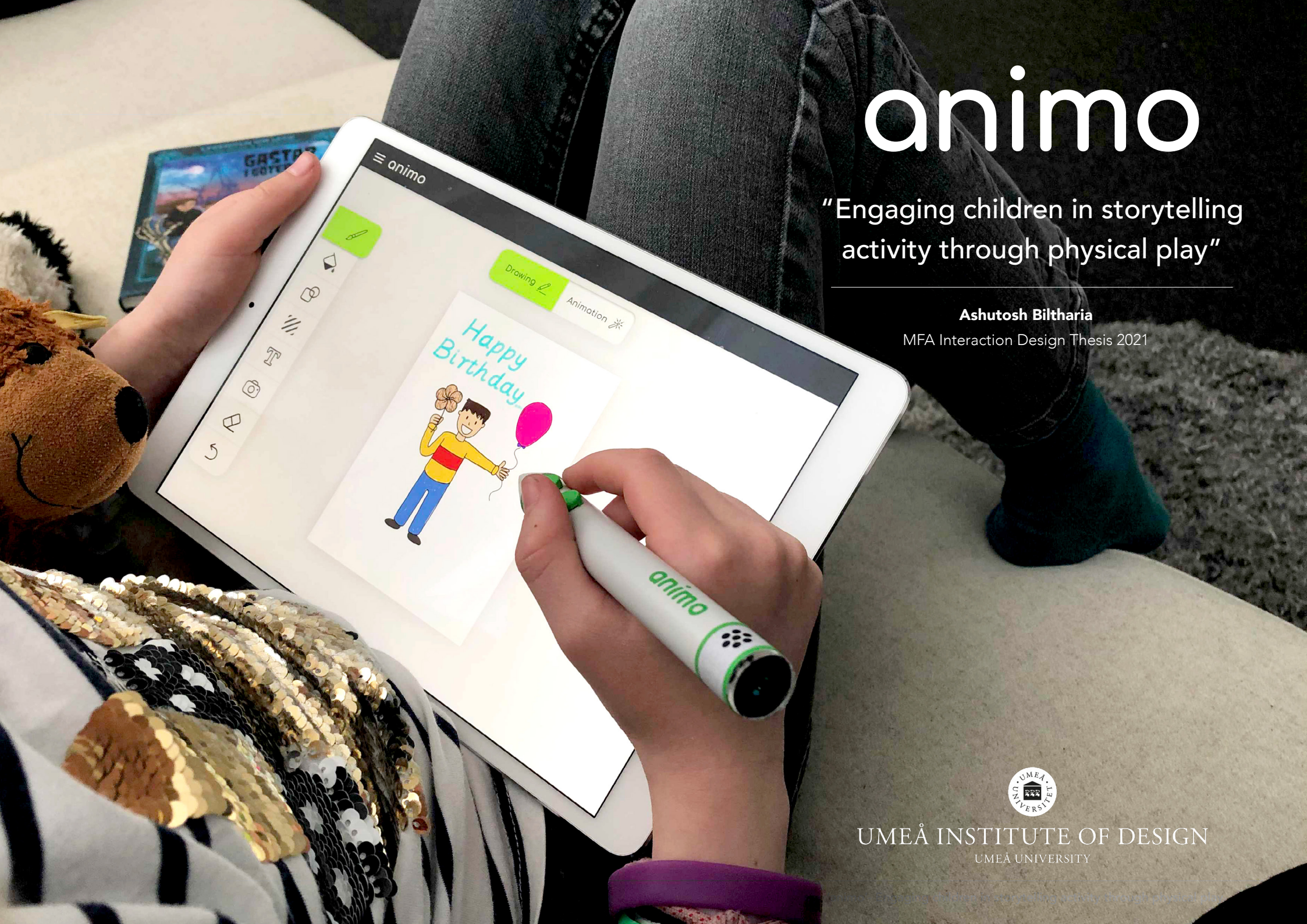


animo

"Engaging children in storytelling activity through physical play"

Ashutosh Biltharia

MFA Interaction Design Thesis 2021

UMEÅ INSTITUTE OF DESIGN
UMEÅ UNIVERSITY

Abstract

The proportion of children who own their own smartphones or tablets increases with age. Up until they turn 10, children are more likely to own tablets. However, between the ages of 9 and 10, smartphone ownership doubles from 23% to 50% - representing an important milestone in children's digital independence as they prepare to transition to secondary school. ('Children and Parents: Media Use and Attitudes Report 2019.').

Studies indicate that this high, glued and passive engagement with the digital devices affects children's lifelong and overall development. Today's generation is born with digital devices, and we cannot completely take away these devices from their sight, but what can do is, create more situations and contexts which encourage children to reduce their digital media time and passive consumption of the content.

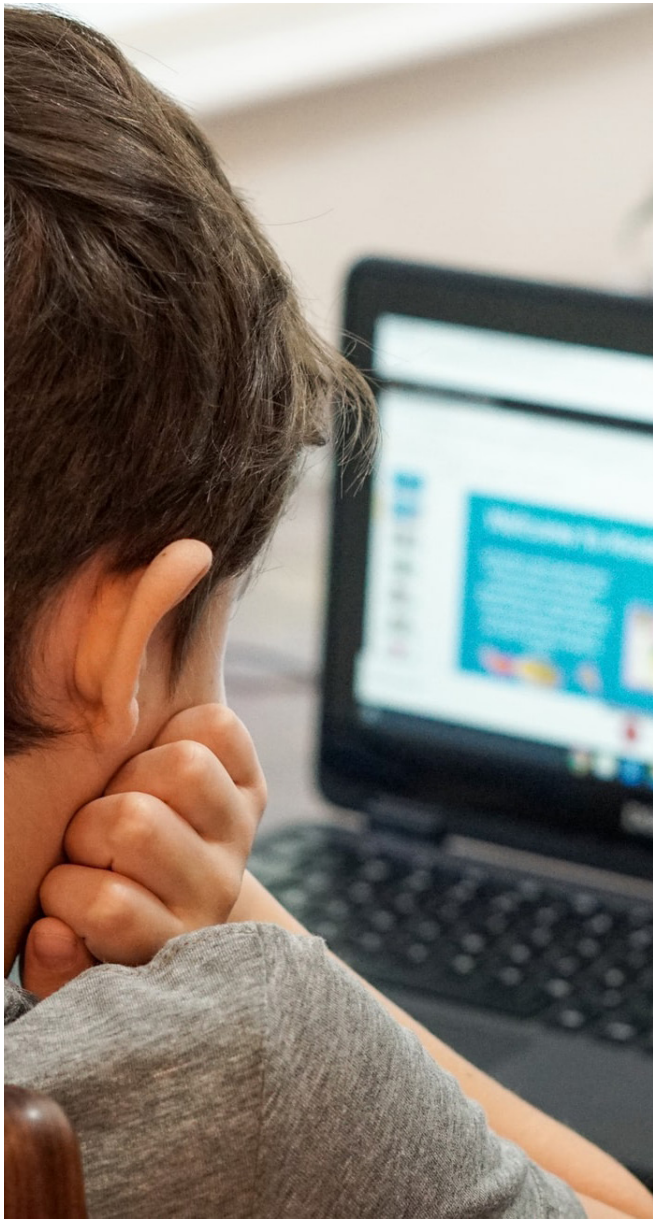
This research informed design project aimed to understand children's (aged 8-11) motivations, aspirations, and engagement with different physical and digital activities in their daily lives to eventually design a proposal that helps increase children's physical play and active participation during their engagement with a digital activity or medium. Findings from the exploratory research led to a few opportunity areas which were further investigated using research through prototyping. I was able to probe, test, learn, and finally prototype a few designs of the activities that enabled children's active participation during a physical and digital activity.

The concept "animo"- a digital tool to engages children in a storytelling activity through a physical play. It creates opportunities for children to build the creation by COMBINING two or more objects or mediums, by ENGAGING in physical play and/or with the surrounding and SHARING the creation that increases their social interactions. "animo" offers children the opportunity to become more curious, observant, and discover living and non-living things. It allows to bring feelings and emotions to their drawings which increases their expressive and imaginative abilities. They develop empathy, love, and care by sharing their creation with others. Small recognitions of their creation provide them with a sense of being noticed and encourages them to explore more.

The concept combined children's current interest in digital tools and mediums with their interests in drawing and doodling, and made it more exciting by giving them the opportunity to include their own life stories. "animo" helps children learn storytelling through animation, but more than that, it exposes them to the infinite possibilities of learning through physical play. The concept enabled a convergence of possibilities of digital mediums and children's real-life scenarios to engage them in a quality activity.

Table of content

1.0 Introduction



The belief in the power of the internet, connected devices, digital mediums, and the convenience they bring us are unquestionable. These devices have made our lives more convenient than ever. However, over the last two decades, we have seen excessive penetration of these devices and technology in our lives. The generation born before the 21 century experienced the transition from analog to digital, and today's generation is born with digital mediums (e.g., TV, tablet, smartphone, desktop computer, gaming devices, and the content they offer). These digital mediums have become a part of human evolution in the 21st Century.

Children are increasingly using digital technologies from younger ages. Children now tend to have their first experience with digital technologies before the age of two, often before they can walk or talk (Chaudron, Di Gioia, and Gemo, 2018). In England (United Kingdom), Estonia, and the United States, on average, 83% of five-year-olds use a digital device at least once a week, with 42% using it every day (OECD, 2020). Rates of in-home Internet access in the 21st Century are also unprecedented. From 2009 to 2018, the proportion of 15-year-olds in OECD countries with home Internet access increased from 85% to over 95% (OECD, 2019). In addition, both Internet quality and the expansion of mobile Internet services have risen in this time period ('Children and Digital Technologies', OECD iLibrary). Between the ages of 9 and 10, smartphone ownership doubles from 23% to 50% - representing an important milestone in children's digital independence as they prepare to transition to secondary school ('Children and Parents: Media Use and Attitudes Report 2019.').

One of the main concerns with children's engagement with digital mediums is its high and glued engagement, which reduces their connection with the world around them. This glued engagement affects their physical & mental health and overall development (Aston, R., 2018). In this digital era, we cannot completely take away the devices from their sight, but what we can do is create more situations and contexts that encourage children to reduce their digital medium time and passive consumption of the content. We need to create situations that emphasize children's physical play and active participation in any activity because it enables greater involvement because it is intellectually exciting, children collaborate both physically & mentally, learn communication, build on others' ideas, improve emotional skills, and it is socially interactive and joyful. Eventually, it offers the maximum growth potential. (Wilkinson et al., 1998).

Through exploratory research, analysis, and prototyping, this project aims to explore the question:

*"How might we integrate **'digital mediums'** with the qualities of **'physical play'** to provide children more exciting growth opportunities."*

With the objective, ***"To explore interactive tools/frameworks in physical and digital space to increase physical play opportunities for children of age 8 to 11",*** it tries to find the alternate activities that help children get engaged with the digital mediums in active and meaningful ways.

2.0 Background

2.1 Learning theories and active participation:

Learning theories in the education field, e.g., behavioral, cognitive, and constructivist, describe learning differently and help us understand how learners receive, process, and retain knowledge during the learning process. Modern learning methods are influenced by constructivist theory, emphasizing the importance of learners' active involvement in constructing knowledge for themselves. The constructivist theory has many varieties, such as learning through active participation, discovery learning, Inquiry-based learning, knowledge building, group learning, zigzag methods, peer tutoring, and learning, etc. (Kay and Kibble, 2016).

Physical play and active participation enable greater involvement because it is intellectually exciting; children collaborate both physically & mentally, learn communication, build on other ideas, improve emotional skills; it is socially interactive and joyful. Eventually, it offers the maximum growth potential. (Wilkinson et al., 1998).

