



Har Suyash Bahadur Sinha's portfolio

www.createwithsuyash.com

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Pourer

Assistive device for visually impaired users to pour safely

WHY? Pouring is a great independent skill

I wanted to experiment with tangible interactions to create a complete experience for visually impaired users to pour confidently.

Empathising with the users

Observing blind people pour liquids and conducting a blindfold simulation

I observed several people on YouTube channels who post about living life as a blind person and noticed common issues.

I also visited National Association for Blind (NAB), Worli, Mumbai to interact with visually impaired people. I had a conversation with a lady working in their canteen and another man at the training centre.

Additionally, I performed a blindfold simulation on myself for different scenarios and with different utensils to get a first hand experience.



Analysing problems

Existing solution: electronic level indicator



Existing devices provide audio feedback when the cup is full. However, they **don't ensure safety or accessibility** as-

- Aligning the vessels is challenging and leads to spilling
- Lack of continuous feedback slows users down

Inspiration



“For assistive devices, one needs to consider the **abilities along with the **disabilities** of the user.”**

- Wu, MA and Chang (2006)



“Recognise more than just the **barriers. Understand **motivations** that we all have in common.”**

- Microsoft's Inclusive Design

SWOT analysis to design for accessibility

Simulation can help us experience the problem first hand but it only focuses on the disabilities or what the user lacks.

SWOT (strength, weakness, opportunity, threat) analysis is one way to understand the user more holistically.

Strengths

- S1 Muscle memory and coordination
- S2 Perform tasks step by step
- S3 Good tactile sense
- S4 Easy to pour with small openings

Weaknesses

- W1 Difficulty in aligning objects
- W2 Can't touch hot objects
- W3 Lack of continuous feedbacks
- W4 Handling many discrete objects

Threats

- T1 Hot liquids can cause burns
- T2 Burnt by touching a hot vessel
- T3 Steam rising from vessel
- T4 Dropping and breaking

Opportunities

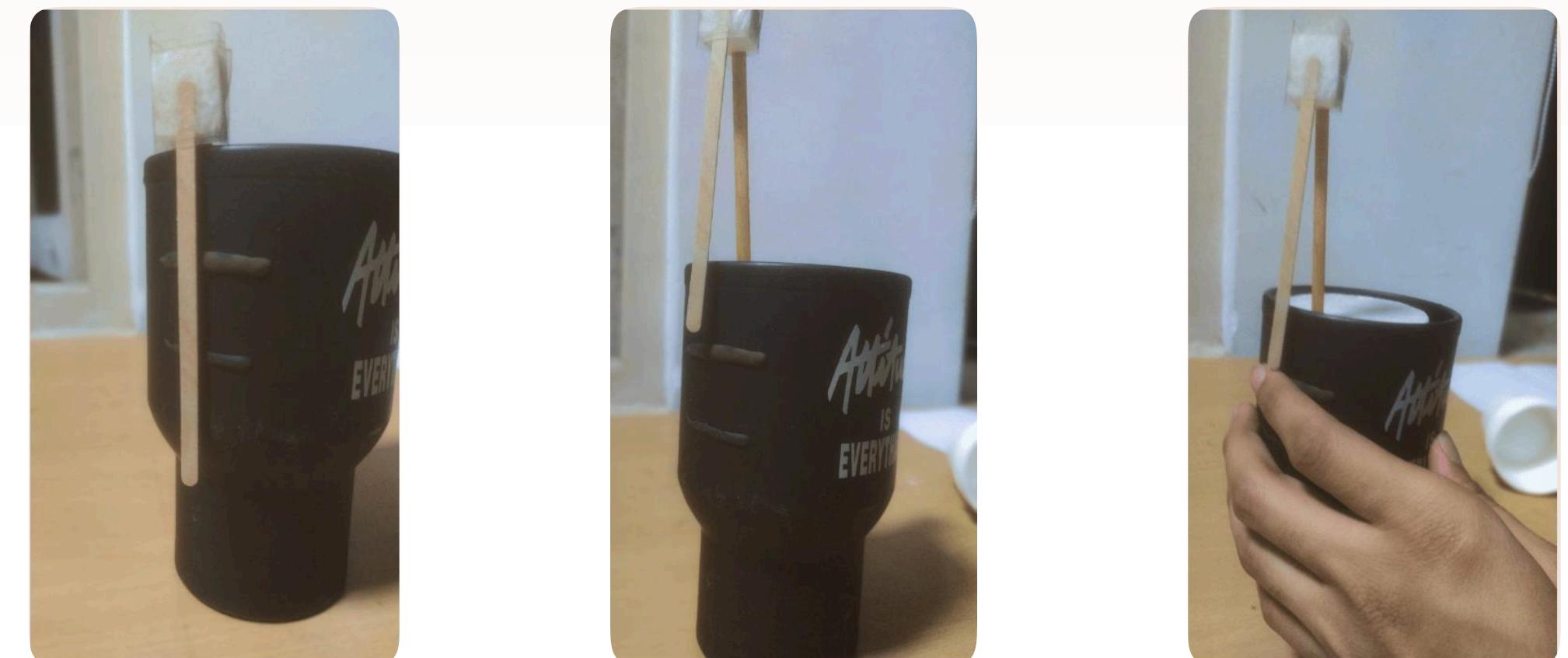
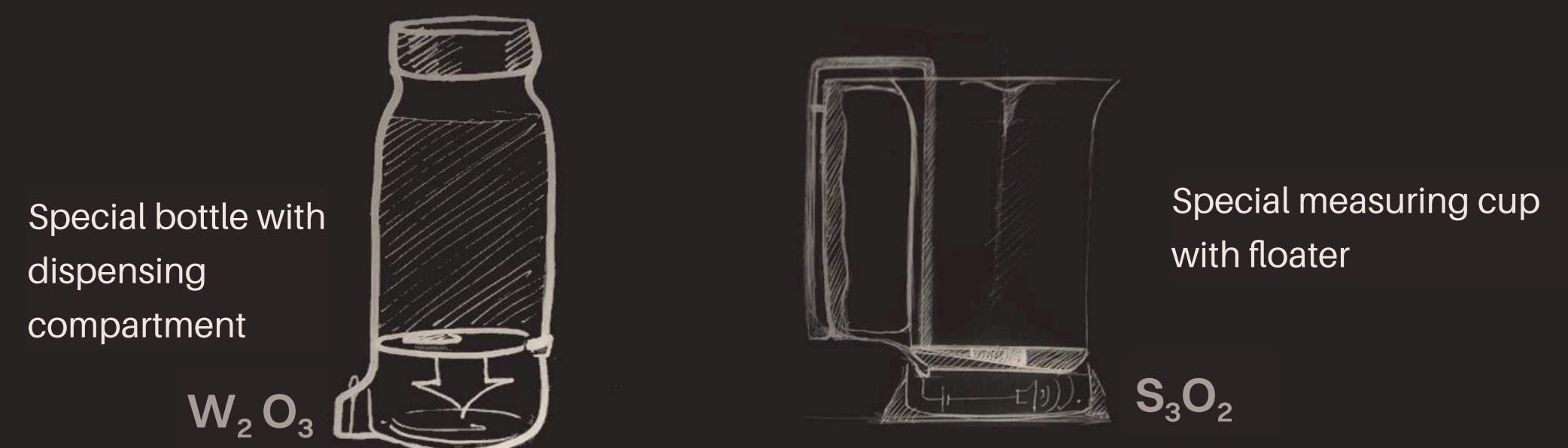
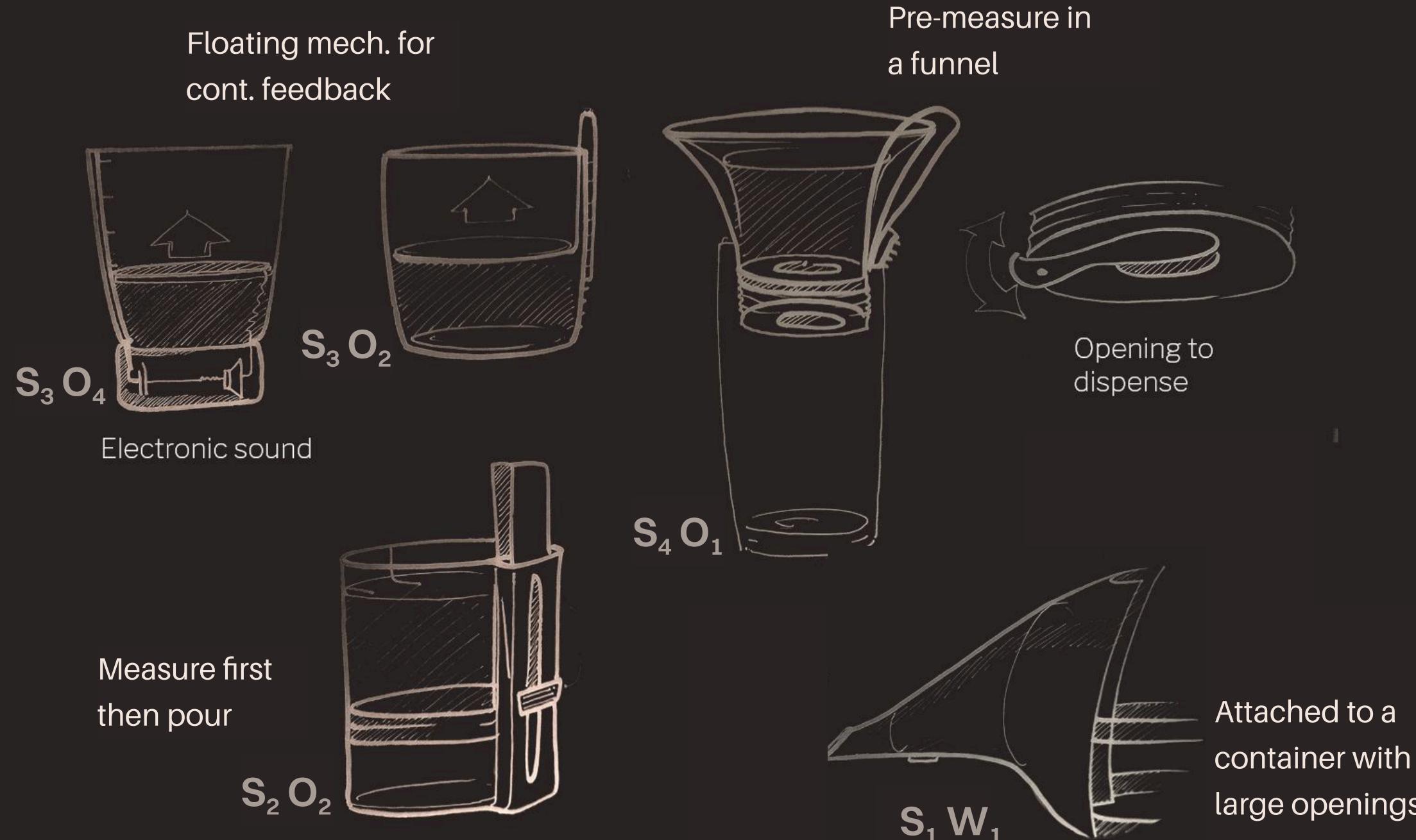
- O1 Device to funnel, filter & measure
- O2 Measure first and then pour
- O3 Separate dispensing system
- O4 Electronic device, audio feedback

Explorations

Using points from SWOT to ideate

After SWOT analysis, Weihrich (1982) proposed a strategy called the "TOWS". TOWS maximises the Strengths and Opportunities, while minimising the Weaknesses and Threats.

The corresponding labels with the sketches (S_1O_2 , W_1O_2 , etc.) indicate the n^{th} SWOT point.



Experimenting with floater mechanism that rises with the liquid, giving cont. feedback

Conceptualising

Criteria for choosing concepts

Safety

1. No spilling over the edge while pouring
2. Avoid touching hot vessel

Functionality

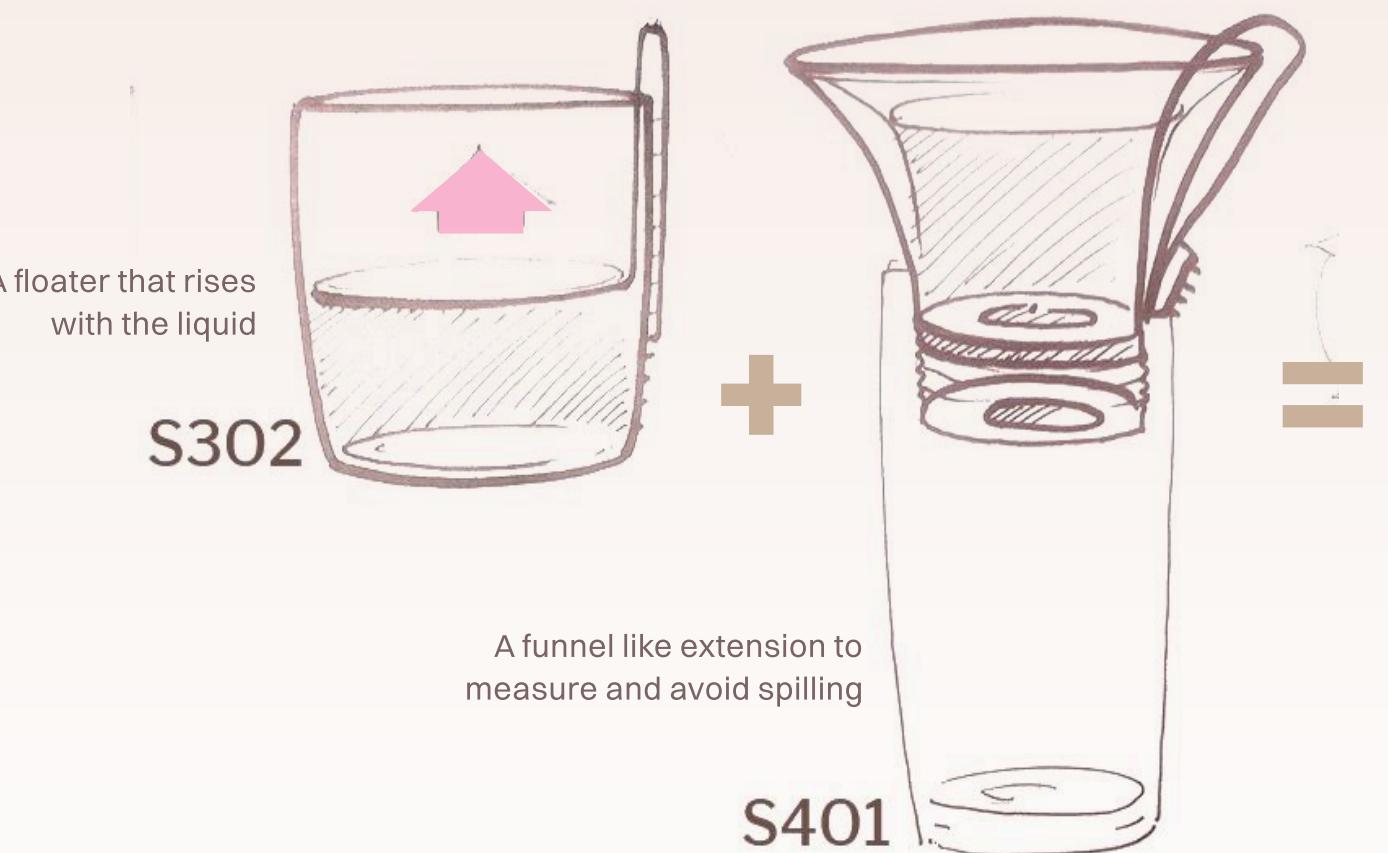
1. Pour measured/ desired amount of liquid

