

Date
18th Nov 2022

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Major Project 2
M.Des. Communication Design 2021-23

Learning Independence



Approval Sheet

The Design Project II titled “Learning Independence: Karaoke-text re-purposed for reading engagement” by Swati Yadav, Roll Number 216450011 is approved, in partial fulfilment of the Masters Degree in Design at the IDC School of Design, Indian Institute of Technology Bombay.



Guide: Prof. Alka Hingorani

Declaration

I declare that this written document represents my ideas in my own words and where others ideas or words have been included, I have adequately cited and referenced the original sources. I also declare that I have adhered to all principles of academic honesty and integrity and have not misinterpreted or fabricated or falsified any idea, data, fact or source in my submission. I understand that any violation of the above will be cause for disciplinary action by the institute and can also evoke penal action from the sources which have thus not been properly cite or from whome proper permission has not been taken when needed.



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Communication Design

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16th November 2022

Acknowledgement

At the foremost, I would like to thank Prof. Alka Hingorani for guiding me throughout the project. Her suggestions have been extremely valuable in shaping the project. I would like to thank the faculty in Communication Design Prof. Sudesh Balan, Prof. Aditi Chitre and Prof. Shilpa Ranade for their feedback throughout this process. Special thanks to Prof. Aniruddha Joshi for sharing his insights and suggestions.

I would like to thank Mr. Tejaram, Founder of Manthan Kotri, Arti founder of Sakhi School, Administrators and teachers at Muskaan foundation for being supportive of the project and providing me with the necessary support to make the project a success. And lastly I would like to thank all the participants who offered their valuable time for this project.

Abstract

This project is a proposal for introducing same-language karaoke-based subtitles for all the videos within Youtube to facilitate effective and engaging reading activity for the viewers. The objective for this project is to alleviate the English learning experiences, build confidence and create positive change by improving English literacy skills in Indian citizens and cultivating a culture of lifelong learning. This project helps build conducive learning to everyone irrespective of their exposure and access to printed reading materials.

Post re-affirming the problem space by doing a pilot interview with four adults, and several ideations for sustainable solution, this project is situated to use the findings from Brij Kothari's research on Same Language Subtitling as a jump start and explore the kind of interventions that can be deployed. A literature review is done as part of secondary research that introduces the topic and situates this project. Qualitative research is done to understand how Indian users specifically women face challenges while learning the language and whether the proposed design interventions will lead to desired outcome.

The report includes a summary of the ideas generated and the iterative process to create the layouts with feedback from different stakeholders. And is concluded with feedback from the learners and experts on the prototype along with future steps for evaluation and web integrations.

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Introduction

This project is a proposal for introducing same-language karaoke-based subtitles within Youtube for all the videos to facilitate effective and engaging reading activity for the viewers. This set of digital tools aims to faithfully accommodate a variety of learning features intrinsic to the comprehension aspect of language learning process.

According to UNESCO Institute for Statistics, 2015, [1] India's net enrolment rate in primary education reached over 92.3 per cent in 2013, and since then there has been a continual increase in the literacy, with a figure of 74.4 per cent given in 2018. Literacy levels in our country are currently collected through self reporting, which often tends to overstate levels of competence. Some studies [2] speculate that a figure much lower than the actual would emerge if literacy skills were actually tested.

Moreover, there is an anxiety construct in Indian adults when it comes to reading, writing and speaking in English even when they have preliminary knowledge of the language. English is the co-official language of India and the diversified nature of the country makes it imperative for the people to know English language even to communicate within the country or use any form of technology. While kids can pick up new languages quickly, adults often struggle to remember words for a long time. Language learning is difficult for adults even when there is an abundance of teaching resources available. Since the learners have no control over the learning material and a there is lack of

alternative approaches to learning, it brings a disconnect and a lifelong fear for the language.

Goal

Goal of this project is to identify method/solution(s) to improve english language learning experience for Indian adults above the age of 35 yrs.

Primary focus is to help the users gain confidence and become self-dependent by helping them learn the skills they want in an effective and easy manner without any language barrier.

The target users for this project are women of the age 35 years and above who can read and construct simple words in English and in their native language.

Motivation

Motivation for this project was mostly intrinsic and based on personal observation. I have grown up living with women who are extremely skilled and talented and yet depend on others and have confidence issues. To illustrate this problem, imagine living where you are unable to read and comprehend the label of the medicine you must give your child, the menu at a local restaurant or even the warning signs on the road. This is the world that

millions of adult Indians live in simply because they are not accustomed to the English language. They have lived most part of their lives in small towns, villages or cities where everyone around is used to speaking in their regional languages and dialects. English is no longer just a means of communication but has become a necessity to stay relevant, updated and connected in this fast paced world. And because of all these reasons, many feel outcasted, falling behind and uninformed.

Approach

The approach taken for this project was to first understand the challenges and limitations of the users who are trying to learn the language. Post that several ideas were chosen and analyzed for their viability. A literature review is done as part of secondary research that introduces the topic and situates this project. The primary research is done to understand how Indian users specifically women face challenges while learning the language and whether the proposed design interventions will lead to desired outcome. This is followed by a summary of the ideas generated and the iterative process to create the layouts with feedback from different stakeholders. To conclude, feedback from the learners about the videos with and without captions and how it helped them has been discussed.

Background

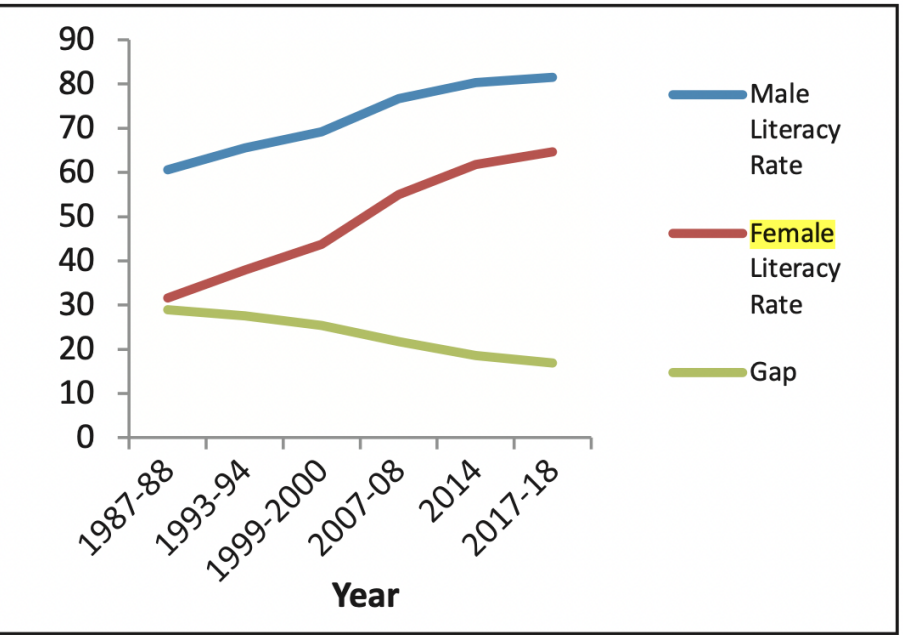
The number of students enrolling to schools in India are at an all-time high according to ACER, 2018 report [3], however, the education system in our country has not effectively progressed to support the same. Since independence in 1947, continual efforts have been made by the government and civil society institutions to provide various literacy programmes for youth and adults. However, traditional language learning programmes are often criticized for their inadequate quality, lack of resources, and inability to reach those who are socially, economically, and geographically marginalized.

The situation is more dire in areas with low income populations, as per report [3]. Furthermore, the shortage of reading materials for newly literate adults exacerbates the problem of sustainable literacy development opportunities. This leads to them relapsing to low confidence throughout their life and depending on others whenever there is an interaction with english language involved. Hence, to overcome this issue, in this project, we try to seek innovative approaches to improve language learning experience for Indian youth and adults.

