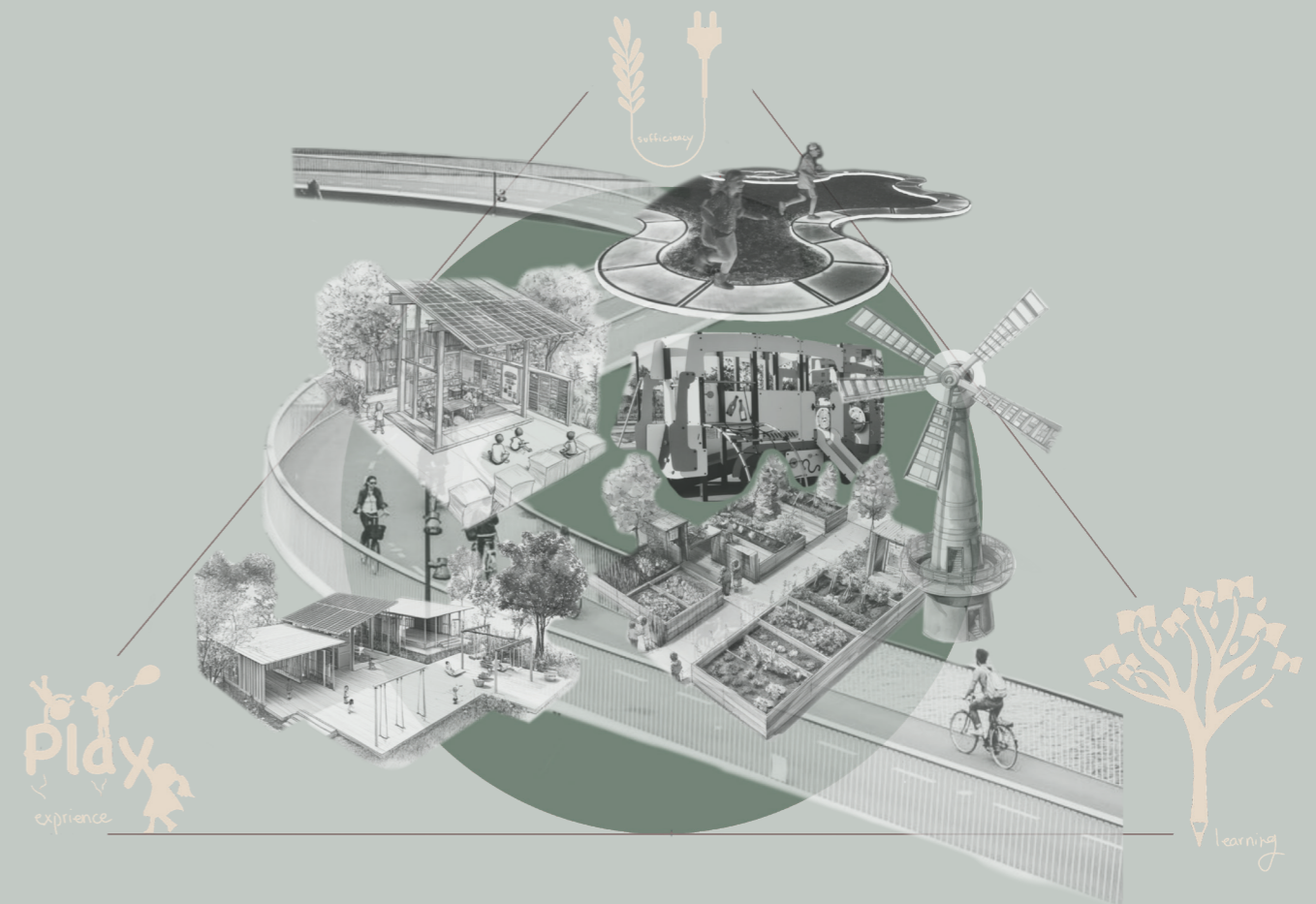


Fig.7. 1 manifesto of the design

# Existing playground



Entrance of the playground, existing football field



Existing gardening area



open and roofed seating area



Existing play elements



- 1 Main road
- 2 Entrance
- 3 Gardening area
- 4 Seating area
- 5 Bicycle parking
- 6 Football field
- 7 Sandy ground
- 8 Asphalt ground
- 9 Existing elements
- 10 Grass ground, no activities
- 11 Empty space
- Residential blocks



0 10 20 50



Sandy ground with few playing elements



Asphalte ground with table tennis



Empty green area, asphalt ground from another view



Unuse empty asphalt ground

## Site observations

Before initiating the design intervention, it is essential to reflect on the existing conditions of the playground in relation to its users, surroundings, and spatial dynamics. The site, located in close proximity to Fjällskolan in Masthugget, is part of a daily route and a social intersection point within the neighborhood.

A main pedestrian and car pathway connects the school directly to the playground, making it a transitional space for students during the morning hours. This pathway shapes the playground as a passage that frames routines and daily movement. Entrance is easily accessible, and there is also a designated bicycle parking area adjacent to it.

There is a small gardening and seating area located at one edge of the playground, but it is currently underutilized and disconnected from the flow of activities. While it holds potential, it lacks spatial or functional qualities that encourage use or interaction and this area stands out as a space in need of reactivation.

The football field is clearly the heart of the playground. It is the most used space, drawing children throughout the day. From early morning until late evening, the field serves as a constant point of activity used by local children, and even youth groups informally.

Within the site, the material palette is primarily composed of sand with occasional patches of grass, creating a neutral yet open-ended environment.

## Activities observations

play elements such as swings and slides already exist on-site and are actively used, especially after school time. These elements will be preserved and integrated into the design proposal due to their familiarity and existing engagement.

During school hours, particularly before noon, the playground serves a different group, elderly residents and passersby, who often use it for rest or as a walking route. Sometimes, kindergarten groups or school classes conduct outdoor activities here, yet these uses remain limited in scope and frequency.

In the afternoon, especially after school ends, the playground becomes more vibrant, again mostly centered around the football field. However, apart from that, the space offers little to no engaging features for families or mixed-age groups, which leads to a noticeable

decline in activity during the late afternoon and evening hours. The lack of diverse, inclusive features means the space does not yet support broader community engagement.