Usability

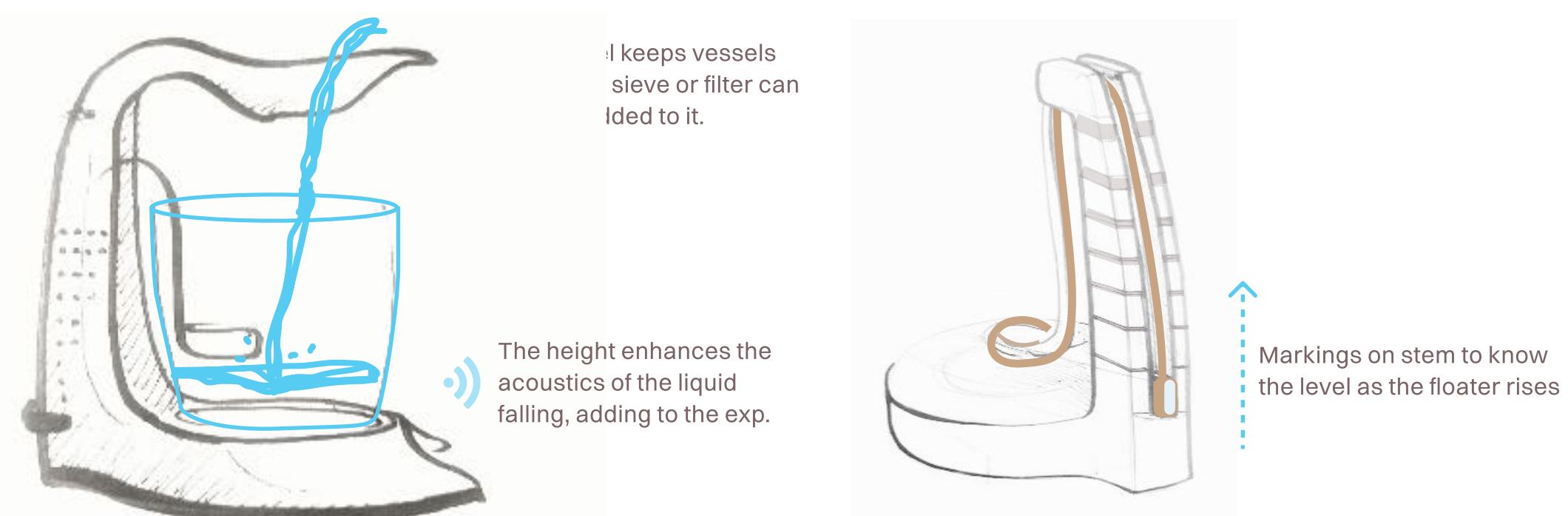
1. Ease of measuring
2. Ease of pouring/ controlling the flow



Chosen concepts -



Final design-



Form and aesthetics

To avoid a taboo of using assistive devices, the person should look stylish using it and it should be **an appealing experience for the observer**.



Testing in context



Results

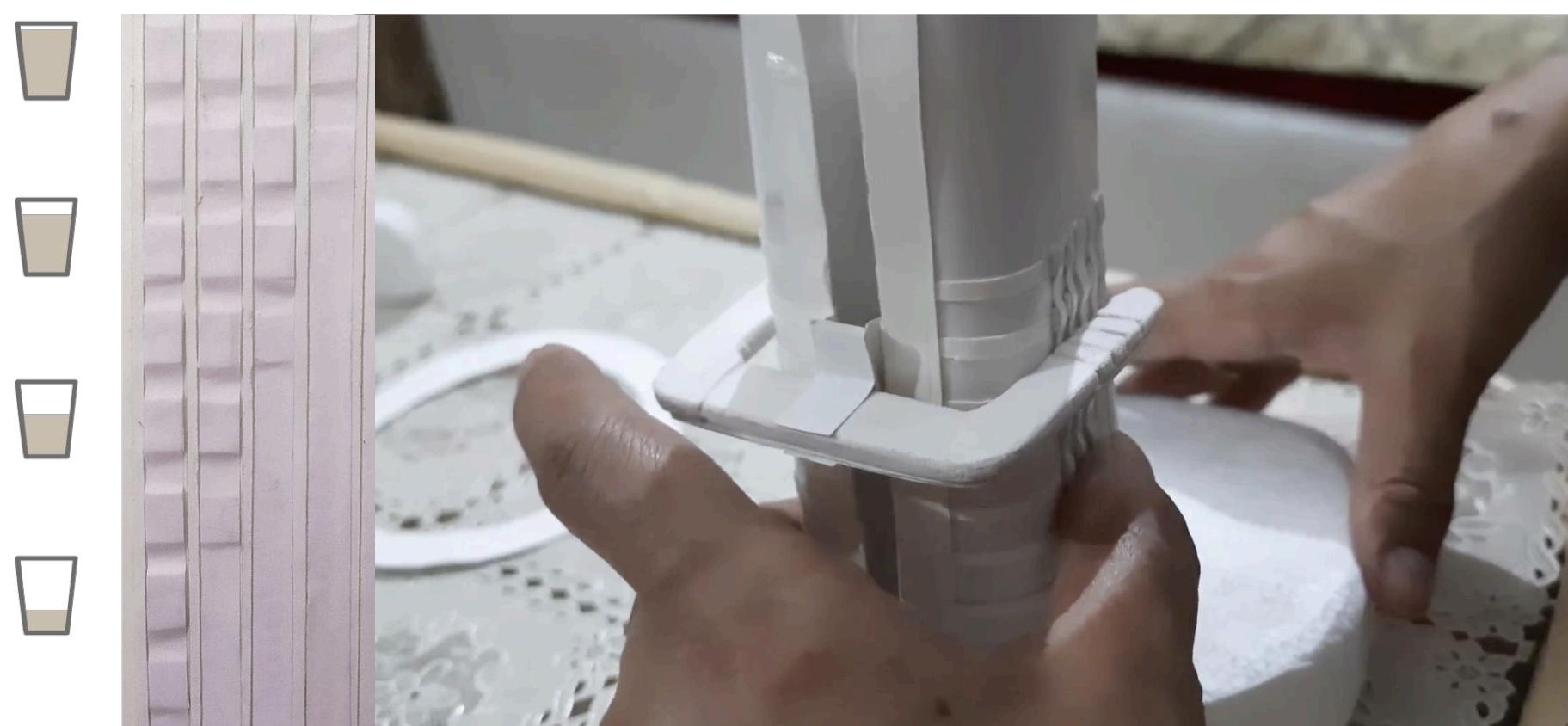
- ✓ Safe from any contact with hot liquid
- ✓ Successfully filled 1/4, 1/2 and full cup

Time motion analysis was used to check how fast and confident the user was while pouring.

	Locating	Aligning	Pouring	Total
Control (without the product)	5 sec	2 sec	28 sec	35 sec
With the designed product	1 sec	4 sec	20 sec	25 sec

The glass
is half full

- a blind optimist



Paper Potli

Group of 2 (contribution: designing paper doll, gender research)

Craft + AR game to dilute gender stereotypes among children

WHY? There still are misconceptions and stereotypes about gender

What starts as an ignorant cultural bias often leads to a toxic and non-inclusive environment for people of various genders.

- ★ Strong
- ★ Meticulous
- ★ Tactful



Insights from primary research



Gendered parenting

Only girls are expected
to do house chores

Boys are told to be
strong and not cry



Confusion and taboo

Gender is still
perceived as binary

LGBTQIA+ considered
western concepts



Harms of stereotyping

Boys get bullied for
expressing femininity

Discrimination at work
based on gender bias

**“Only my wife looks after kids
as I have to earn money”**

-Male taxi driver



**“We don’t like dancing as it is girly.
We like to watch them dance”**

-Government school boy

**“We are a traditional family and
don’t like discussing gender”**

-Mother of a high school
girl

**“We hear about LGBTQ on social
media but all this will spoil our kids”**

-Mother of a high school
girl

Gender?

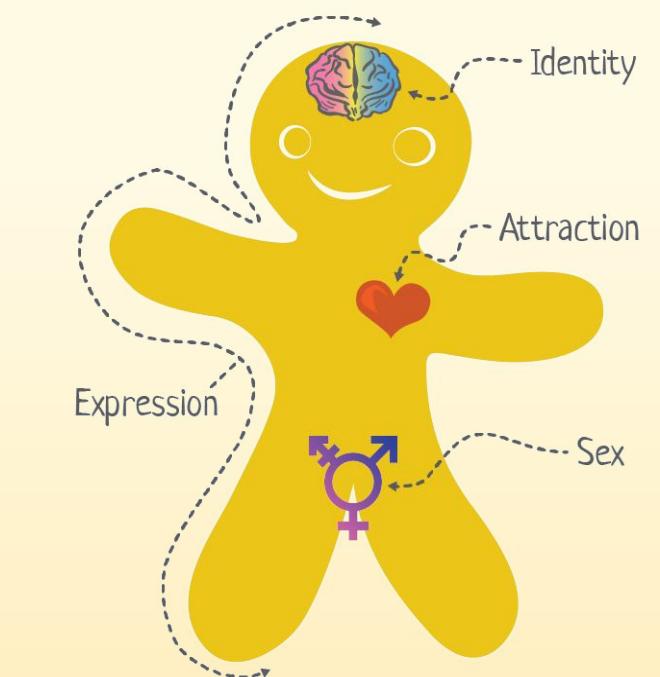
Inspiration from secondary research

Sam Killermann's Genderbread Person

illustrates different dimensions of gender and
separates them from biological sex.



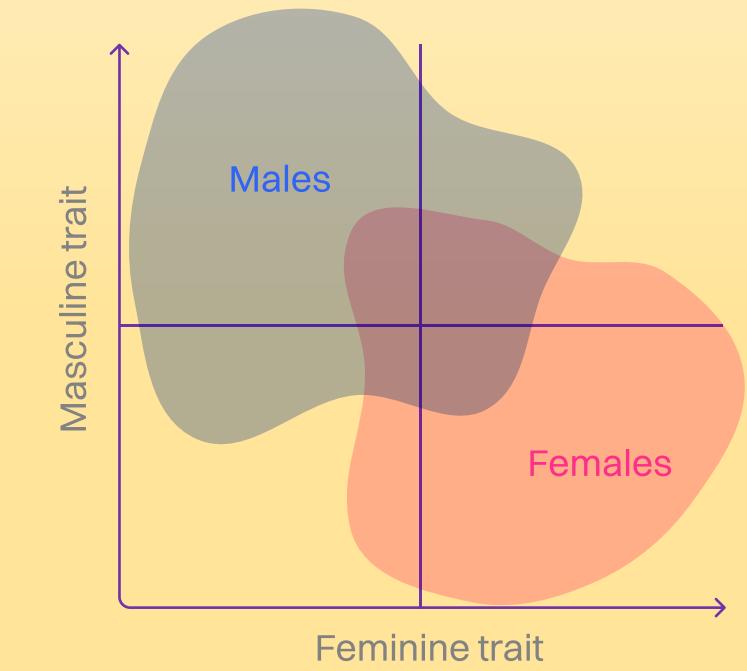
Sam Killermann
(Artist, author)



Sandra Bem's Sex Role Inventory statistically
shows how we can be both masculine and
feminine and how it is healthier.