An argument for women learners

About three decades ago, the adult male literacy rate in India was almost twice that for adult females. While this gap has narrowed substantially over the years, adult male literacy rate still surpasses the adult female literacy rate

by 17 percentage points. Females have historically have had lower literacy rate as compared to males which explains the existnce of a wider range gap [4].



Source: National Sample Survey @ Observer Research Foundation's India Data Labs

However, the literate population of Indian women are mostle dependent on their children or their male counterparts for their day-to day needs. Even when they are literate, can read and speak in their local language and also have preliminary nderstanding of english as their second (or third) language, feel under-confident while going out alone, shopping or speaking to people in general. They also find english as a roadblock in their personal and professional growth despite their educational or economical backgroud.

Furthermore, despite all the challenges and limitations, women are immensely motivated to learn new skills and educate themselves.

Why is english language imprtant?

With the advancements in technology and improved standards of living, English has taken up a major part of the written world that we come across in our daily lives. It is no longer just a means of communication but has become a necessity to stay relevant, updated and connected in this fast paced world. And because of all these reasons, many feel outcasted, falling behind and uninformed.

Even when development begins with education, and education stems from language, language is much more than a means of communication; it determines the books one reads, the television programs one watches, the ideas one is exposed to, the values one holds, one's personal interests, and one's career opportunities. In essence, it defines our identities. Therefore, it is crucial for anyone to be able to learn and comprehend the language they want in an easy manner.

While kids can pick up new languages quickly, adults often struggle to remember words for a long time. Language learning is notoriously difficult for adults even when there is an abundance of teaching resources available. Since the learners have no control over the learning material and a lack of alternative approaches to learning, it brings a disconnect and a fear for the language throughout their lives.

Need for improved learning experiences

Since independence in 1947, continual efforts have been made by the government as well as civil society institutions to provide various literacy programmes for youth and adults. However, traditional literacy programmes are often criticized for their inadequate quality, lack of resources, and inability to reach those who are socially, economically, and geographically marginalized. According to the National Readership Survey, 359 million Indians who are officially literate do not read any publications regularly [5]. Hence, it has been necessary to seek innovative approaches to improving literacy learning opportunities for youth and adults.

From my personal observation, I have seen that people in the age group of 35 years and older, who have spent most of their childhood in rural areas, attending schools in their regional languages, are excited to learn the English language but often shy away from trying due to fear of embarrassment. For them, English is to stay connected with their children, be self-dependent and at times to maintain their status quo. Even though all of them have elementary education, they find difficulty in reading, writing and understanding in English. In order to overcome the gap, they take it upon themselves to learn the language and try to read newspapers, novels, magazines, buy English speaking books, borrow books from children in elementary school or watch rapid English speaking YouTube tutorials.

Despite all these efforts, they find it difficult to retain anything they have learnt. It is majorly because the information provided is mostly factual and lacks relatability. They are often unable to remember words and can almost never connect with the concept. They often face one or more of the challenges listed below:

- Lack of relatability
- There is motivation to learn, but there is also fear
- Overwhelming content
- Embarrassment of failure
- Hesitation and Shyness to try new things
- No peer learning
- Lack of support from family

This project is conceptualised from the need to support Indian adult specifically women to provide them with improved reading and learning experiences considering the limitations and challenges they face during the process.

Pilot Interviews

To get an understanding of the target user group and focus area, I conducted two pilot interviews. Both participants were female in the age group of 40-50 years. I focussed on individuals who have elementary level schooling and can understand basic word formations with their meanings, and my objective was to gain insights in order to devise solutions that make the learning process a delightful experience.

In these interviews I spoke to individuals who were from different geographic, economic and professional backgrounds to answer questions like:

- Do they feel the need to learn the English language.
- Do they face difficulties in going about their daily lives with the proficiency level they have in english?
- Which medium do they choose to go about the learning process - courses, books, videos, workshops?
- Do they drop out of the learning process mid-way? Further probing into finding the reasons why they drop out?
- Do they lose track of the learnings they should get? How does that affect them? And what alternative aproaches they try to mitigate the same?
- The overall challenges they face in the process.

By the end of the interviews I also gave them a reading artefact for them to read it at their own pace and comfort zone. We discussed the details about the book after three weeks.

Insights

After a two hour long discussion with both the participants, I was able to re-affirm the problem I was working towards and could understand the need of the solution in their lives. Few key-points from the conversations are listed below:

- Both the participants got very excited when I described the problem I am working towards and said that it will be really beneficial for them if we find an easy way to achieve this goal.
- They face difficulties when going to the grocery store and the packaging is difficult to read.
- They feel embarrassed in front of their children's english speaking friends or even salesman in malls or shops.
- In order to learn the language and try to read newspapers, novels, magazines, buy english speaking books, borrow books from children in elementary school or watch rapid english speaking youtube tutorials.
- Despite all these efforts, they find it difficult to retain anything they have learnt. So they lose motivation and eventually do not continue for long.
- They have tried learning the language several times, by imitating, remembering, making notes, reading but according to them nothing has worked.
- For them, there is almost everything is possible but not this.

Initial Design Ideas

- **An Interactive book:** An interactive AR based reading application which helps them to find the meaning, pronunciation, translation and more information about the words they are coming across. They can use the app to read a physical or digital text and wherever the reader is stuck the app mascot recognizes and gives hints and suggestions to help them understand the written text.
- **A graphic novel where the learner write their own story:** By taking references from the given illustrations/pictures, reader will note down the words they know and come across daily and will try construct sentences using those words. The sentences will eventually make a story which the learner will read and make corrections wherever needed until they are satisfied.
- **Mobile app which tracks number of English words they spoke or heard on a daily basis:** A system which shows them the number of English words and sentences they are actually exposed to and understand on a day to day basis will give them a boost of confidence and motivate them to further learn and build their vocabulary. A simple tracker which tells them the number of english words they use on a daily basis.

- **A VR application:** A virtual reality based interface which allows learners to travel to a new place where all the information is in a foreign language and learners have to do basic tasks like navigate to another place, shop, order food or simply take a bus. In this scenario, the learners are forced to talk in a language which is not their local dialect and eventually helps them learn and gain confidence.
- **Taking advantage of short stories:** Reading short stories has proved to be popular with students. The short story needs to ensure students can be engaged without investing too much time or energy, but the depth of stories should enable learners of all abilities to be engaged with the book. A book of 5 short stories which have different themes ranging from travel, technology, self-help, spiritual to something entirely fictional and dream-like. The chosen themes and corresponding themes would be picked on from their daily lives and challenges so that they connect and relate with them a little more. The idea is to make the books easy to read, relatable and have direct usability.
- **Build storybooks from the stories they create:** Inspired by the LeTS foundation model, the idea is to talk to adults, help them come up with their own stories, and create books out of them for them to read and learn. These stories will build instant connection with other adults and who face similar challenges, motivation and curiosity.

Why the ideas did not work?

After careful analysis of all the above mentioned ideas, we decided to not go ahead with any of them because of following reasons:

- All of them required the user to download, purchase, learn to use an additional medium to access them
- Many of the ideas limit what the learner is exposed while going through them in the form of surroundings, stories etc.
- Some of the ideas are expensive and context specific and might not reach learners across the country.
- Content in all of these ideas is limited and is a one-time thing. Any new update to the artefact will require manual intervention.

We decided to go ahead with primary and secondary research to get in-depth understanding of the requirements user have and how those requirements can be fulfilled without any additional effort.