2.2 Children's high engagement with digital devices and consequences:

Today, educators advocate and apply hands-on, play, and learn methods to create an environment that offers holistic growth to the children. However, digital technologies (e.g., computers, robots, Artificial intelligence, Augmented reality, Virtual reality, etc.) influence the way children learn in their environments. On the one hand, over-consumption and addictive nature of **digital mediums (e.g., TV, tablet, smartphone, desktop computer, gaming devices, and the content they offer)** limit children's experiential learning opportunities which happen when children engage more with the world around them. However, on the other hand, the digital mediums themselves don't provide enough opportunities of learning through active participation. Digital technologies do offer innovation opportunities that can offer great learning, and the challenge is to shape them in the right way. (Luckin et al., 2012)

2.3 Project scope:

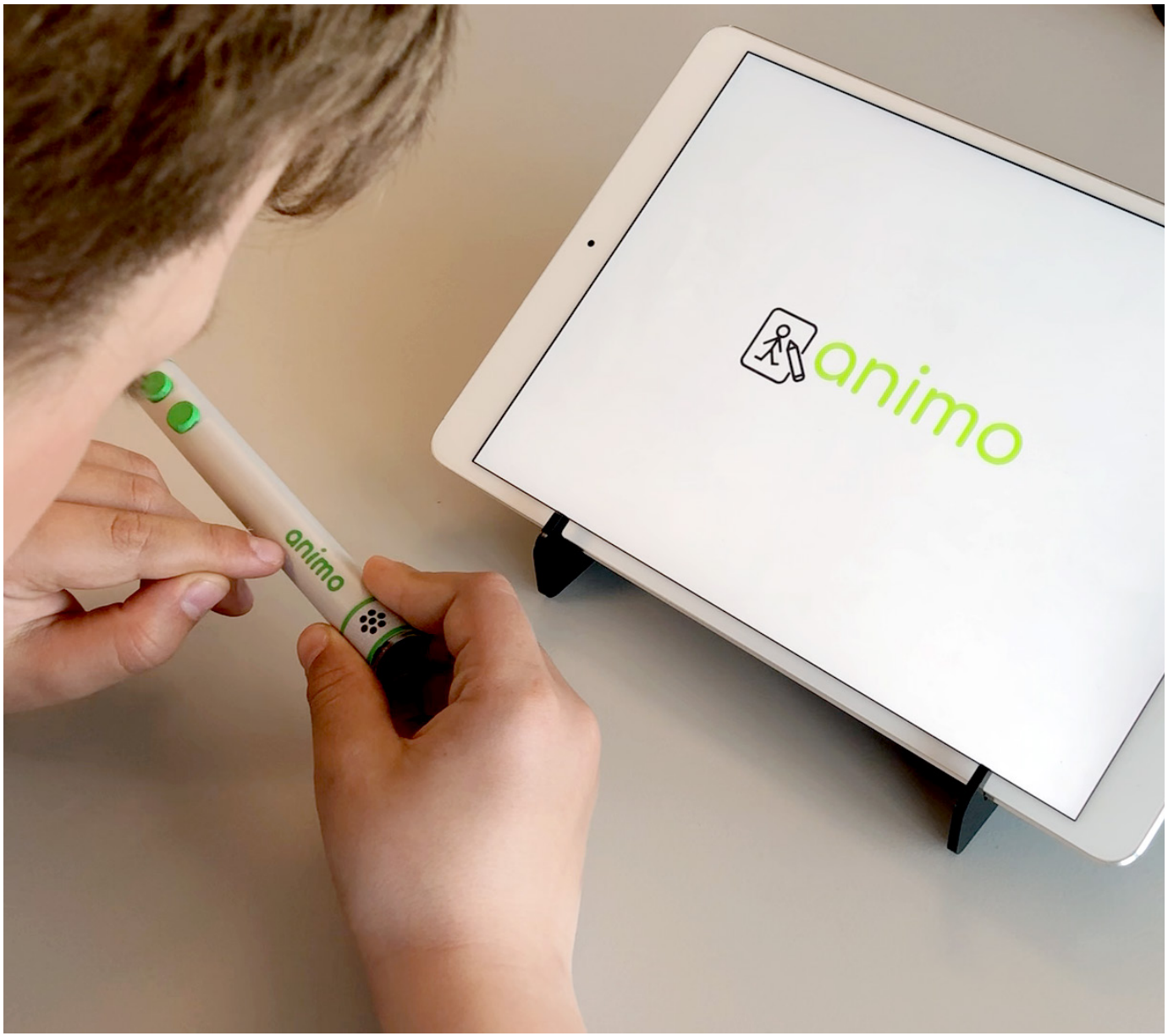
As mentioned in the introduction, the age 9-10 is the age of digital independence for children; they start understanding the use of the internet. I thought it would be interesting to investigate the change in their mindset with this digital independence; also, this can be the right age to make them think about the benefits and consequences of digital independence. I wanted to focus on this age group, but I broaden the age group to 8-11 for research activities considering the lack of reach to children due to Covid restrictions.

In this project, I focus on exploring activities that help children engage with digital mediums in active and meaningful ways. My design goal is, "To explore interactive tools/frameworks in physical and digital space to increase physical play opportunities for children of age 8 to 11".

3.0 Design Concept

The thought behind the design concept was to create more situations and contexts which encourage children to reduce their digital medium time and passive consumption of the content. Creating activities that emphasize children's physical play and active participation could bring more involvement from children. A few of the best ways to achieve this could be by incorporating children's current interests and their life stories in the activity.

The design concept combines children's current interest in digital tools and mediums with their interests in drawing and doodling and makes it more exciting by giving them the opportunity to include their own life stories. It enables the convergence of possibilities of digital mediums and children's real-life scenarios to eventually grab their attention to engage them in a meaningful and quality activity.



4.0 Approach

After the initial research about learning theories, physical play, children's engagement with the digital devices and setting up the project scope, I set up my initial research question as:

How might we integrate 'digital mediums' with the qualities of 'physical play' to provide our children with 'more exciting growth opportunities'?

As I started user research, my main approach was to engage with children to learn their perspectives and life stories, know about their lifestyle, motivations, behaviours, hobbies and interests. This was my first project with children and in ideal (without Covid-19) scenarios, I would have engaged with them over some co-creation activities in physical space, but, as this project was carried out during the Covid-19 days and restrictions, I decided to draft some activities and creative tasks on an online portal (Notion) and shared the description with children, they sent back the result in the form of photos and one-shot videos. During the research phase I learned about users' needs and persona which helped me define the design principles. I also learned from experts that I need to focus on play and learning will eventually happen as a by-product of play. During the ideation & probing and concept development phases my aim was to bring play element to the designs and evaluate them using the design principles.

5.0 Methodology

As I chose the above approach, I thought the best methods of investigation would be:
Research through activities and synthesis- This was exploratory research, and I wanted to learn about children's motivations, aspirations, likes, and dislikes. The best way to interact with children was to engage them with creative activities and use those activities to learn more about their lives.

Research through probing and prototyping and synthesis- I followed investigation through probing and prototyping in different project stages. That was the best way to show and share the ideas with children and get their reactions and opinions.

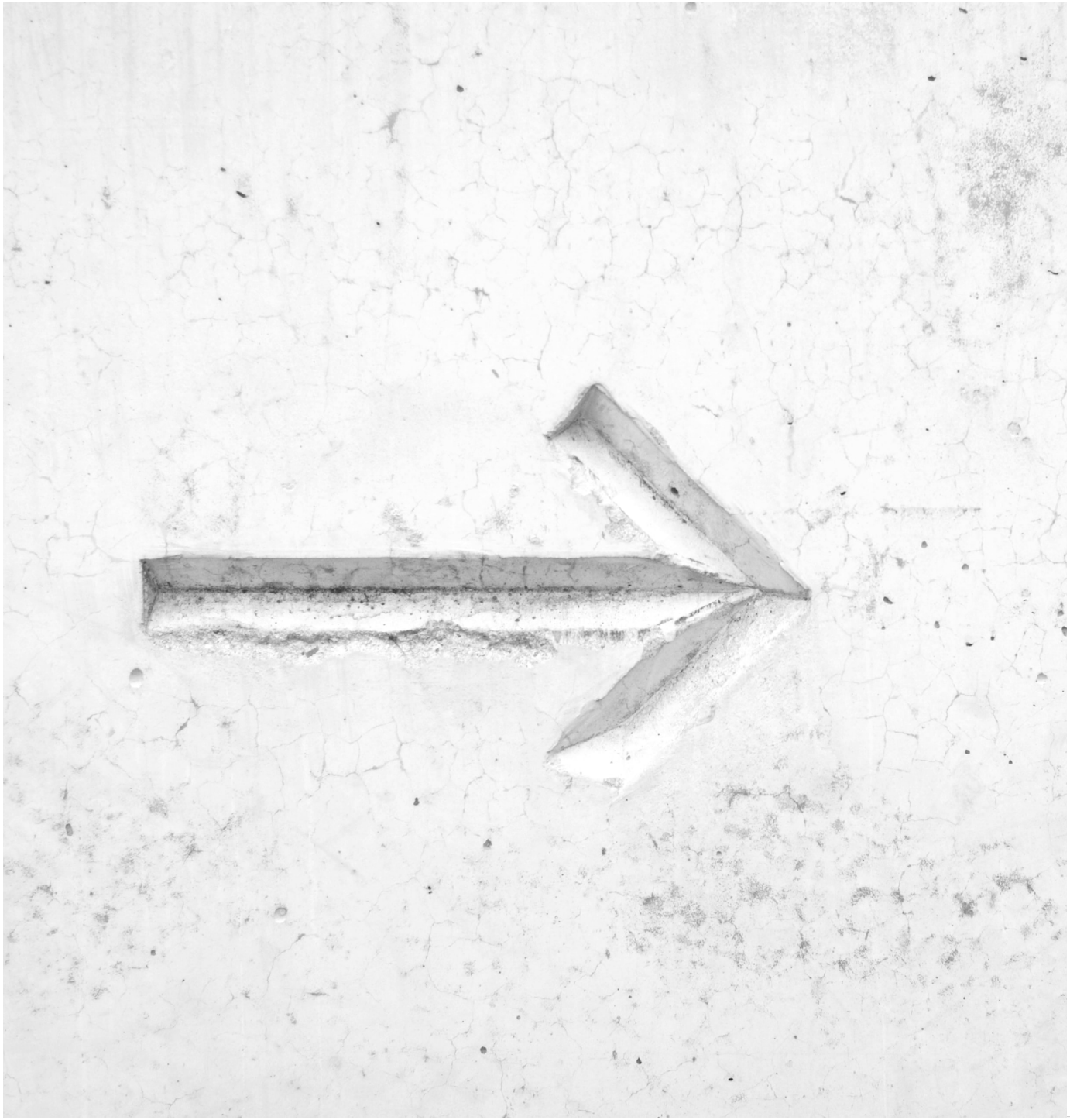
Remote testing through One Shot Videos- On one side, Covid restrictions made the process challenging, and on the other side, it made it easy to reach children through digital platforms. I connected with most of the children digitally, and sending the one-shot videos to children and learning through their opinions was an integral part of the process.

On-site testing- I wanted to observe and learn through the intuitive interactions of children with the physical prototypes. Fortunately, I got the opportunity to test the probes and prototypes with a few children.

A mix of the above methods was best to follow because they helped me get engaged with children through activities or artifacts, which brought children's involvement in the research activity and eventually helped me learn from their reactions and opinions. Apart from the above specific methods, my overall design process included- Research & Synthesis, Ideation & Prototyping, Testing, Refinement, and Execution.

The tools and activities which were followed:

- Online questionnaire and survey
- In-depth interviews
- Research cum ideation workshops
- Storytelling techniques etc.



6.0 Design

6.0 Design

6.1.1 Approach:

This research was an exploratory research because in the beginning I knew that I want to do the project for children, but I did not have any specific area to focus on OR did not know where to intervene or to start with. So, the research was about learning children's motivations, aspirations, likes and dislikes and finding out opportunity areas. I also wanted to learn from the ecosystem of parents, teachers and children which the core of children's learning and how children's engagement with digital mediums affects this ecosystem.

The information gathered was analysed at different stages using affinity mapping method in which I tried finding themes or clusters in the information, Main findings from each cluster were taken ahead to generate insights. Those insights helped formulate the opportunity areas towards the end of research phase.

6.1.2 Secondary Research:

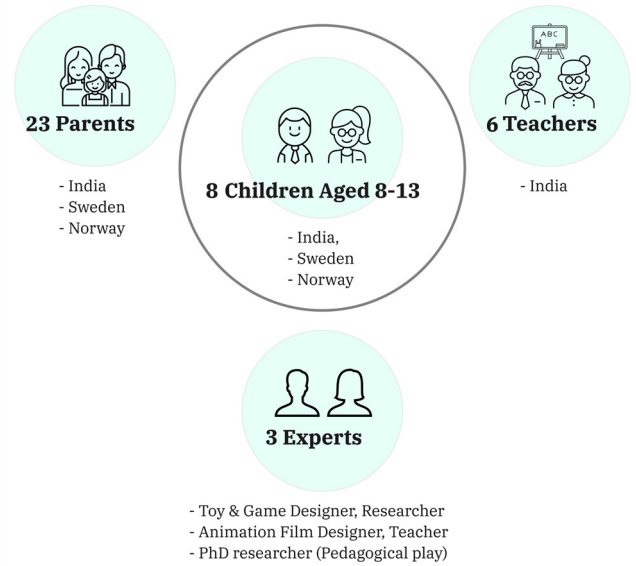
(Literature review, online research)

As already covered in the background section, I did a bit of literature review to understand theories of human learning, children's education and learning in the current digital world, and the application of digital technologies, e.g., AI in education etc. I investigated on how current technology and devices shape the ecosystem of children, parents and teachers. I also attended a few Edu-tech conferences to learn about ongoing attempts in children's learning and education field.