Sandra Bem
(Psychologist)

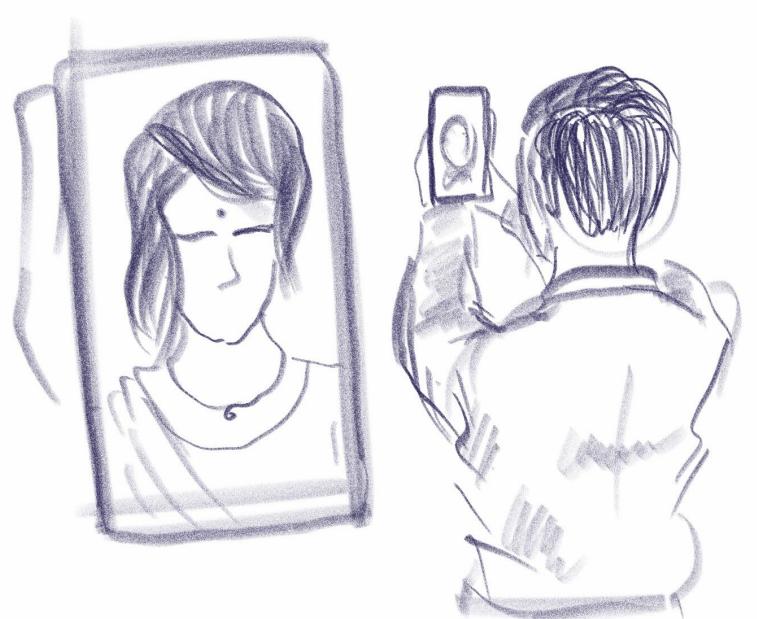
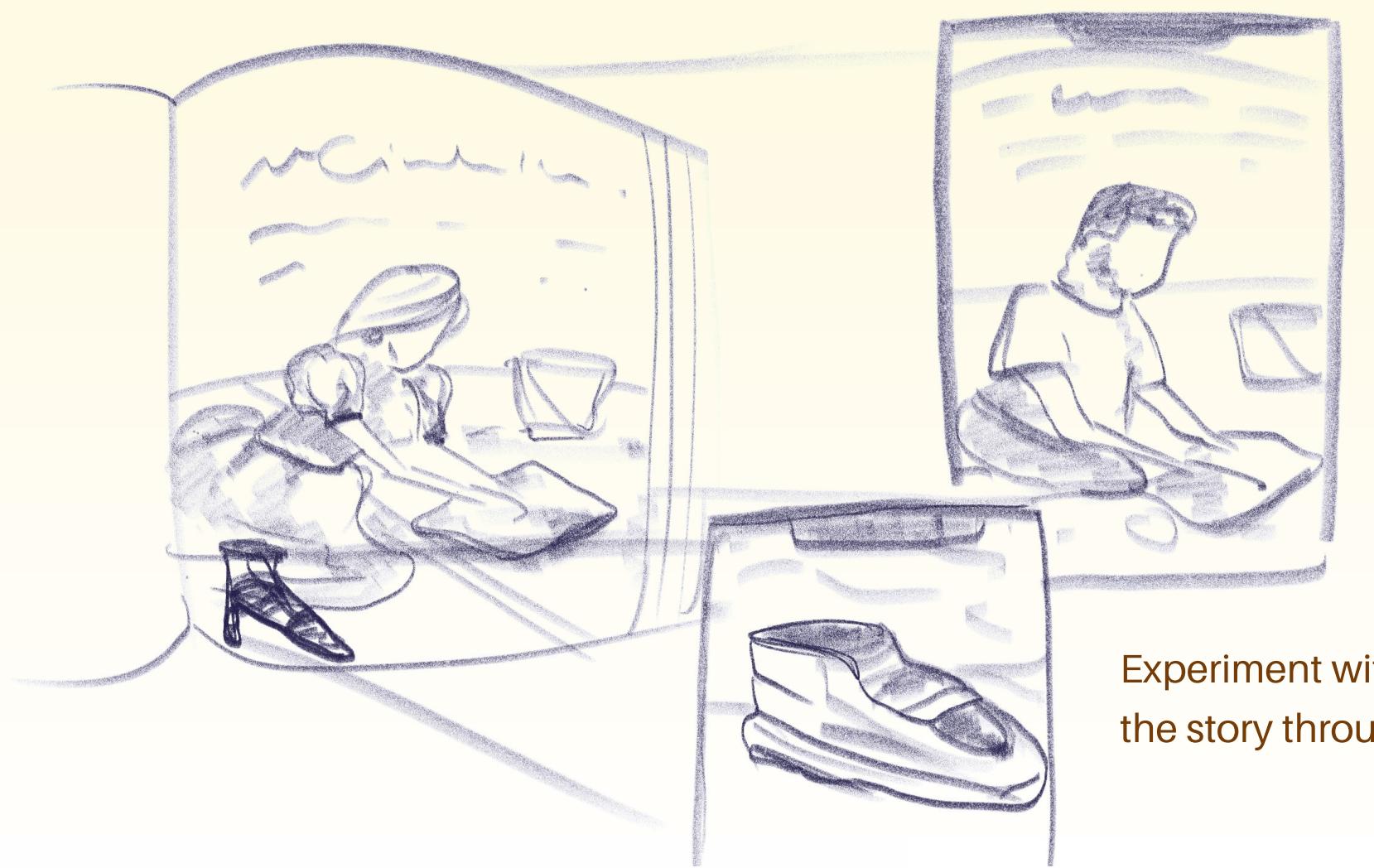


A social construct

Explorations

Idea #1 AR stories

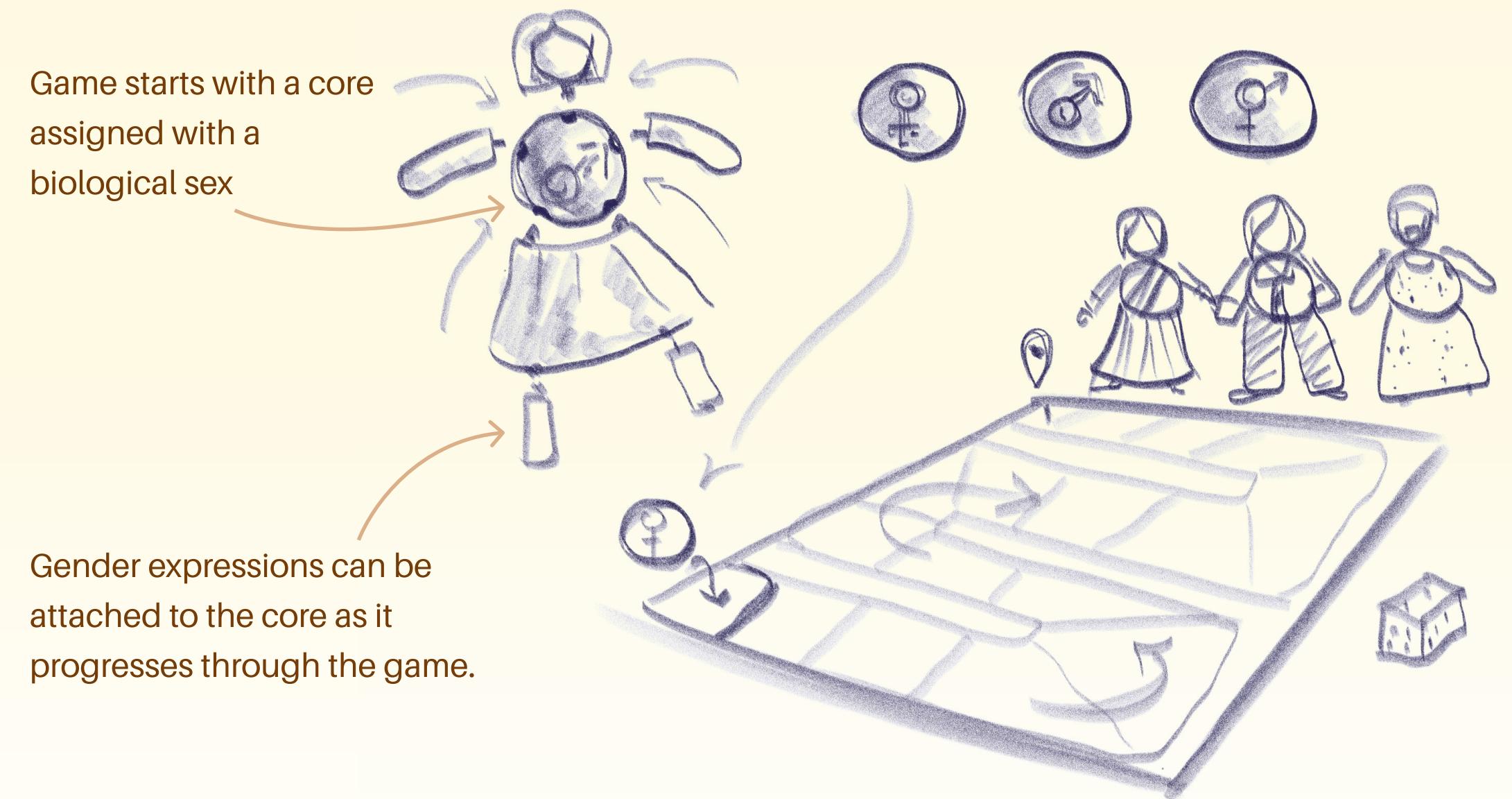
A lot of stereotypes are reinforced through traditional stories.
AR can add another dimension on top to explore.



Idea #2 AR Avatar

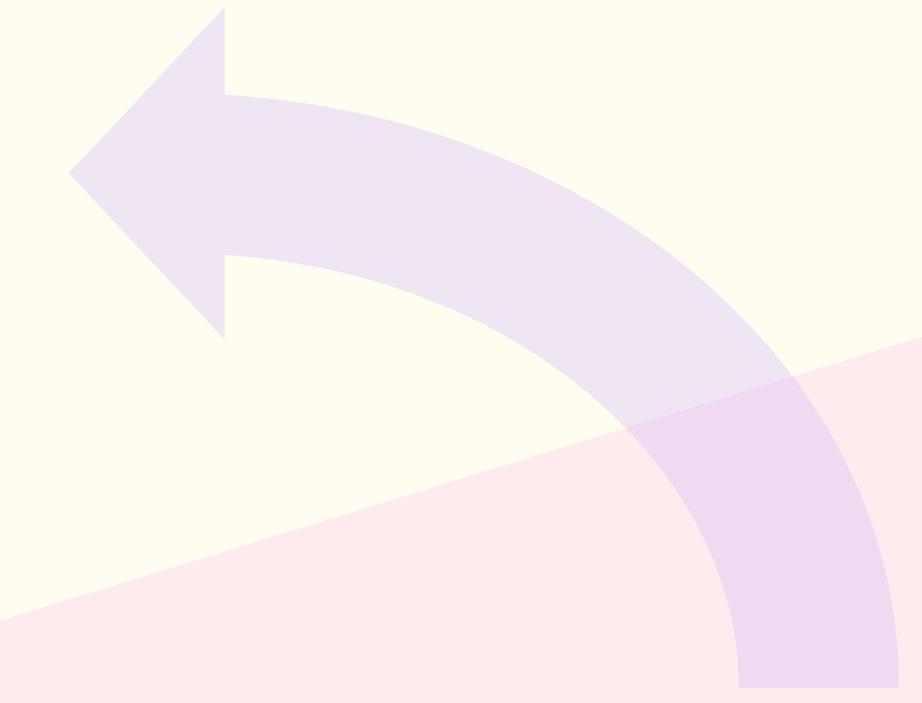
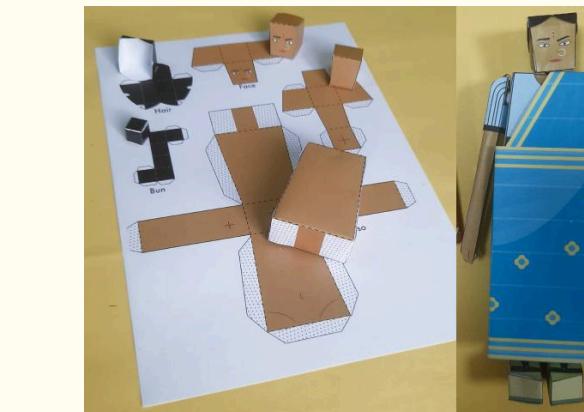
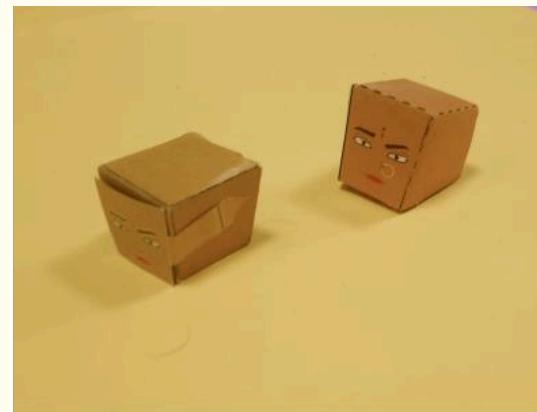
AR filters to help people explore and express different expressions of gender

Idea #3 Board game “journey of gender”



Learnings

- ✓ AR as a medium can add more dimensions to tangible objects.
- ✓ Role playing through stories and dolls can help engage children.
- ✗ People perceived androgyny as absurd. Characters should feel real.
- ✗ Talk on Sex and gender can be stigmatised. Build on people's biases.



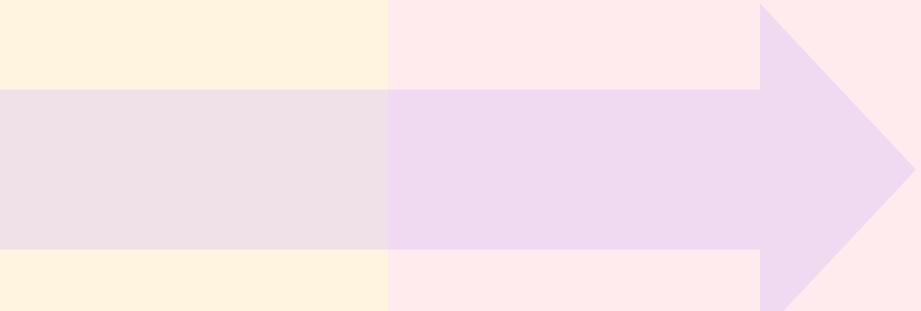
1. Express through avatars:

Children can design them on the app, print templates and craft 3D dolls. Dolls are popular children toys to role-play and this makes children learn to make things.

2. Explore through AR role-play:

The paper doll comes alive in an AR app and can perform tasks. Children pick up stereotypes from their environment eg. observing their mother in the kitchen. The AR world aims to create extension of the real world.