Below the time-user activity pattern shows when and how different groups interact with the space, it becomes evident that the playground is mostly used by children and students. Certain periods, like mid-mornings and late afternoons, reveal significant drops in activity. This uneven use highlights both the strengths and gaps of the current setup. While the football field successfully keeps continuous activity, other areas remain dormant and disconnected from the social fabric of the neighborhood. This understanding becomes a crucial design to not only show opportunities for activating underused zones, but also supports the creation of a more inclusive and dynamic space that responds to the diverse needs.

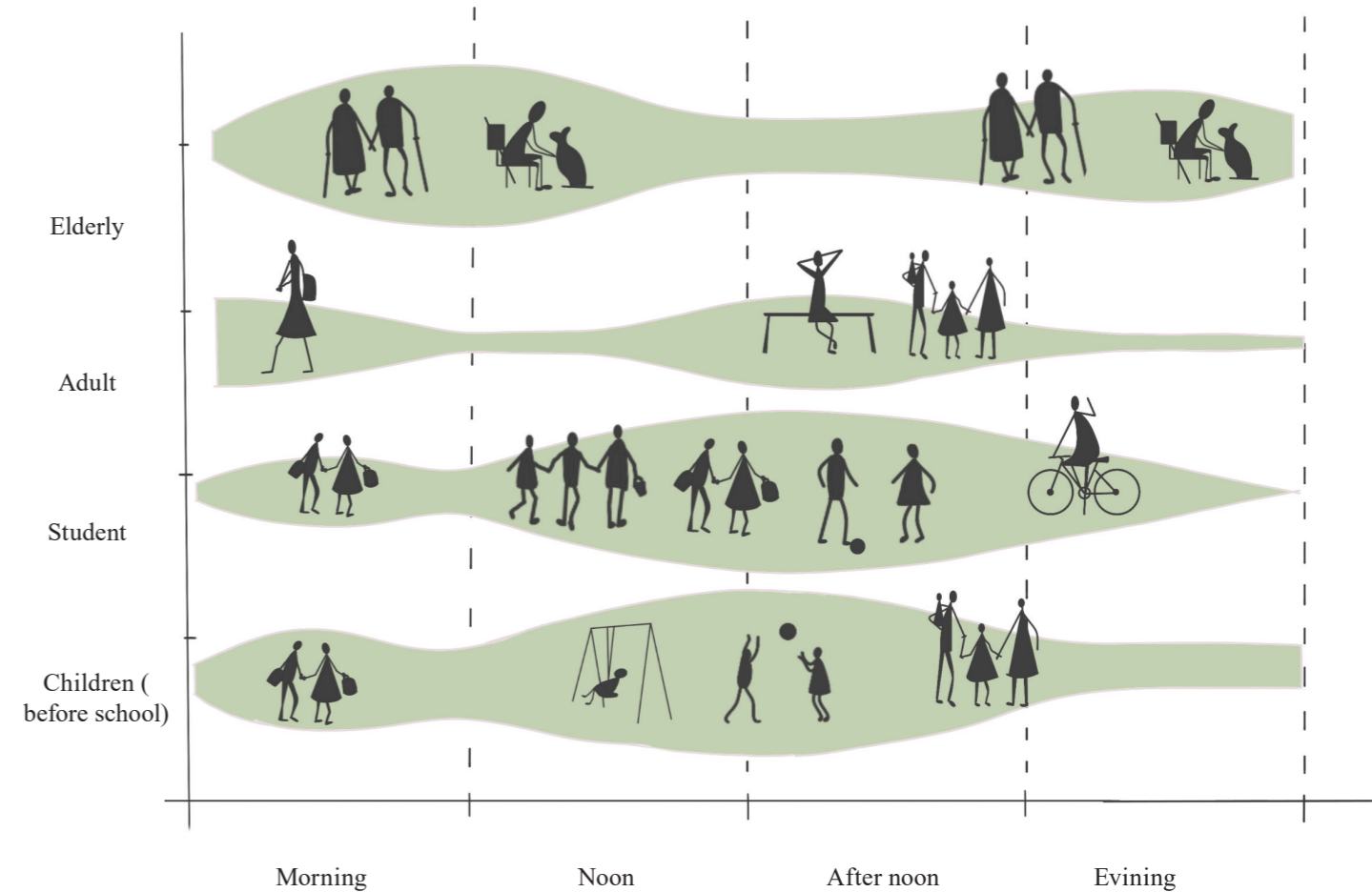
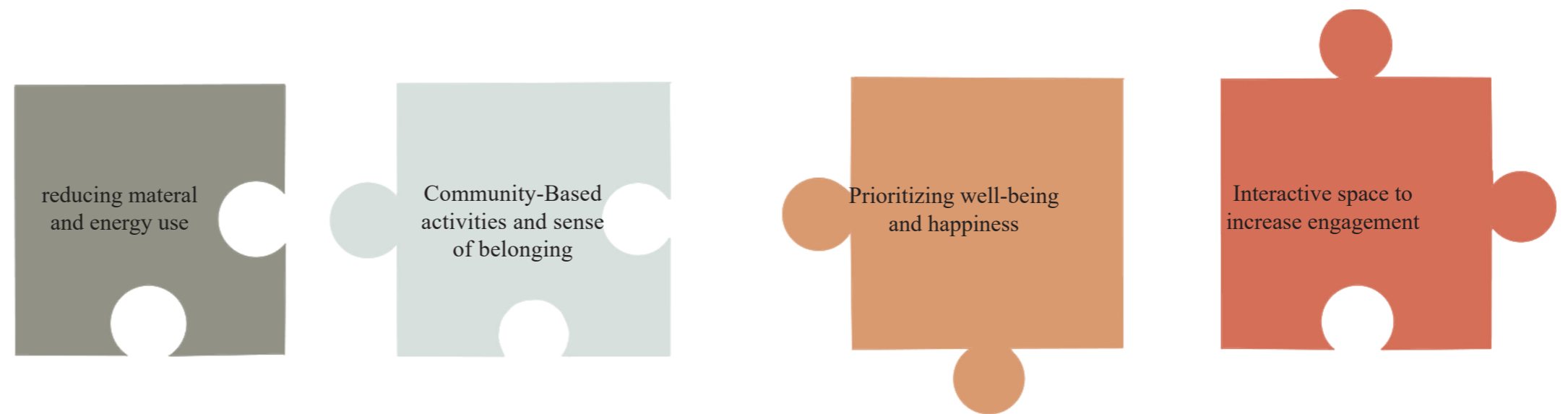


