

BOOKWORM

EMBODIED SCHOOL LIBRARY HACKING
WITH CHILDREN'S PARTICIPATION

Xinyi You

Child Culture Design
DEMCD 5 Master Degree Project
HDK-Valand Academy of Art and Design,
University of Gothenburg

June, 2020

ABSTRACT

School libraries are losing visitors since the design lacks children's participation. Children's involvement in decision-making has been an international calling, especially after the ratification of the UN Convention on the Rights of the Child (UNCRC) in Sweden in 2020. While in a traditional design process, where the design team makes most of the design decisions, this project investigates the question of how a designer could involve children and be informed by their ideas. Also, it explores the design of physical objects that can motivate children to read in the school library.

This project applied a bottom-up participatory design with children to tackle the problem. The goal of this project is to create a series of spatial products for the school library to enhance students' reading experience. This project has three phases: research-informed design, idea co-generation, and product development. Specific methods applied in the stages are situation mapping, design for co-design, arts-based workshop with children, qualitative analysis, real-life trial, 3D modeling, rendering, testing with scale models. The result of the project is the Bookworm - embodied library hacking objects. By re-defining the library reading experience with children, the Bookworm challenges the stereotypical image of school library furniture. The product carries values of physiology, cognition, and sociology. It presents a new ergonomic way to read in the students' favorite postures. At the same time, it offers another definition of library reading activities. Moreover, the potential for space modification changes the choreography between children and elements of the school library.

Keywords: Children's participatory design, Spatial product, School library, Leisure reading, Furniture, Embodied hacking, Child culture design

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INTRODUCTION

Libraries are losing young audiences. A study in Canada showed that young teenagers between twelve to fifteen years old from an eastern Canadian municipality express their positive feelings for their library. However, they do not use the library frequently (Howard, 2011). The same issue was spotted in the school library as well. A librarian at an international school in Gothenburg talked about her concern about the library. The library visits have been dropping since August 2019, when the school opened a new student center, where students can make noise, play board games, and buy snacks. The reason for the issue is complicated. According to the study in Canada, it includes the lack of attractive library facilities, websites, and the involvement of teenage users (Howard, 2011).

Child participation and consultation has raised awareness in society recently. Balagan, a children's space at Malmö City Library, is an independent area dedicated to children between nine to twelve years old. It is a result of the collaboration of designers and more than a hundred children. Besides, in the Guidelines for Library Services to Children aged 0-18, published by The International Federation of Library Associations and Institutions (IFLA), it is stated that when planning and designing new libraries, designers should consider users' participation (IFLA, 2018).

School libraries are still struggling to seek attention, while some library designs and guidelines have started involving children. An interview with a librarian at a public library revealed that the students in nearby schools had to use the public library instead of the one at school as the school overlooked the library. Besides, a school librarian has complained about how hard it was to get funds from the school board to upgrade the library furniture - these issues the school library is facing hinder students from spending time there.

To clarify: the term children are referring to people between 0-18 years old, according to the United Nations.

LITERARY REVIEW

This chapter contains four parts. The first part demonstrates the complexity of the issue around the school library and the necessity of motivating students to spend time in the school library. The second part introduces the concept of affinity space, as well as the requirements to design a physical affinity space. The third part concerns the idea of design-after-design in participatory design practice. In the end, by explaining the word 'hacking', the fourth part explores the approach to enhance students' reading experience in the school library.

A Place That Fosters Child Culture

The school library as a place where child culture and school culture both exist adds complexity to the issue of the student library losing its popularity.

After World War II, with the emergence of cheaper paperback books and more accessible alternative entertainment, libraries were less regarded as a source of knowledge and entertainment. As a result, both public libraries and school libraries started expanding services to attract visitors (Lerner, 2001). In a school library, students have more options in terms of book selection, internet access, and seating options. Unlike passively receiving information in a classroom, students now have more freedom to choose their activities. Therefore, the school library is potentially a place where children, as active makers of culture (Mouritsen, 2002), generate their own child culture.

However, currently, libraries in many schools are run by teachers since school libraries are part of the school system. School librarians think of themselves more as school teachers (Lerner, 2001). This phenomenon means that the school culture is highly present in school libraries, where a robust framework and library rules are regulating students' behavior.

Design a Physical Affinity Space

To cultivate children's culture in the library is mainly about building an affinity space. Affinity space, according to James Paul Gee, is a space to which people have an emotional attachment. It is an area that accommodates different degrees of engagement and various intentions. At the same time, it carries interest and contribution from its users (Gee, 2012). An affinity space can be virtual, like a computer game, or physical, like a classroom. Students today are more often exposed to affinity spaces. They might have experienced a more involving and intriguing way of intellectual development (Gee, 2012). In this case, if they do not feel affiliated with the school library, in the end, they might question the purpose of going there.

The nature of an affinity space defines its design. Gee concluded twelve main features of an affinity space, which include joint endeavor from the users, regardless of gender, race, cultural backgrounds (Gee, 2012). It implies that when designing an affinity space, co-design with users is crucial. In another article, Gee envisioned a new type of architect that contributes to face-to-face interaction in a physical affinity space. Designers should consider what attracts people, what is already available, and what is new. To realize this, the designer should encourage participation, interaction, making, and teaching (Gee, 2017).

Hacking - An approach for Design-after-Design

Participatory design originated in people's movements of their social, political, and civil rights, as people wanted more involvement in decision-making. The essence of participatory design is to ensure future users have a say in the design. Traditionally the design result delivery marks the end of a participatory design process. At the same time, more academic discussions take place regarding the aspect of design for the design in use, also known as design-after-design (Simonsen et al., 2011).

Researchers have been extending the contexts of participatory design over the years, from the territory of information technology to museum projects, urban planning. Also, designers have been attempting to include children in participatory design-after-design projects. In Taiwan, school children participated in a food market revitalization project, in which designers empowered children to explore the market and help to create a more child-friendly environment (Designsurfing, 2016).

This project uses 'hacking' in the design-after-design children's participatory process.

7 The act of hacking is a way of intervention that has two implications (Busch, 2008). Firstly, to be able to 'hack' means to acquire the skill needed no matter if it is to get around a computer firewall or to change existing furniture in the school library. Hacking is also about making changes within an existing system to optimize its productivity. To be specific, students as the users of the school library, they already know their needs. Hacking the school library entails students having the right mindset, which is design thinking, as well as basic concepts of product design. With tools like cardboards and wood sticks, students can configure their library environment and thus achieve the hacking.

During the collaboration with the International School of Gothenburg Region (ISGR), I conducted a series of hacking workshops, in which student participants learned to explore, criticize, and express their ideas for the school library furniture. The material produced by children later informed the design decisions.

To summarize, different from designing products without the involvement of the actual users, the project, instead, offers a bottom-up approach to the problem that the school library is losing young visitors. Students got the mindset and tools to conceive a new way of reading by designing and building their library furniture. They, as young hackers, questioned and challenged an existing system (the school library). Students were jointly developing a physical affinity space in the library throughout the hacking. In this way, they could be more attached to the school library than they were before. The spatial product developed takes care of children's ideas, which, in the end, becomes a symbol of the embodied hacking of the designer and the students.

RESEARCH QUESTIONS

As a result of the literary review, this study proposed two research questions as a compass for the design practice that leads to its final design result.

- How can a designer collect students' thoughts on the school library through a series of 'hacking' workshops and translate the ideas in a way that informs a spatial product design project?
- What kind of physical objects can be applied in a school library to improve students' reading experience?

METHOD DESCRIPTION

This chapter focuses on listing the specific tools and methods used in different phases of the project. Here, readers can find a brief description of the methods, when they are involved in the process, how this specific case applied the methods as well as the outcome. The chapter aims to visualize a possible toolkit for designers who intend to involve children in their design process. The next section will explain how this project evolved and further elaborate on some of the tools described below.

At the the end of this chapter is an illustrated method overview showing the different methods used at each stage

interviews with potential stakeholders

At the beginning of the research, Interviews with potential stakeholders can provide a quick overview of the situation and problems. Later the designer will be able to decide a future site to work. In this case, I interviewed librarians from both public and school libraries. The interviews were structured around young visitors and particularly on their behaviors in the library.

on-site observation

On-site observation is another approach to gain another perspective of the situation. Together with the interview, the designer can get a holistic view. The method also includes doing small experiments in the place.

During the observation, I paid attention to the following aspects:

- *Which are the most and least visited reading area?*
- *How do children interact with the spatial arrangement in the school library?*
- *In what ways are children using school library furniture? Are they different from its designated use?*
- *Are there behavioral differences between children of different age groups?*

Besides, I rearranged several least visited areas of the library. The new spatial pattern had an evident influence on children's seating choices.

situation mapping

Situation mapping is an ideal tool to summarize and visualize information gathered in the methods as mentioned earlier. In this case, it mapped out the choreography in the space, for example the way children were interacting with their classmates as well as the spatial arrangement.

design for co-design

Co-design workshop with children plays a primary role in the second phase of design. The main goal of the co-design workshop, in this case, is to create an environment for children in which they can express and realize their ideas. The design of workshops with children in a school entails having constant dialogues with teachers to know what works better with the students.

Since this project established a partnership with the Guldheden campus of ISGR, I had an opportunity to host a two-week furniture design workshop for 65 students aged 10-12. That required a straightforward timeline and clearly-listed tasks. Therefore, I designed a workshop handbook for every student participant.

workshop series with children

I planned a series of workshops to co-design with children. The role of the designer during the process is not only supervising the workshop process but also keeping an ongoing conversation concerning the topic.