Secondary Research

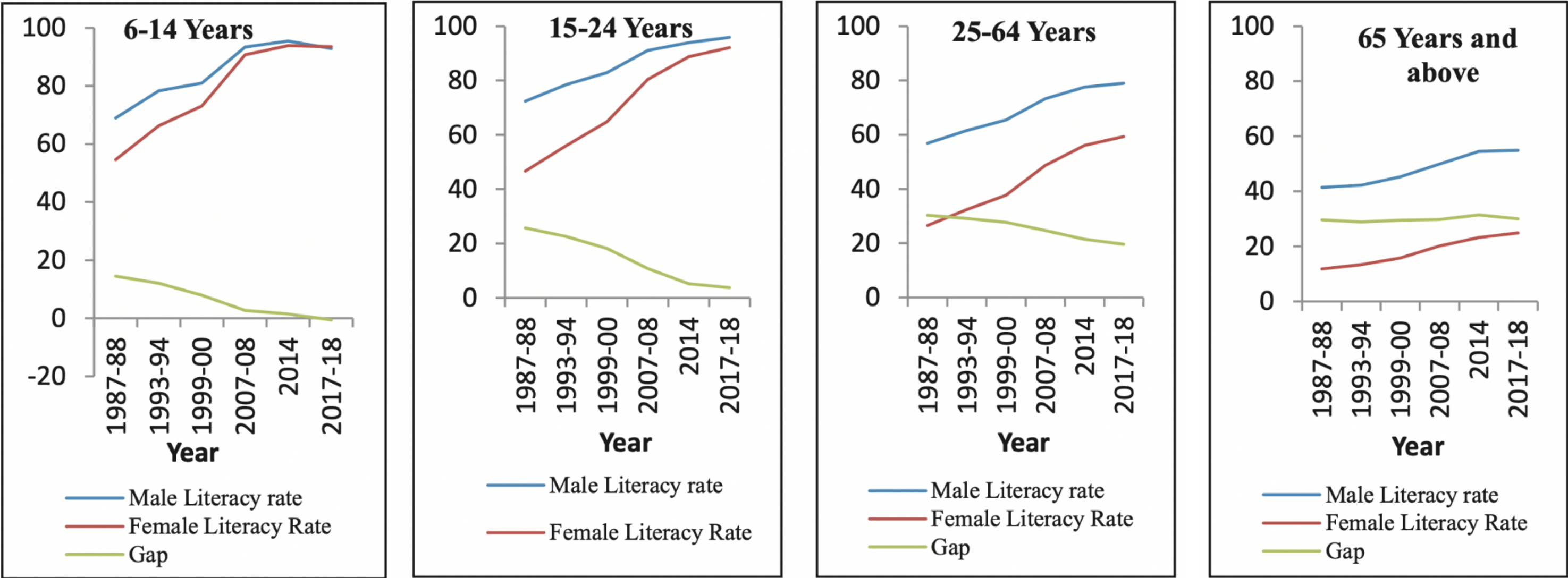
Introduction

In secondary research I checked the current position of seminal work that shed light on ‘Captions for reading engagement’ as an area of study was the ‘Same Language Subtitling: a butterfly for literacy?’ [6] by Brij Kothari, published in 2002. It was aimed at understanding the impact of simple addition of existing television programmes, especially film songs and music videos, to the improvement of reading skills of over 325 million neo-literate people in India. The results confirm that SLS of film songs leads to reading skill improvement, thus reaffirming the enormous potential of this simple and economical approach for mass literacy skill development.

Literacy Landscape in India

There are 276 million adults in India who have not studied beyond middle school [1]. According to UNESCO Institute for Statistics, 2015, there has been a continual increase in the literacy rate, with a figure of 74.4 per cent given in 2018. These numbers are promising; however, considering that India has a population of more than 1.3 billion, the statistics also suggest that 266 million Indian adults over the age of 15 still lack basic literacy skills. Tanushree Chandra, in her paper “Literacy in India: The Gender and Age Dimension”, [4], talks about literacy landscape in India between 1987 and 2017, focusing on the gender gap in different age cohorts finds that the gender gap in literacy has

Literacy in India: The Gender and Age Dimension



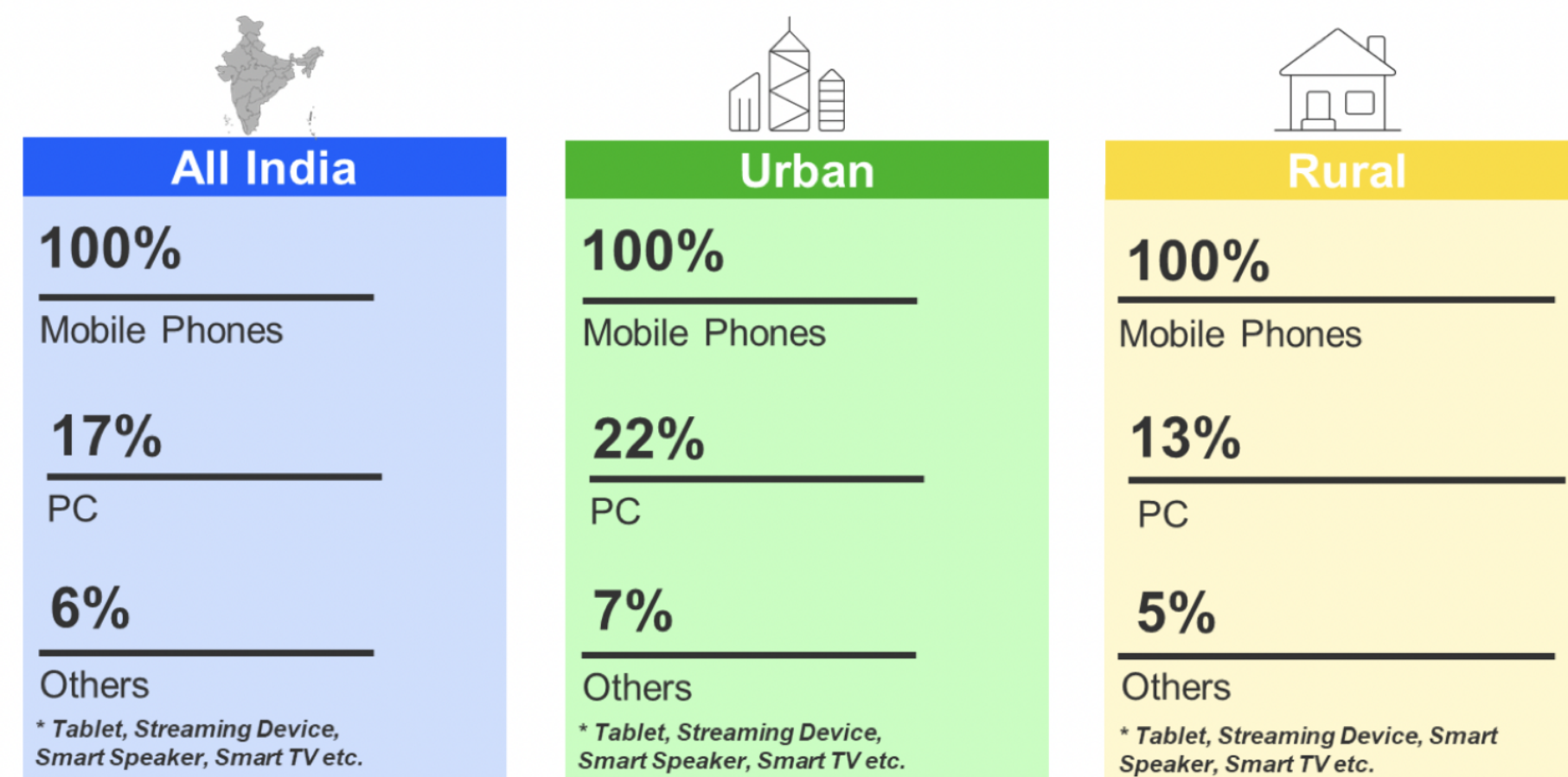
Source: National Sample Survey @ Observer Research Foundation's India Data Labs

shrunk substantially for children and youth, but the gap for older adults and the elderly has seen little improvement. A state-level analysis of the gap reveals the same trend for most Indian states. In the paper she also offers recommendations such as launching adult literacy programmes linked with skill development and vocational training, and leveraging technology such as mobile-learning to bolster adult education, especially for females. Literacy levels in our country are currently collected through self reporting, which often tends to overstate levels of competence.

Some studies by Kothari and Bandyopadhyay [2] speculate that a figure much lower than the actual would emerge if literacy skills were actually tested. Currently, millions of Indian adults read at or below 'basic' reading levels and many more struggle with reading comprehension. According to the survey [5], 359 million Indians who are officially literate do not read any publications regularly, yet, those same adults are watching hours of media content on social networking websites and video streaming platforms per day.