6.1.3 Primary Research:

During three weeks of research, I got in touch with 3 experts, 8 children of age 8-13, 23 parents and around 6 teachers.

- **Expert Interviews**- To learn from their experience of working with children
- **Creative (remote) activities and remote interviews with children**- To learn about their motivation, aspirations, likes and dislikes and what are they up to in their lives.
- **Questionnaire (parents & teachers) survey**- To study the eco-system of Parent-Child-Teacher which is the core of children's learning.



6.1.3 Primary Research:

Expert Interviews:

Swapnesh Samaiya
(Toy & Game Designer, Researcher)

Swapnesh is a Toy & Game Designer and a Researcher from India. He designs games, interactions and does design research. He writes about his observations, views and experiences on games, play, art, design and technology. He has extensively worked with children of all the ages in India.

During the conversation with Swapnesh, I learned about:

- Age wise cognitive development of children.
- Children's personality, behavioural and aspirational changes as they grow up.
- Activities they get involved in at various stages in life.

Apart from the above, he mentioned some important points:

- Children are active learners, if you give them clay, they start making things.
- Playfulness is a nature of human beings, but adults want kids to learn things that is not a part of their play. Children are natural learners, they explore, they are curious, and they experiment.
- Educational games become boring because they try to teach something.
- To design for kids, you need to be with kids and learn about life, make some activity on the spot and try it.
- Learning is a volunteer process; they submit themselves Voluntarily only when it is exciting.

"The whole concept of having a school as separate institution is flawed."

"It is impossible to separate learning from play. When there is a play, there is a learning. ***Focus on play- learning is a by-product****".*

6.1.3 Primary Research:

Expert Interviews:

Gaurav Juyal
(Animation Film Designer, Teacher)

Gaurav is a Designer and Educator from India. He focuses on learning through the senses. He has been actively working in the domain of education and learning for over 10 years. He conducts workshops on subjects like Animation, Fundamentals of Design & Design Thinking and Hands on material-based workshops and has worked with hundreds of organizations and thousands of children and youth in and outside India.

Gaurav was concerned about:

- Digital platforms which are designed for instant gratification e.g.- social media and digital games.
- CREATE CURIOSITY- Learning is not complex to replicate, just create curiosity.

I learned from him about:

- Human senses and their importance in knowledge building.
- Different ways and activities to integrate sensory experience in children's learning.
- Children's personality, behavioural and aspirational changes as they grow up.
- I need to design for quality engagement rather than high engagement with digital devices.

Example of High engagement:

- Sedentary screen-based activities and/or passively receiving screen-based information
- Examples- Scrolling through social media, randomly watching videos on Youtube, playing repetitive games and binge-watching shows.

"Children keep clicking the game and App platforms, it's over doze of high engagement which is brutal. they don't blink eyes for long, their minds get no peace".

"Aim for Quality engagement, not for the High engagement".

Example of Quality engagement:

- Cognitive and/or physical engagement during the device usage.
- Examples- Making Youtube videos, playing educational games, editing pictures, coding a website etc. Kids are expected to reply, draw a picture, create or move.

6.1.3 Primary Research:

Expert Interviews:

Hanne Hede Jørgensen
(PhD researcher (Co-design for Pedagogical play practices), Design School Kolding, Denmark)

Hanne is a PhD researcher from Denmark. Her PhD is about if and how pedagogues, who participate in a design for play, discover and develop play practices that can support a diversity of play participations amongst children. Together with pedagogues in the schools she designs for different play types and uses these play designs as explorative experiments to explore what pedagogical play practices can be.

She talked about- How to create play or design for play and the elements required to make the play activities successful.

I learned about:

- PLAYFULNESS- If we use playfulness, we can motivate children for anything.
- CHALLENGING- Give them the possibilities to play to push their comfort zones.
- OPENNESS- The Key is openness, keep the design/ prototype as wide as possible. We can't control which direction they take their play to. So, create something with openness and be ready to get surprised and tweak in your creation.
- INTERESTS- Children have different preferences than adults, so find the possibilities to include their interests.

"You need to know about the PLAY! And that's how they make sense out of the world- to express themselves, Way of being".

*"**Play Mood**- Children practice with body, up & down",*
*"**Performance**- They want an audience"*
*"**Destroy**- They like destroying things".*

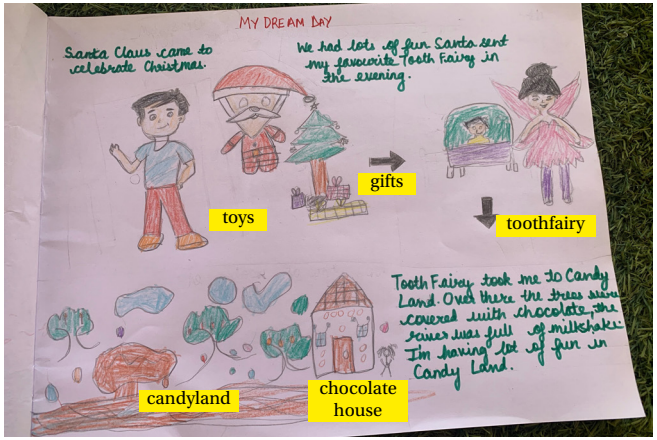
6.1.3 Primary Research:

Creative (remote) activities and remote interviews with children:

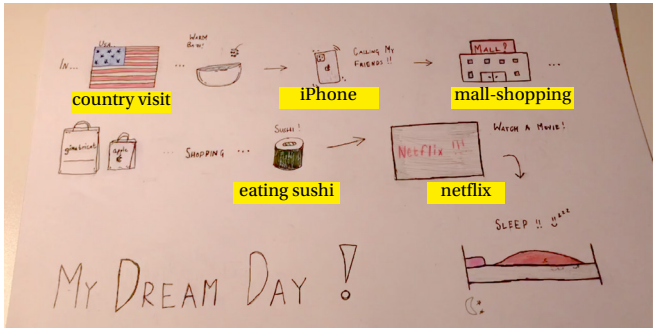
I started interacting with children by sending them a few activities to do, mentioned below are a few of the outcomes of three activities. 1) Drawing a dream day- to know what would they want to do in their ideal dream day. 2) Drawing the dream desk- to know what would they like to see, aquire, possess for their dreal desk. 3) Children's association with some words- Gave them a few words and asked them to collect photos for those words to learn about their association with these words.

Through these activities, I learned about children's hobbies and interests, what drives them, what do they aspire for, their personality, user persona etc. (More learning from these activities are mentioned in the next pages)

1) Drawing a dream day in her/his life

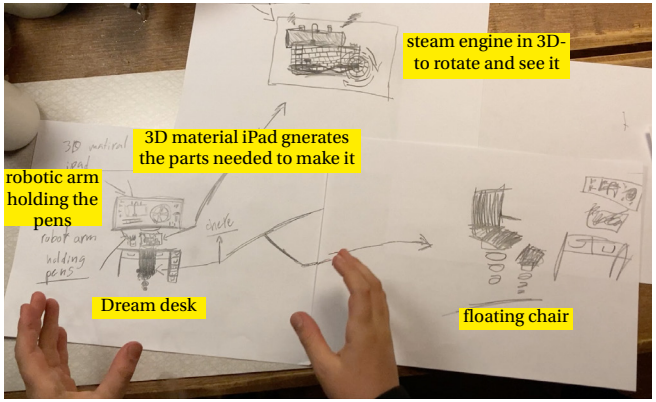


Shivansh(8 year) drew his dream day



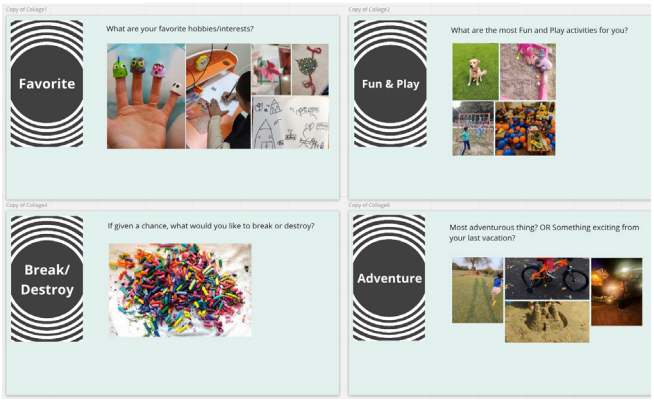
Rehet(10 year) drew her dream day

2) Drawing her/his dream desk



Nael is explaining through a video about his dream desk

3) Photo collage of the things associated with some words



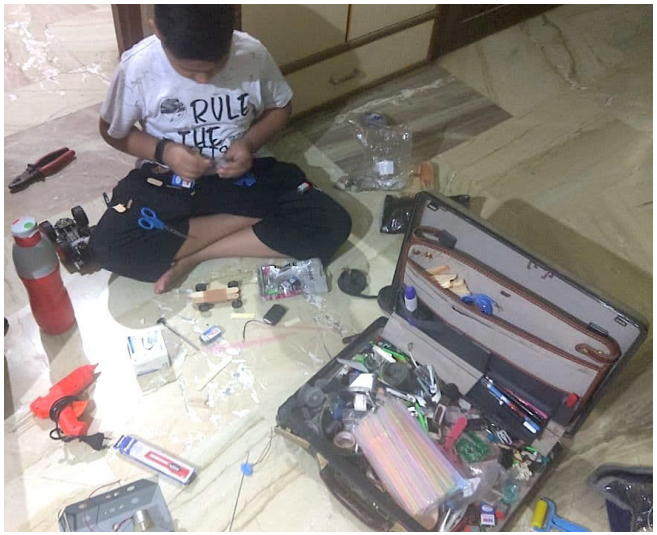
Syona's association with the above words

6.1.3 Primary Research:

Finding from creative (remote) activities and remote interviews with children:

I learned from desktop research that children spend a lot of time with digital devices, and I observed during the user research that in addition to their digital time they are involved in many other activities as well, such as:

1. Applying the learning from digital media into a physical activity (Tinkering):



Aarav learning to tinker using YouTube

Aarav learns from YouTube about sensors and applies the learning in tinkering with things. He makes things and takes part in science exhibition and competitions at his school.

2. Making art & craft, interest in music:

Syona's interest in art, craft and Music

Syona loves doing art and craft. She has a guitar, and a mouth organ and is excited about music but doesn't have an opportunity to go through a formal training in music.

3. Experimenting, combining two/more things to make something new:

Ilo experimenting with steam engine to shine the light bulb

Ilo has a steam engine and he wants to make the light bulb shine by using the steam engine. He is trying to combine knowledge of teo things and doing it for fun.

4. Curating a collection, displaying and showing off:

Otto loved to show-off and display his collection

Otto loves collecting Pokemon game cards. He has a collection of them and love to display his unique cards. He also plays Fortnite online-game with his online friends whom he has never met in the physical world.

6.1.3 Primary Research:

Questionnaire (parents & teachers) survey:

I connected with parents and teacher through calls and online questionnaire survey. The quantitative data about some of the main findings (children's time on digital media, children's time spent with parents and the activites children enjoy) is mentioned in the image on the right hand side.

Reflection on the main findings from Parents:

1. **Children spend more time on digital Media, but love more the outdoor and Indoor physical activities:**
   - Because digital mediums are purposefully designed for glued engagement.
   - Because digital media is visual as well as audio, it has their favourite stuff and they can quickly switch between different topics in parallel if they get bored.

2. **Parents said children are lacking in handwriting skills.**
   - It could be one of the potential opportunity areas to work with.

3. **Children's digital time has reduced learning through physical social interactions.**
   - It could be one of the potential opportunity areas to work with Or a design criteria to follow.

(Quantitative data from the survey)

"Though children spend more time on digital media, their true joy comes from other indoor and outdoor activities"

(said by a few parents, and above data validated it)

6.1.4 Main findings and Learning:

Personality of children aged 8-11:

- It is a transition phase from child-like to teenage.
- Start to show an independent personality or individualistic approach.
- Higher age groups like more challenging activities- physical and mental
- They experiment, collect, curate, make-break and organise things they love
- They have relatively stable interests

Activities:

A few of the insights from parents, teachers and children and children's activites caught my attention, they seemed to be good opportunity areas to work with. They are as follows:

Handwriting- "Children are lacking in handwriting skills because of their excessive time with digital devices"(Said a few parents). It could be an opportunity area to explore.