To understand children's opinions on their school library and their reading habits, I invited them to choose a piece of school furniture, improve the piece's form and function by re-designing or changing the current design. The workshop was broken down into a series of activities to assist students' first design journey. The activities include analysis, design, construct, photo shooting, making exhibition boards, and writing. Since students were working in pairs, throughout the process, I kept a constant dialogue with children to get more specific and individual responses on the topic.

qualitative analysis

The qualitative analysis approach is for reviewing children's ideas. This method makes sure that children's participation is not tokenism (Hart, 1992). Furthermore, the result collected can be informative for future design practice.

In this case, since the material that needed to be analyzed was nineteen

Subject (the piece of furniture that students choose to design)

Attributes (additional functions students add to the current subject)

Feelings (that students want to have in the library or through the design)

Actions (that students would like to do with their design)

Critiques (about the school library or the chosen furniture)

Categorizing words from students' writings in the five entries provides an overview of students' thoughts. Within each category, I abstracted a few keywords that appeared most often to understand what were the most wanted in the school library from the children.

Phase 3: Design Development

real-life trial

Designing big scale furniture in 3D modeling software hardly offers the designer a straightforward feeling of the real size. A real-life trial requests the designer to sketch out the actual size of the piece of furniture to make sure it is the right size. Also, in this case, it is a tool for me to test the most comfortable angle for a tilted seating surface for children in a situation where access to resources was limited.

3D modeling and rendering

Using 3D modeling software gives a direct image of the objects. With the help of rendering, people can see how the objects look like when put in the context.

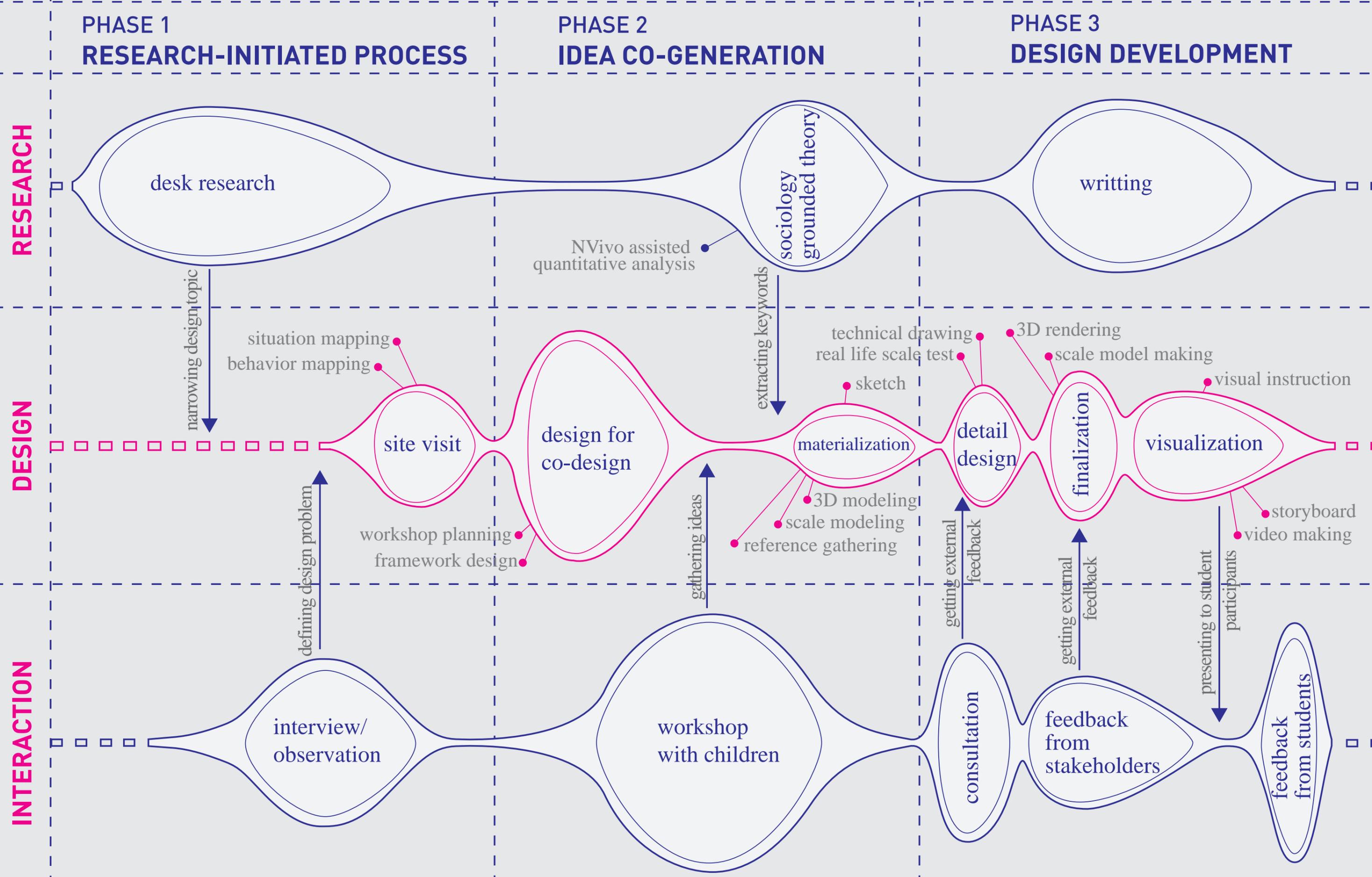
Since I was not able to build prototypes over the time of the design process, the development of the objects was heavily dependent on the 3D models and renders.

testing with scale models

Testing details on a scale model makes sure if the technical aspects of the objects are working. In this case, I applied fabric and foam on the scale models to testify the manufacturing techniques.

METHOD OVERVIEW

● design tool
 → interaction between processes



PROCESS DOCUMENTATION

As mentioned in the literary review, the project is my attempt to answer the following research questions:

- How can a designer collect students' thoughts on the school library through a series of 'hacking' workshops and translate the ideas in a way that informs a spatial product design project?
- What kind of physical objects can be applied in a school library to improve students' reading experience?

This part demonstrates how this design project evolved in the course of the questions. It contains two central bodies: the project process and the result. The first session explains in detail how the three phases mentioned in the last chapter developed. Some particular design methods will be described in detail.

The first phase illustrated an overview of the complicated relationship in the school library. The specific tools used in this phase included interviews, on-site observations, situation mapping.

The primary interaction between students and the school library is the weekly compulsory library class. The 45-minute class starts typically with a 15 minutes group reading session. Then students are allowed to borrow books and read quietly in the library. At the beginning of the project, I spent a few weeks in the library classes to get to know the children, observe their behavior patterns as well as to get insights from the librarians.



Figure 1: Group reading area at ISGR school library (Guldheden campus)



Figure 2: ISGR school library (Guldheden campus)

SITUATION MAPPING

17 Through the on-site observations, I saw children using the library furniture in different ways from its designated usage. Also, I noticed that children prefer to read silently in a group than reading far away from the others. A short interview with one student also testified the point. Another way to prove the findings was to rearrange the current setting in the library. For example, to check if students prefer reading corners, I created a corner beside the least visited reading desk, which after the intervention, became one of the most popular places for students' leisure reading.

The result of this phase was an overall situation mapping (see Figure 3-4) that visualized the existing information about the site. I mapped out different reading postures, the physical environment of the library, as well as scenarios of the library class.