Internet and media consumption in India

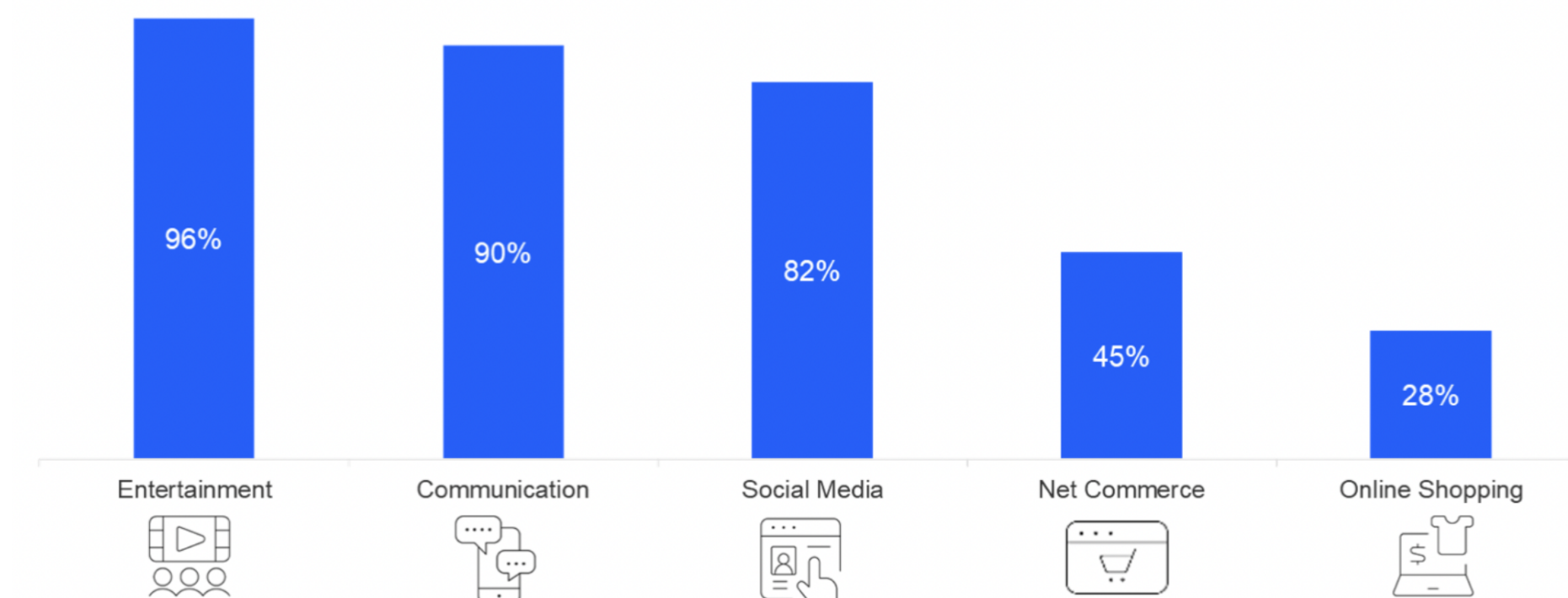
According to Newzoo's Global Mobile Market Report 2020 [7], India with a population of over 1.3 billion people, has recorded a massive expansion in smartphone users from 300.12 million users in 2017 to 492.78 million in 2021 with a smartphone penetration of from 22.3% to 35.4%. The 'ICUBE 2020' report by IMAI and Kantar [8] indicates that the Internet usage in India continues to grow. As of 2020, estimated number of Internet users who have accessed Internet in the last one month is around 622 Million.



Source: Kantar ICUBE 2020, Active internet users

In Urban India, Active internet users have grown by 4% over last year to reach 323 Million (est.), while in Rural it has increased by 13% over last year to reach

299 Million (est.). The growth is significantly larger in the year 2021. There are 58% Male Internet users and 42% Female Internet users in India. The ratio of male to female in Urban India is 57:43 and that in Rural India is 58:42. Mobile phone remains the most used device for accessing internet with almost 100% of the active internet users opting for mobile phones to access internet.



Source: Kantar ICUBE 2020, Active internet users

Nine out of Ten active internet users access internet every day; On an average, they spend around 107 minutes (~1.8 hours) actively on the internet daily. Mobile phones are omnipresent. Cheaper and faster data plans, availability of the content in Indic languages have triggered the universal usage of mobile phones by all. Also, Entertainment, Communication and Social Media are the topmost activities done online among internet users in urban and rural India. According to Global Media Insight, as per April 2022 statistics, India has the

largest YouTube using population, with 467 million active users. 96% of the AIU use internet for entertainment related activities (like watching videos, listening to music, playing games, etc.). It is followed by online communication (text, voice and video chats, emailing, etc.) and social media (someone who has accessed content on social media website or platform) with 90% and 82% respectively. Entertainment, communication, and social media are key activities done in both urban and rural AIU. Communication is a key activity on internet. Almost 9 out of 10 AIUs engage in activities which are directly linked to communication out of which 56% is voice and video related.

Same Language Subtitling

Same Language Subtitling (SLS) is adding accurate subtitling on a phonemic level to the lyrics of existing film songs or music videos, in the 'same' language that they are sung in. It uses videos with a format similar to karaoke, where captioned text changes color in synchronization with audio. Students are able to hear the words being spoken/sung and read the words being spoken/sung at the same time. It typically uses repetitive sources of audio, such as music, poetry, audiobooks, or famous speeches. SLS was developed by Dr. Brij Kothari, the president of PlanetRead, a non-profit organization dedicated to reading and literacy development. It was originally used with Bollywood film songs on TV to promote literacy in India. [6]. The goal is to encourage reading and increase reading proficiency.

Subtitles and its impact on Literacy

Brij Kothari [6], Greg McCall [9] & the late Alice Killackey [10] all three have individually completed successful research into the link between the use of subtitles and the ability to significantly improve childrens and students reading & literacy skills. In each case either Karaoke video or childrens Hollywood movies was used. Now various organizations like Zane Education has made subtitled curriculum-based educational video available to learners.



Source: PlanetRead, Brij Kothari experimental studies

SLS is a deceptively simple innovation that is already delivering regular and inescapable reading practice to 150+ million viewers worldwide. Eye-tracking research has shown that viewers naturally synchronize the auditory and textual information while watching SLS music video. As per a statement by PlanetRead "When SLS is integrated into popular media, reading happens automatically and subconsciously."

Dr. Brij Kothari of Cornell University coined the term "Same Language Subtitling" in 1996 to describe his application of Karaoke-styled captioning. Kothari developed his SLS using Bollywood film songs on TV to promote literacy in India. His massive SLS study has received awards from the Tech Museum of Innovation (San Jose), Development Marketplace (World Bank) and the Institute for Social Inventions (London). In his 2002 article "Same language subtitling: a butterfly for literacy", Kothari proposed using the SLS format to raise the literacy in India on a massive scale [6]. In the paper, he documented his initial trials at a primary school, which was a two-phase study designed with a controlled pre- and post-test. The experiment was conducted over a three-month period at a rural Indian Public Primary School. Three groups of 46 were formed with an equal number of children from the fifth and sixth grades, and with the same male-female ratio. All students were pre-tested for monosyllabic word recognition. Each group received 18 hours of class time with presenters following three different programs targeting vocabulary. The first group watched five subtitled Hindi film songs each session, three sessions a

week. The second group viewed the same program without subtitles. The third group did directed reading activities. After three months, the same monosyllabic word recognition test was repeated. Group means were then compared statistically. The results demonstrated a significant improvement in phoneme acquisition for the SLS group.

There is a massive, ongoing, long-term study that proves that SLS can significantly impact non-readers through emergent level readers for phoneme, syllabic, and vocabulary acquisition. Further, Kothari's study demonstrates that SLS can significantly impact reading engagement and maintenance amongst functional level readers. According to Kothari, SLS strengthens decoding capacity, promotes functional reading levels, stanches reading skill loss and increases overall reading behaviors. [2]. Two nationally telecast Hindi film song programs (Chitrahaar and Rangoli) were used with the SLS format to provide reading practice for at least an hour per week to, hopefully more than 100 million struggling and emergent readers.