Art, craft, and tinkering- I observed that children are doing art & craft and experimenting with raw materials to make something new (specially aged 10-11). It can be a good opportunity to follow and explore in their interest area.

Sound & Music- I learned that a few of them are excited about music, but don't have an opportunity to learn it through a formal training. And a child's (Syona's) story of marbles inspired me where she collects marbles of different sizes becuase they make different sounds when she plays with them. This area could give me an opportunity to explore my interests with sounds as well.

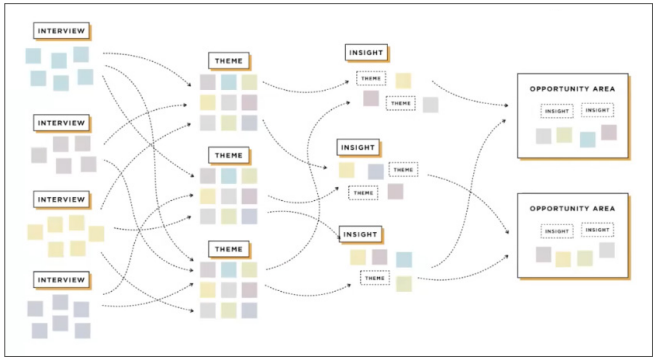
Attributes to follow while designing for children:

- I leaned from the experts that I need to follow these attributes as an inspiration to design for children

  Create Curiosity, excitement, Give opportunity for performance, destroy- make/break, Make it more open, challenging and competitive.

6.1.5 Analysis & Synthesis:

As mentioned earlier, I followed affinity mapping method for analysis and synthesis of research data. Findings from interviews were categorised in themes, and I generated insights which further led to a few opportunity areas.



(Representation image of affinity mapping method)

6.0 Design

6.1.5 Analysis & Synthesis:

Here is a glimpse of analysis and synthesis of research data. I found a few themes in the findings, generated insights which helped in formulating the opportunity areas. The image here shows the synthesis after the interactions with children, in the same way I had also carried out synthesis for the research data obtained from the experts, parents and teachers. How might we statements in different opportunity areas, were iterated, refined in 2-3 rounds based on the keywords, attributes that were found during the insight generation.

(Synthesis using the affinity mapping process)

6.0 Design

6.1.6 Opportunity Areas:

The insights from the affinity mapping exercise helped me derive three opportunity areas which were further taken to the Ideation and probing phase.

Opportunity1

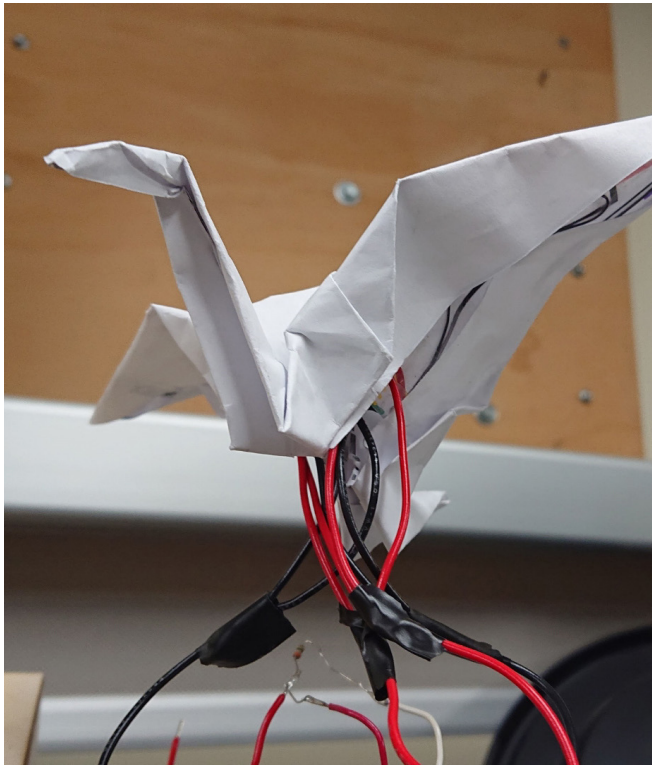
(Handwriting)

HMW create opportunities for children to **actively engage, self-explore their handwriting skills.**

Opportunity2

(Art & Craft, Tinkering)

HMW create opportunities for children to **actively engage, self-explore their creative skills (art & craft, visualising, making etc)**



Opportunity3

(Sound & Music)

HMW enable children to **actively participate and share their curiosities and interests with others through music/sound.**

6.0 Design

6.1.7 Design Principles:

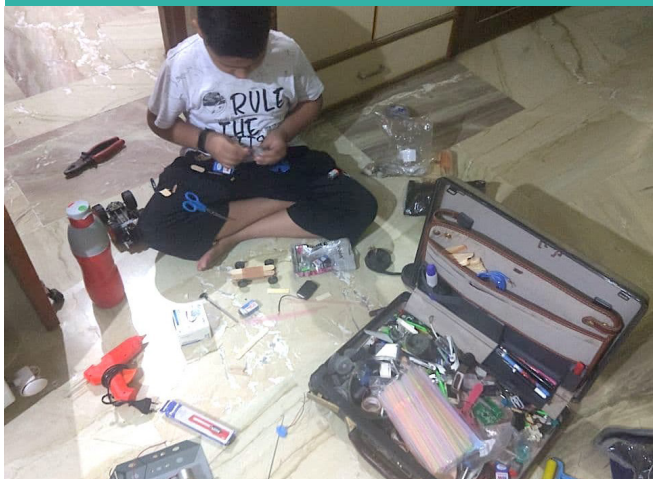
Insights (user personas, their needs, and their involvement in different activities) inspired me to define a few design principles which I followed throughout the project to evaluate my design decisions.

INSIGHT:

- Children are applying the learning from digital media (YouTube) into a physical activity
- They are experimenting, combining two/more things to make something new

1. COMBINATION OF MULTIPLE

Enable building by combination of two or more objects and/or mediums



INSIGHT:

- Children love physical activities through which they explore the surroundings and become curious and observant about things.
- Physical activities strengthen physical, emotional and social skills

2. ENGAGEMENT WITH PHYSICAL

Enable engagement in the physical play and/or with physical world

INSIGHT:

- Research finding- Children love to share and show-off their things
- Experts say- Children love to display their creation to an audience.

3. SOCIAL INTERATION

Enable social interaction by opportunities to involve others and share

6.0 Design

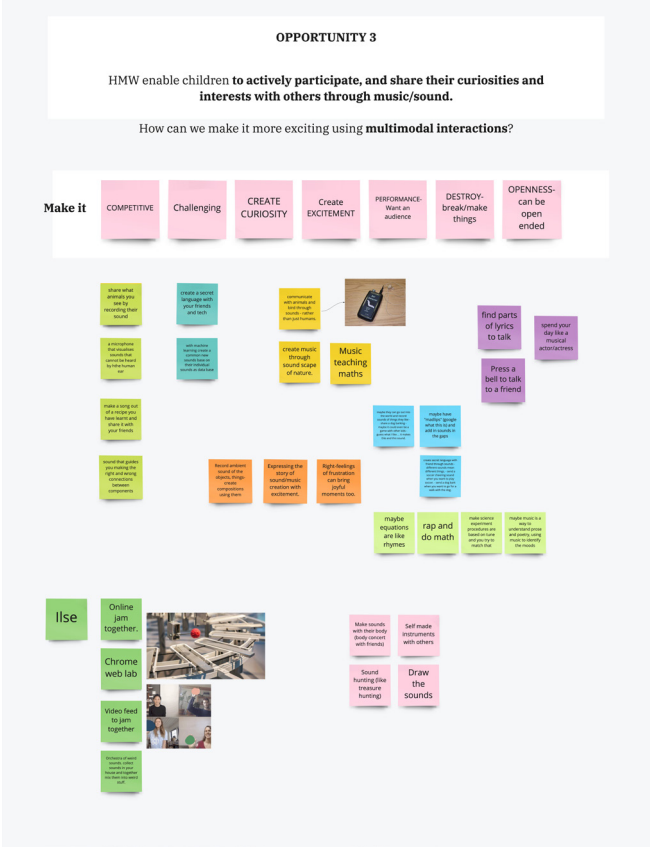
6.2 Ideation, probing and testing

After deriving three opportunity areas from research, my approach in this phase was to use lo-fi exploration or probes to see users' reactions to generate the ideas in the respective opportunity areas. I also wanted to see if there is an overlap and if I can combine one or two opportunities to narrow down my focus area.

Ideation:

I did a quick ideation workshop with fellow designers and the aim of this session was:

- To generate quick ideas for all three opportunity areas and
- To explore a combination of opportunity areas.



(A glimpse from the brainstorming workshop)

6.2 Ideation, probing and testing

Probing/ Lo-fi explorations:

The ideation workshop brought me a few ideas to make probes in first and third opportunity areas. I first started making probes in those areas.

Aim of the activity-

- To use 'deliberate lack of functionality to provoke/ entice users.'
- To get 'quick reactions and insights to generate more ideas' in two opportunity areas (Handwriting, and Sound & Music)
- To get 'clarity about which opportunity I can and want to focus' on.
- To check early in the design process 'if a merger of the above two opportunity areas looks exciting.'

Trying a combination of opportunity 1 & opportunity 3 (i.e. Handwriting & Sound/music):

Why this combination- 'Children are lacking in handwriting' was a concern of parents and teachers. But most of the children don't care about it because it is not their personal interest or intrinsic drive. Sound/music and visuals through light & generative art (which were my explorative choice) can be some of the ways to bring-in play element to capture children's attention or make them excited about handwriting. It was promising to explore a merger of two opportunity areas, it will help narrow down the direction and focus on one area.

6.2.1 Probe(1): Personal Handwriting-pad

Idea: Mapping the handwriting movements with sound and visuals (light, generative art) to see if play elements of sound and visuals can capture children's attention to handwriting activity .

The making of probe1:

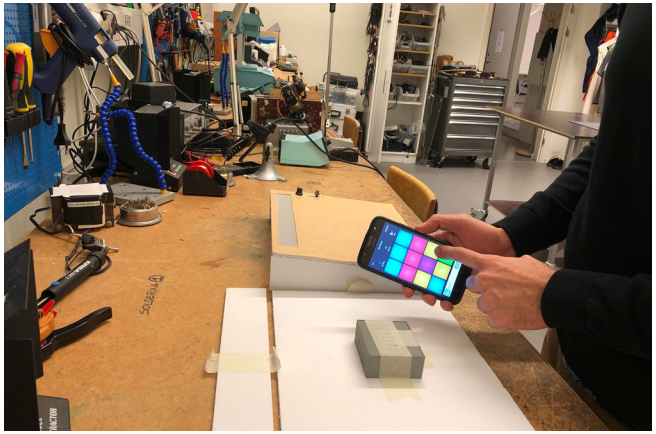
I made a box on which a child can put A4 paper and write something. I put LED lights and bluetooth speaker inside the box which could be controlled from a distance using a remote (for lights) and my mobile phone or tablet (for speakers using bluetooth to play the sounds using an App).

During the test I tried mapping the play of light and sound with the handwriting movements of the user to give them an experience as if the light and sounds are responding to their pen or pencil movements.

Aim and why this form (physical & digital)-

- To test with them a small personal physical artefact.
- To test if the play elements of sound and light create curiosity and grab children's attention. Do they want to participate in handwriting activity this way? If Yes/ No- why?
- To test where would children like to have such an Interaction: school or home?

(See here the Wizard of OZ video clip of this experiment)



(Mobile and tablet Apps were used to play the sounds)

6.2.2 Probe(2): Bigger handwriting pad for family collaboration

The making of probe(2):

I made a bigger box on which 2-4 users can put A4 paper and write. (Rest of the making process is same as probe1).

Aim and why this form (physical & digital)- It was found during the research that 'Children's Social Interaction is reducing' and through this one I tried exploring social/family collaboration for handwriting activity. I wanted to see how parents would want to teach/support children with handwriting using an experiential tool. I also wanted to test where would children want to use this one: at home with family or at the school with friends?