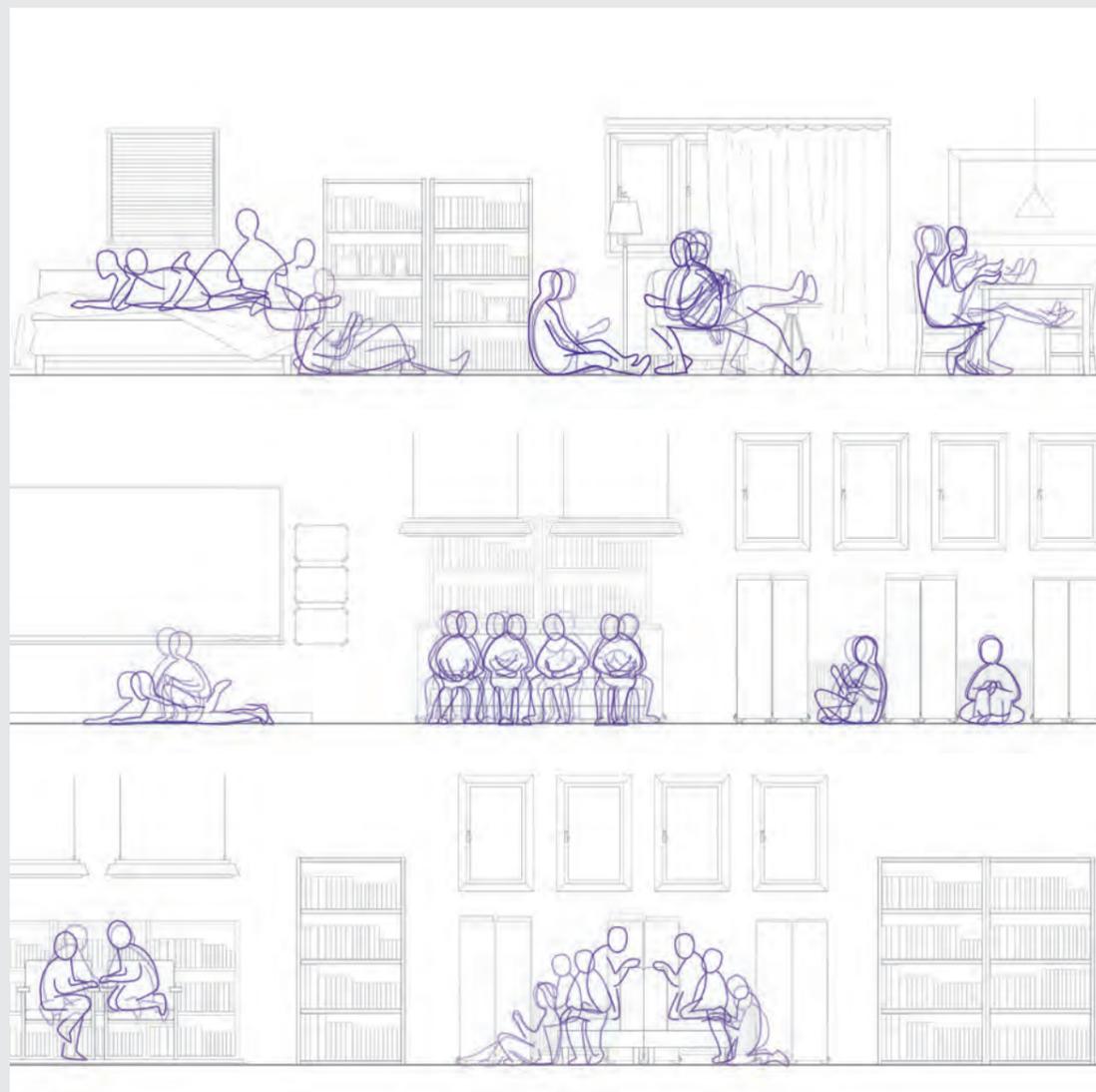


Figure 3: Home-reading and library-reading postures

CATEGORY

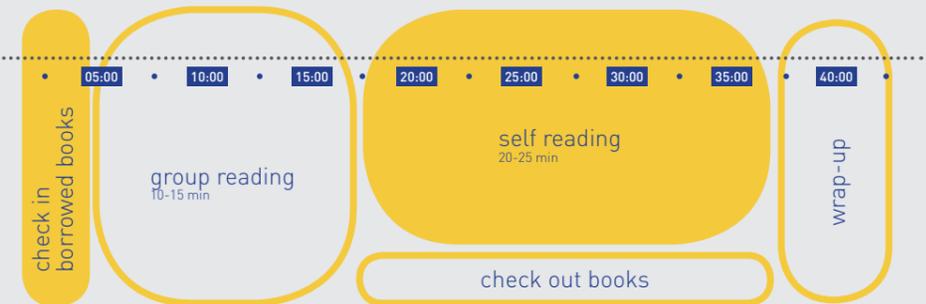
SCENARIO 1

- activity initiated by the teacher
- activity initiated by students



SCENARIO 2

- activity initiated by the teacher
- activity initiated by students



SPACE LAYOUT

- function
- ▲ entrance
- reading area

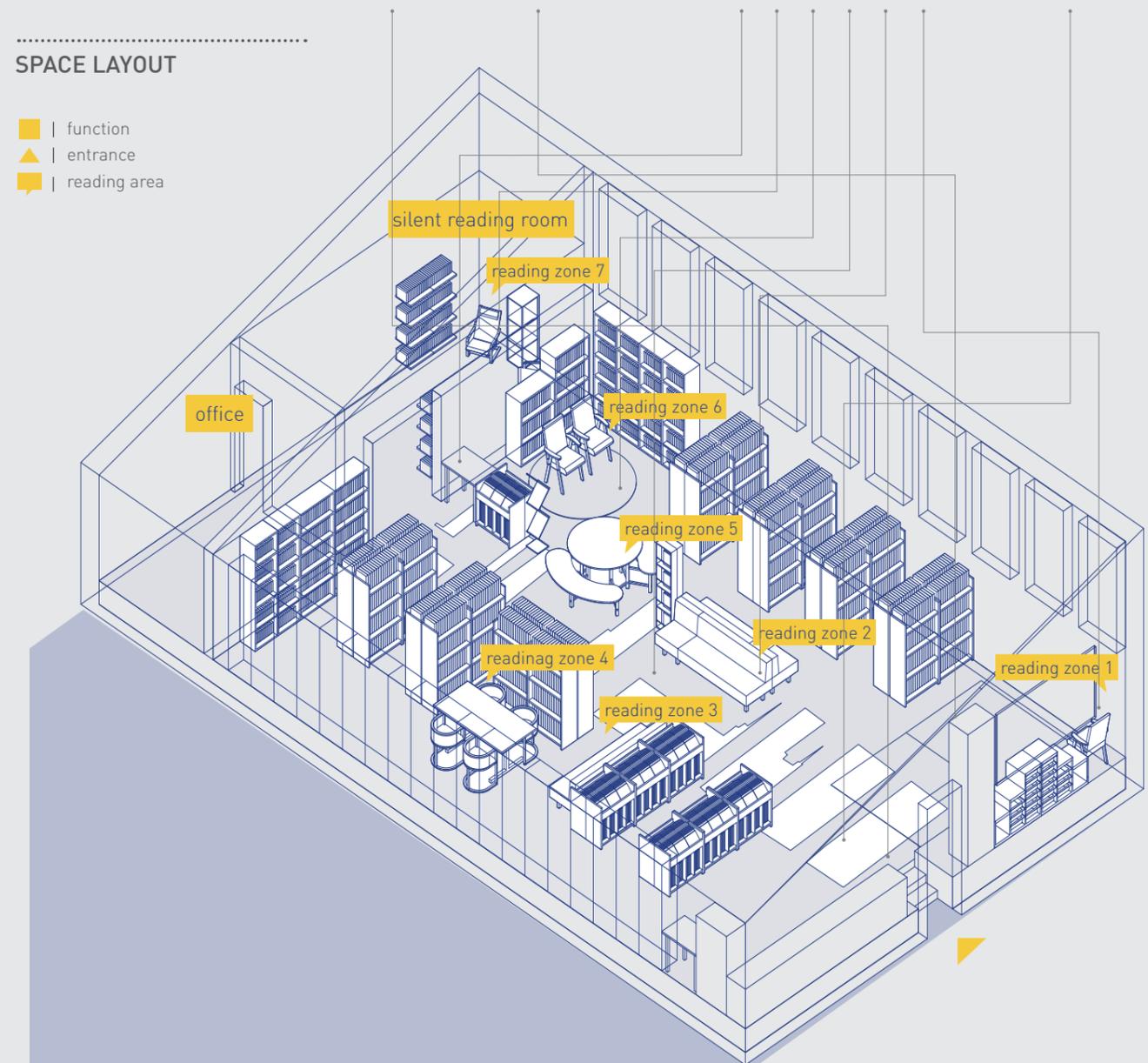


Figure 4: Situation mapping

19 Phase 2: Idea Co-Generation

The second phase is a children's participatory design process to get children's ideas on school library furniture.

Communicating with teachers is crucial in a school context. Together with teachers at ISGR, I arranged a two-week school furniture hacking workshop for Year-5 children as the second half of an ongoing design course. The teachers brought up the importance of creating a structure that stated each step and timeline of the project to help students stay on track (see Figure 5). Therefore, I designed a workshop handbook for children.

At the beginning of the design course, students acquired the ideas of form and function. The workshop began with introducing children to the concept of design context. Later, they brainstormed ideas that could improve the structure and function of a piece of furniture in the school. The children then designed and built real-life scale mockups with wood sticks and cardboards for an exhibition at the end of the workshop. After the workshop, the materials collected from the workshops were pictures of the mockups, and students' written content justifying their ideas.

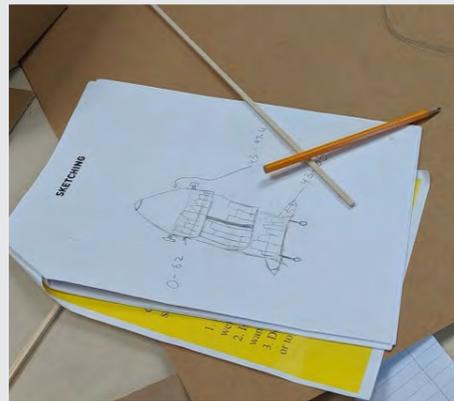


Figure 6: Students' Sketch



Figure 7: Building with cardboards



Figure 8: Exhibition in the school

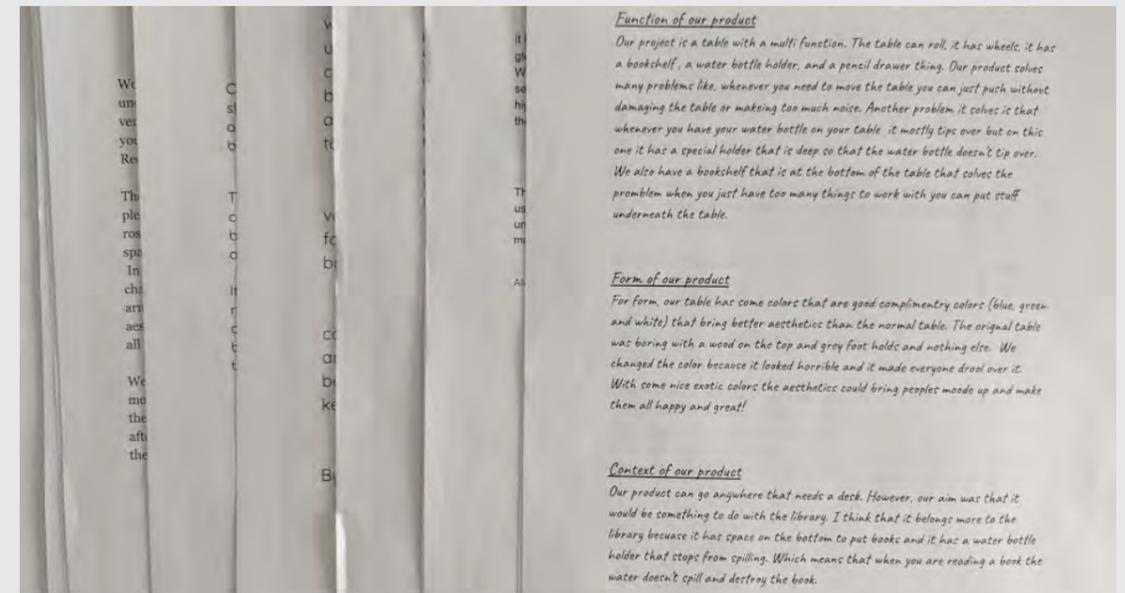


Figure 9: Written material collected from students



Figure 5: Workshop timeline

21 I established five entries (subjects, attributes, feelings, actions, and critiques) to categorize keywords from students' written material. The result showed that children liked to read while having their belongings around so that they do not need to get up often. It also showed that calm and joyful are the two main feelings that students usually associate with the school library. Regarding reading postures, curling up and lying down were the most mentioned.