Fig.7. 2 Time- user activity pattern in the playground on weekdays

## Design principle based on the outcome of literature studies and workshops

four core principles that emerged through the methodological process of this thesis, specially the participatory workshops and site observation. These principles reflect both the children's ideas and the values of sufficiency, understood here not as a limitation, but as a way of rethinking what is enough, and how we can live and play well within limits. So, the focus is on using what is already there more meaningfully. The playground becomes a platform where children can experience sufficiency through their different activities.



### 1. Reducing material and energy use

This principle addresses the environmental side of sufficiency, aiming to reduce the unnecessary materials and footprint of extra materials of the playground by carefully considering the resources involved. It is divided into three main strategies:

- **Old Structure:** Wherever possible, existing elements and spatial structures are preserved and re-integrated. This includes swings, slides, or boundary features that still function and hold value for children.
- **Natural Material:** Using natural, low-processed materials like wood, stone, or sand supports both environmental goals and sensory experiences for children. These materials offer variation and allow for open-ended play.
- **Reuse Material:** Reused or repurposed elements, from furniture to small-scale play features, extend the lifecycle of materials and invite creativity. This also makes the material story part of the learning experience.

These strategies are not just about reducing impact but about inviting children to see value in things that already exist, and to engage with resources in a more thoughtful way.

### 2. Community-Based activities and sense of belonging

Sufficiency is not just individual, it is social. This principle supports the idea that shared activities and relationships build a stronger, more resilient connection to place. Through activities that involve cooperation, maintenance, and storytelling, children experience their role within a larger community. This includes:

- Gardening and care for shared spaces
- Informal gathering areas that support intergenerational use
- Seasonal or small-scale workshops involving neighbors or school

These are simple actions, but they help to build a playground that is more than just a site for play, it becomes a shared, lived space that grows with the people who use it.

### 3. Prioritizing well-being and happiness

These principal challenges conventional ideas of progress and consumption by asking what a “good life” might look like, especially for children. Instead of more features or advanced technology, it focuses on activities that support joy, curiosity, and rest. Children in the workshops often attracted toward simple but engaging ideas, playing together, painting, growing plants, or just having space to be. Designing for well-being means:

- Different zones for different activities
- Supporting different rhythms of use across the day.
- Offering play that is open-ended and not overly structured.

In this way, sufficiency becomes something felt, not taught, through the mood and rhythm of space.

### 4. Interactive space to increase engagement

Finally, interaction plays a key role in making sufficiency visible and engaging. This principle focuses more directly on the physical design aspects, how form, color, and spatial layout can encourage children to explore, question, and adapt to their environment. this includes:

- Using bold shapes or colors to spark interest
- Creating surfaces for drawing, painting, or co-creation
- Designing modular or flexible elements that can be changed or rearranged

Rather than prescribing how a space should be used, this approach leaves space for interpretation. It supports learning by doing, and encourages children to test, imagine, and take ownership of their surroundings.

Together, these four principles create a foundation for designing a playground where sufficiency is not only present as a concept but can be experienced through everyday actions. They are not abstract ideas, they come directly from the process of working with children, and they support the aim of this thesis: to understand sufficiency through lived experience, reflection, and play.

## Grouping activities

Taking the outcomes of the workshops into account, along with the core principles of sufficiency, the redesigned playground is divided into five main activity groups. These zones are developed to reflect children's ideas, promote hands-on exploration, and encourage thoughtful use of materials and space. Each group serves a different type of engagement, aiming to support diverse users and learning experiences throughout the day.

### 1. Care-Natural zone

Located near the existing but underused gardening space, this zone is reimagined to invite children into slower, more reflective interactions with nature. It supports the idea of care, cycles, and observation, key values in sufficiency thinking.

- Gardening boxes for herbs and vegetables
- Sensory path made of mixed textures like wood, gravel, and sand to visualize the scene of nature
- Small stations with natural materials to play with

### 2. Existing Play Elements

Children strongly expressed attachment to existing swings and slides during the workshops. These elements are kept and slightly adjusted to support familiarity and comfort, while keeping existing elements is the most sufficient action.

- Swings, slide, and climbing structures
- Sandbox area for imaginative group play

### 3. Gather & Rest zone

This zone offers a calm pause point within the playground. It supports informal interactions between children, teachers, parents, and elderly visitors. By creating space to sit, observe, or talk, it encourages slower rhythms and connection.

It is attached to existing seating spot in playground. Simple, circular seating arrangements using natural or reused materials.

- A shared table or bench setup for rest, drawing, or board games
- Flexible use: lunch break, storytelling, or small group reflection

### 4. Move & Imagine zone

A simple, low-tech intervention that brings life to unused surface areas. Painted games support active thinking, group play, and spontaneous interaction, while requiring minimal material input.

- Games like tic-tac-toe, hopscotch, maze paths painted on the ground
- Room for children to invent new rules and change how the space is used

### 5. Make & Repair zone

This space builds a bridge between the playground and the school, as well as the wider neighborhood. It invites learning through doing, an approach that aligns closely with both sufficiency and experiential learning.

- Outdoor worktable for seasonal or creative activities
- Space for crafts, repair, reuse projects or collaborative challenges

Dividing the playground in this way allows for different forms of learning, movement, and interaction to coexist. Each zone brings a new way to engage with sufficiency, sometimes through care, sometimes through play, sometimes just by noticing and being present. It's not about adding more but making better use of what already exists and what can be reimagined through children's eyes.