6.2.3 Probe(1&2)- User testing

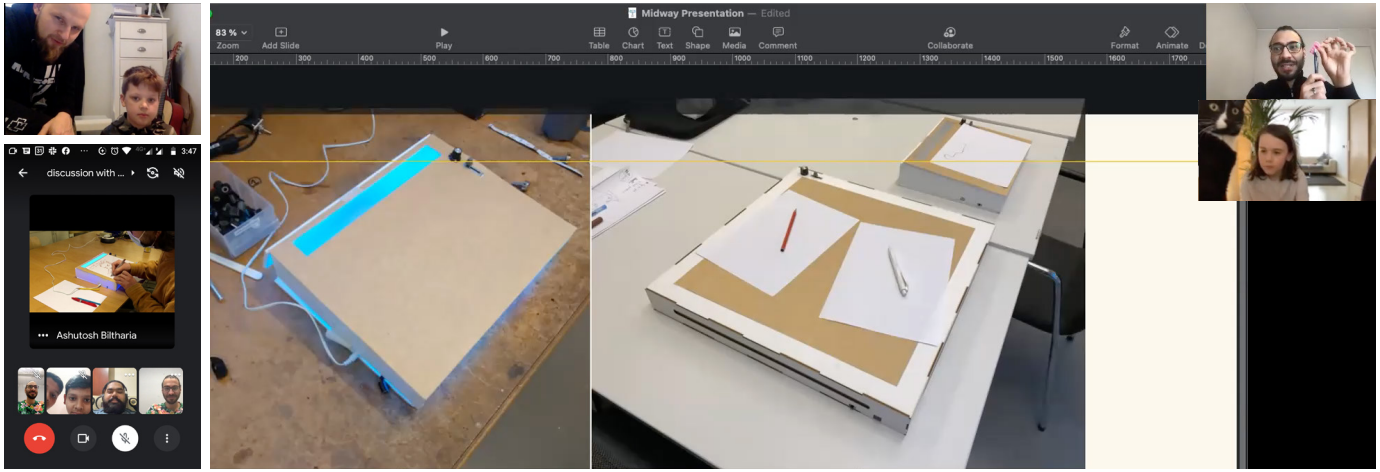
Remote testing:

I did the remote testing in two ways:

Over a zoom call- I showed children the probe with just the wire attached, and without any sound or light and asked them to share their thoughts. Once they were done thinking, I showed them the 'Wizard of OZ' video. In the end I asked children to share their feelings, thoughts or what else comes to their imagination?

Sending an explanatory OneShotVideo- I sent a set of questions with one shot video for both children and parents and received their reactions and answers.

Probe(2)- Bigger handwriting pad for family collaboration



Probe(1&2)- Remote testing with the users and parents

6.2.3 Probe(1&2)- User testing

On-site testing:

Personal handwriting pad- I provided user with the tools (e.g. papers, pen, pencil) to handwrite. As she started writing, I followed these steps:

- First, I mapped hand movements only with light
- Then I mapped it with light and sound simultaneously.

Bigger handwriting pad- For the bigger pad, I asked parent & child to collaborate for the handwriting activity and also to use it the way they want to use it. I listened to their experience and feeling about the whole interaction, and what else they would want to do with these probes.

Experiment1- Handwriting only with light

(video link)

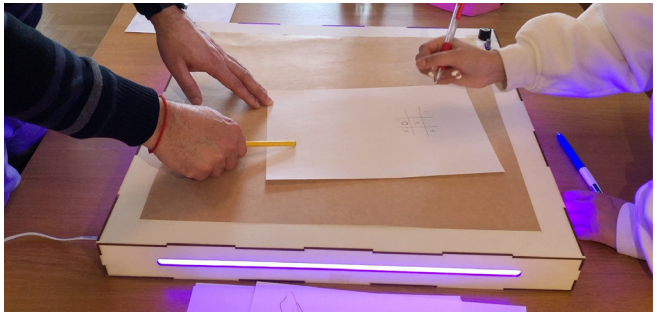
Experiment2- Handwriting with light & sound

(video link)

Experiment3- Collaboration with family

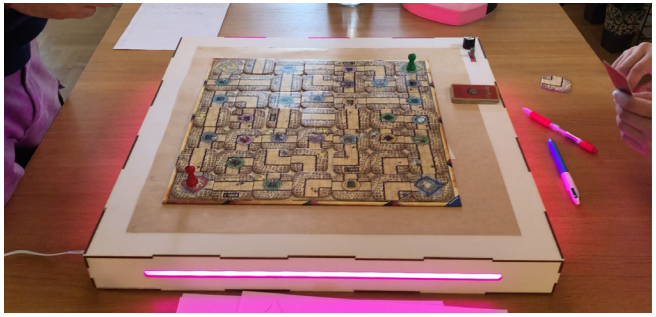
(video link)

User reaction1- How they imagine using this probe



(video link)

User reaction2- How they imagine using this probe



(video link)

User reaction3- Rehet found this probe more engaging for art and drawing activity

(video link)

6.2.4 Probe(1&2): Reactions and feedback from the users and others

Due to the covid restrictions, I had to first test the probes with adults. Later, I got opportunity to test with children as well. One major finding of this exercise was- Users and adults started with handwriting, but their focus intuitively shifted to drawing curves, lines, and making their art.

Testing with users and adults

Users' and adults' creation

Through the remote and on-site user testing I observed that probes also triggered user imagination with handwriting, drawing and the use of sound with it. They expressed their stories with the characters (letters, words, drawing) with sounds. Though I got the reactions from the adults as well, I have mentioned here only the main reactions obtained from the users-

- I love it but also a bit confused about how this works. I enjoyed it more for drawing than writing something.
- It would be awesome if drawing becomes a code which could be scanned to replay the music.
- I would like to use it as a scanner to scan old painting and listen to how it sounded when it was created.
- It is good for cursive writing because writing the print letters will break the music.
- It is amazing for my animation; I can use this as a light table and put sounds to my animation.
- I can also put sounds to the letters, words I write and to my drawings of cat, dog, trees, river.

A gist of the ideas from the users and others

6.2.5 Probe(1&2): Evaluation using the Design Principles(DP)

DP1: Combination of multiple (Enable building by combination of two or more objects and/or mediums)-

- Children imagined building a story by combining sound to the writing/ drawing characters (letters, words, and drawing).

DP2: Engagement with physical (Enable engagement in the physical play and/or with physical world)-

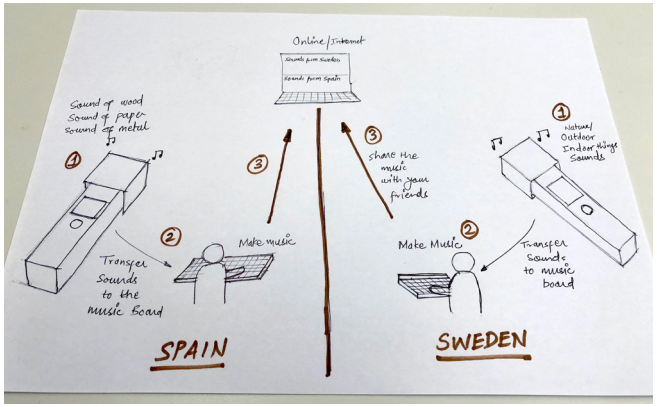
- Children imagined capturing the sounds from daily life and surroundings and using them for their writing and drawing activity.

DP3: Social Interaction (Enable social interaction by opportunities to involve others and share)-

- The probe2 did not bring much insights for family and social collaboration because Covid-19 situation restricted its testing in an effective way. I tried to test it by making the explainer video and sending it to users, and parents to get their reactions, and I realised that probe2 could not provide them enough framework to think and imagine its usage.

6.2.6 Probe(3): Recorder for sound and creating music

Idea-
Step1- Capture the sound of surroundings,
Step2- Create music by simple effect tweak-ins, mixing
Step3- Create a collection and share/exchange it with online community.



Sketch of sound recorder and crearing music

Why sound and music- During the research, I learned that there are children who are not taking any formal training in music, but they are excited about instruments and music. I thought, capturing the sounds of surrounding and making music can be one of the ways to actively engage children with the physical world and help them make and learn something they are excited about.

The making of probe3-

I used the existing sound recorder by covering the other functionalities to show a single main function to keep their attention and give the impression that this product is dedicated for 'sound of surrounding' experience.

Sketch of sound recorder and crearing music

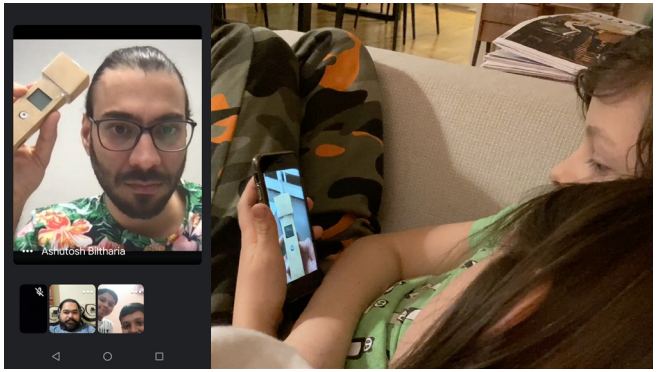
Aim and why this form-

- To test if this idea make sense to children and how they feel about creating music in this way?
- To test if they start noticing surroundings which they generally overlook.
- To test where would children want to have this interaction: at home or at the school?
- To test with them a small personal, and handy artefact dedicated for this experience.

6.2.7 Probe(3)- User testing

Remote testing:

The remote testing was done same as previously explained for the probe(1 & 2)



Sketch of sound recorder and crearing music

6.2.8 Probe(3)- Reactions and feedback from the users

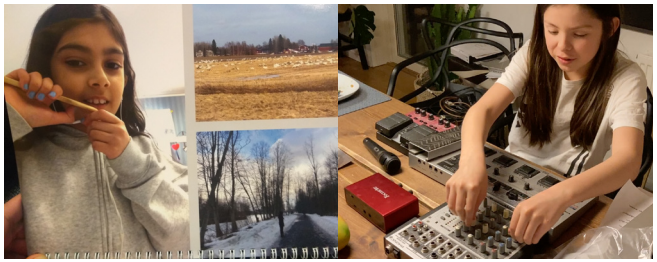
Some of the main reactions from the users, and a few parents and teachers are as below-

Ilo & Nael(11& 9 year)- I can record anything nature, bird, water dropping sounds- it is super for making sounds louder in the movies, e.g. Sound of raindrop can be put in the movie scenes to enhance the rain sound in the movie.

Kaur(10 year)- It would be fun to record sounds and use it for pranks. I will put sound under someone's pillow just for fun.

Otto(10 year)- I could hear the things talk that I normally can't hear, I can record their voices.

User stories- Ilo (11 year) has an old music mixer setup which doesn't work but he aspires to make music. Rehet (10 year) found a bamboo piece that she tried scratching it with nails and listen to its sound using the microphone.



Sketch of sound recorder and crearing music

6.2.9 Probe(3)- Evaluation using the Design Principles(DP)

DP1: Combination of multiple (Enable building by combination of two or more objects and/or mediums)-

- During the remote testing, children could imagine the use of sounds to build music or enhance the sound in the movies.

DP2: Engagement with physical (Enable engagement in the physical play and/or with physical world)-

- During the remote testing, children were excited about exploring the surroundings to capture the sounds.

DP3: Social Interaction (Enable social interaction by opportunities to involve others and share)-

- Children could not imagine how the aspect of sharing the music will work in this probe, because the probe was able to give them the experience of collection of sounds but it lacked in showing how the music could be made and shared.

6.2.10 (Probe1,2 and 3)- Reactions from the experts

I got in touch with Andreas Estensen (a sound designer) and Bethany Koby (Industry expert). They pointed out a few important things about all the probes.

Andreas Estensen
(Sound Designer)

Bethany Coby
CEO (Tech Will Save Us)

Andreas-

- Limit the user possibilities- Find a balance, because too much experimentation and completely free exploration (handwriting, drawing & Music) can easily become a noise.
- Use simple sounds to create play and give feedback.

Bethany-

- Using sounds of surrounding to make music is a good idea. A tool to play, explore, spark curiosity and self-express. Sampling is not easy to do. A lot of kids might sample a lot of stuff and not happy with the outcomes because it won't sound in a way that feels good to them. So, be sure how you deal with the mixing part of it.

6.2.11 (Probe1,2 and 3)- Challenges, Learning and takeaways

Probes helped me get the user reactions, they helped trigger their imagination, but there were also some challenges and learning during this phase which paved the path for the next stages in design process.

Challenges and learning:

Mapping the light- I could not effectively map play of light with handwriting because it was a pre-programmed light. I could only control on/off, rather than a smooth transition control.
Abstract Mediums- Probes1&2 were too open to test for handwriting and music because both are two big and abstract mediums.
Collaboration- I could not test much the collaborative writing activity because of the lack of reach to children and parents.
Intuitive interactions- Setting no limits to the handwriting and sound/music worked in a way because it showed users intuitive interactions.
Drawing- Intuitively, users drew more or wanted to draw more than handwrite.
Either sound or music- One way to put the limits could be choosing simple sounds as medium to create play or give feedback.