Moreover, I gathered and analyzed three existing design references that relate to students' preferences (see Figure 10). They are Playscape by Mikiya Kobayashi, MQ seatings, as well as the Ekstorm Lounge Chair.

In the end, by analyzing children's participatory workshop results and gathering references, I summarized a list of design requirements for the product. The ideal product outcome should be something modular so that it can be put together to modify the space. The shape of it indicates various ways of usage. Meanwhile, the choice of color and fabrication should imply the feeling of calm and joy.

I started sketching according to the design requirements (see Figure 11). Through the process, the idea of single-stroke tubular shape showed the most potential in the course of the design requirements, for example, it has the potential to construct; the simplicity carries the vagueness of its usage. Therefore, I decided to develop the tubular-shaped product in the third phase.



Figure 10: Existing design



Figure 11: The evolution of the design idea

Phase 3: Design Development

The third phase is the project development iteration. It consists of specific tools like sketching, consultation with experts, real-life trials, 3D modeling, detail finalization, mockup making, and visualization. This project went through two cycles of the iteration. Although ideally, more should be done in this phase, for example, workshops with children to get more detailed information, prototyping, getting feedback from librarians, on-site testing. Because of the unusual situation of COVID-19, the tools and methods used in this phase had to change accordingly.

At the beginning of the third phase, I visualized the first ideas for the series of spatial products (see Figure 12). I mapped the front views of the two biggest products on a paper to check the sizes in real-life scale (see Figure 13).

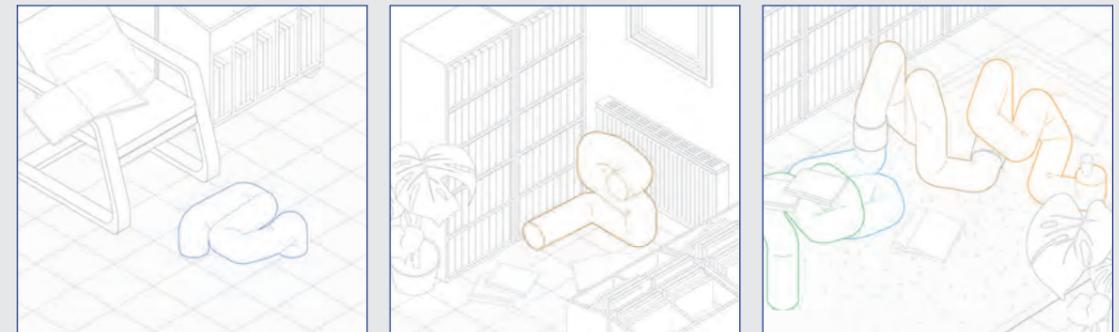


Figure 12: Initial ideas



Figure 13: Testing the scale

23 For the ergonomics development of the project, I consulted with Ulrika Myhr, a licensed physical therapist. I got feedback on the ergonomic aspect of the products. For instance, the design could address positive sitting postures (where the center of body weight is before the hips) by adding a tilted seat. Besides, various kinds of support, such as elbow support, back support, would be beneficial if the products were for sitting on the floor. Following the advice, I tested in person the right angle of the tilted seating (see Figure 14).



Figure 14: Testing the right angle for a positive sitting posture

I conceived the product to have a steel structure in the middle of the tubular. Covering it with polyurethane adds a softness to the product. The product is covered by a layer of felt, together with the color, the product creates a feeling of warmth and calm (see Figure 15).

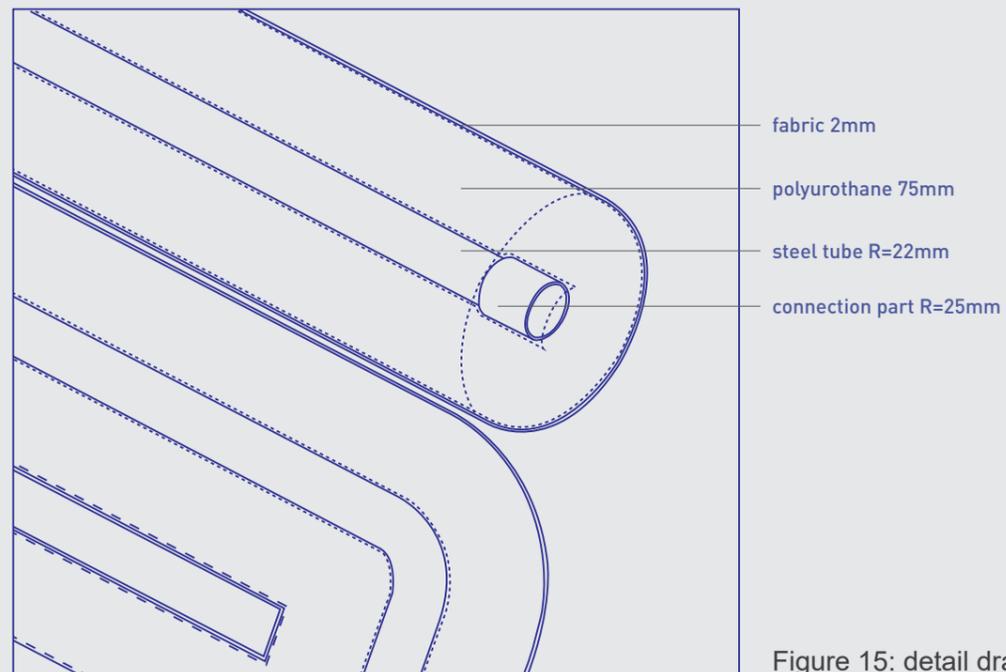


Figure 15: detail drawing

To test the applicability of the technique, I tried to realize the production process on a 3D printed scale model of the steel skeleton (see Figure 16). 24

Figure 16: Testing on a scale model



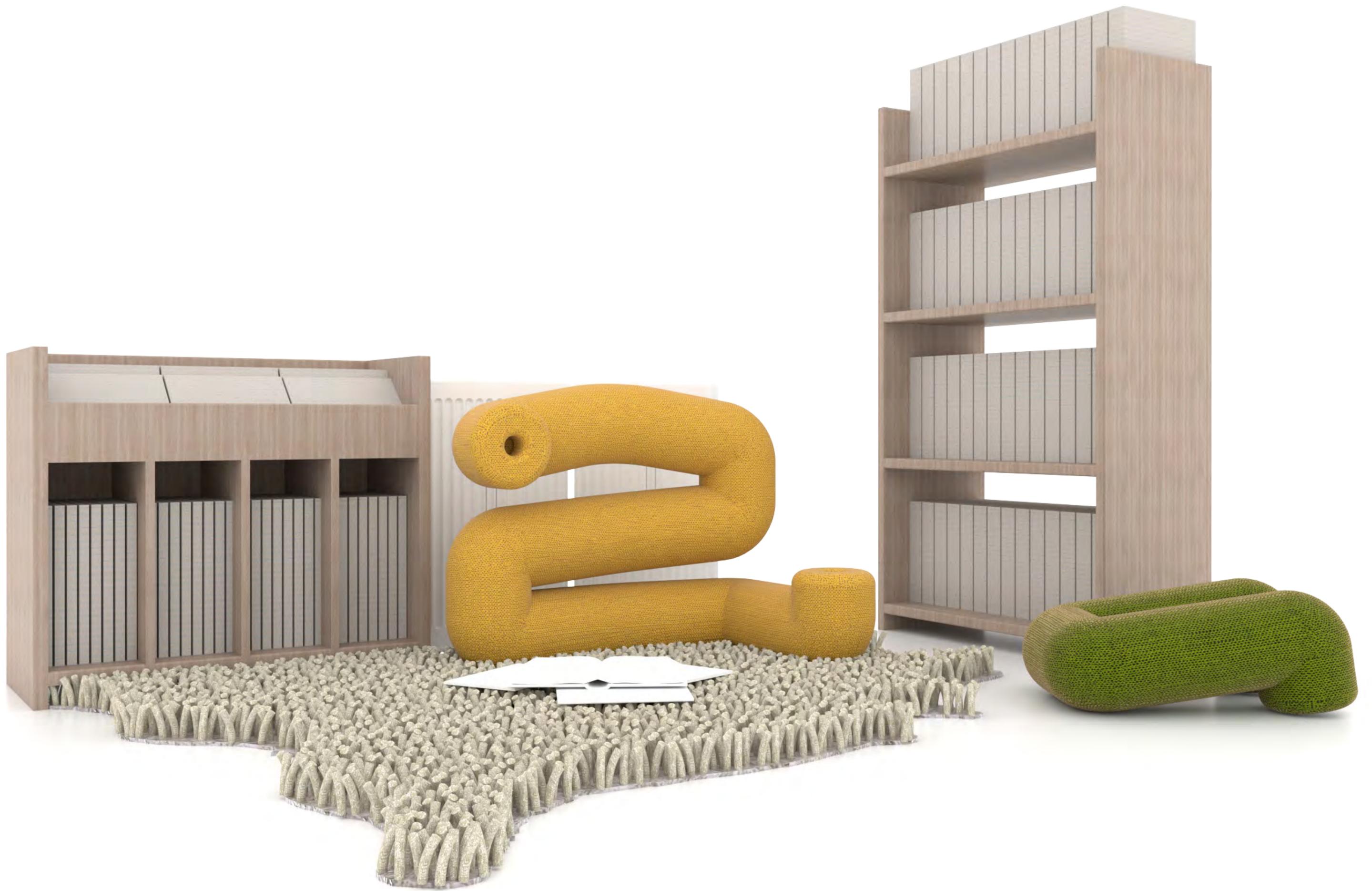
PROJECT OUTCOME

The outcome of this project is a series of embodied spatial hacking products for the school library called the Bookworm. The Bookworm enhances students reading experience by offering them possibilities of different sitting postures and chances to modify the furniture according to their own will.