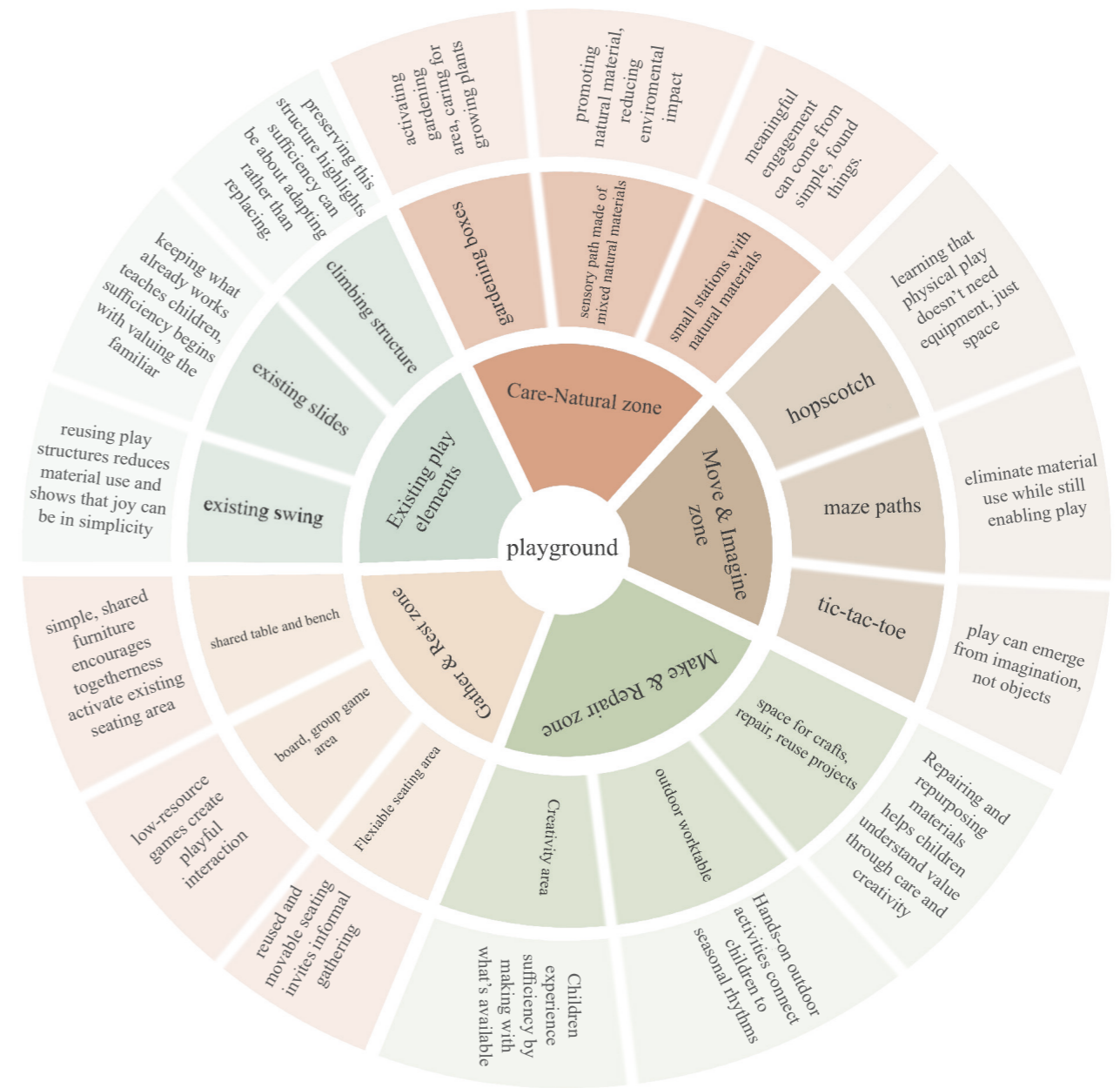


Fig.7.3 activity- zoning diagram

# Transformed playground

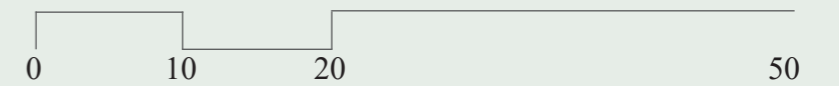


1 Care-Natural Zone

3 Move & ImagineZone

2 Gather & Rest zone

4 Make & Repair zone



The **design strategy collages** developed for this thesis are playful and conceptual tools that reflect the children's ideas, combined with sufficiency principles. Each collage visualizes a different zone of the playground and represents the feeling, values, and types of activities proposed for that area. By working with collage, it became easier to translate abstract principles like using less or sharing into spatial ideas and material choices. Key words and moods are used to describe each zone and connect them to specific sufficiency principles.

### Care-Natural Zone



**Key sufficiency aspect:** functional upcycling- natural materials - circularity and care - no new extraction - no need for electricity - plant care awareness

**Theme of the first zone:** nature based - texture discovery- eco play- interactive freedom

### Gather & Rest Zone



**Key sufficiency aspect:** using upcycled components - no new infrastructure - no power- no new furniture - community based activities