Takeaways:

Decided the next investigation area which was handwriting & drawing with a focus on the personal and smaller writing activity, because making something for collaborative activity and not able to test it for collaboration (due to covid distancing) might bring shallow results. Exploring just sounds with handwriting and drawing could be a good idea.

6.2.12 Way forward- Focusing on one opportunity(Handwriting & Drawing)

Based on my learning from the ideation and probing phase, I decided to focus on Handwriting and drawing. The main reasons are mentioned below:

Users' and adults' creation

- I found interesting that how users' intuitive interactions led the handwriting activity to drawing activity.
- Children's excitement to express their stories and how they could animate the writing (letters, words) and drawing characters (cat, dog, trees, river etc.) by putting sounds to them, provoked me to think about exciting opportunities in this area.

6.2.13 Handwriting & Drawing- Learning from teachers, experts, hobbyists and parents

I interacted with teachers, experts, hobbyists and parents to learn their perspectives on handwriting and drawing as a creative activity:

- **Questionnaire to 5 teachers of children 3-6 age**- To learn how they teach children the handwriting in very small ages.
- **A call with 2 experts**- To learn how they see the value in handwriting and drawing as creative activity.
- **A call with 2 doodlers**- To learn about their motivation of doodling and experimenting with visuals of letters, words and drawings.

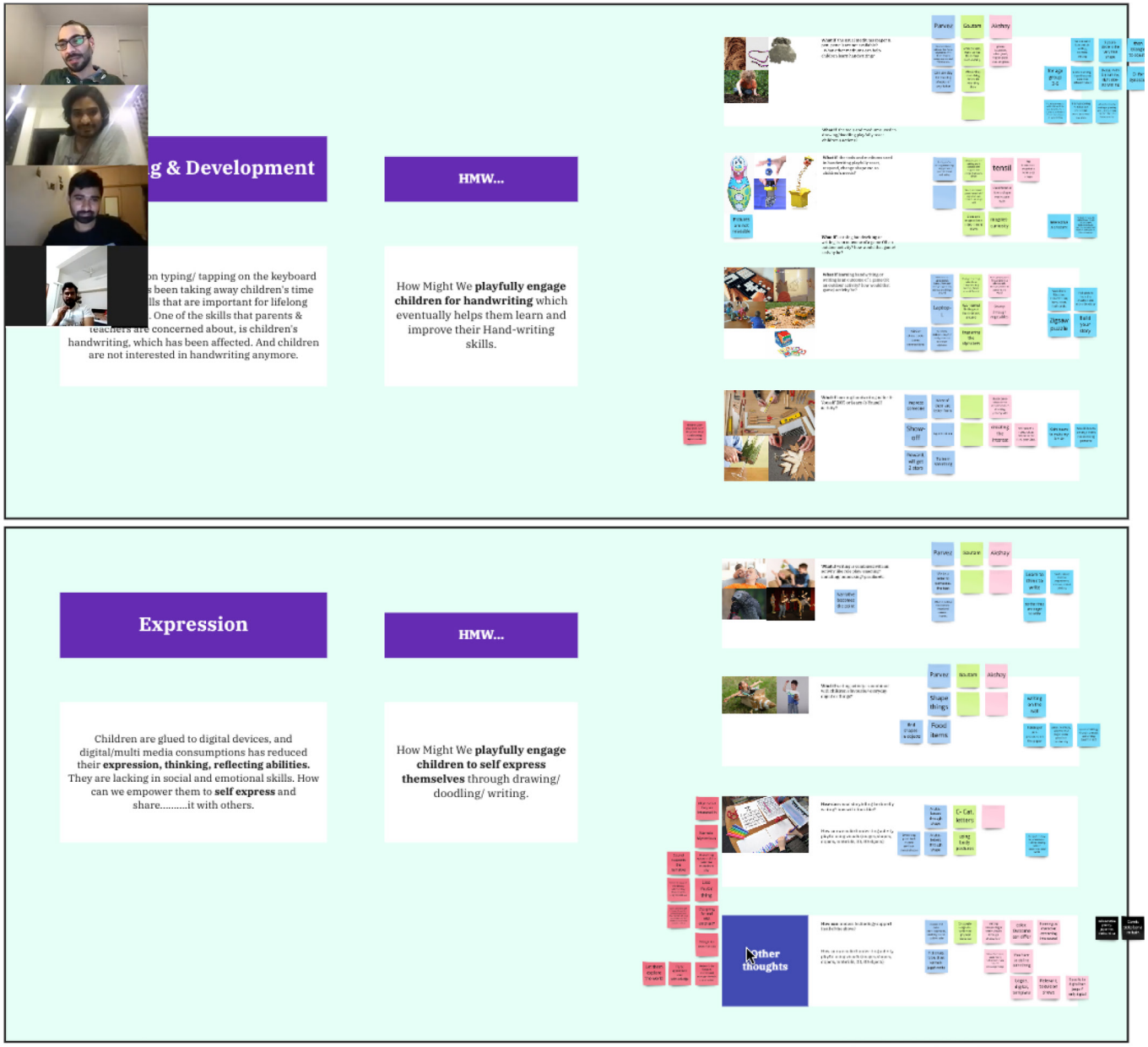
A call and ideation workshops:

- **With 3 hand letterers**- To learn how and why they are still doing had-lettering, what has changed.
- **With 6 parents & teachers of children aged 8-12**- To learn how children in my focus group express themselves and an expression means to them.

For ideation I rephrased my previous 'how might we' HMW statement into two HMW statements (as mentioned below) and formulated 'What-if' questions with some images as inspiration for each statement.

"How Might We playfully engage children to help them improve Hand-writing skills"

"How Might We playfully engage children to help them express through drawing, handwriting"

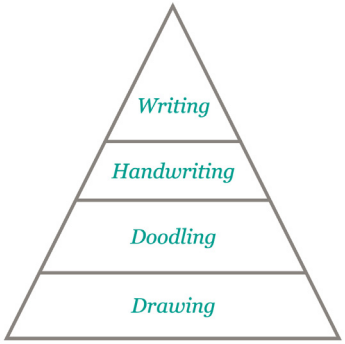


A glimpse from one the workshops

6.2.14 Main learning from teachers, experts, hobbyists and parents

I got very interesting insights through the interactions with all of them. A gist of the insights is mentioned below:

Basics of handwriting and drawing:



FOUNDATION

"First handwriting experience for children is drawing on the wall and floor- it is the first curiosity with which a child express him/herself to the parents. Drawing is the foundation."

(Says a teacher of children aged 3-6)

"In today's society, handwriting is explored as a hobby or creative activty".

"Creating a personal connect with the activity will help children being more expressive- Drawing, writing, handwriting is a part of an expression".

(Swapnesh, Researcher and Toy and game designer)

Examples of children's (aged 8-11) expression shared by parents:

Examples of children's expression shared by their parents

"Let them be the way they want to be then only we can talk about self-expression of children"

(Says a mother)

6.2.15 Takeaways and Final How Might We statement

In addition to some ideas from the ideation, below is the gist of takeaways which paved the path for further actions in the design process.

- **Drawing is taught first**; it is the foundation and the very first form of a child's expression. It is a bigger umbrella and doodling, handwriting, and writing reside under it.
- **The value of handwriting** as a utility has reduced. It is explored only as a hobby. Children do handwrite if it is a part the activity, they are excited about.
- **Activities combined with children's current interests**, exciting mediums and their life scenarios and stories are some of the best ways to grab children's attention.
- **A personal connect** with the creation can bring a conscious engagement from people which eventually fosters more creativity in a person.
- **Self-expression** can make people explore different art forms, tools/mediums and eventually learn new things. Examples are the visuals from Parvez (hand-letterer, adult) and Syona(8 year).

Above learning helped me decide to focus on the second How Might We statement (a way of expression). I included doodling and writing in the statement because doodling and writing are also a form of expression within the same domain of drawing and handwriting. Rephrased How Might We statement:

"How Might We playfully engage children to help them express through drawing, doodling, handwriting and writing".

6.0 Design

6.4 Concept development

Inspiration- I observed during the probing exercise that children were excited about expressing themselves through drawings and writing. Also, parents shared the example of their children's expression (image below) through drawing as comic strip and cards. I was inspired by how children irrespective of the quality of drawing express themselves by making these cards which can be

Examples of children's expression shared by their parents

often found hanging on their study desk, house walls, refrigerators and other spaces. It made me think how I can explore ideas in the lines of this 'way of expression' of children.

My approach was to create a personal connect and a platform for children's expression through handwriting, drawing, doodling and writing. I also also engage them in physical world in the process of creation.

Postcard and polaroid photo experience:

As children love to display and share their creation, I also thought how I can create an activity which enables the sharing aspect similar to postcards and polaroid camera photos. I thought about the age-old experience of the postcards, the beauty of writing a small letter, sharing the postcards with images and paintings on it, and how these postcards and printed photos are a form of expression.

Examples of postcard, polaroid camera, and handmade cards

I thought **"How I can reinvent the drawing card and greeting card experience for children" using the design principles".**

"What if there is a tool that helps create, enhance and share an expression through drawing, doodling, handwriting and writing".

Revisiting the idea canvas:

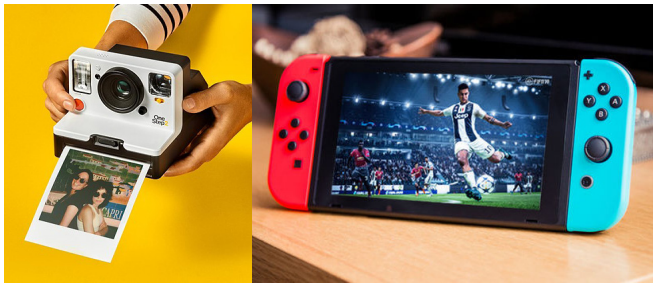
I also referred to the ideas from probing exercise (as shown in the image below) to make use of the ideas which were shared by children. Based on previous findings and observations that children were more excited about expressing themselves through drawing, handwriting and animating the characters using sounds, I decided to follow their interests for the concept explorations.

Examples of children's expression shared by their parents

During the concept development, I made sure to follow the design principles which I had set in the beginning and bring physical play to the concept activities.

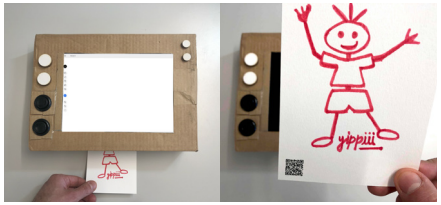
6.4.1 Concept Iteration1- Doodle Box (More physical than digital)

I came up with an idea of a doodle-box, a physical and digital interface. Physical controls to use and control the software/app on a digital screen. It also had an inbuilt printer. The inspiration for this idea came from Polaroid camera and Nintendo switch:



Inspiration from Polaroid camera and Nintendo switch

Creating the doodle | Putting in doodle box | Adding animation and sounds



Printing the code | Sending/sharing the card

Through this concept:

1. Children can create the doodle, put it into the doodle-box,
2. The doodle is scanned and appears on the digital screen,
3. Children can try and apply different inbuilt animation and sound effects to the doodle which they can see on the digital screen.
4. The Doodle-box saves the digital effects on a web URL and prints the address of the URL in the form of QR code.
5. Children share their creation with friends, family.
6. Receiver scans the QR code which opens the animated form of the doodle.
7. Receiver can preserve the physical cards as memory. This physical card is a code to the digital creation of the child.

Video prototype link here: https://vimeo.com/546996995

Through this iteration, I tried creating an activity which encourages children's physical interactions more (making card in physical, the physical controls) and keeps digital interactions to the minimal.

This iteration gives children the opportunity to:

- Create in physical.
- Experiments with creation in digital
- Share, show-off the final creation

Evaluation using the Design Principles(DP):

DP1: Combination of multiple (Enable building by combination of two or more objects and/or mediums)-

- Though it enabled combining physical and digital creation, it lacked in providing flexibility and more opportunities for children to experiment.

DP2: Engagement with physical (Enable engagement in the physical play and/or with physical world)-

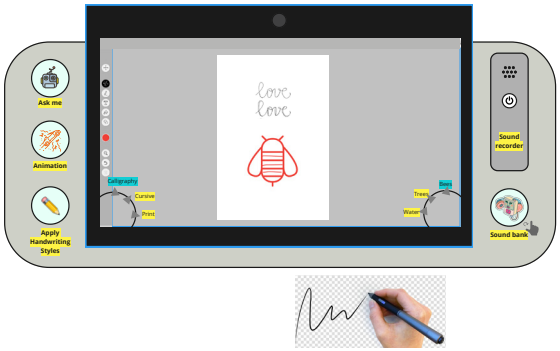
- It had just one opportunity to engage with the surrounding which was recording the sounds of surrounding and put in the doodle.