I created some 3D renderings as well as an animated video to present the design idea with the audience. The animated video is the primary tool to communicate with the children participants. Since they contributed to the process, it is crucial to show them how this project considered their opinions. Also, the video serves as a visual instruction to demonstrate and inspire children the way to use the products.











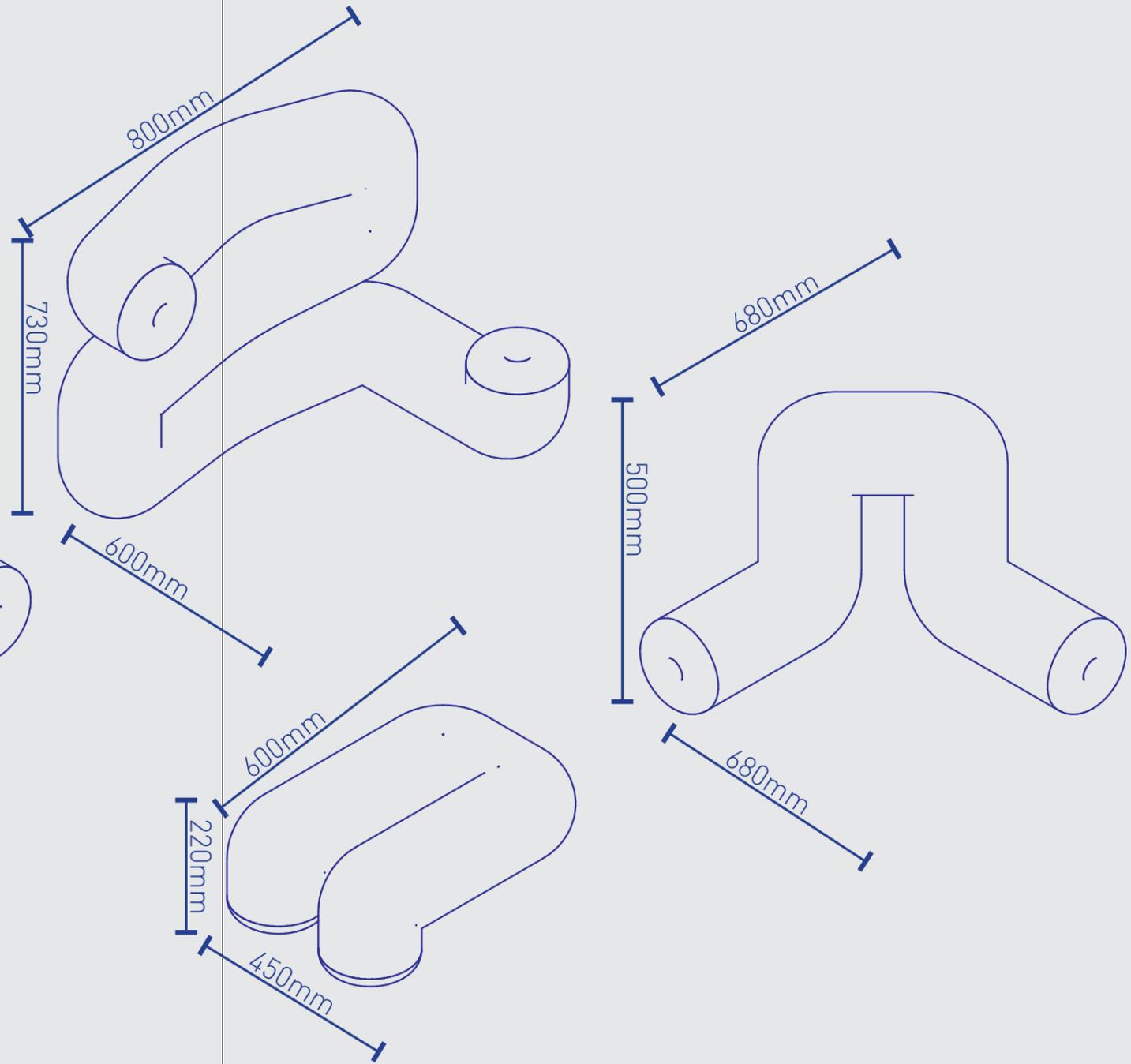
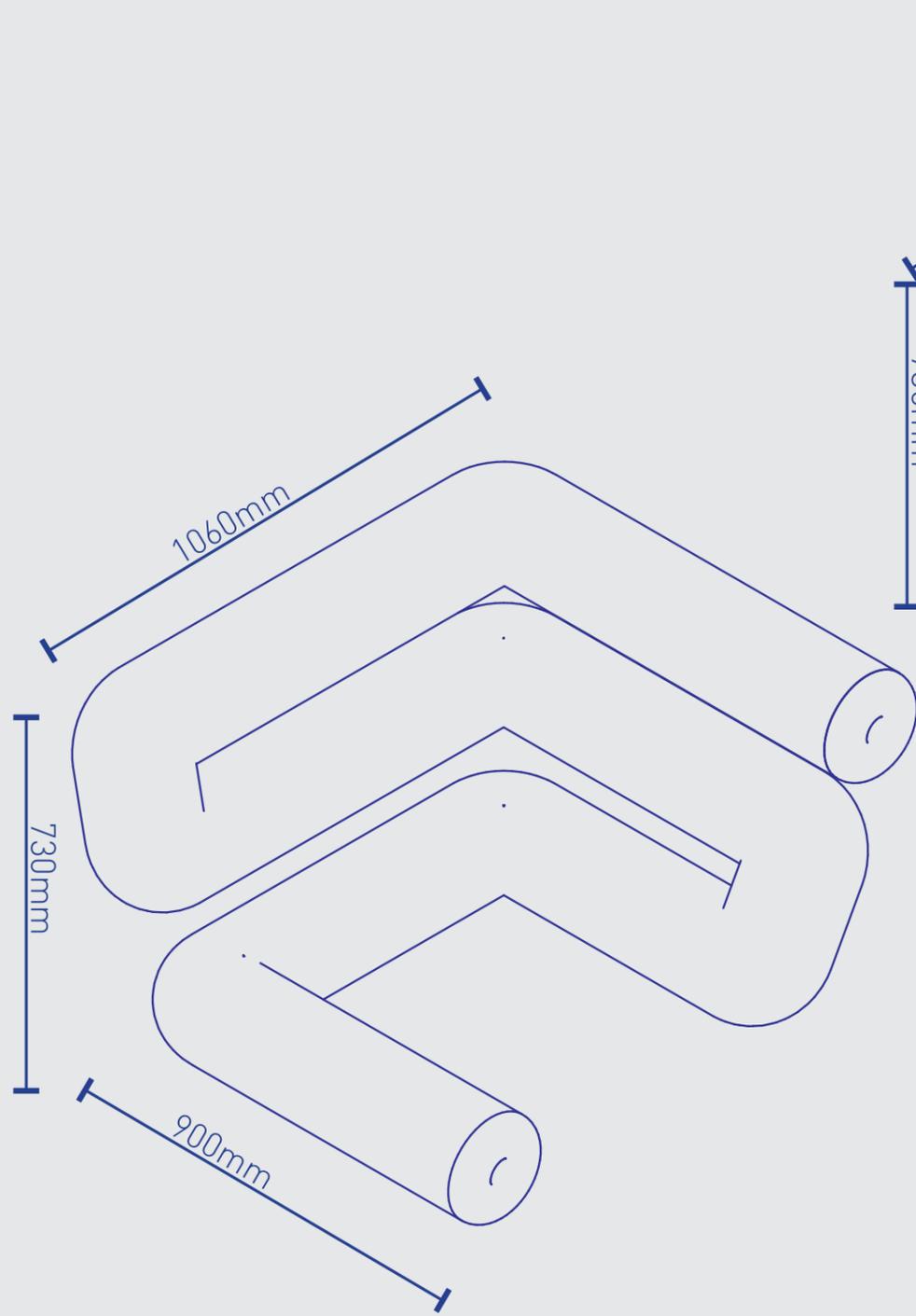
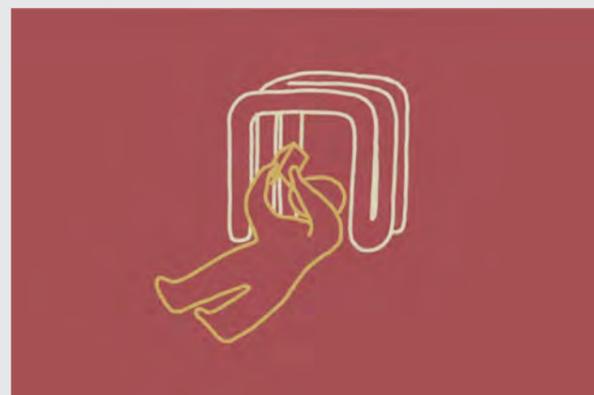
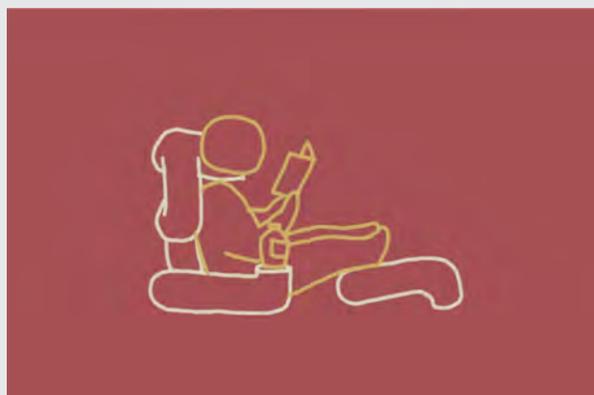
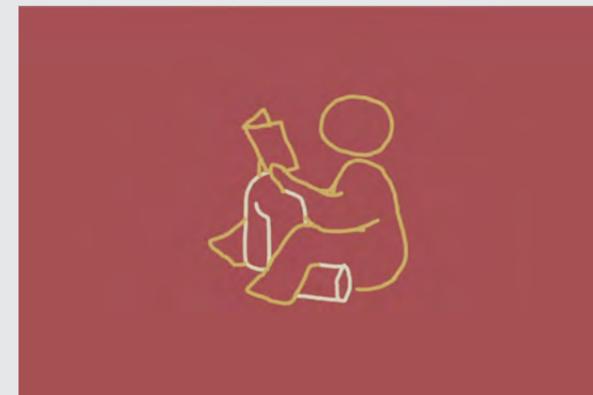
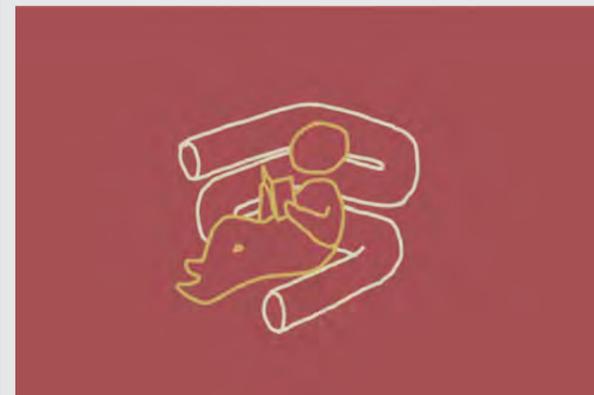
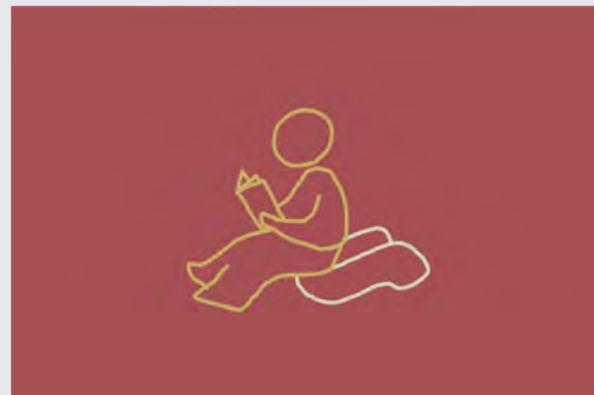
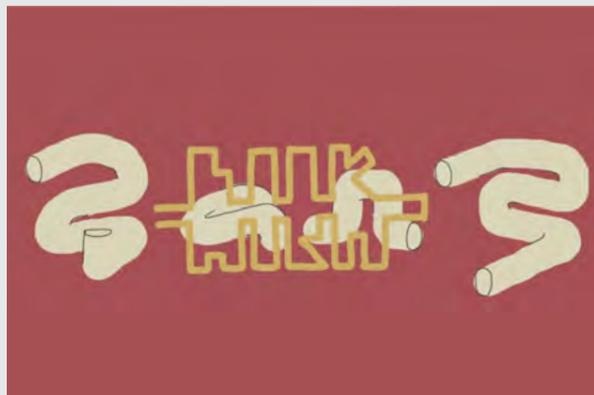
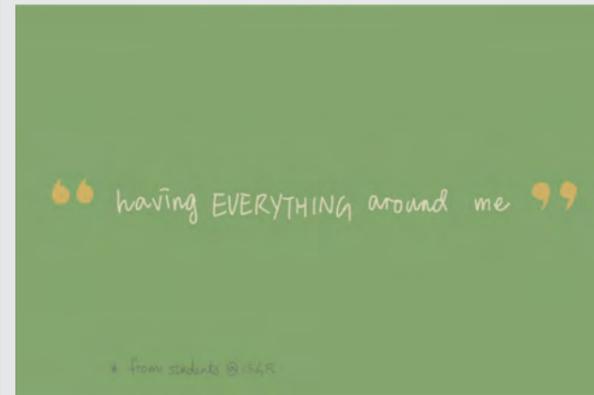
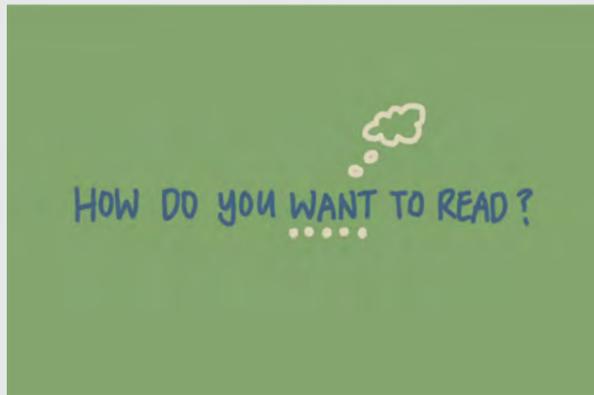