**Theme of the second zone:** informal outdoor learning - playful resting - movable elements - social and spirited vibe

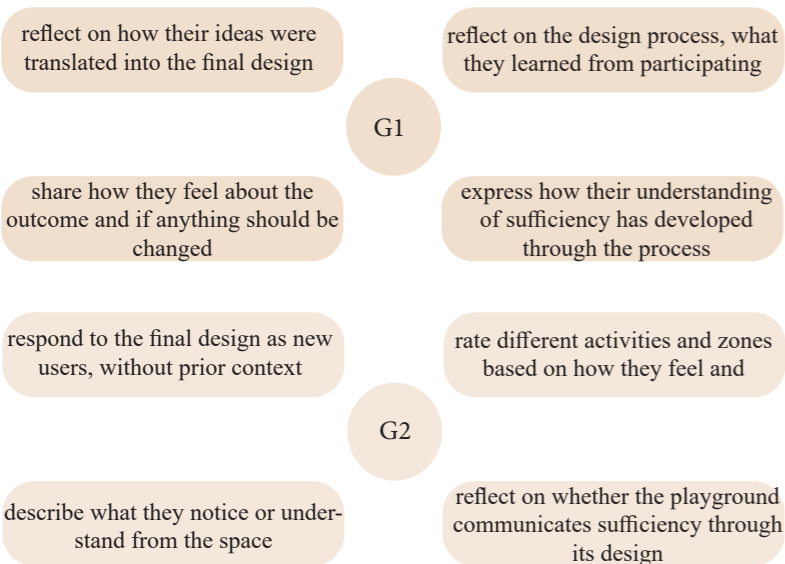


## Reflection workshop

This third and final workshop was developed as a reflection point, both on the design process that was in the form of participatory design and the outcome. The aim was to bring back the students who had participated in the previous workshops and give them the chance to see and respond to the final design. At the same time, a second group of students, who had not been part of the participatory process, were introduced to the same design for the first time. This allowed for a comparison between process and outcome whether sufficiency is something that children understand through designing, or if it can also be learned just by playing in the space.

The reflection workshop was divided into two sessions, each with a different group. The two groups were asked different sets of questions, and participated in different ways, but the overall goal was the same, to understand if the playground can support if sufficiency can become part of how children relate to the space, even after the design process ends.

### Aim and objective



Overall, aim is to explore whether the learning process continues beyond the workshops. Can children still engage with the ideas of sufficiency through the playground itself? Is it the participatory process that carries the most learning, or can the space alone support that experience for others?

## Outcome

The 1st group, children who had taken part in the earlier workshops, responded with a clear sense of connection to the final design. Many of them recognized specific ideas that originated from their contributions. Their reflections showed a strong sense of familiarity and ownership. For them, the workshop was not just about seeing a finished design but about recognizing their own role in shaping it. Several expressed that this made the space feel more personal and meaningful.

Their responses also reflected a deeper understanding of sufficiency. They talked about reuse, and creating value through shared ideas and collaboration. These were not terms introduced during the reflection session, they were ideas that had been built naturally through participation. The design process had given them a space to think, test, and imagine differently. They reflected on how they now notice everyday things in new ways, or how they understood that not everything needs to be new to be meaningful or fun.

The 2nd group, who had not been part of the previous workshops, responded to the playground design from a different perspective. Their initial impressions were shaped by observation and interpretation. Without knowing the background, they still described the playground open, and natural and unusual. They were drawn to the painted games, the mix of materials, and workshop. After a brief introduction to the concept of sufficiency, their responses shifted. They began to connect parts of the design to ideas like reuse, shared use, or care.

Even though they hadn't contributed to the design, their responses showed curiosity and an openness to interpreting what the space was trying to communicate. Their reactions highlighted the potential of the playground to speak through its form, materials, and atmosphere, without needing to explain itself too directly.

## Organization and Tools

### Group 1

This session was organized as a feedback session with the same students from workshops 1 and 2. They were shown the finalized playground layout, with visuals for each zone and activity group. Tools included printed maps of the new design, cards with open-ended reflection prompts, and sticky notes where students could write their ideas. They were asked to respond freely and talk about how the space felt now that their ideas had been shaped into something real.

### Group 2

The second group, made up of new students from the same school, interacted with the design through visual materials, without any explanation at first. They were asked to describe their first impressions, name what they thought each zone was for, and choose a word that came to mind when they looked at the playground. After this, a short explanation of the concept of sufficiency was given, and the same questions were asked again. Each student also rated the activities using a sticker scale to indicate interest and relevance.

Regarding how they engaged and participated, the first group engaged very personally with the design. They were proud, curious, and reflective on their idea and how it became part of something bigger. Some pointed out specific ideas they had shared in the earlier workshops. Others spoke more about the process itself, what it felt like to be involved, to be listened to, and to see their thoughts become real.

The second group interacted in a different way. They were focused on what the design looked like and how they imagined it would be used. Their understanding shifted a bit after hearing about sufficiency, suddenly, materials and functions had more meaning.

## Comparison and Reflections

The responses from both groups show that the playground works on two levels. For the children who participated in the workshops, the space holds more than just activity, it holds meaning, memory, and a feeling of ownership. Their reflections weren't only about the zones, but also about what the process taught them. Words like "care," "decision," and "enough" appeared naturally in their responses, showing that sufficiency had become a familiar concept to them and a way of thinking and acting that feels reachable. For them, the design is not separate from the learning, it's part of a longer process they lived through.

For the second group, the experience was different, but still valuable, they responded more to the overall feeling of the space. Several described it as "slower," "calmer," the word "different" came up so much. When asked what they meant, they explained it looked and felt unlike the playgrounds they usually see "cool," "fun,". After being introduced to the idea of sufficiency, and understanding the design principles behind the playground, many of them were able to connect parts of the space to those values. This suggests that even without being part of the design process, the playground still has the ability to communicate its purpose and open new ways of thinking about play, materials, and space.

It reveals that perhaps some explanation is needed for new users. While children can engage with the space naturally, once they understand the values behind it, their experience becomes more reflective and layered. They begin to notice details, question choices, and see the playground as something to think with.

What becomes clear is, the participatory process adds depth. Children learn more when they are part of shaping their environment. But at the same time, the design itself also carries meaning. It creates an opportunity for others to enter, explore, and begin their own learning.



# The end or just a new beginning?

## **Discussing and conclusion**

- reflection ( third workshop) with children
- discussion

## Research Questions

This part goes back to the research questions that guided the beginning of the thesis. By looking at the full process it is now possible to respond to those questions with that grounded in what was actually done.

### Main research question:

*How can an existing playground be transformed to support children's learning of sufficiency?*

This thesis shows that a playground can be transformed into a learning environment for sufficiency when both the design process and the final design are guided by sufficiency principles. In this case, the transformation didn't start from scratch it started by involving children as co-designers. Through participatory workshops, they didn't just share opinions, they actively shaped what activities should exist in the playground based on sufficiency principles and their interests.