DP3: Social Interaction (Enable social interaction by opportunities to involve others and share)-

- Concept showed how children can send their creation (a drawing card) to their loved ones.

6.4.2 Concept Iteration2- A dock with an App for tablets (Balancing physical and digital):

In this iteration, the idea is about- A dock (printer integrated) with an app (for tablets and with a stylus).



Top view of the dock with a tablet

The opportunity for children is to:

- Create in physical or digital.
- Engage with the physical world.
- Experiments with creation in digital
- Share, collect, and show-off the final creation.

Opportunities in detail:

Use the physical drawing- Children create the drawings in physical paper, scan/ take a photo to import them to the App's canvas (postcard size) and start editing in digital.

Drawing digitally in the App- An opportunity to start their creation directly on the canvas in the App.

Use the favourite objects- Taking a photo of favourite/ daily objects using the camera through the App will generate a simple doodle of that object, children could modify and build on top of that doodle.

Handwriting styles- Type the desired text and choose a handwriting style, the App will convert the text in a dotted or skeleton form of the handwriting style. Children, by using digital brushes can overwrite by following the dotted path/ skeleton of handwriting style and put their chosen textures, colours etc. and eventually enjoy learning the handwriting styles in this process.

Sound bank- Using the sounds from the sound bank, e.g. if they want to put sound of a bee to the doodle of a bee, they can choose that sound from the sound bank (as shown in fig:.....Sound of Bee is chosen).

Sound recorder- A sound recorder (RHS in fig....) to record and put the sounds of their choice, e.g., surrounding, nature, their own voices etc.

Add animation- Try and apply the inbuilt animations from the App and save the animation effects on a web address/ URL. App helps print the URL in the form of QR code on the card.

Printer in the dock- Printer to print the creations and the QR code on card.

Sharing/showing off- Once printed, children can check the digital effects by scanning the QR code with a mobile phone or tablet camera. They can share, send or show-off their creation to friends and family.

Receiver experience- Receive the physical creation, scans the QR code to see the animated form of the expression, preserve the physical cards as memory which is also a code to the digital creation of the child.

Evaluation using the Design Principles(DP):

DP1: Combination of multiple (Enable building by combination of two or more objects and/or mediums)-

- Opportunity to use the physical drawing, drawing digitally in the App, use the favourite objects, handwriting styles, using the sounds and animation effects to build the creation.

DP2: Engagement with physical (Enable engagement in the physical play and/or with physical world)-

- Only two opportunities to engage with the surrounding- 1) using the daily or favourite object and 2) Recording the sounds of surrounding and put in the doodle.

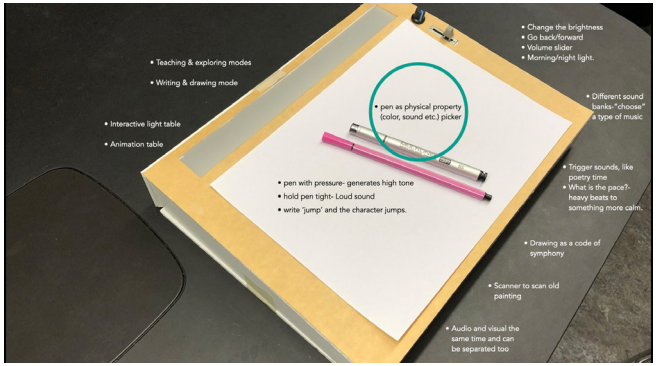
DP3: Social Interaction (Enable social interaction by opportunities to involve others and share)-

- Concept proposed how children can send their creation (a drawing card) to their loved ones.

I also evaluated this iteration on "How much digital and physical interactions make sense". My initial attempt was to explore an experience like Nintendo switch but as the App was a part of this proposal, shifting the physical controls of the dock (image- top view of the dock with a tablet) to the App sounded better. The idea of dock could be dropped and the only thing which remains is printer; to print the creation on a postcard. 'Printing the creation' is an important part of the concept because it gives children the experience of a physical touch and feel of the creation and of seeing how their digital creation works by scanning the QR code using a phone or tablet. This evaluation led to the next and final iteration.

Referring the idea canvas again:

I made a stylus pen a part of the iteration2, this made me reflect on the probing exercise again. Among a lot of other ideas, one child's idea of a pen had struck me the most. A pen which can pick the colour of things.



A gist of the ideas from the users and others

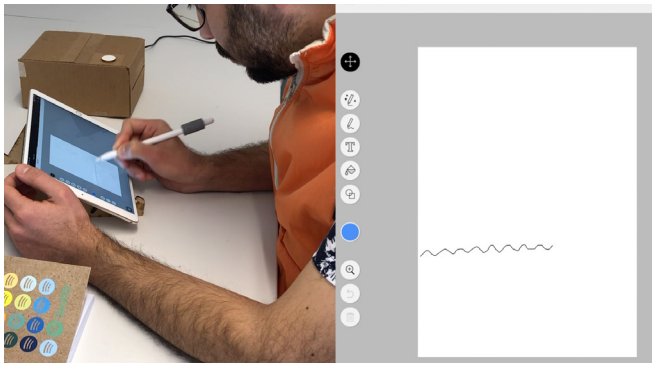
I also came across an experiment called I/O Brush done by MIT Media Labs in 2005, which assured the technical possibilities of the property picker pen idea.I decided to prototype the experience of this idea with the next iteration.

I/O brush experiment from MIT Media Lab (video link)

6.4.3 Concept iteration 3 (Final)- An App with a digital pen and small printer:

This iteration included an app for 2D or 3D animation, a digital pen which can pick the properties, e.g., colour, texture and sound from the surrounding and a printer and scanner to print or scan the creation.

Iteraction 3 idea representation



Video prototype link here: https://vimeo.com/537633538

I prototyped this experience in a video form, which was a compilation of all the possibilities I wanted to show to children to learn from their opinions.

Opportunities in detail:

Use the physical drawing- same as iteration2.

Draw digitally in the App- same as iteration2.

Use favourite objects- Use the favourite objects and things OR get inspired by the shapes and forms of the objects of surrounding to build the drawing.

Doodle bank: Children can simply search for the keywords and doodle bank will give them the doodle options of that keyword.

Handwriting styles: same as iteration2

Digital pen: As shown in the video, children can pick the properties (colour, texture) of the objects using the digital attachment in the pen.

Sound of their choice: Use the digital pen to record and put the sounds of own choice, e.g., surrounding, nature, own voices etc.

Add animation: Try and animate the creation by applying inbuilt 2D or 3D animations. App also saves the animation effects on a webaddress/ URL. App helps print the URL in the form of QR code.

Printing: A small postcard printer to help print the creation with QR code on a postcard size paper.

Sharing/showing off: same as iteration2

Receiver experiences: same as iteration2

Sharing loop: The idea here is also to create a loop of sharing the cards, and receiver child can also share her/ his creation as a reply to the sender.

Evaluation using the Design Principles(DP):

DP1: Combination of multiple (Enable building by combination of two or more objects and/or mediums)-

- Opportunity to use the physical drawing, drawing digitally in the App, use the favourite objects, use the shapes and forms from surrounding, digital pen to capture the sound and colour of the objects, hand-writing styles, use the sounds and animation effects to build the creation.

DP2: Engagement with physical (Enable engagement in the physical play and/or with physical world)-

- More opportunities to engage with the surrounding- 1) Using the daily or favourite object, or their shapes and forms of objects, 2) Pick the physical properties and sounds.

DP3: Social Interaction (Enable social interaction by opportunities to involve others and share)-

- Send the creation (a drawing card) to their loved ones and the concept also proposed how a loop of sharing the cards could be created.

6.4.4 Concept iteration 3 (Final)- User testing

Kaur(Age 10): After showing the concept video, I asked him how he felt and what would he like to do or create using such platform.

Kaur looking for things around to use in his drawing

Observations:

- **Inspiration**- He wanted to execute his drawing idea and started exploring the surrounds to find relevant shapes for inspiration.
- **Investigation**- He started to explore and investigate other things (things other than drawing inspiration) in the process, which validated the idea of engaging children with the surrounding to increase their observation and curiosity.
- **Expession**- He started expressing his story and how through the 3D animation effects his drawing characters can become as big as the room size.
- **Not proud of handwriting**- He told that he doesn't like to write because his handwriting is not good and he is not proud of it.

Eva(Age 7): Though Eva was not in my focus group, I took this opportunity to still test the concept with her.

Eva drew her favorite toy's story

Observations:

- **Inspiration**- Her favourite toy (a bear) became a starting point.
- **Expession**- She wanted to express the story of her bear and how a dolphin is speaking to the bear.
- **Two Mediums**- She could express an animated story of a physical object using digital medium.
- **Sharing**- She wanted to share the final creation with a friend across the street.
- **Parent-child interaction**- When she could not draw the dolphin, she went to her father and asked him to draw a dolphin for her. There was a family interaction happening through this activity.

Learning from the user testing of the final iteration helped me narrow down and think about core of this concept, and propose the final concept which is explained in the next section

6.0 Design

6.4 Final design concept

Learning from the user testing of the final iteration helped me narrow down and think about core of this concept. I wanted to emphasize on one main thing or metaphor which will grab children's attention in a best way. I decided to emphasize the digital pen as the core idea. Concept video shows- a mother and her son's story.

Concept Video:

Concept explainer video link- A mother and her son's story

I designed the interactions (as shown in the video) that could be created using the digital pen like a magic wand.

The concept video gives a glimpse of how 'animo- a tool to engage children in storytelling activity through physical play' helps a mother convert her son's passive engagement with digital mediums into an active engagement. (video link is embedded in the above image)

6.4.1 'animo'- physical details

The concept 'animo', is a combination of the digital pen and an App. The digital pen has sound recorder, camera and custom buttons. The custon bottons are by default set to work for sound recorder and camera.

Camera- In the pen for children to capture color, material texture, patterns from the surroundings.

Concept overview

Sound Recorder- In the pen for children to capture the sounds from surrounding using physical objects, living and non-living things, record voices and conversations. Sound recorder is given in the pen because it would be easy to carry, handy and portable. Another option of recording the sounds is by using the microphone in the tablet.

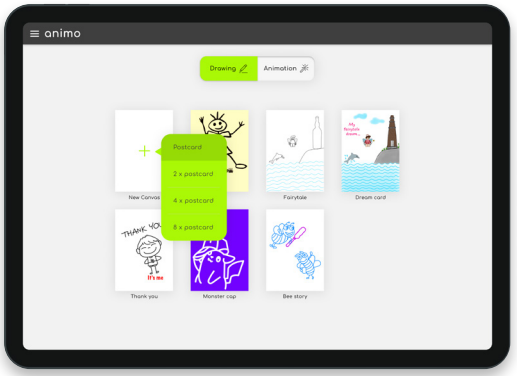
Buttons- Help in the above two functions by default settings, but can be set for other functions of the app.

6.4.2 'animo'- digital details

The digital part of the concept is animo app which is simple to use for children and works in sync with the animo pen. The App is proposed to work with all tablets and is available on the app stores. The digital design of the App is kept minimal.

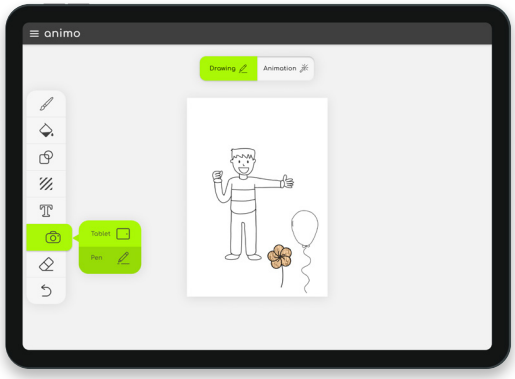
animo App opening page

Start the drawing: Children can start by choosing the canvas size in the drawing mode as shown below.



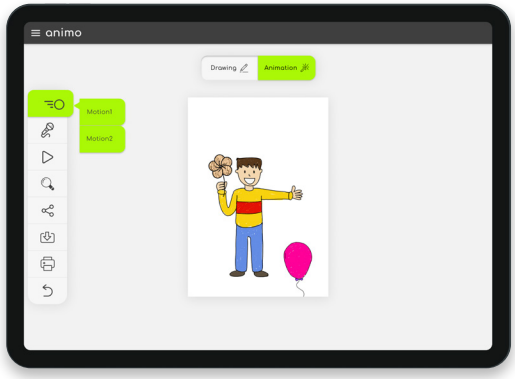
Choosing a canvas

BUILD the creation using two or more object and mediums- The camera options in the drawing toolbar give children the opportunity to capture the physical properties of daily things like shapes, forms, textures, and colors.