Paper Potli (Final concept)



3. Explain through gender traits:

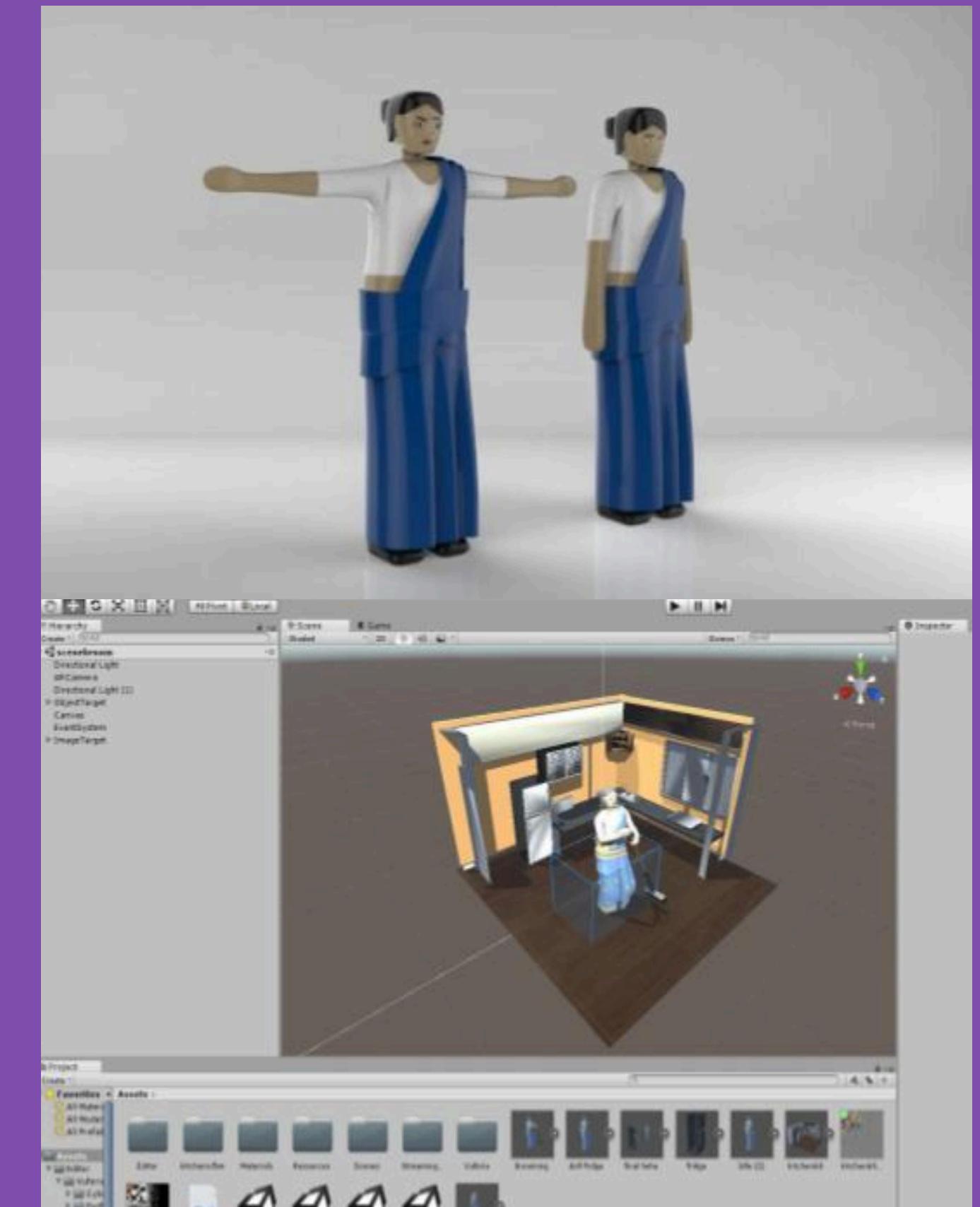
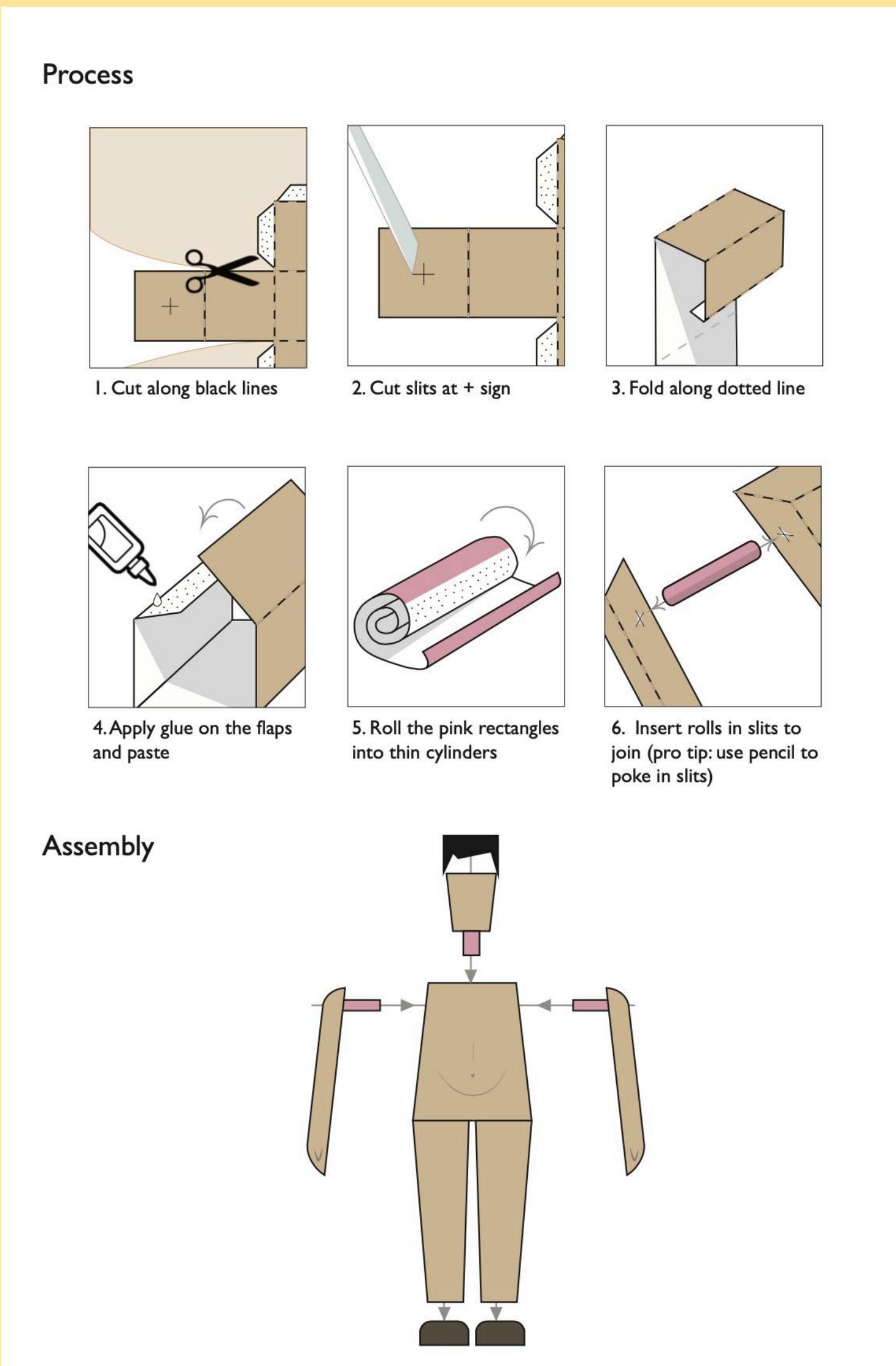
For each role done in AR, We allot a balance of masculine and feminine traits. It demonstrates how something like cooking that is considered a woman's role, has aspects like working with dangerous tools and self-reliance that are typically considered masculine.



Gender traits taken from the Bem sex role inventory without explicitly labelling as masculine or feminine.

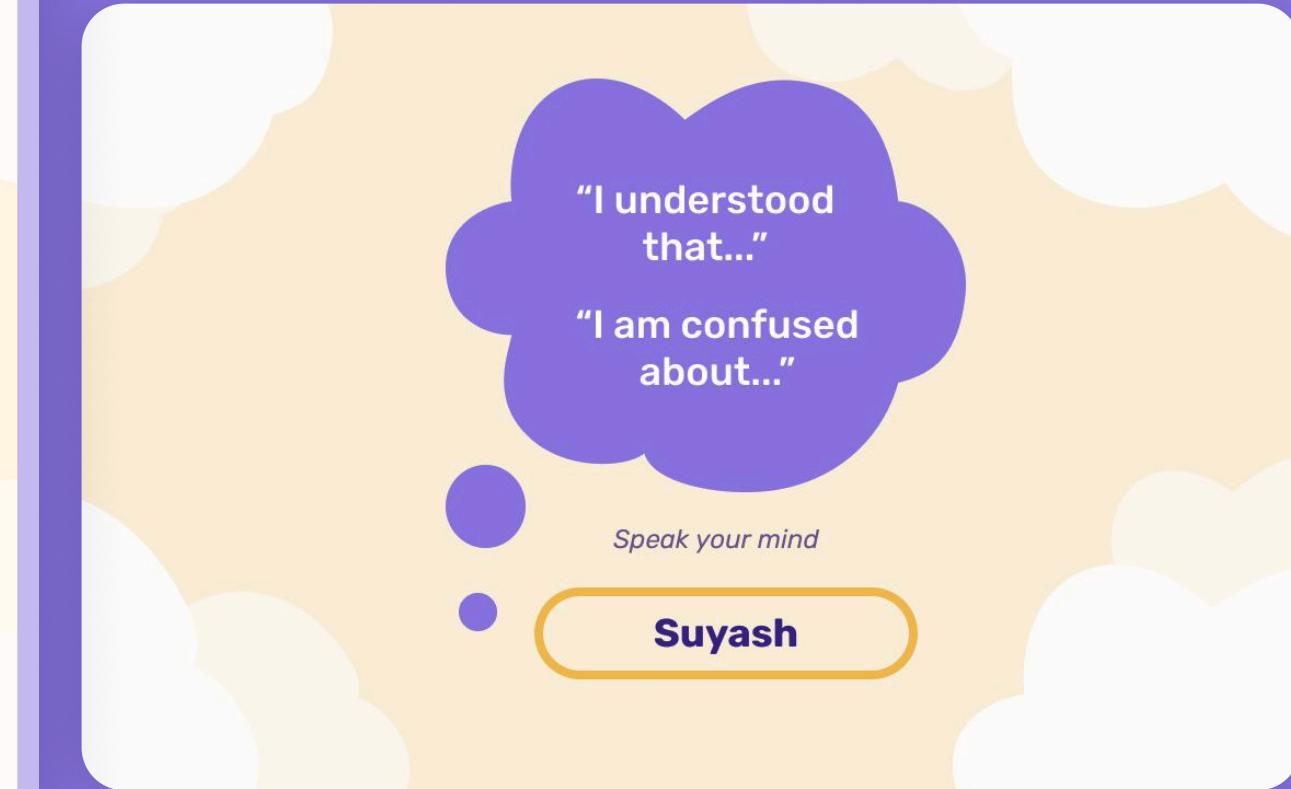
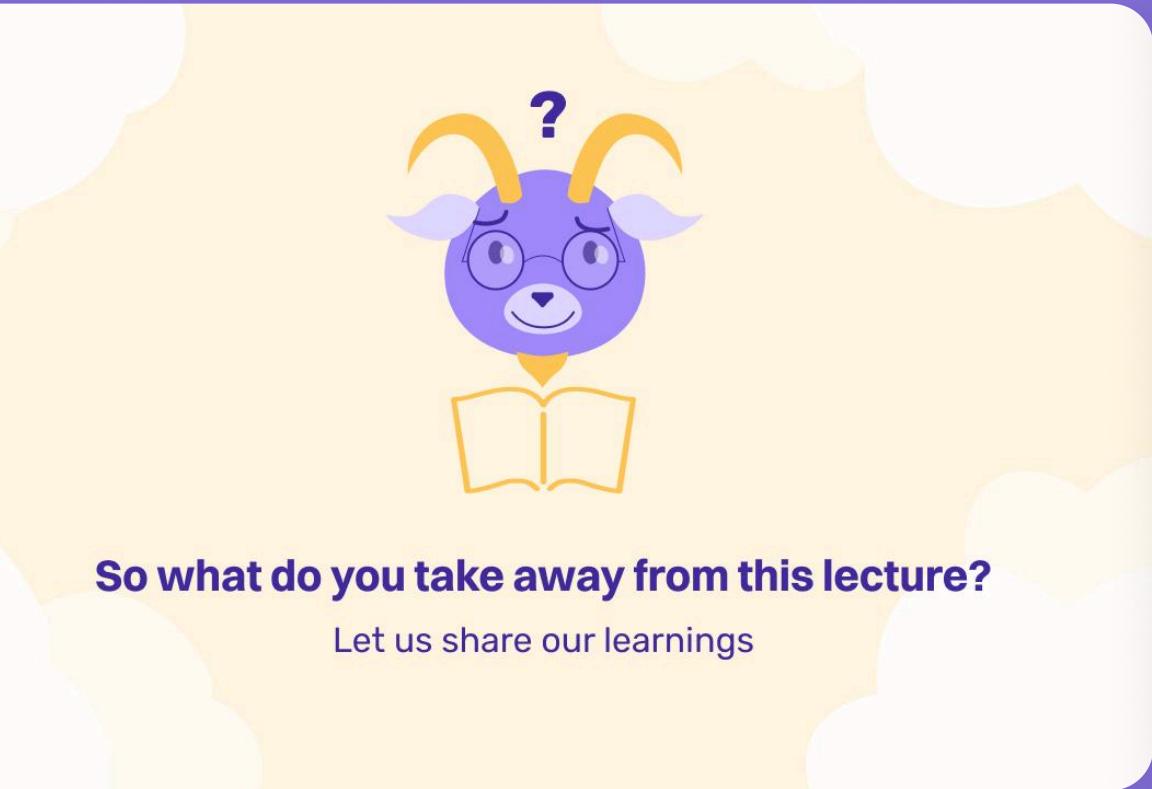