The activities themselves were designed with sufficiency principles in mind. They used low-impact material elements, reused or natural resources, and encouraged children to be creative and active without needing more. This helped the design remind them that happiness and well-being can be achieved through simplicity, shared experiences, and meaningful engagement. It became clear that learning doesn't have to be formal, it can be part of everyday play, if the space is built in the right way. The design offers flexible, open-ended zones where children can discover and reflect on these ideas over time.

Importantly, the playground is not the final point of learning. It becomes a space where learning can continue, especially through the school's outdoor activities. Teachers can use the workshop zones, the garden, or the shared areas as extensions of the classroom. This way, sufficiency becomes part of the children's rhythm, not something separate or abstract.

### Sub-questions

*What are sufficiency principles?*

As result of literature studies sufficiency principles are values that guide how we can use less and still live well. They are not about restriction they're about redefining what a good life means.

The principles applied here included:

- Reducing material and energy use: pushes for a real reduction in material and energy use, this means choosing to use less, rather than just finding "W" ways to consume the same amount.
- Upper Limits and Lower Thresholds: Sufficiency is about staying within the planet's resource boundaries while ensuring that basic needs met for all. It's about finding the balance between not taking too much and ensuring no one has too little.
- Focusing on well-being and happiness: Instead of measuring happiness through material wealth, it focusses on community, engagement, and experiences as key to well-being. This challenges the idea that more material possessions equal a better life.
- Community-based activities and a sense of belonging: Sufficiency is not just an individual mindset it's a collective responsibility, it's about encouraging cooperation, care, and shared ownership.

These principles shaped both the design and the process from early ideas in the workshops to the spatial layout of the final proposal. (Based on Persson & Klintman, 2022; further conceptualized in Persson, 2022).

*What design strategies align with sufficiency?*

The design strategies in this thesis are directly based on the sufficiency principles and what children

created during the second participatory workshop. These principles were explained to them in simple terms, and then they used them as a guide to develop their own activity ideas. What they designed was thoughtful and clear, and it helped to shape the final design in a way that stays close to the values of sufficiency.

The first principle of design was about material and energy use which addresses the environmental side of sufficiency. The strategy here was to keep what already exists, like the swings and slides, instead of removing and replacing them. These familiar elements are already in use and valued by children, so preserving them avoids waste. Then, children proposed using natural materials like sand, wood, and stone, things that are simple and already present in their environment. They also supported the idea of reusing materials, like tires or old boxes, to build new games or seating. These choices didn't come from being told what to do, they came from the children, who naturally saw how things could be done in a simpler way.

The second principle was community-based activities and gathering. This was reflected in design strategies that support shared use of space. Children suggested ideas like a gardening area, places to sit together, or spaces where students, teachers, or even families could do things together. These are small actions, but they change the feeling of the playground. It becomes a place where children are not just playing they are taking care of things and working together.

The third principle was prioritizing well-being and happiness, not through advanced technology or flashy features, but by creating moments of rest, joy, and curiosity. Children showed in the workshop that they were more excited by painting games, group play, or growing something. Their ideas reflected that happiness is not about quantity, it's about meaning. The strategies here were to create different zones that support different types of play, some fast

and active, others slower or reflective. It also meant designing the playground to work through different times of the day, giving space for everyone.

The last design principle was about Interactive space to increase engagement. This focused more on design aspects like shape and flexibility. Children imagined surfaces to draw on, areas that could be rearranged. These were ways to make sufficiency visible and fun, without needing extra materials. The strategy here was not to fix how every space should be used, but to create open-ended elements that invite exploration and creativity.

All these strategies were not just chosen from theory. They developed together with the children, through a process that let them shape the playground in a way that feels real, natural, and rooted in what sufficiency can mean for them.

*How can experiential learning be incorporated into playground design?*

Experiential learning became a core part of this thesis not just as theory, but in practice. From the beginning, the idea was to let children learn by doing, not by being told what sufficiency is. The workshops themselves became learning moments when children modeled ideas, they made decisions. When they reflected on their routines, they realized what they needed and what they didn't.

The second workshop especially showed this clearly. Children designed based on sufficiency principles and ended up with creative, thoughtful ideas that didn't rely on new things or expensive tools. They learned what sufficiency means by practicing it. And through this, I understood that the design process itself was as valuable as the final design.

In the end, the playground became a space that invites continued learning, where children can keep discovering sufficiency through how they use it but real learning started long before, through the participatory process itself.

## Future potential

While this project was rooted in a specific playground in Masthugget, the outcome is not limited to this place. What has emerged is more than just a site-specific proposal, it is a methodological framework, shaped through co-creation, that can now be seen as a design tool in itself.

This tool is not about replicating forms or copying solutions, but about offering a process: one that invites children to move from reflection to imagination, to creation, and finally to response. It creates a structure where sufficiency is not imposed but discovered, by engaging, building, testing, and caring.

What makes this process applicable in other contexts is its flexibility and grounding in everyday experiences. It adapts to different locations, communities, and cultural environments because it begins with listening, not prescribing. It starts from what already exists, and it grows from within the people who use the space.

This thesis shows that sufficiency principles can be translated into spatial strategies when children are included as co-creators, and when learning is seen as something that happens through experience, not just instruction. These strategies can be applied not only to playgrounds, but also to schoolyards, public parks, community gardens, any shared space where learning and living intersect.

Importantly, the design itself does not mark an endpoint. Since every step was done together with the children, the process is able to continue through implementation, for example through summer school programs, outdoor workshops, or classroom integration. This deepens children's sense of care and ownership, turning the playground into a living learning space.

Over time, the space could host community planting days, storytelling circles, repair cafés, and other shared rituals that connect people across age groups. The playground becomes not only a place to play, but a platform for sufficiency in practice.

Ultimately, the strength of this work lies in its

ability to grow beyond its site. What started as a local exploration can now serve as a model for participatory and sufficiency-based transformation, one that is adaptive, grounded, and deeply human.

## Limitation of this thesis's approaches

While this thesis aimed to keep each step relevant and clear, some limitations became evident along the way, one is the limited target group. The focus was on children aged 7–12, which gave meaningful results, but the playground is also used by other age groups whose experiences and needs were not deeply explored. Including them could have offered a broader design perspective.