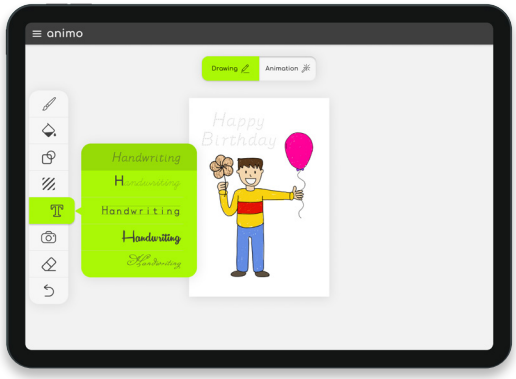
Choosing the camera option to capture the texture

ENGAGE in physical play and with the surrounding while building the creation- An easy and fun way to add motions to the characters brings the play to the activity. Drawings respond to the motions of the pen. Animation toolbar adds motions as layers.



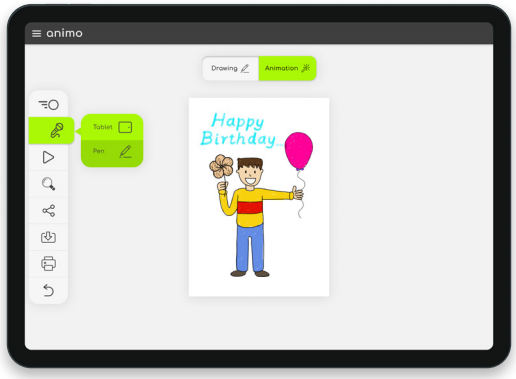
Given motions get added automatically as layers

Try Handwriting styles- Children can use their own handwriting but also can use the handwriting guide to learn new styles. It also helps improve handwriting.



Handwriting style guide

Capturing the sounds- Creates curiosity and brings more awareness about living and non living things. As shown in the concept video, it also gives children the opportunity for social interaction and collaboration with others for their creation.



Sound recorder options to capture the voices/sounds

6.4.3 Opportunity Analysis using the Design Principles (DP)

Based on design principles, I analysed different opportunities which animo brings for children.

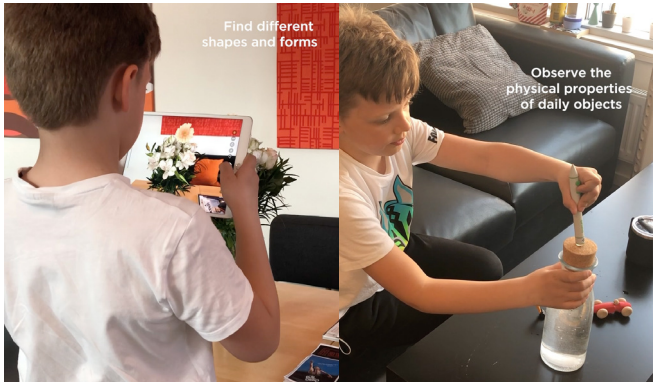
DP1: Combination of multiple (Enable building by combination of two or more objects and/or mediums)

DP2: Engagement with physical (Enable engagement in the physical play and/or with physical world)

DP3: Social Interaction (Enable social interaction by opportunities to involve others and share)

1. Opportunity to build ideas using the surroundings and the physicality of daily objects-

What it does- This opportunity increases children's curiosity and observation about the physical world. They start to notice things which they generally overlook.
DP- This is based on the DP1 and DP2



Child getting engaged with the physical world

2. A simple way to apply motion-

What it does- This opportunity provides an easy and fun way to add motions to the characters and brings play to the activity. Through this opportunity children learn storytelling skills which help in their expressive and communication abilities.
DP- This is based on the DP1 and DP2

Child adding motions to the drawing/ characters

3. Write with own handwriting or use the guide to write in styles-

What it does- This opportunity helps improves cursive writing, learn new styles, and encourages writing as a creative activity.
DP- This is based on the DP1

Child trying handwriting guide to learn cursive writing

4. Capturing the sounds and involving others in the creation-

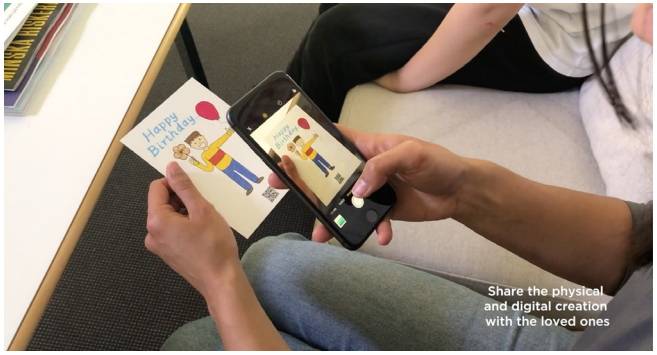
What it does- This opportunity provides ways to include others in the creation. It creates curiosity and brings more awareness about living and non living things when children start noticing sounds from the surrounding to use in their creation.
DP- This is based on the DP1, DP2 and DP3

Child involving family member to build the creation

5. Sharing the expression-

What it does- This opportunity provides physical and digital experience of the creation and encourages social interaction. Displaying the creation to others brings a sense of being noticed which motivates children to explore more.

DP- This is based on the DP1, DP3



Child sharing the physical and digital creation with loved one

7.0 Contribution

The project developed the concept “animo”- a digital tool to engages children in a storytelling activity through a physical play. It creates opportunities for children to build the creation by COMBINING two or more objects or mediums, by ENGAGING in physical play and/or with the surrounding and SHARING the creation that increases their social interactions. “animo” offers children the opportunity to become more curious, observant, and discover living and non-living things. It allows to bring feelings and emotions to their drawings which increases their expressive and imaginative abilities. They develop empathy, love, and care by sharing their creation with others. Small recognitions of their creation provide them with a sense of being noticed and encourages them to explore more. The concept combined children’s current interest in digital tools and mediums with their interests in drawing and doodling, and made it more exciting by giving them the opportunity to include their own life stories. “animo” helps children learn storytelling through animation, but more than that, it exposes them to the infinite possibilities of learning through physical play. The concept enabled a convergence of possibilities of digital mediums and children’s real-life scenarios to engage them in a quality activity.

The project envisioned how behaviour and responsiveness of involved mediums can bring more expression to the user interactions or how the relation between behaviour and response can be utilised to make the user interaction more exciting. ‘animo’ is also an example of how interaction design can help create tools and frameworks which increase human sensibility, curiosity and discoverability about the living and non-living entities i.e., the world around them.

Researched through prototypes (both physical and digital). Tested the low and high-fidelity physical prototypes (amid Covid-19 restriction) with twelve target users, three parents, three experts in remote and on-site settings. Made wizard of oz video prototypes to share online with children, parents, and experts to get the feedback.

Presented “animo” at UID Talks, the UID21 event and shared online to the participating industry professionals, academia personnels, and design students.

8.0 Acknowledgement

It is my greatest pleasure to express my gratitude towards the Umeå Institute of Design (UID), Umeå, Sweden for giving me an opportunity to study here. This project was a part of the academic requirement for the Master in Fine Arts (MFA) program in Interaction Design at the UID. It was an independent project and I developed the design concept at UID. However, the project would not be in this shape without the help of the many amazing people.

I would like to extend special thanks to my supervisor Linda Bresäter, Brendon Clark for digital method lab sessions, my tutors and mentors Marije de Haas, Ylva Fernaeus, Niklas Andersson, Monica Lindh-Karlsson, Jonas Sandström, Rickard Åström, and my examiner Stoffel Kuenen and external advisor Jenn Sarich-Harvey for their honest and critical feedback during this journey. I am grateful to receive critiques, suggestions and support from the field experts Andreas Refsgaard, jennifer sykes, Andreas Estensen, Bethany Coby, Swapnesh Samaiya, Gaurav Juyal, Hanne Hede Jørgensen, Nils-Erik Gustafsson.

I can't thank enough to Brendon Clark, Marije de Haas, Mihkel Güsson, Jasjit Singh, Rashmi Mishra, Birendra singh, Anne Kathrine Windel, Barbara & Gavin Feller and their families for helping me with the user research and testing. I would like to thanks and extend my love to all children- Aarav, Atharva, Otto, Nael, Ilo, Rehet, Julie, Sino, Kaur, Leya, Syona, Aarav, Shivansh, Amun, Eva for participating in the activities.

Also, many thanks to Minh Huy Dang, Geert Roumen, Shibashankar Sahoo, Petra Persson, Adarsh Paul, Shilpi Samson, and Connie Jehu for helping me during the project. And thanks to my family, friends, everyone in India who helped me with interviews, questionnaire, workshops, user tests etc., Finally, I am thankful to Demian Horst for UID Talks and all my friends, classmates, batchmates, faculties and staff members at UID. Last but not the least Paolo Camerin for being a constant companion in the IxD lab and studio and for all the good times during this project.

9.0 Reflection

Thinking through hands and prototypes: One of my challenges during the previous projects have been thinking through hands or prototypes. Many times, I was stuck with conventional way of research and found it difficult to start researching through prototyping or provo-typing. The motivation behind doing this project in physical and digital space, was to give myself more opportunities of research through prototyping. I am happy that, this time I tried the new ways to prototype the user experience.

Crafting the story: Among all the projects at UID, this project has taught me the most about how to craft the story of a project, and how to communicate it to the audience. I have learned the importance of the presentation of the story as well. I have learned to step back and take a zoom-out look to understand if the story makes sense and how to fill the gap and address the missing pieces.

Writing: This was the second project after fluid assemblage which taught me the importance of writing and how it plays a role in aligning the thoughts and ideas. I started writing the thesis report a little late, and this time I learned how writing is the best way to craft the story of the project and helps in building an argument for the project.

Playful experiences: While designing a play and active participation for children, I read and learned about designing playful experiences, this learning would also help me bring play (if needed) to the user experiences for any age group in the future.

10.0 References

Guy R. Lefrançois (2019)
“Theories of Human Learning: Mrs Gribbin’s Cat”
Pulished by: Cambridge university press

Rosemary Luckin (2018)
“Machine Learning and Human Intelligence: The future of education for the 21st century”
Pulished by: UCL Institute of education press

Luckin, Rosemary, and Mutlu Cukurova. ‘Designing Educational Technologies in the Age of AI: A Learning Sciences- driven Approach’. British Journal of Educational Technology 50, no. 6 (November 2019): 2824–38. https://doi.org/10.1111/bjet.12861.

Luckin, Rose, Wayne Holmes, Mark Griffiths, Laurie B Corcier, Pearson (Firm), and London University College. Intelligence Unleashed: An Argument for AI in Education, 2016. https://www.pearson.com/content/dam/corporate/global/pearson-dot-com/files/innovation/Intelligence-Unleashed-Publication.pdf.

Kay, Denise, and Jonathan Kibble. ‘Learning Theories 101: Application to Everyday Teaching and Scholarship’. Advances in Physiology Education 40, no. 1 (March 2016): 17–25. https://doi.org/10.1152/advan.00132.2015.

Luckin, Rosemary, Brett Bligh, Andrew Manches, Shaaron Ainsworth, Charles Crook, and Richard Noss. ‘THE PROOF, PROMISE AND POTENTIAL OF DIGITAL EDUCATION’, n.d., 90.

‘Children and Parents: Media Use and Attitudes Report 2019’, n.d., 36.

Chaudron, Stephane, Rosanna Gioia, and Monica Gemo. Young Children (0-8) and Digital Technology, a Qualitative Study across Europe, 2018. https://doi.org/10.2760/294383.

OECD. ‘Children and Digital Technologies: Trends and Outcomes’, 15 October 2020. https://doi.org/10.1787/9f7090f1-en.

Aston, R. (2018), “Physical health and well-being in children and youth: Review of the literature”, OECD Education Working Papers, No. 170, OECD Publishing, Paris, https://doi.org/10.1787/102456c7-en.

Wilkinson, Collette, Laurenna Peters, Kimberley Mitchell, Tracy Irwin, Kary McCorrie, and Martha MacLeod. ‘“Being There”: Learning Throughactive Participation’. Nurse Education Today 18, no. 3 (April 1998): 226–30. https://doi.org/10.1016/S0260-6917(98)80083-X.

11.0 Appendix

Time Plan