Designed instructions and template for crafting paper dolls



Designed the 3D AR world to be mapped with doll using Unity

Contribution



EDUS

Design driven research · Learning experience design

Cognitive engagement in classroom interactions

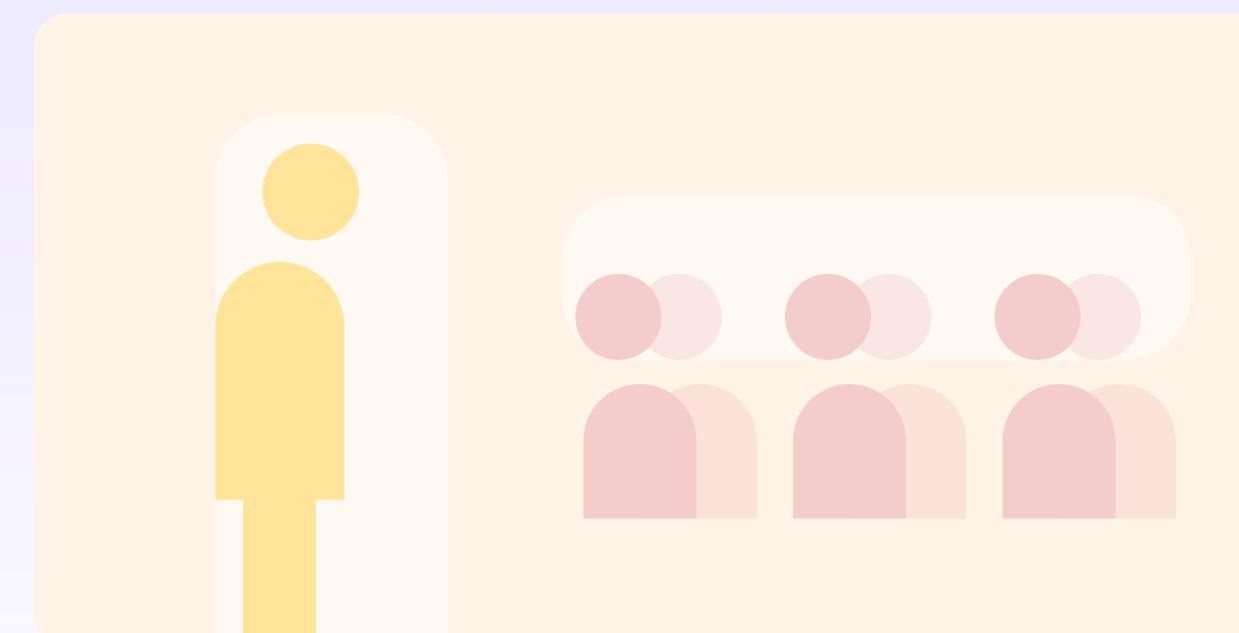
WHY? There is scope for more interactive learning in India.

Performance anxiety, hesitation, lack of articulation are some barriers for students to actively engage and learn. These issues are hardly addressed by many interactive teaching tools.

Understanding the problem

Online education beyond pandemic

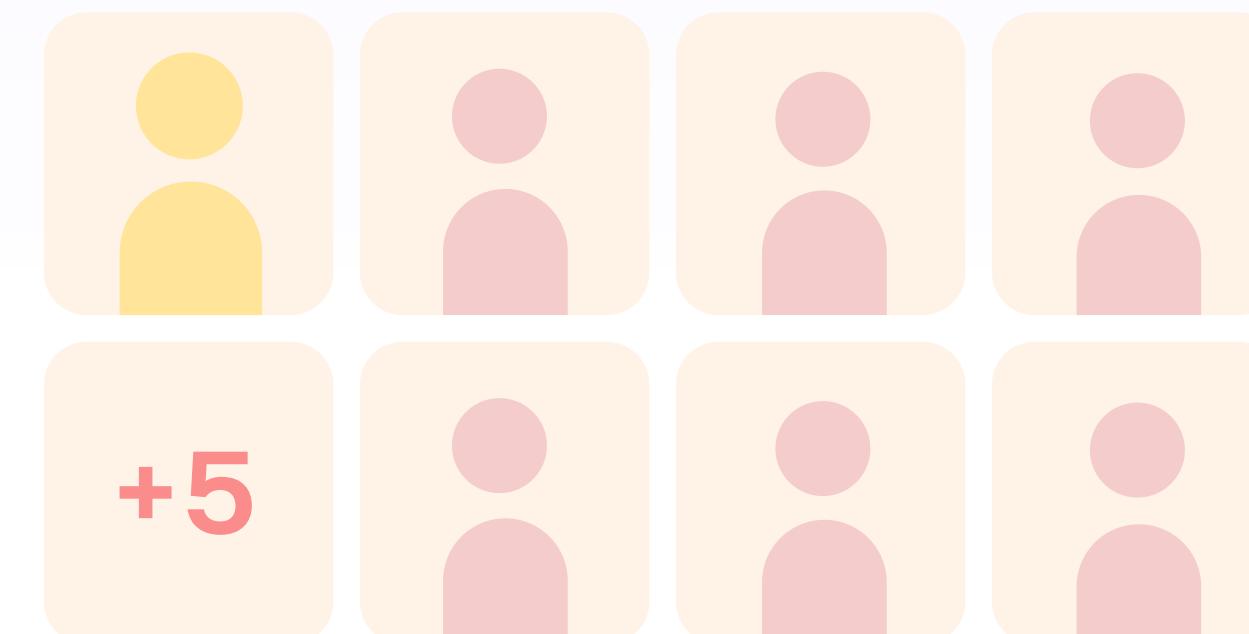
- Education faces serious challenges during COVID19
- The shift to online education is sudden for many schools.
- The platform has shifted but we are practicing the old models of teaching involving lecturing that has led to students being less attentive



Traditional classroom landscape

The Shift in Pedagogy - Sage on Stage vs Guide by the Side

- Traditional way of teaching involves lecturing
- A teacher has more control over the class
- The landscape and the dynamics are different online

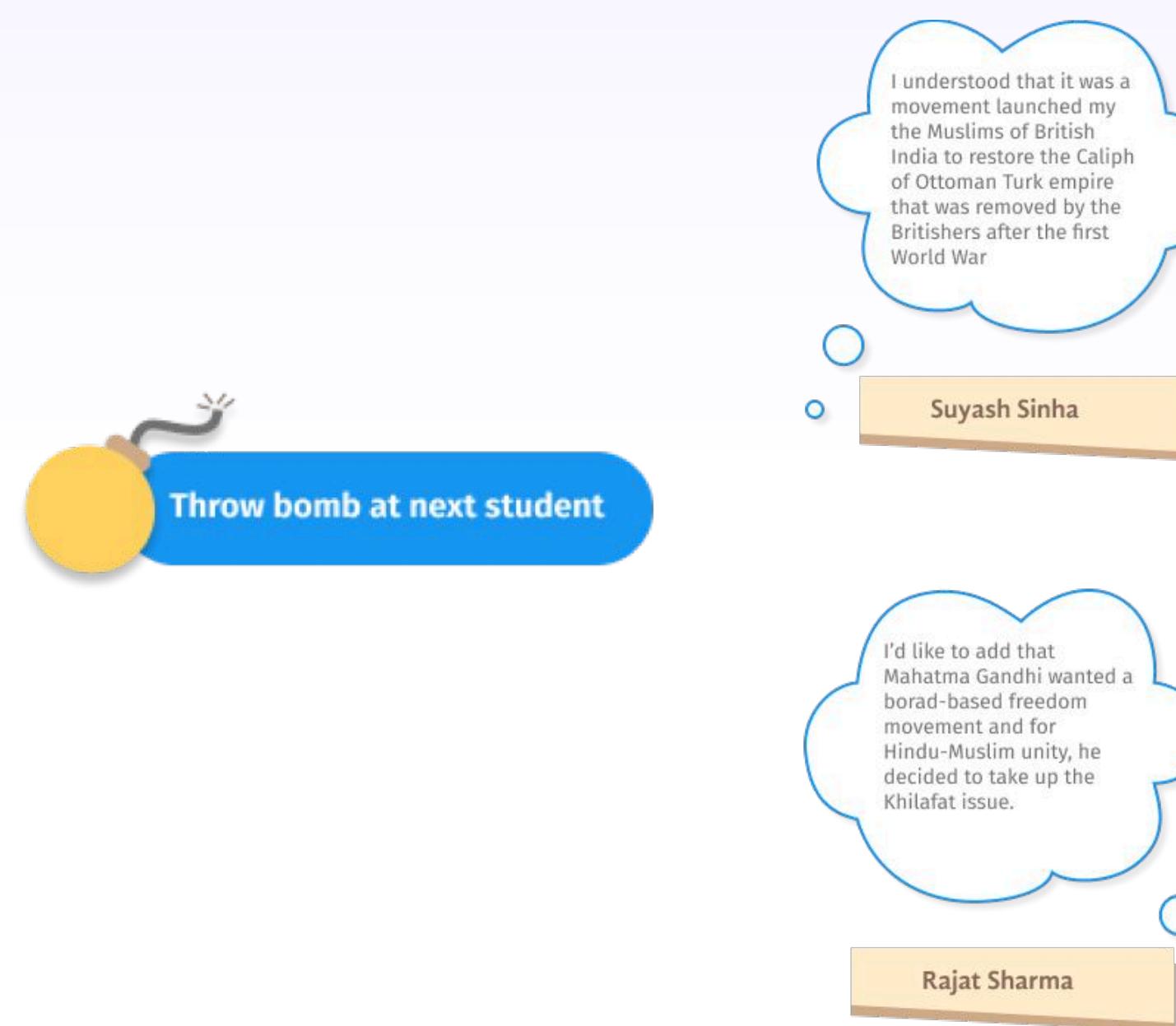


Online classroom

Going to the root of lack of motivation

Factor 1- Fear of Judgement/ being right or wrong

- Judgement of individuals not ideas
- Stage fright/ too much attention
- Too much emphasis on performance



Possible solutions for factor 1

- Creating a perception cloud to show variations
- Shared participation/ supporting students if they are stuck
- Take away point in the end to show there is something to learn

The image displays four mobile application screens illustrating solutions for fear of judgement:

- Shradha's Profile:** Shows a user icon with 0 responses, the text "No. of Responses for Previous 5 days: 0 1 0 0 0", and a button labeled "Encourage Shradha". A message box says: "Suyash and Ravi are having an interesting discussion on Suyash's answer. Why don't you give your opinion there!!!". A "Push" button is at the bottom.
- I Am Ready:** Features Uncle Sam's "I Want You" recruitment poster with the text "I want YOU to answer!!" and a "I Am Ready" button.
- What did we learn?**: A text input field with placeholder "Type or pick from starting prompts from below..." and three dropdown options: "The most interesting part...", "I am wondering about...", and "I am struggling with...". A "Post it" button is at the bottom.

Going to the root of lack of motivation

Factor 2- At loss of what to say/ ask

- Too open ended questions/ it's outside the text
- Not listening carefully or not questioning what they are told

Possible solutions for factor 1

- Giving existing prompts to facilitate thinking
- Distributing Question Cookies at the start to find answers
- Stream of thought- adding on to the previous person

The most interesting part...

I understand that...

I am wondering about...

I am confused about...

I am struggling with...

In my opinion...

You can crack open the egg at the end of the class

What is meant by the idea of Satyagraha?