Literacy elements of SLS includes having accurate text, accurate synchronization, engaging media which is preferably at or above instructional reading level but below frustration level, clear vocal audio, embedded text ('hard' Subtitling or open subtitling), repetition of media that can be replayed, rehearsed or memorized, and finally engagement activities like read-alongs, analysis/Response Questions, rehearsed readings etc.

Recognition that SLS works

In 2013 PlanetRead (Same Language Subtitling Use and Research Project) received a U.S. Library of Congress Literacy Award as "an innovative program that reinforces literacy skills". 'Best Practices' in Literacy Promotion and News from the Library of Congress.

In 2013 the U.S. Department of Education Institute for Education Sciences (IES) recognized Same-Language-Subtitling as a promising reading intervention demonstrating significant impact to reading comprehension.

In 2003, The New York Times cited SLS as "One of the most cost-effective ideas in literacy, such subtitles could be used worldwide to increase literacy and cost almost nothing."

Why closed captions not enough?

In a landmark study on watching subtitled television [11] first proved that subtitles cannot be ignored and viewers automatically exhibit reading behaviour. A later study, by the same author [12] confirmed that both children and adults exhibit automatic reading behaviour. The 2020/21 study from NESTA [13] which involved 450,000 children watching videos showed that 98% of viewers did not change the setting and there were zero complaints at

having subtitles on screen. The idea of leveraging Closed-Captioning (CC) on TV to enhance the reading skills of struggling readers, is as old as CC itself [14] but longitudinal studies are very few. Linebarger [15] commented on one such study by Koskinen [14](1997): "In a longitudinal study of continuous caption use in the home, children who viewed with captions scored significantly higher on normative tests of word identification and passage comprehension when compared with non-caption viewers."



Source: Vahchef - VahRehVah, Youtube

While CC is a good start, Closed-Captioning (CC) does not have the literacy impact of SLS subtitling. While regular captioning is definitely a bonus and should be used where available, studies indicate that improving the visual quality and increasing the synchronization between visual and auditory model significantly impacts growth in reading fluency and comprehension.

Apart from that closed Captioning is not available on most videos when the content is not English language based. Also, Closed-Captioning is rarely synchronized to the audio and there is often a lag between the audio and the viewed text. Closed captions also do not have punctuations and other remarks for the audio content. This deters the simultaneous processing of audio and text and greatly reduces the impact of CC as a literacy tool.

Primary Research

Interviews with women of age 35 years and older, who were literate and had preliminary knowledge of English as their second or third language and teachers and founders of various Non-profit organizations and schools who taught adult men/women in Rajasthan and Maharashtra.

The methodology used for the primary research was unstructured contextual enquiry based interviews. The aim was to understand the reading fluency of the users, the challenges they face in the process and the factors that influence the same. The discussion topics were the kind of materials they have access to in English language, how much of their daily lives is dependent on English, people they speak to on a day-to-day basis, how they communicate with English-speaking people, what they do when the other person does not understand the language they speak in, the kind of materials, resources, mediums they have tried to learn the language. The aim of the interviews was to understand the journey of a woman throughout her day, the challenges they face because of English and the possibilities for intervention.

Interviews

A total of 9 women and 4 teachers were interviewed from different geographic, economic and academic backgrounds. Details about all the interviews are described below. Among the nine women, four women had access to plenty of English speaking people around them as they were working

Level of language proficiency	Motivation to learn English language	Challenges faced during the learning process		Accessible Resources
Are they able to comfortably read, write and speak?	Are they trying to learn the language?	Are they facing issues in comprehension?	Are they facing issues in expression?	What resources do they have access to?
How accurately are they reading written words on screen and on paper.	Why do they want to learn the language?	How many times do they come across English language on an everyday basis?	How many times do they come across English speaking people on an everyday basis?	Are they surrounded with English speaking folks?
How accurately are they able to make meanings out of the written material.	Have they tried learning the language in past?	What are the measures they take to read, remember, comprehend the language.	Do they try speaking in English, when they come across situations where they cannot communicate in their local language?	How much access they have to internet, mobile phones, printed books?
	What all have they tried to reach their goals?			How comfortable they are using mobile phones and what applications do they use on a daily basis.

Discussion Guide for interviews

Inspite of the the differences, all of them faced confidence issues while going out alone, shopping by themselves, or talk to someone they are not familiar with. They were also asked about the number of English speaking people they have around them and if they learn or take help from them. Almost all of the participants owned a smartphone and were able to do basic tasks like making a phone call, send simple text and voice messages on whatsapp, scroll through youtube to find videos of their choice.

All the participants, learners as well as teachers were from different districts of Rajasthan, Kolkata and Maharashtra. Teachers were founders of different Non-profit organizations which were

devoted to help adult learners upskill themselves and become self-dependent. Interviewing them gave me an in-depth understanding of the learning process and challenges. I understand the user base for data collection is limited and I plan to talk to more people in future, however, after talking to each one of them and hearing their responses, the significance of the problem became evident and intervention in this space became highly crucial.

professionals in urban cities . While four women did not have any English speaking people around them. All of them knew preliminary level english language, but were at different proficiency levels. Users were asked about their motivation to learn the language and different methods they have tried in the past to learn. They were also asked about the challenges they faced during the learning process. While some faced major issues in comprehending the written words while some were facing issues in expressing their thoughts in English.

10.12
Wednesday, 15th June 2022

All Those Years Ago

forget = भूलना
swarming = घुंघुं
thousands = हजारों
unexpectedly = अप्रत्याशित
precious = बहुमूल्य
longer = लंबे समय तक
breathe = साँस लेना
unrecorded = अप्रत्यक्ष
ordinary = साधारण
born = जनित
halfway = आधे रास्ते
between = के बीच
dirt = गंदरा
plumtree = आम का पेड़
headed = यंत्रणा
south = दक्क
down = नीचे
side = ओर
other = अर
whistle = सीटी
managed = कामयाब
behind = पीछे

dashed = धाँसा
coins = सिक्के
windows = खिड़कियाँ
like = पसंद
ghosts = भूत
toss = फेंकना
large = बड़ा
copper = ताम्र
hole = छेद
middle = मध्य
tiny = बहुत छोटा
silver = चाँदी
called = बुलाया
licked = लिक
tin = टिन
syrup = शर्करा
straggling = बिखरा
huts = झर
bricks = ईंटें
belonged = आता था
seemed = लगे
represented = निरूपित

really = वास्तव में
need = जरूरत
rely = भरोसा करना
which = कौन
again = फिर
could = सके
appear = दिखाई पड़ना
inventory = माला
How = कौन से
any = कोई
such = ऐसा या वसा
list = सूची
describe = वर्णित
room = कमरा
dots = बिन्दु
wide = चौड़ा
great = महान
white = सफेद

Thursday, 16th June 2022

distant = दूर
unattainable = अप्राप्त
luxury = विलासिता
Anglican = अंग्लिकन
priest = पुजारी
face = चेहरा
been = गया
half = आधा
destroyed = नष्ट किया
both = दोनों
spoke = कीली
unusual = असामान्य
taught = सिखाया
insisting = जोर देना
thrashing = काटना
language = भाषा
after = पतर
beginning = शुरुआत
stretched = कार्यवाह
featureless = बिना लक्षण
cluttered = अलमल
Which

Tuesday, 14th June

although = हालांकि
would = सके होगा
could = सके
astirished = सके
enough = इतना
Might = शक्ति
right = सही
precious = किमती
all = सब
Know = जानना
Whom = कसेको
solve = हल करो
lives = जियोगे
thought = सोच
quite = पूर्णतया
eighty = अड़सठ
drought = सूखा
dithered = डिथर्ड
thinner = पतली
decision = फैसला
death = देव
bright = चमकदार

edge = किनारा
Enquiries = पछताह
satisfaction = संतुषि
public = पब्लिक
qualifications = योग्यता
satisfactory = संतोषजनक
attention = ध्यान
creditworthiness = साक्ष्य
virtually = आभासी रूप से
talk = बात करना
positive = सकारात्मक
pouring = डालने का कार्य
information = जानकारी
concluded = निष्कर्ष निकालना
tongues = जीभ

Notes made by one of the participants

On the basis of their proficiency in the english language and access to english speaking people and learning resources, I categorized the users in two groups. Scenario illustration of both groups and teachers are done as follows:

Group 1: It consists of women who were literate, can read and write in their local language and have preliminary knowledge of the English language.