Figure 17: Project dimensions



CONCLUSION

To explain the contribution of the Bookworm, one must look at the values that the project carries. Physiologically, the products encourage positive seating postures as well as offer various kinds of support for floor seating. Besides, it is another perspective for students to understand the concept of reading and the school library. By being able to interact and change the space, means that the school library is not merely another classroom. The Bookworm also carries the value of sociology by re-defining the choreography within the school library. Therefore, reading in the school library became an engaging and fun activity instead of a passive compulsory class.

Moreover, the Bookworm contributes to the broader discourse of the children's participatory spatial product design process as well as physical affinity space building. As mentioned in the literary review, this project challenges the conventional product design iteration, in which the design team makes most of the decisions. On the contrary, this project takes a bottom-up approach to tackle the particular issue of the library losing attraction to children through a series of hacking workshops. It is a possible step stone for a larger-scale application of the children's participatory design process. The potential of space modification embedded in this project is beneficial to create a physical affinity space.

This project has its drawbacks. Due to the situation of COVID-19, I had to cancel the planned workshops after the hacking workshop. Those workshops were designed to confirm my idea with student participants and to test prototype ideas on-site. It led to the fact that the children participants and other stakeholders were not actively involved in the last phase - product development.

In the original plan, this project was supposed to have a public exhibition in May, which was unfortunately canceled. The exhibition meant to show visitors how the project evolved together with children's ideas. Also, I intended to get more direct feedback from the exhibition visitors. However, these can only be done in another way. Instead, I am working on content to publish on the school library webpage. In this way, I can present to the stakeholders and receive feedback online.

Since this project has a specific focus on children, it overlooked the opinions and experiences of other library users, for example, librarians and school teachers who sometimes have meetings in the library.

I plan to seek opportunities or collaborations with companies to advance the project. If possible, I would like to invite more stakeholders to join the process, which means that librarians and teachers will be involved. Also, this project can be hopefully tested on-site not only in the original context but also in other school libraries or even broader contexts.

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APPENDIX

Material gathered from children's hacking workshop in the school library

A problem that people face when sitting in the library to work or to read is that they sit down on a chair and work/read and they suddenly need something and they need to go and fetch it. We fixed this problem by building a chair that has a cupboard for storage, so that before you sit down you take what you need and you can put it in the cupboard. We included a tray for stability when working which goes in the cupboard. On the side of the chair there is a mini Bookshelf to put the books you need in.

We improved the form by changing the colours. The colours of the original library chairs were white or peach and we found them pretty boring, so we changed the colours to red which simulates warmth and dark blue which simulates stability and calmness.

I think our chair fits it's context because it is made to enjoy your time in the library while working or reading. I also think the colours match the context because they give the emotion and feeling that you are at peace and that you are relaxed which reminds me of the effect the library has on me.



45 The design has an improved form because it is a person which is nice to look. The function works well because it can hold books in low and high spots so small kids can take the bottom one and not climb on it to take the book.