Rajat Sharma:

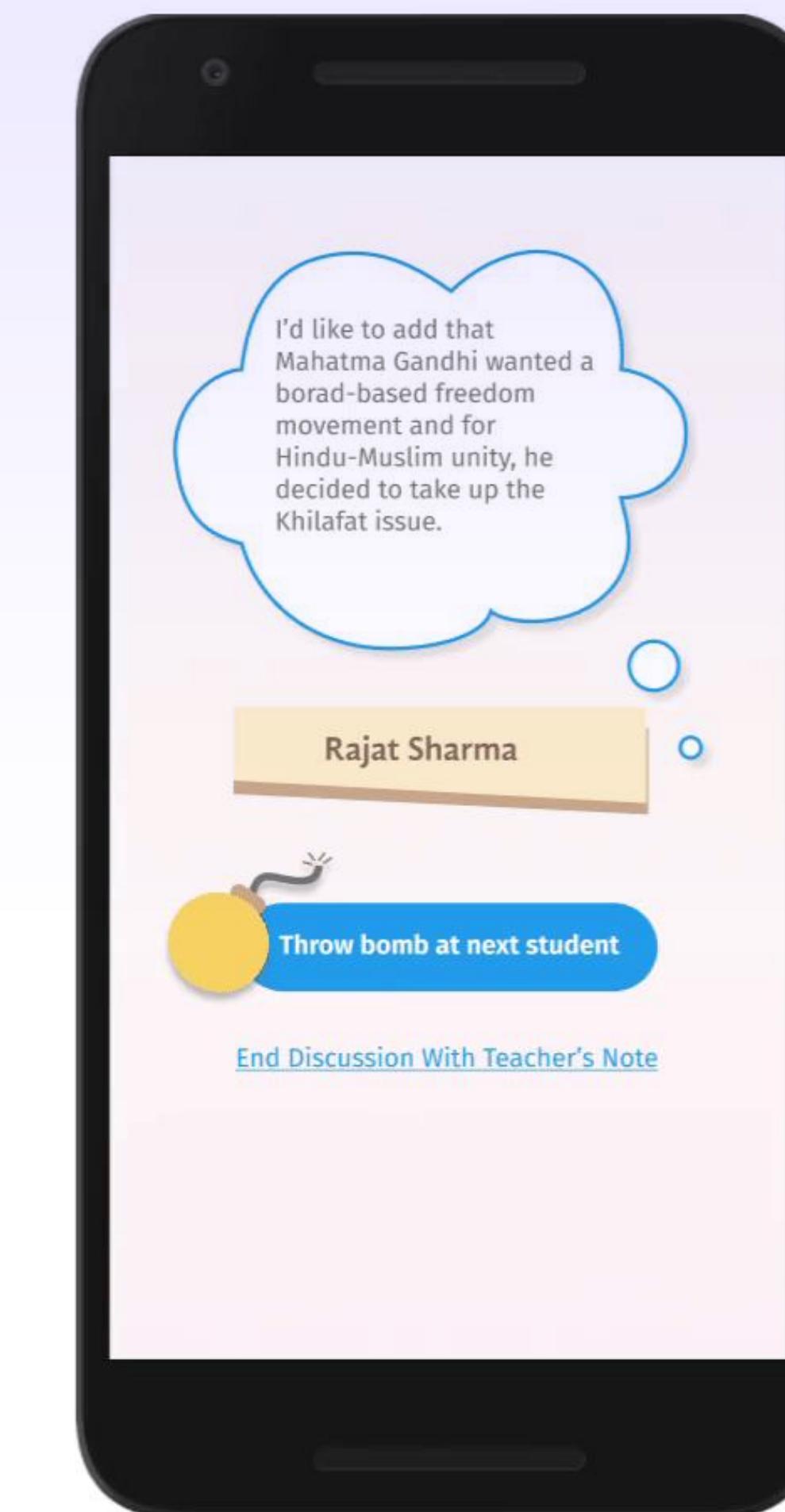
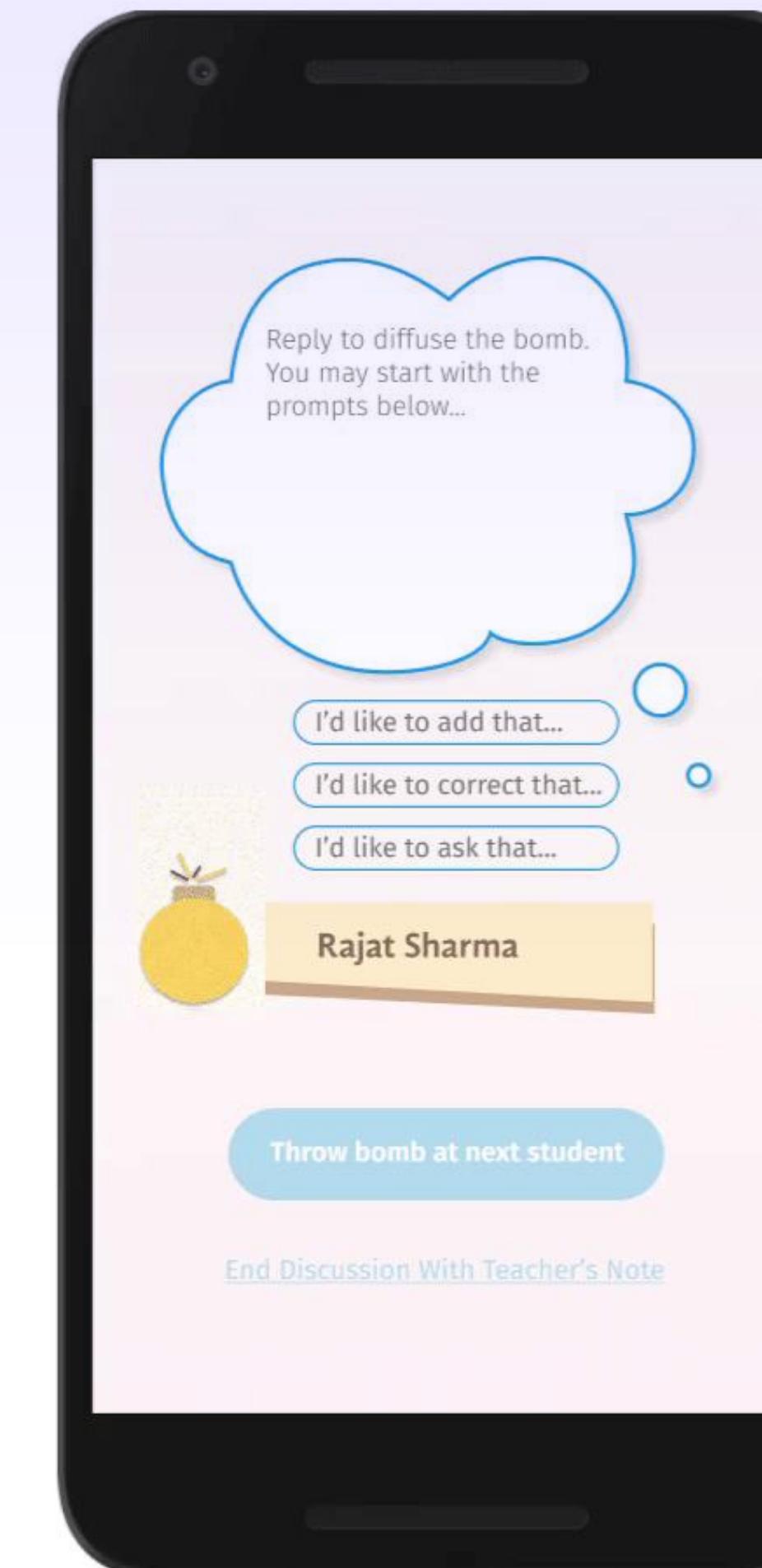
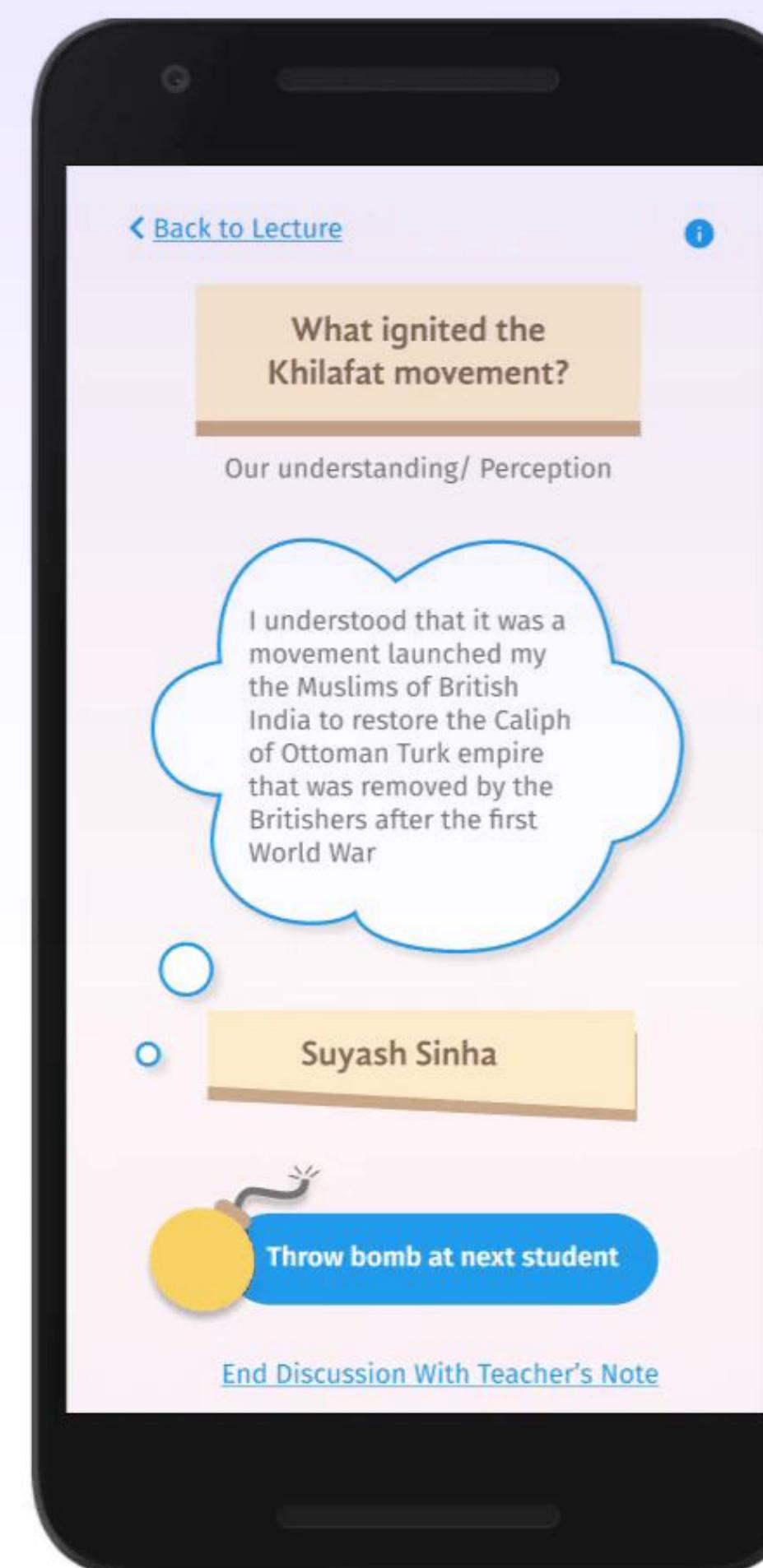
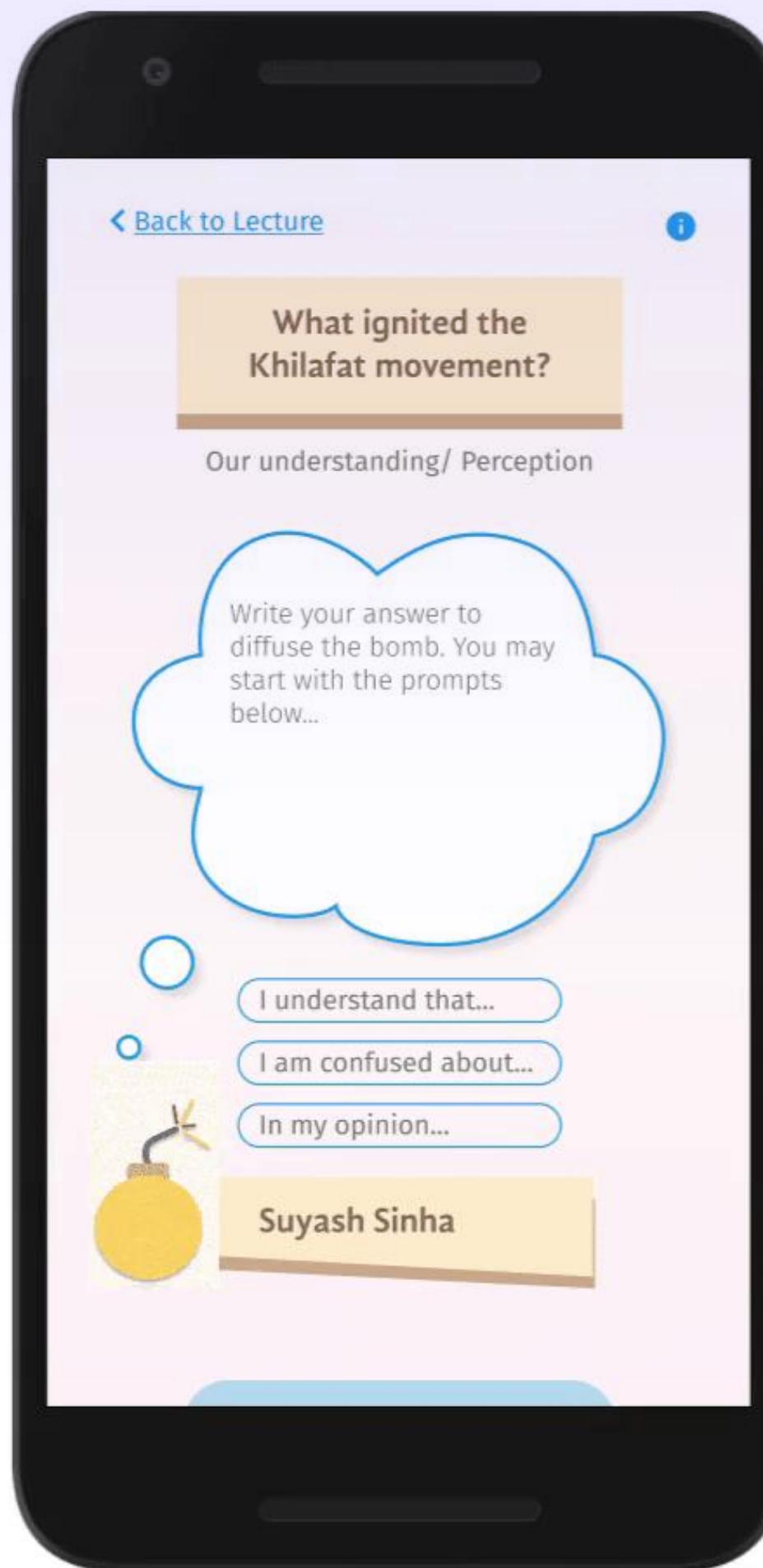
Nationalism spreads when people begin to believe that they are all part of the same nation, when they discover some unity that binds them together. Thus, separate electorate could be divisive

3/3 Expand Question Counter

Questioning Rajat:

What about the role of positive discrimination or uploftment of those who are not already equal?