Most of them had to leave their education after 15 yrs of age due to societal and family pressure and they ended up taking care of their family full-time. Even though they have skills, they feel under-confident to go out, talk to people, run their own business or learn new things. The choices they have is to depend on someone to help them naviagte, understand, and learn new things, try learning from children's books due to lack of resources, watch "English

speaking tutorials” on youtube, immitate what they hear from other people or videos or undertake traditional forms of learning programmes (online/offline) for which which they often dont get support from their families.

Group 2: It consists of a group of women who are earning and supporting the family financially, they can read and write in english as well as in their local languages, but they also feel shy and embarassed when someone speaks in english in front of them and they are usually unable to respond. They believes that not being fluent in English is a roadblock in their professional growth. What they do to overcome this barrier is to listen and observe how people speak, comprehend the meanings and try imitating, read and speak in english wherever possible, watch english shows, videos, songs and movies, help out their kids wiith homework and learn along the way, undertake traditional forms of learning programmes (online/offline) which are often very expensive and time consuming.

Teachers: 4 teachers were interviewed as part of the primary research process. One of them was a home tutor who teache children but also has an experience of teaching older women who were wives of defence personnels. I also spoke to founders of Manthan Kotri and Sakhi school which are non-profit organizations working towards helping men and women upskill themselves and become self-dependent. I also spoke to the founder and faculty at FLEC, a coaching institute which specializes in teaching foreign languages.

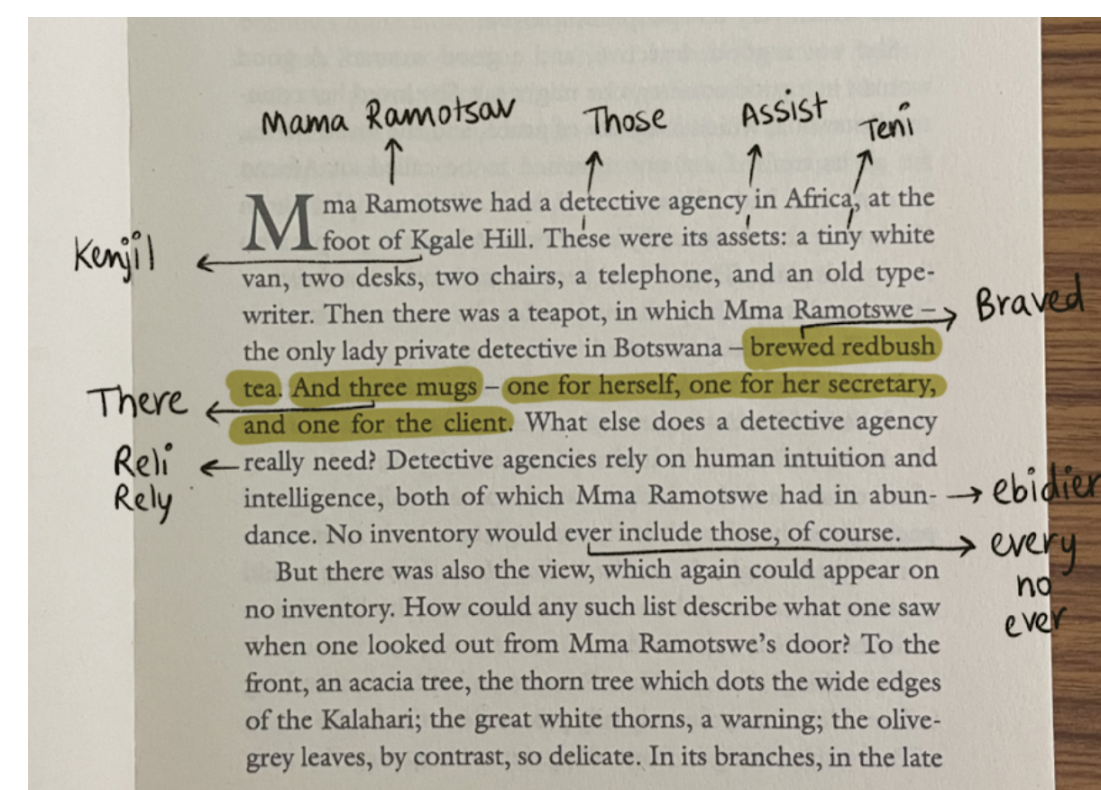
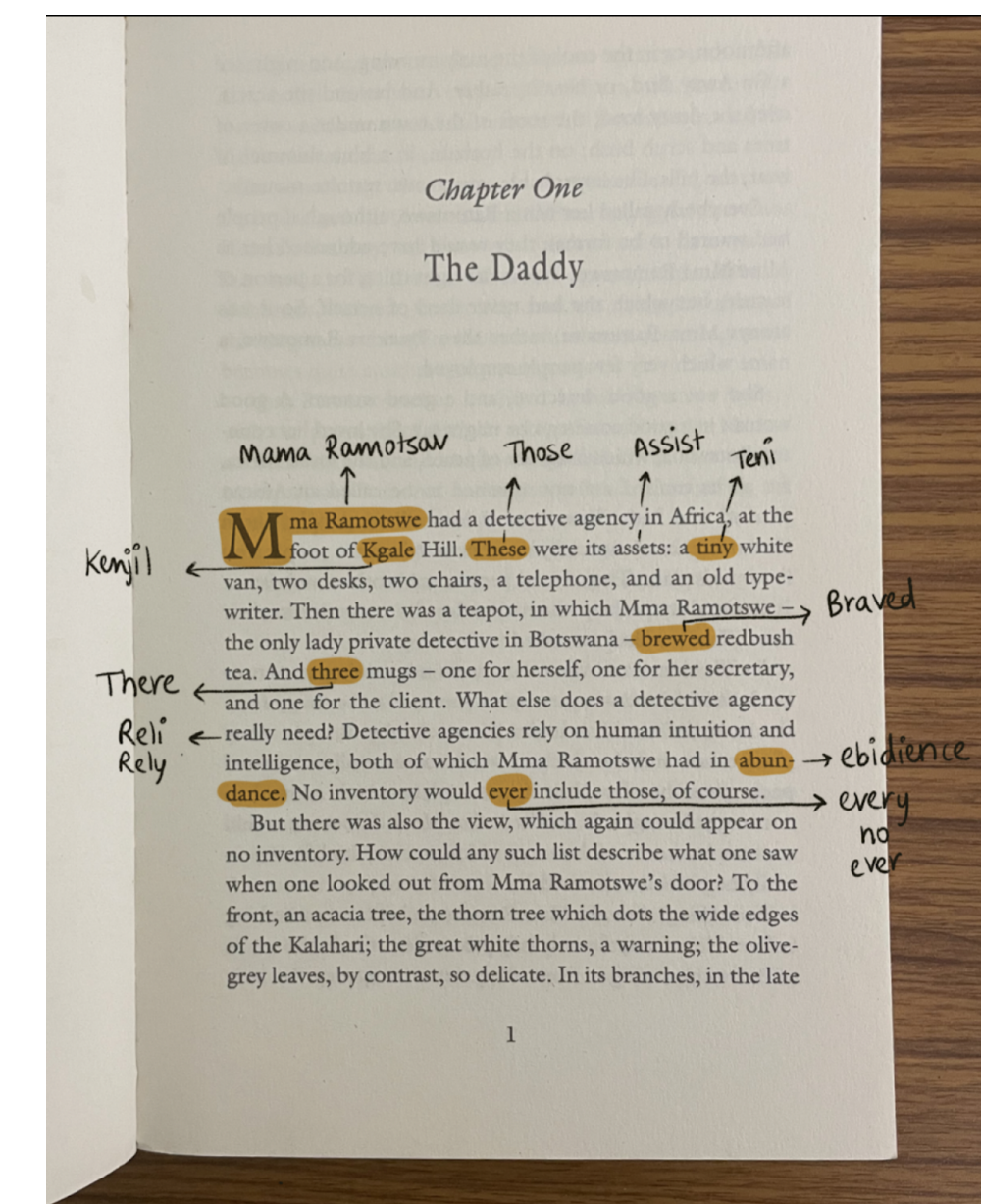
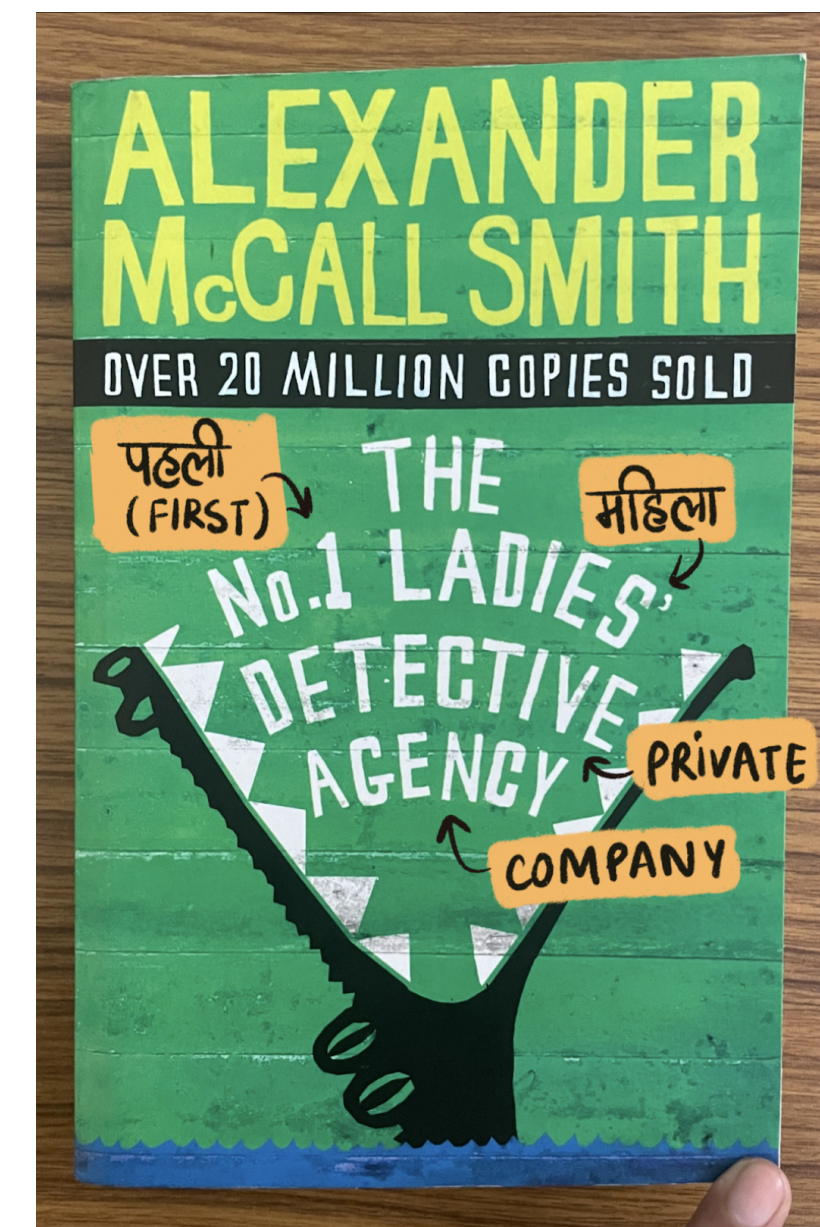