Another limitation was the seasonal factor. Some activities may function differently in winter, affecting how the playground is experienced throughout the year.

These limitations are worth noting and point toward areas where future research can go further.

## Implementation and responsibility

This thesis offers a conceptual design framework rather than a finalized architectural proposal. However, it is grounded in a real context and envisions a transformation that could be implemented gradually and collaboratively.

The most appropriate way to realize the design is through shared responsibility. The City of Gothenburg, particularly departments involved in urban development, sustainability, and child-friendly public spaces, would likely serve as the main coordinators, providing permissions, funding opportunities, and technical support.

The school community, especially teachers, would be essential collaborators. Since the playground is already part of the children's daily rhythm, teachers can actively integrate the space into their learning activities. In parallel, the students themselves, who helped shape the design, can

remain involved during the implementation phase through outdoor workshops, seasonal activities, and school-based maintenance sessions.

This collaborative model encourages a sense of shared ownership. Parents, neighbors, and other local actors (such as cultural or environmental organizations) can be invited to join in small-scale activities, like reuse markets, repair cafés, or planting days, ensuring the space is cared for not just by one actor, but through a community-centered model of stewardship.

This also reflects the spirit of sufficiency: a playground maintained not through constant replacement or surveillance, but through trust, use, care, and repair. It's a shift from design as delivery to design as a living process.

## A final note from the author

This thesis started with a question that felt more like a personal curiosity. I was searching for something felt more grounded and that's how sufficiency came in. Not as a perfect answer, but as a mindset, a way of rethinking our habits, expectations, and how we raise the next generation to understand them.

Working with children was core of this work. Their perspective shaped every decision, outcome and even redefined the direction of the thesis more than once. At first, I expected to teach them sufficiency. But what happened through the workshops was something else. They taught me how simple, creative ideas can grow when children are trusted and given space to explore. They didn't need to learn sufficiency, they can live it joyfully through the way they designed and built stories around small ideas.

The playground became a shared ground between design and learning. The co-design process gave the space emotional depth. The idea was never to propose a perfect design but to show how space can become a platform for continuous learning, reflection, and community engagement. What makes the project

sufficient is not just the materials used but the fact that every part of the process was collaborative, and aware of limits and values at the same time.

Of course, there are challenges. Designing for sufficiency means working with limitations, often against the expectations of conventional public space design. It also raises the question, can sufficiency be learned just through play, or does most of the learning come from the process itself? That question remains open and maybe that's the point. The playground isn't a final answer. It's a tool for conversation, a starting point. The thesis doesn't aim to prove that we can fully redesign behavior through playgrounds. Instead, it offers a small, real example of how we can begin, a space where children don't need more things, but more opportunities to take part, create, and imagine "enough" as something joyful. That's what I hope this work offers, not just a design proposal but a shift in how we think about the everyday environments build for future generations.

*A playground built with less can offer more when it becomes a space where children shape, wonder, and belong.*



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# appendix

## Interviews

The interviews were conducted during the early stages of the thesis to support the research direction and provide insight from people who work closely with the topic. Two separate interviews were held, one with a representative from the Planning and Strategy department at the Gothenburg municipality, and another with two elementary school teachers one from third and one from fifth grade.

First interviews were done online using video calls and the second one was in person, both lasted around 30 minutes. During the interviews, the conversation

Below is the full list of questions used in both interviews.

Municipality representative

What are the main factors contributing to high energy consumption in Gothenburg?

What strategies are currently in place to reduce energy consumption in the city?

To what extent does the municipality focus on technological efficiency and sufficiency?

Has the municipality considered using urban design to influence energy sensitive habits?

Are there any plans to study behavioral aspects of high consumption, or is the focus mostly on efficiency measures?

Have you ever had any plan regarding this issue targeting children?

Do you see potential in using public spaces, such as playgrounds, as a learning tool?

Opportunities for Collaboration and Future Directions  
Would the municipality be interested in exploring new ways to integrate sufficiency principles into urban planning?

How could research like mine contribute to ongoing or future municipal sustainability initiatives?

Are there any challenges or limitations that might prevent the municipality from implementing behavioral-focused sustainability strategies

followed a semi-structured format meaning that while there were set questions, there was also space for open discussion and follow-up questions when something interesting came up. This helped keep the interviews flexible while still focused. Notes were taken manually throughout the conversations. No audio or video recordings were made, in order to keep the process informal and comfortable for participants.

The aim was not only to gather information, but also to create space for personal reflections, and allow the participants to speak freely from their own experience.

Elementary school teachers

How do children understand the concept of using less in their daily activities?

Do children consider the environmental impact of their choices, If so, in what ways?

Do you believe children are more likely to adopt sufficient behaviors?

How do children generally interact with playgrounds and public spaces?

Do children tend to value and take care of public space?

Have you seen children creatively repurpose materials or find alternative ways to play when playing tools are limited?

What role does play can have in children's learning at this age?

Are there any specific games, activities, you've seen that successfully encourage reflection on resources and consumption?

If a playground were to be designed for children to learn about sufficiency, what key elements or activities do you think should be included?

What types of learning experiences would be most effective in helping children understand new concepts?

## First workshop

The first workshop was held with three different classes from Fjällskolan, first grade, third grade, and fifth grade. The goal was not to teach children about sufficiency directly, but to observe how they already relate to the idea through their daily actions and decisions. It was meant as a formative step, both for the students and for myself, to better understand how children of different ages perceive material use, energy, and resourcefulness.

The workshop took place inside the school classrooms and lasted around 30 minutes for each group. Each session was led by me, with support from the teacher who was my translator in some points as well. All three sessions were held separately, on different days, to adapt the format slightly based on age and capacity of each group. Before starting, I briefly introduced myself and explained why I was there and what the activity would involve. I used simple, age-appropriate language, with no use of the word "sufficiency" in the beginning instead, I used examples like using only what we need or not always buying something new.