Flow of discussion



Simplified user journey to test in online classes

Goals to evaluate for psychological engagement:

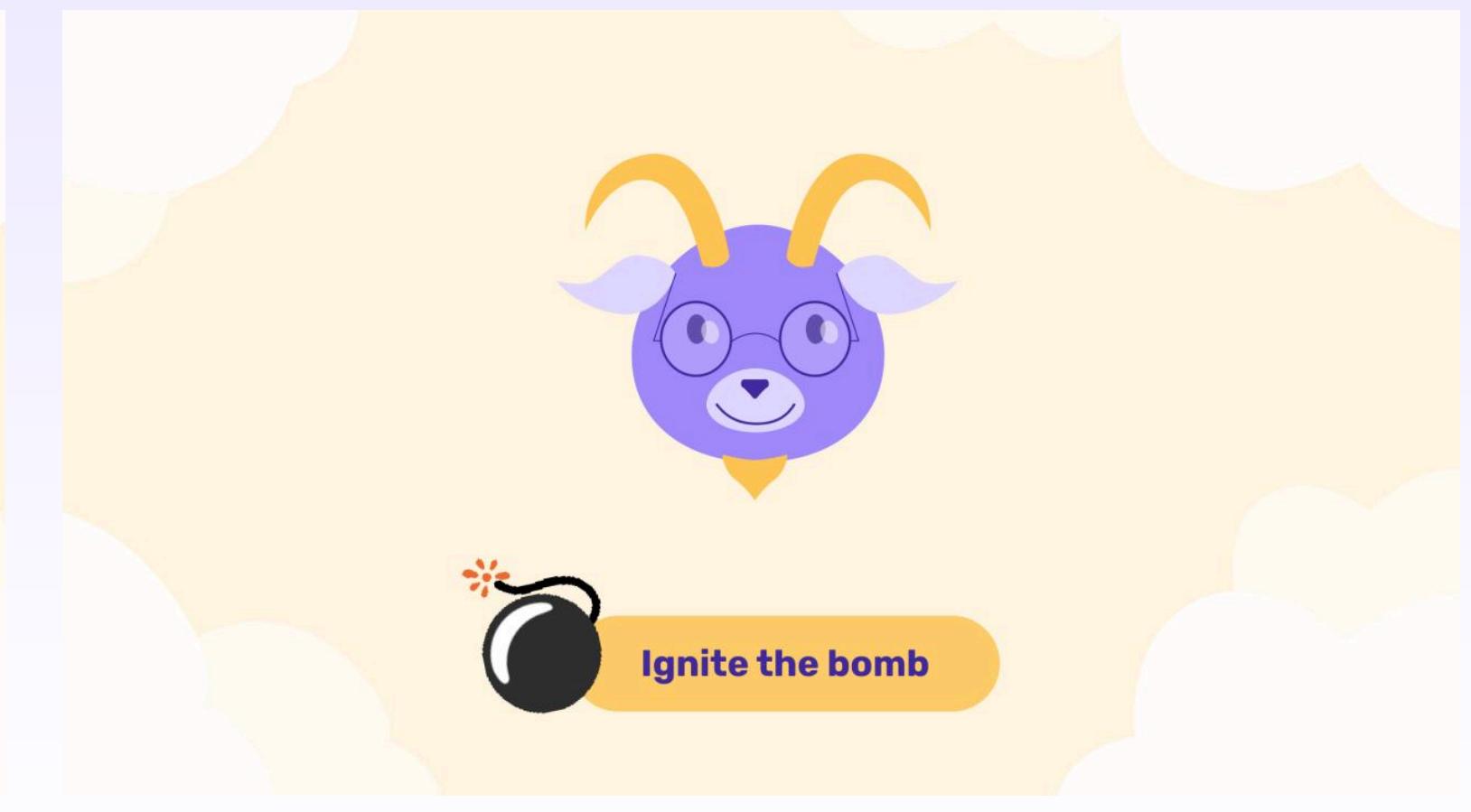
1. Effect of external locus of control to increase relatedness with the teacher
2. Effect of small of positive stressors to improve focus and attention
3. Effect of prompts and sentence starters to help students think
4. Effect of encouraging teachers to help students
5. Ease of use for teachers for on the spot formative assessment through cold-calling



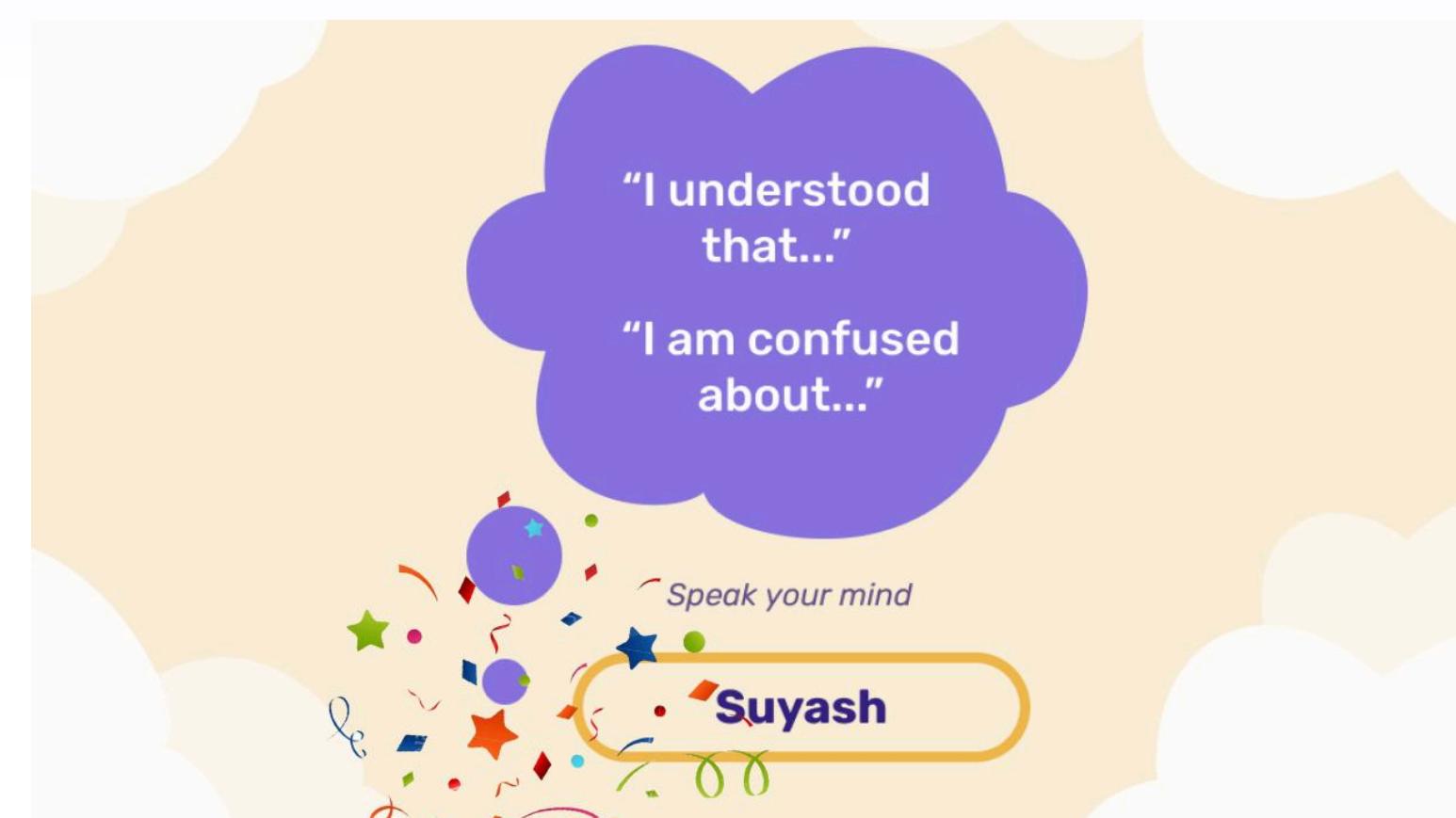
External locus of control to ask questions and nominate people



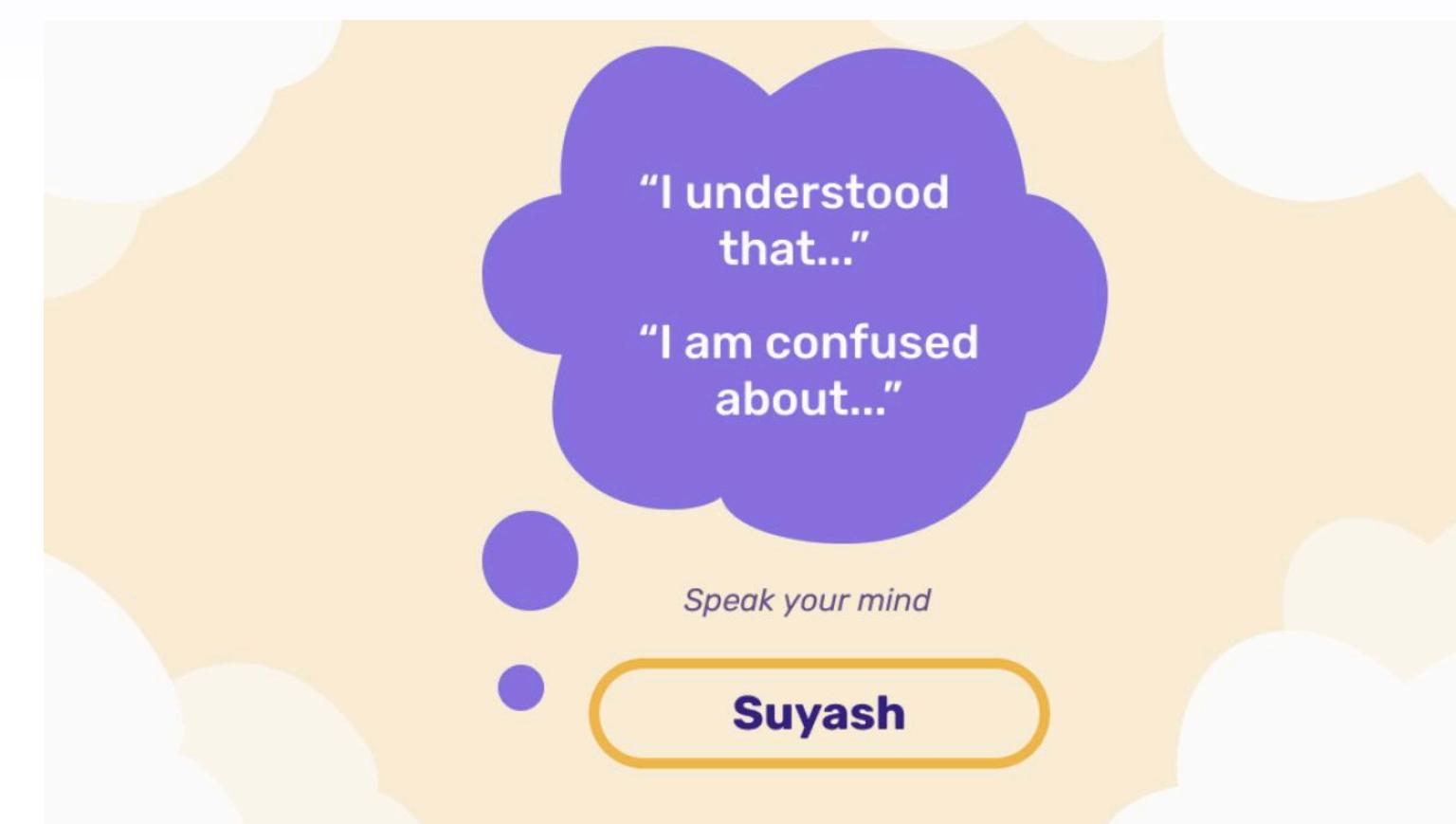
Teacher can put questions in this template and place them in slides



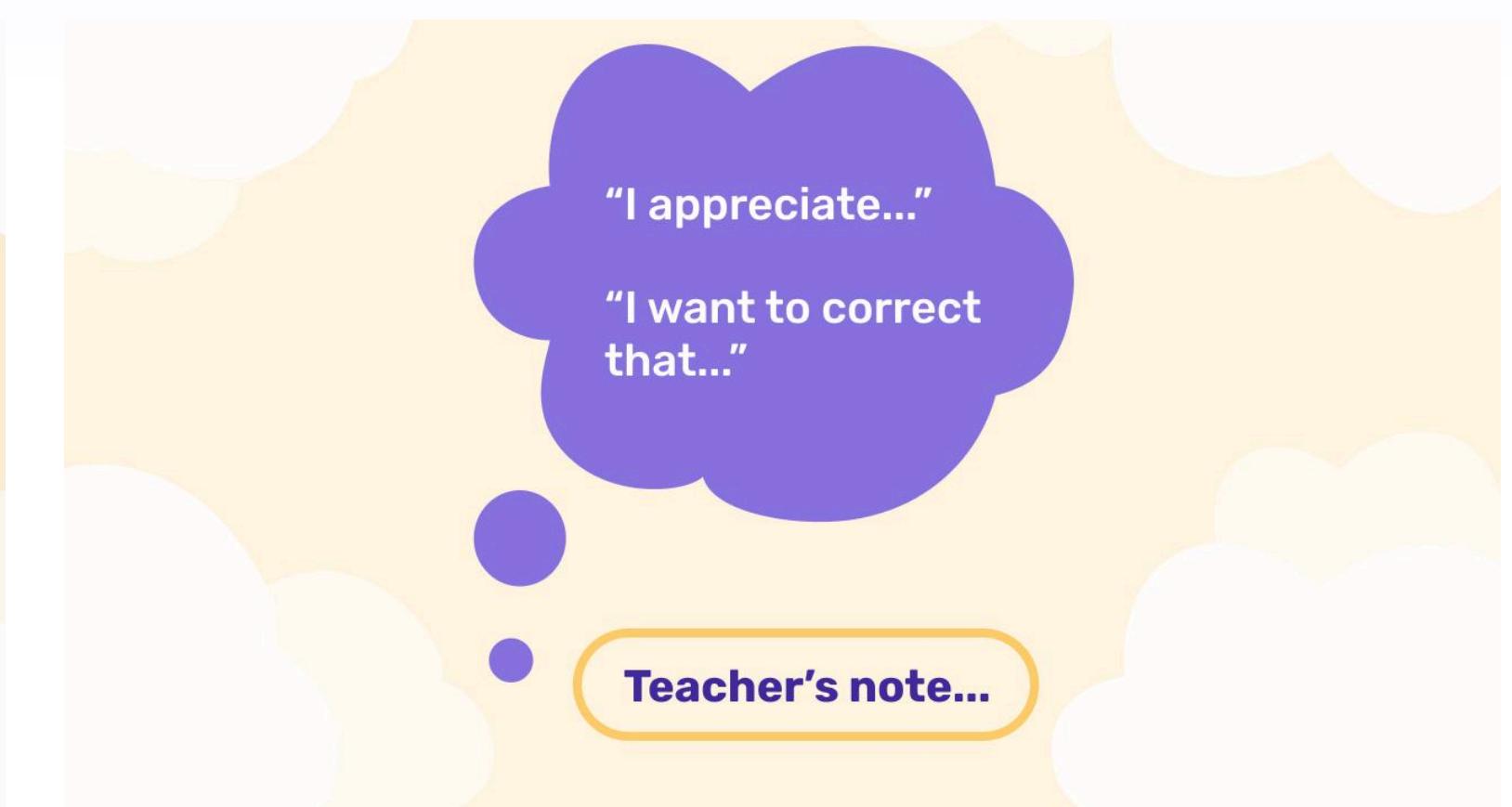
Random nomination of people with a bomb to build some tension