Some key-user statements

According to the teachers, the main challenge was consistency. Most of the women discontinue their course because of family, financial or time constraints. They also mentioned women don't need empowerment, they are already so empowered and strong as they take care of their families, run their houses and support their needs. All they need is awareness and a little support. They also spoke about the strong motivation women have to upskill themselves despite the challenges and yet they feel guilty to spend any resources on themselves.

Reading and Comprehension tests

I also conducted few reading exercises where I asked the participants to read a book at their own pace. I interviewed them after a gap of 3 weeks when they had finished atleast 2 chapters of the book. I randomly chose few paragraphs from the book and asked them to read it aloud. During the process I also asked them to tell me what they understood from the text they were reading. During the process, I observed how accurately they were reading the words, what they were comprehending and connecting the meanings of different words in a sentence and how accurate the meanings were. I also analysed the challenges in reading such as similar looking words are often misread, or fonts which are really small in size and italicized are often skipped or read with least amount of accuracy. I also tried to observe the difficulty (or ease) with which they were able to read words they were not familiar with eg. Mma Ramotswe and Kgale.



Summary

They unconsciously pickup English words by listening and start using them accurately while speaking. Most of their vocabulary is built by listening, so they are unable to comprehend the same word when reading or misspell while writing. The main challenge for group 1 is in comprehension and there have lack of resources, self-confidence and support from family.

Furthermore, since they are already familiar with English, they consciously pickup new words, pronounciations and sometime accents while talking to other people. They have access to resources but feel guilty while spending money and time on themselves. The main challenge this group 2 is expression and the main challenge for them is lack of time to spend on upskilling themselves.

All the participants had access to smartphones and eventhough they needed help to do tasks like saving contacts or change some phone settings but were able to easily perform simple tasks like sending text (in their regional language transliterated in english) or voice messages on whatsapp, make audio or video calls, scroll through social media and watch their desired videos on youtube.

Re-defining the objective

This section talks about how insights from the primary and secondary research were used to generate ideas and describes how the scope of the project was narrowed down.

Primary research in this space has identified the problems women face while learning the language and their motivation to continuously work towards it despite the challenges. The major concerns revolved around the language barrier they have when they try to engage with English language while travelling, watching something, shopping, meeting people etc. The lack of a sense of self efficacy and lack of actionability leads them to depend on others for basic things like saving contacts on their phone or talking to a salesmen. Secondary research evaluates the viability of subtitled videos to the learning adults and adds to the studies conducted by Planet Read [Reading Out of the "Idiot Box": Same-Language Subtitling on Television in India, 2002] on subtitling the lyrics of song-based television programs, in the same language as the audio.

This project was conceptualised from the need to support Indian adult specifically women to provide them with improved reading and learning experience. After primary and secondary research the results indicated that the need is even more dire and by implementing simple solutions the impact of the solution can reach a wider audience than we started with.

Scenario 1

Scenario	Choices	Observation
A woman who is literate, can read and write in their local language and has preliminary knowledge of the English language. She had to leave education after 15 yrs of age due to societal or family pressure and take care of the family. Even though she is skilled, she feels under-confident to go out, talk to people, run their own business or learn new things.	Depend on someone to help them navigate, understand, and learn new things.	They unconsciously pick up English words by listening and start using them accurately while speaking. Most of their vocabulary is built by listening, so they are unable to comprehend the same word when reading or misspell while writing. The main challenge for this group is lack of resources, self-confidence and support from family.
	Since there is no exposure to the English language, they try learning through children's books.	
	Watch "English speaking tutorials" on YouTube and try to build vocabulary.	
	Comprehend the meaning of certain words and imitate what others are saying as it is. Example: choice, education, intelligent, tough, daughter, favour, marks, fail, B.tech., B.Ed. etc.	
	Undertake traditional forms of learning programmes (online/offline).	