The materials provided included pre-cut images from magazines and Pinterest, glue sticks, large sheets of paper, markers, and some extra blank cards. The activity asked students to reflect on different moments in their everyday life going to school, playing, eating lunch, or spending time at home. Each student received a sheet divided into parts of the day and was invited to select or draw images that matched how they usually spend those times. After that, they were encouraged to think again and choose images or draw alternative ways to do the same thing with less stuff, less energy, less waste. I walked around and spoke to students during the activity, asking simple questions like "What made you choose this one?" or "Could this work in another way?"

The most important aspect was to let them be free in their expression. It was not about correct answers but about seeing how they think, what they prioritize, and what they value. At the end, we had a short group discussion to reflect on what they had created. I wrote down their comments and thoughts, and some students also shared their collages in front of the class.

## Example of oards that children made



## Second workshop

The second workshop was a continuation of the process, held with the same group of third- and fifth-grade children who participated in the first workshop. This time, the aim was to move beyond observation and reflection, and into active creation. The children were invited to become co-designers of the new playground based on the sufficiency principles I had prepared and simplified for them.

This workshop was conducted inside the school building, in a classroom setting arranged to support hands-on modeling. The session lasted approximately one hour, and the atmosphere was informal and collaborative. Before starting, I gave a short and simple explanation of what sufficiency means, using examples that are connected to their own experiences. I introduced the four principles I worked with: using less material and energy, supporting community activities, prioritizing well-being over materialism, and making space for creativity and interaction.

To make the workshop easier to follow, I prepared a printed board of the existing playground layout so they could see the space. I also created a small booklet that introduced the sufficiency principles with playful visuals and examples, such as “Use what’s already there,” “Create something together,” and “Have fun with less.”

Each student was then given different color dough, sticky note paper and marker. The instruction was

to create activities they would like to see in the playground. They could work in two groups of five, and they were encouraged to think about where this activity would be placed in the playground.

As they worked, I moved around, asked questions like “Why do you want to use wood here?” or “Can you do the same game with fewer materials?” helped steer them gently towards more thoughtful decisions, without limiting their creativity. What was most interesting was how naturally they adapted to the idea of “less is enough,” and how often they turned it into something playful.

Some students created activities that used reused tires, others designed quiet corners with bookshelves made from plastic boxes. There were group seating areas using leftover wood pieces, a game corner with painted games that don’t need any tools, and a repair-and-make station where you can build things from what you find. Almost all ideas respected the principles in some way not because they were told to, but because they began to internalize them through the act of creating.

At the end of the session, they presented their models and ideas to the class. I took notes, photos, and asked each group to give their activity a name and short explanation. This process helped them reflect on what they had done, and why it was meaningful.



## Third workshop

The third workshop marked the final phase of the participatory process and served a dual purpose: first, to bring the children back into the design conversation and give them a voice in responding to the proposed playground transformation; second, to allow the new group of students to encounter the design without prior knowledge of the process and offer a fresh perspective. The structure of this workshop was carefully planned to accommodate both groups with different levels of involvement and awareness.

The atmosphere of the workshop was thoughtful and calm, with students showing engagement and willingness to express opinions. Returning students demonstrated a strong sense of ownership, often recalling their own ideas from earlier sessions and noticing how they had evolved or been integrated. New students were especially focused during the observation phase, and their questions often revealed what was clearly communicated in the design and what was not.

Importantly, the children approached the workshop with a serious sense of responsibility. Many took time to consider their responses, especially when evaluating the sufficiency aspects. The use of physical collages and tactile maps made it easier for all students to connect with the material, especially for those less comfortable expressing themselves in writing.

### Participants and Setting

This workshop was held at the same school as the previous sessions, involving two distinct student groups from the same age range (7–12). The first group had already participated in previous workshops and were therefore familiar with the thesis goals and sufficiency principles. The second

group had not been involved before, making their feedback particularly valuable for testing whether the final design could communicate sufficiency principles independently.

The workshop was conducted indoors, using large-scale printed maps of the proposed playground, physical zone collages, and colored sticky notes as the main interactive tools. The environment was kept informal but focused, allowing children to move around, talk freely, and engage with the material in small groups.

### Workshop Structure and Materials

Each group followed a distinct approach: Group 1: Returning Students (Co-Design Participants) These students were invited to reflect on the final design by identifying what they liked, what could be improved, and what they felt was missing. To guide this, three colors of sticky notes were used:

Green : Things they liked and appreciated in the design

Yellow: Aspects they liked but wanted to improve or add ideas to

Orange: Things they disliked or felt were missing from the playground

This structure allowed students to express both affirmation and critique, in a way that was visually traceable and easy to analyze. The sticky notes were placed directly on the zones of the playground map, creating a collective layer of comments and insights.

Group 2: New Participants (Unfamiliar with Process) This group was first introduced to the playground design as a standalone project. They were encouraged

to observe and describe what they noticed by writing or drawing on purple sticky notes. This step tested how clearly the design communicated ideas of sufficiency, imagination, and care.

Then, the sufficiency principles were briefly introduced through storytelling and visual examples. Children were then asked to reflect on whether and how they could see these values present in the design. For this part, blue sticky notes were used for their comments and suggestions related to sufficiency.

### Role of Researcher

My role during the session was to facilitate without directing. I guided conversations when needed, but mostly observed and documented. I posed reflective questions to prompt deeper thinking such as:

“What does this zone make you feel like doing?”  
“Do you think this space takes care of nature?”

“If you made this part, what would you change?”  
These open questions allowed children to express values, needs, and priorities in their own language.

### Post-Workshop Analysis

All sticky notes were collected and photographed, and their content was transcribed and categorized into key themes such as: emotional response, sufficiency understanding, material preference, social use, and clarity of design. These insights were then used in the discussion and reflection chapters to evaluate the effectiveness of the design in communicating the intended values.

This final workshop was not only a closure of the participatory process—it was also an evaluation tool. It allowed the design to be tested not just aesthetically or functionally, but pedagogically: could it teach sufficiency without words? Could it provoke curiosity and care? These are the questions that shaped the session and ultimately helped anchor the thesis conclusions.

The combination of two groups—one with internal perspective, one external—proved to be especially effective. It helped validate the design from two angles: as a continuation of a process, and as an independent experience.



*A playground built with less can offer more when it becomes  
a space where children shape, wonder, and belong.*



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