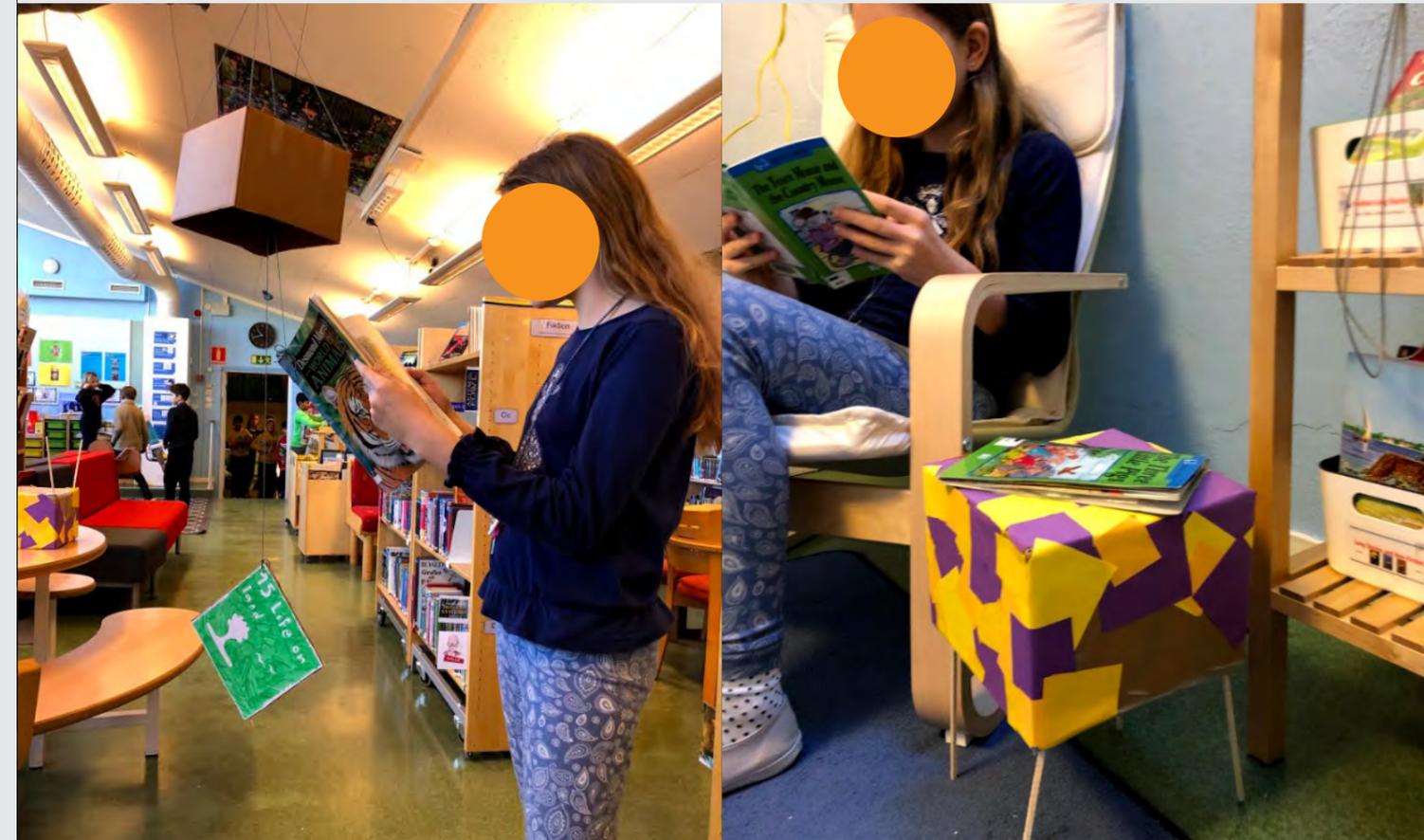
The form of it was supposed to be bigger than what we made but we could not make it bigger so we made it small. What could also be improved is make the arm and legs bigger to hold more books.

We created a person to hold books, it suits to be there because it's designed to hold books. We thought to make another bookshelf that is not less boring in our perspective.



Our book shelf is better than a normal shelf because it saves space because it hangs from the ceiling. It is also an interesting way to display books and shows the global goals the book connects to and makes people more aware of the global goals. When it hangs from the ceiling it's more visible to people further away, so they can see the book from further distances and look at the book from every side. Since it is higher up it's harder for little kids to take the book and put it in the wrong place/Tear the book up.

We improved the form by hiding the string that hangs the book inside the box. The way we hang the books is more visually pleasing/aesthetically pleasing. We used purple string instead of any normal looking string like black or white the usual unengaging colours. We also plan to put newspaper on the box so that it would match the context better.



47 Our project is a chair. The main problem we saw was that the chairs in school were very uncomfortable. So we decided to create a better chair for schools. So firstly we added a higher backrest and a headrest to the chair. Then we added a flat surface to keep your feet on and two soft pads to raise up feet to make it comfier.

For the form, we did not think it looked nice in the very light wood colour and with the silver metal footrest, it looked terrible. So we painted it a nice dark brown and hid the metal footrest.

The context of this chair is in the library as it is a comfy chair to read in or to just overall sit in. The form and function suit the context because of the chair being comfy to read in and the minimalistic form keeping everything simple looking.



This bookshelf is like a normal bookshelf, but it's also foldable so it's really easy to carry around. It holds more books than a normal bookshelf. And it has 3 compartments so there's a lot of space so a lot of books.

The bookshelf holds all the books in a way that is visible to people facing north and south. The sides of the shelves are a ombré blue, so it's dark blue on the top, light blue in the middle and pastel blue at the bottom. The shelf has 3 layers so the ombré look goes perfectly well with the layers.

This bookshelf goes well in a library and in a reading room. This bookshelf would go well in a child's room because of its eye-popping colors.



49 We made another version of the library chair. It was at first rather uncomfortable. It's backrest hurt your back and it was hard. We made a better version. We made the backrest longer and we have walls wrapping around you, instead of jutting armrests. This all created the Function of the Rose Recliner. The Form of the Rose Recliner is to make you feel peaceful and aesthetically pleased. Instead of a dull red, we made the form as pretty as possible. We got roses for the feeling of a garden or maybe royalty. We also created the chair as spacious as possible.

In the other chair you couldn't curl up or lie down, without falling out of the chair or hard wood pieces sticking into you. That problem we solved, by no armrests but curving-in wall! The original chair was hard, colorless, and not aesthetically pleasing and needed serious improvements. Hopefully we solved all the problems and made the library more cosy!! We chose to put the chair in the ISGR library because we felt that it needed more chairs to read or work in, that were comfortable. The roses were great the calmness of the library. We made the chair extra comfy. The function was after all for people to read in and the form fit the library so we donated it there.



50 This chair has several additional functions than the original product that we were inspired by. It has a nice cushy place where you can sit on with armrest that moves which might make it easier to move around in the chair. Unfortunately in the original chair the seat moves up and down which makes it harder to move around. Unlike the other chair, in our chair you have a place to hang your bag and a mini rotating table next to you where you can put your book, drink, etc. While you're doing your stuff, you can also let your feet rest on the footrest which can move forward and back, depending on your comfort. Sadly the original chair didn't even have a footrest.

This chair also includes some form and aesthetic, unlike the original product which has none. Though the chair has a lovely design on the backrest. It has bright shades of orange and red all over it. It also has a donkey face footrest which might give you a smile every time you look at it even in bad situations.

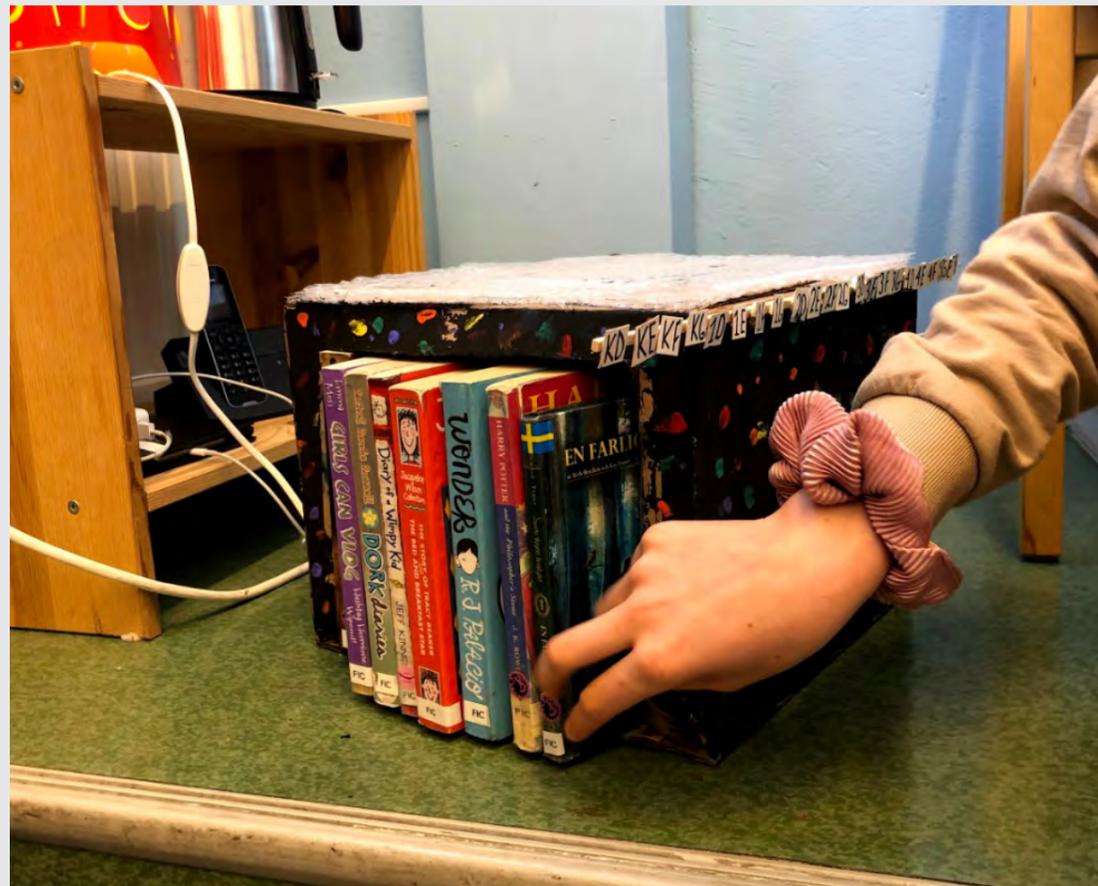
This chair is designed for a school library. It's supposed to be used for a calm and a cozy independent reading time. A good place to put this chair would be in a silent corner of a room for comfort. You can also place this in the living room or somewhere else depending on your comfort.