Cheering and celebration for positive emotional response



Giving prompts and an option to seek support from teacher



Appreciation and feedback from teacher rather than feeling judged

4. Method

4.1 Research framework

An exploratory mixed method study [19] was used in the current study with more emphasis on qualitative methods. The quantitative portion includes data from 10 self-reported questionnaires taken from the Intrinsic Motivation Inventory (IMI) [20]. IMI contains statements to determine enjoyment, perceived competence, pressure/ tension, perceived choice (autonomy), relatedness. These can be rated on a 7 point likert scale (from 1 “not true at all” to 7 “very true”). IMI was chosen as the components evaluated in IMI align with our goal to increase psychological and emotional engagement. The qualitative part consists of insights from interviews with the participants to know more about their experience and also investigate their response in IMI in-depth. To make sure that any positive result was because of the design intervention itself, two scenarios were tested with the same group- one without any design intervention (regular class) and one with the design intervention implemented.

4.2 Participants

The study was conducted in an online class of sixteen 7th grade students at Amity International School, Lucknow. History class was chosen due its descriptive nature that allows more open discussion along with testing memory retention of facts leading to more cold-calling from time to time. Seven of the sixteen participants were male and nine were female. The participants were selected through convenience sampling, which is that the researcher selects participants based on their accessibility and proximity. Prior permission was taken by the Principal, the teacher and parents through an online consent form. They were informed about the procedure and that this is a non-compensatory volunteer expt with low to no risk. Further, assent of the students was taken.

4.3 Procedure

Firstly, students' pre-test response was taken to the IMI after a conventional class (NO design intervention) involving cold-calling. Next, a post-test response of the same group was taken after a 1 class using Edus. The mean score of the same group was compared in both the scenarios (without intervention and with intervention) to check for any increase. Lastly, brief semi-structured interviews were conducted with the students to further examine their experience and assess their subjective emotional response.

4.4 Data analysis

Self-reported scores from the IMI questionnaire are summarised using descriptive statistics, showing the central tendency (mean) and spread (standard deviation) in students' response. As the low sample size ($n=16$) limits the generalizability of the result, we mostly rely on descriptive statistics and qualitative assessment. However, a paired t-test was done at the end to check for any statistical significance even in the small sample. The data from the interview was analysed to identify recurring themes, gain insights and support the self-reported quantitative data.

5. Results

There was a slight increase in the self reported psychological engagement from the scenario 1- conventional class ($M = 5.58$, $SD = 0.81$) to the scenario 2 with the design intervention ($M = 6.04$, $SD = 0.55$). Mostly students ($n=15$) reported having fun with the interactions with Edus. Many students ($n=12$) reported they wished that their name showed up on the screen more often.

Postman UX Accessible error signifier

UI/UX design • Convincing team for accessible designs through systematic explorations

Original inaccessible designs for {{variables}}
https://www.postman-echo.com/get?foo1={{variable}}&foot2={{my_variable}}
Explorations

Design element	Resolved	Unresolved
Box	Element property used- Solid fill {{variable}}	property used- <u>dotted stroke</u> {{variable}} {{variable}}! Adding error icon for more emphasis
Highlight	property used- no highlight {{variable}}	property used- use highlight {{variable}} Other option was to use underline but not used to avoid conflict with spell checks in browser or OS. {{variable}} {{variable}}
Value	bold content primary {{variable}}	regular content tertiary {{variable}}

Articulating exploration in systematic way to communicate with the team

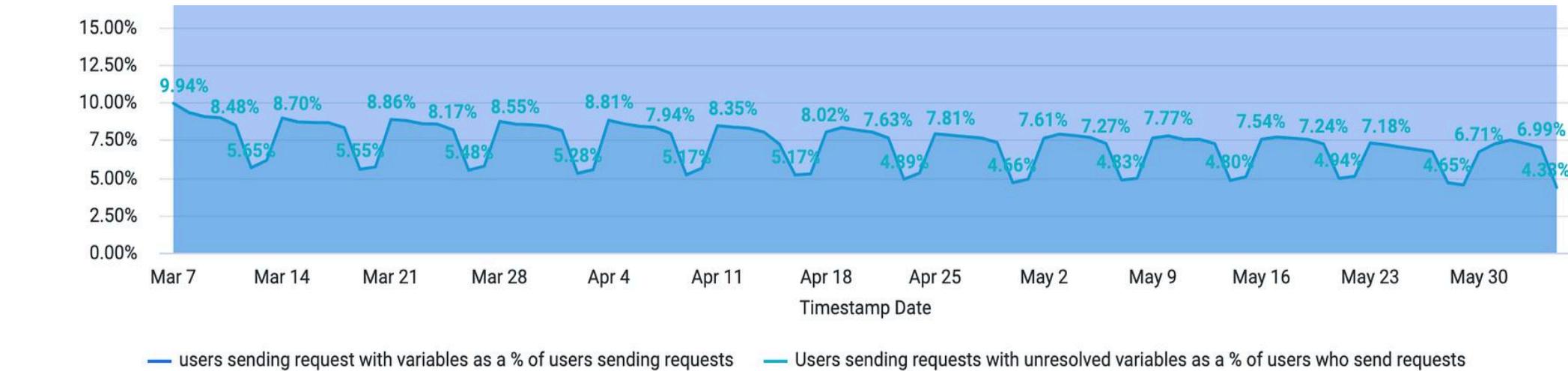
Ground rules-

- Don't rely only on colour for the binary info eg. red-green.
- Use colour for only attention, making something stand out.
- Unresolved should communicate some negative/warning feedback but not harsh error. (tbt)
- Resolved should communicate some positive feedback but shouldn't be very loud all the time.
- Both should feel like from same family and a unit separate from URL with affordance of hover.

{{baseUrl}}

{{baseUrl}}

intervention: Adding a subtle background to highlight error

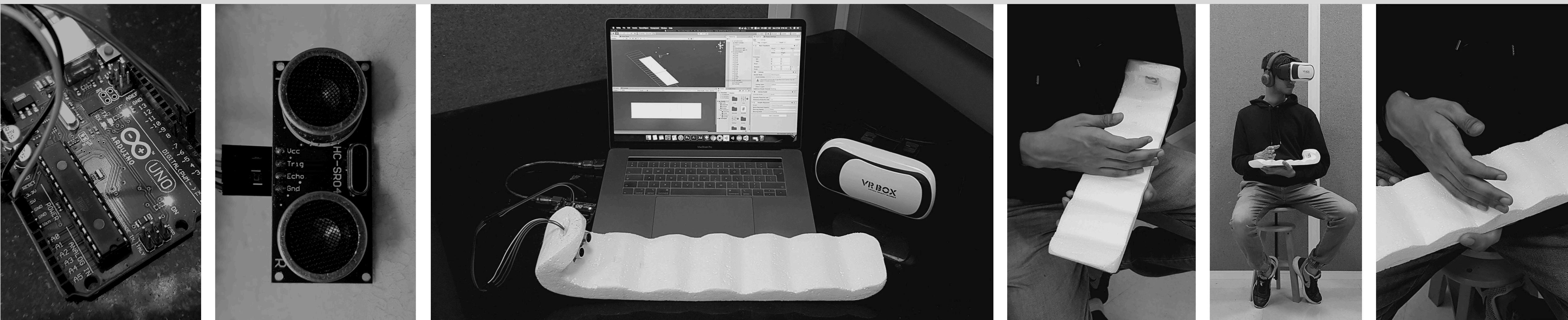


impact: Users facing the variable error reduced from ~10% to ~6%

One of my projects at Postman was a small change big impact story. We had to redesign the way variables were represented when they had an error. While advocating for colourblind accessibility which was often neglected, I went through systematic explorations and user testing to get the team's confidence. It was evident how accessibility makes product easier to use for all (as shown in data).

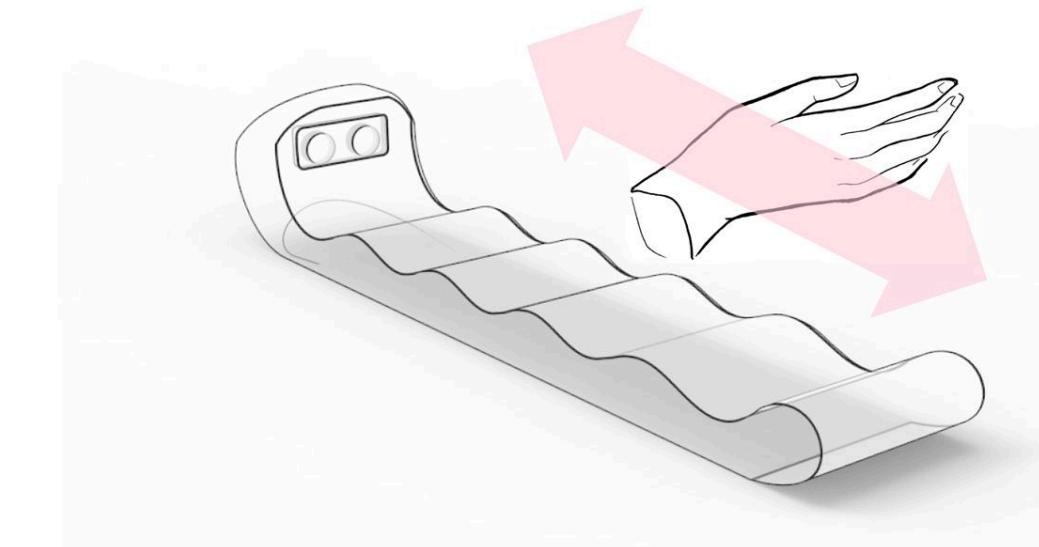
VAVE Gesture based musical instrument

Jan 2020 (3 weeks) • Group of 2 (my contribution: prototyping with sensors and Arduino + physical prototype)

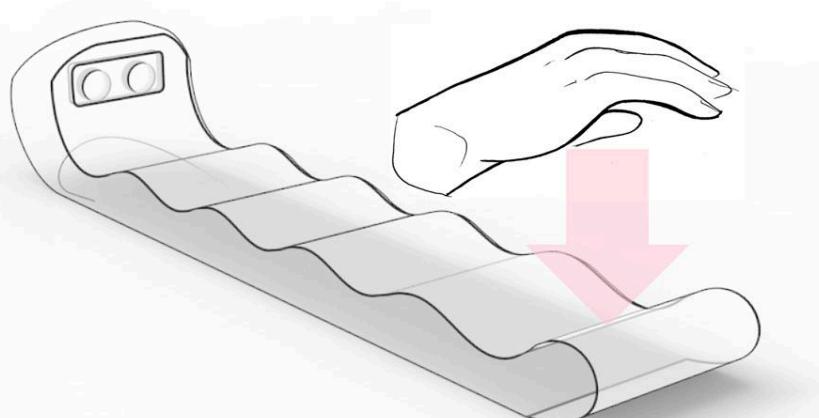


VAVE is a handy instrument played by waving and making other hand gestures over it. The physical instrument was to have a tangible mode of interaction while the music was played electronically by detecting the position of hand through an ultrasonic sensor and mapping it to musical notes using Arduino, processing and Audio Helm extension in Unity.

PLAYING THE NOTES



VOLUME FADE



Graphic Design at Girl Up Seher

Graphic design • Design for social media campaigns • Volunteering with Girl Up Seher



While working with Girl up Seher, an organisation dedicated towards gender equality, I got the opportunity to design social media posts for several campaigns such as on menstrual hygiene.

I used imagery with **real-life textures, photo manipulation and illustrations to provoke emotions while maintaining an aesthetic appeal.**

SUSTAINABLE OPTIONS

Switching to sustainable menstrual hygiene options is recommended to reduce one's carbon footprint and to align with some of Sustainable Development Goals (SDGs) by the United Nations. It also helps with improving the disposal system in place for menstrual hygiene.

Making a switch to cloth pads, menstrual cups and period panties can make all the difference and can all reduce the woe of constant disposal.

- PPE kits are quite thick and it makes people sweat a lot, especially during summers. Within a few hours, a lot of women are completely drained of energy during this time. They mistake period blood for sweat and don't even realise that they've started menstruating.
- Society has conditioned us not to talk freely about these things, so they're also hesitant to inform their peers or seniors when such a situation arises.

Instagram page