51 Our project improved the function because the shelf was small and you can't sit on it. Our project allows you to not only sit on it but also store books in the slots and in the back there is a place to put valuables such as money, keys, and many more. We put a stick with all the grades and classes on it so the teacher can Stock different grades over the books she is going to read to them.

Our project improved the form because it's the original color was just plain wood but we made it plain black with lots of rainbow polka dots and it's really flashy and nice. It makes you want to learn more about it.

This is made for the library. It fits this context because you can put books in and sit on it. The librarian can put the class marker on the book they are reading so she/he doesn't have to go looking for the book. The library is supposed to make you feel good and lots of people like the rainbow so it makes them feel good.



52 Our chairs function is to help people sit comfortably. The original chair was uncomfortable because it was not soft and did not have an armrest, we solved these problems by adding armrests and a headrest to make it more comfortable.

We improved the form by adding color to the chair which improved the aesthetic. The original form was simple, unsightly and needed to change. We improved the design by adding colored papers.

The context of this chair is in a library or living room. The form suits the context because it is comfortable and therefore could belong in a library or living room. Its form matches its context because it has footrest and armrests and reclines which is good for comfortable seating.



53 The design improved the function by having an opening chair. The problem was that we had to design a chair which both children and adults could use. We solved the problem by making an opening chair so if an adult comes he could just open the chair. Then the chair would be larger and the adult could sit on it. We also put bubble paper so it is comfy for the person who sits on it.

The design helps the furniture's form by making it neater, more beautiful, and kind of useful. Our design is wooden sticks glued on the furniture so it looks good and people like it, drawings on the side of the furniture so the drawings look nice and beautiful. And colored tissue papers glued on the sides so it makes the person feel that it is good. The form is two boxes on top of each other and in the small box there is bubble wrap wrapped around it so it is useful in being comfy.

The context of this chair is to be in the library where both children and adults can sit. The function fits this context because children and adults come to the library so both children and adults can sit on it. The form fits because it looks nice so children and adults will come sit on it. because it looks attractive, good looking and beautiful.



54 Our shelf is called Rocket The Read. Before it was a boring shelf with no colour. So, we thought about improving the form and the function. We improved form the colour, we added a brake and we made it look like a rocket.

The function we improved are, we added more fun like you can ride on it, the books look really interesting to read because of the form, we added more context to the shelf and at the back side usually books fall but we added cardboard.

It is brown, red and silver. It is designed to be in the library to return books in the kid's area, on the shelf there can be books about rockets or science or etc, it can also be in kid's bedrooms. It has a high form and high function. It has a brake to stop and you can ride on it. It is also shaped like a rocket.



55 Our product has improved in its function because it has an adjustable footrest. The problem was that there are not so many good chairs in the library and we thought that we could make a cozy chair for small kids to read books in.

Our product has improved its form because we added a dark blue background with some stars on it so it will attract some small kids. The original design of the product was gonna be some wide blue and red stripes but we made the chair too small so we decided to do the small kid design.

This chair should be used in the library because it is comfortable and has a big backrest with a pillow and its blue so it will fit in the blue section with no problems.



Our design is a foot rest that has multiple functions. It can be a mini chair, a mini table and a storage area. People buy chairs, tables, storage areas and foot rests separately so they waste their money, time and space but if with our design they will spend less money, less time and less space since it is compact. It also has two handles at the top side of the design to carry it easily.

It is difficult to find furniture in the color we want, since monochromatic furniture does not match any environment. We paid attention to the colors we used in our design, the colors we choose are the colors that adapt to most environments. Separating chairs, tables, foot rests and storage areas is also very difficult to achieve color harmony so our design is the perfect furniture to choose.

You can use this design everywhere such as in the living room, in the library and in the bedroom because it has multiple functions, the colors match most of the environment and it is easy to carry since it is so light and it has handles.



57 Our furniture is a chair that has two tables. People can work and also read books so the function of our furniture is that one of our tables moves so people can sit on the chair. The original function of this chair was just a normal comfy chair and there was no extension to it.

If our chair and tables was sold in a store the form would be in the chair and in the table and it would be that the chair's cushion would be blue colored because it is its normal color and the table would have a small bookshelf that would be decorated with paintings of books as it is for the library.

The context for our working chair is for the library because it is a silent reading corner chair and also a working chair. We added a table to the chair because students and teachers can easily put anything on it and work or read. The form and function match our context because the table is painted with books and there is a small bookshelf.



58 The chair was very uncomfortable because when you sat on the chair your foot and your arm felt so uncomfortable because the arm rest was too big that made the armrest hard and uncomfortable. There was no footrest and your feet were uncomfortable so we decided to add a footrest. We decided to put the foot rest under the chair instead of sticking it with the chair because then you will be able to move it in and out for the people who are tall. We also thought of putting a book holder because it would be easier to read. We thought that the headrest was too high up for the short people so we chose to make the headrest adjustable by adding a strap to go all the way around the top of the chair. We made the chair more comfortable and useful by adding these things.

The form of the chair was ok like it was before we redesigned it. The form was good because it was white with wooden legs and armrest, white and wood fits in the context (the library) because they are calming colors for when you read. So we didn't change anything to it. We also tried to show the people who buy this chair how much effort we put into the chair.

The chair that we designed is for the library or for a silent reading chair. You can't use it in a classroom because the back of it is too long and the back is laying down. You can also use it to sleep on. It is also kind of a bed with the foot rest we added. It is good for silent reading because when you read a book it is always better to be comfortable and being on a sleeping position.



59 Library Chair 2.0 is a comfortable yet functional chair. It has a built-in storage shelf for your favourite books, because then you don't have to leave your comfortable position to get a new one. It also has a movable desk for homework, and a lamp to read by. Some other features are armrests, but set in the reading position your arms feel most comfortable and slanting sides. The problem was when you curl your legs up, the sides dug into your legs.

While Library Chair 2.0 is functional it is also aesthetically pleasing. The fabric is in different hues of blue. We chose blue because it radiates peace and calmness, which is how we think it should feel in the library. We also chose different patterns and different kinds of fabric to create a kind of shabbiness that makes you feel at ease with your surroundings. It adds to the feeling of relaxation.

The Library chair 2.0 is meant to be used in a library and for reading, You can also use it for doing your homework, eating your snack, or just chilling. You can use it any time of day.



I think that we can improve our project by putting some foam so our project could be used as a chair. Some problems were when we were adding some sticks we put a lot of glue together so we didn't get time to find the sticks which would have the same size. But if we would stop in the middle to find the same size sticks then all of our glue would be wasted.

60

At the starting we thought that our project would look good if we would paint it but at the end after painting when the paint dried it just went off. Then we stuck big colour papers to add more form.

We got this idea by a shelf at the library and a big box. So we thought to make an opening so we could put our hand inside our project remove the books which have been returned. For the form we two just draw some things on the paper.



61 Our project is a table with a multi function. The table can roll, it has wheels, it has a bookshelf, a water bottle holder, and a pencil drawer thing. Our product solves many problems like, whenever you need to move the table you can just push without damaging the table or making too much noise. Another problem it solves is that whenever you have your water bottle on your table it mostly tips over but on this one it has a special holder that is deep so that the water bottle doesn't tip over. We also have a bookshelf that is at the bottom of the table that solves the problem when you just have too many things to work with you can put stuff underneath the table.

For form, our table has some colors that are good complimentary colors (blue, green and white) that bring better aesthetics than the normal table. The original table was boring with a wood on the top and grey foot holds and nothing else. We changed the color because it looked horrible and it made everyone drool over it. With some nice exotic colors the aesthetics could bring peoples mood up and make them all happy and great!

Our product can go anywhere that needs a desk. However, our aim was that it would be something to do with the library. I think that it belongs more to the library because it has space on the bottom to put books and it has a water bottle holder that stops from spilling. Which means that when you are reading a book the water doesn't spill and destroy the book.



62 The function of our cupboard are the one drawer of the cupboard can move so you can keep things inside it. There is a door at the top of the cupboard that opens, you can keep some stuff in it too. You can move the cupboard by dragging it. It sometimes breaks when you carry it. I guess if you carry it carefully it will not break. First when we fixed the drawer it didn't work because we stuck the cupboard then we took it out and we separated the drawer and the cupboard. Then we made only three sides of the cupboard and put the drawer then we could pull it out that's only the problem we faced.

The form of our cupboard is it has a beautiful opener which has black, red and blue. The drawer which we made is not even painted on the cupboard, But the form is really good. We could have made the cupboard more nice. We can do this by adding more colours on the inside because we have not yet painted the inside the cupboard.

The context of the cupboard is that it is made to be in the library to keep board games inside because all the board games were messed up before we made the cupboard. We made sure that we had extra space (the door at the top) just in case we are not able to fit all the boards in the main area (the drawer).



ACKNOWLEDGEMENTS

I sincerely appreciate the support from the librarians (Fleur, Sophie, and Elin), teachers (Jamie, Michael, and Brett), and of course, all the Year-5 students at the International School of Gothenburg Region (ISGR). I am grateful to meet all the kind, open-minded people at ISGR. The project would not happen without their help.

I want to thank my examiners, tutors, teachers, and fellow students who gave me critiques, feedback, and courage in my journey of becoming a child culture designer.