After primary research, I illustrated two main scenarios and noted down key observations. These observations directed towards the possible design interventions and helped in redefining the objective of this project:

Scenario 1: They majorly face issue is comprehension

Limitations and corresponding design insights:

- Lack of resources - Using something they already have
- Low self-confidence - Can learn at their own pace
- No family support - From the comfort of their home

Scenario 2

Scenario	Choices	Observation
A woman who is earning and supporting the family financially, can read and write in English as well as in their local language, feels shy and embarrassed when someone speaks in English and she is unable to respond. She believes that not being fluent in English is a roadblock in their professional growth.	Listen and observe how people speak, comprehend the meanings and try imitating.	Since they are already familiar with English, they consciously pick up new words, pronunciations and sometime accents while talking to other people. They have access to resources but feel guilty while spending money and time on themselves. The main challenge this group faces is lack of time.
	Read and speak in English wherever possible.	
	Watch English shows, videos, songs and movies.	
	Help out their kids with homework and learn along the way i.e. books.	
	Undertake traditional forms of learning programmes (online/offline).	

Possible medium for design intervention: **Smartphone**

Scenario 2: They majorly face issue is expression

Limitations and corresponding design insights:

- Lack of time - Using something they anyways do

Possible medium for design intervention: **Text messages/video**

Objective:

The objective for this project is to alleviate the English learning experiences, build confidence and create positive change by improving English literacy skills in Indian citizens and cultivating a culture of lifelong learning. Target audience for this project is now wider and can be of any age group.

Specific objectives of this project are:

- Leverage an existing popular media platform like instagram or youtube to help learners practise and directly improve their reading skills and, indirectly, writing skills.
- Provide conducive learning to everyone irrespective of their exposure and access to printed reading materials.
- To build confidence among the learners so that they can freely learn, upskill, travel, talk, secure better chances in the workforce and play a more active role in their communities and society.

Assumptions:

- User are literate and can read and comprehend basic english words.
- Users own a smart phone, have access to the internet, and can do basic tasks like watching a video on youtube.

Approach

Using video content already available on the internet over printed media or traditional forms of language learning was born from the fact that it is a easily accessible, free and a dynamic way to reach masses. The ubiquity of smartphones in India, popularity of video streaming platform like youtube and the low prices of data makes it easier to do so for a larger audience each day [Devanuj and Joshi, A., 2013]. Research has identified multiple different approaches for engaging learners at home with the help of captioned media [National Center for Technology Innovation and Center for Implementing Technology in Education, 2010].

This project is situated to use the findings from Brij Kothari's research on Same Language Subtitling as a jump start and explore the kind of interventions that can be deployed. The goal is that findings from these interventions could then be used by Kothari to inform longitudinal studies that would evaluate further improvements in this domain.

Design Idea 1: Short videos

First Idea was to leverage Instagram reels as a medium of learning. Reels are a new way to create and discover short, entertaining videos on Instagram. India has the biggest userbase for the Instagram reels feature and since endless reels are available to everyone in just a click-away, I decided to explore them as a solution to the literacy problem.

As per datareportal.com [17] report 2022, there was a massive popularity of instagram reels in India and the short nature of the videos makes the content bit-size, fun and easily consummable.

Instagram reel duration: 15 sec to 90 sec

Media used: Audio, video, text and special effects

Number of instagram users in India: 230.3 million (highest)

Number of active Instagram users in Southern Asia: 288.1 million

Female instagram's global users: 47.2%

Average daily time spent on instagram reels: 30 min

I started analyzing these short videos in three popular categories such as beauty, humour and spirituality. I randomly selected 40 reels from popular Indian content creators such as @kiaraminime and @rjkarishmaa and extracted details such as the type of text added to the video, and the ratio of english to hindi words spoken in the video, meanwhile also comparing spoken words with written text.

Results:

1. Number of Videos: 40
2. Duration: 30-60 sec
3. Type of text
 - a. Subtitles: 23
 - b. Translations: 5
 - c. Title text: 12
4. Total number of words spoken: 50-100
5. Total number of words written: 5-90
6. English to Hindi words ratio: 15%-100%

Conclusion:

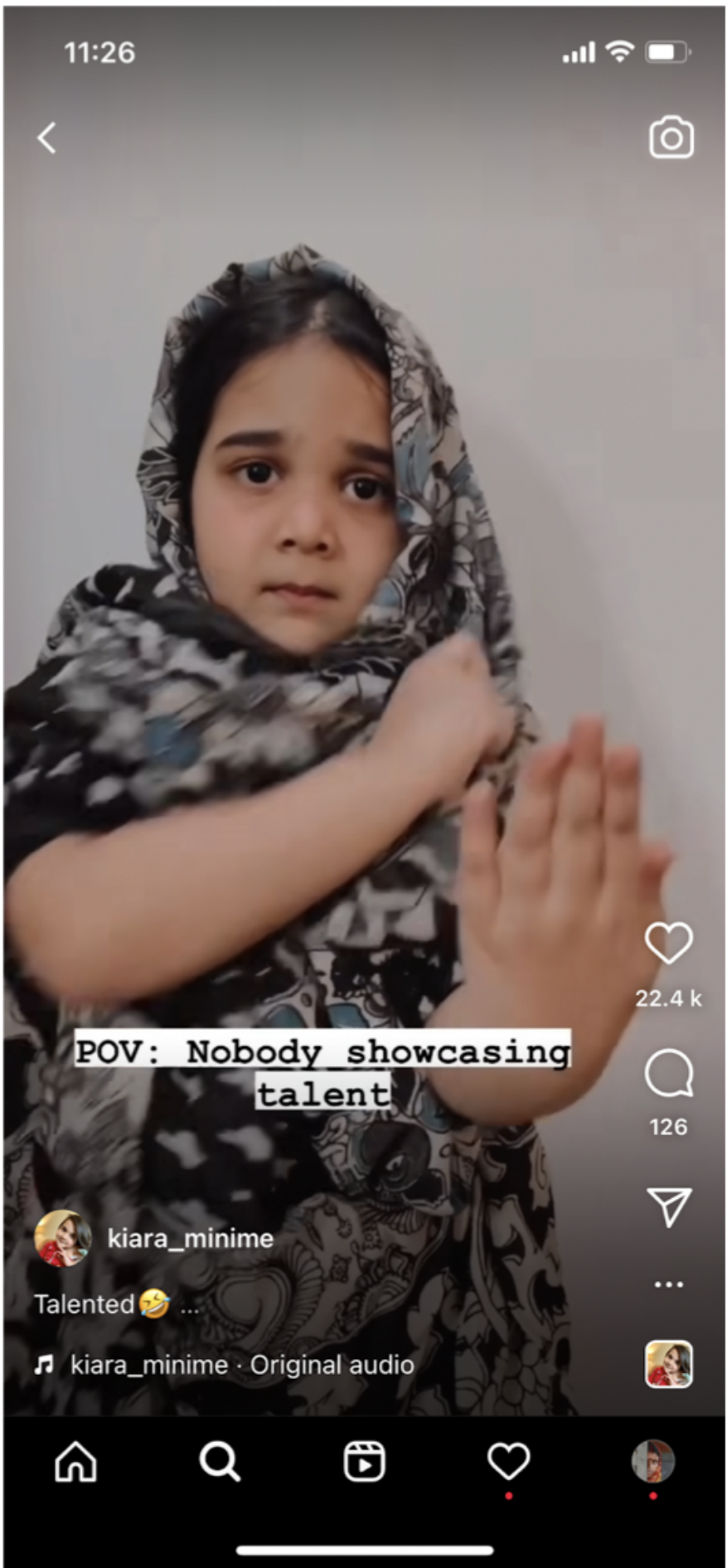
Eventually, we decided to not go ahead with this idea of using instagram reels due to following reasons:

- Eventhough, reels short length seemed excting, it also makes the nature of the content very fast-paced. Thus, making any further learning intervention to most of the content difficult to grasp in that short span.
- Based on the latest available data on dataportal.com, users aged 18 to 24 account for the largest share of Instagram's advertising audience, thus making it not an efficient choice for older adults.
- There is no control of the viewer on the content they watch on the explore feed, this makes the intervention even more difficult.

Source: @kiaraminime, Instagram



Subtitles: 52 sec
Spoken words: 90
Written words: 100
Ratio: 16%



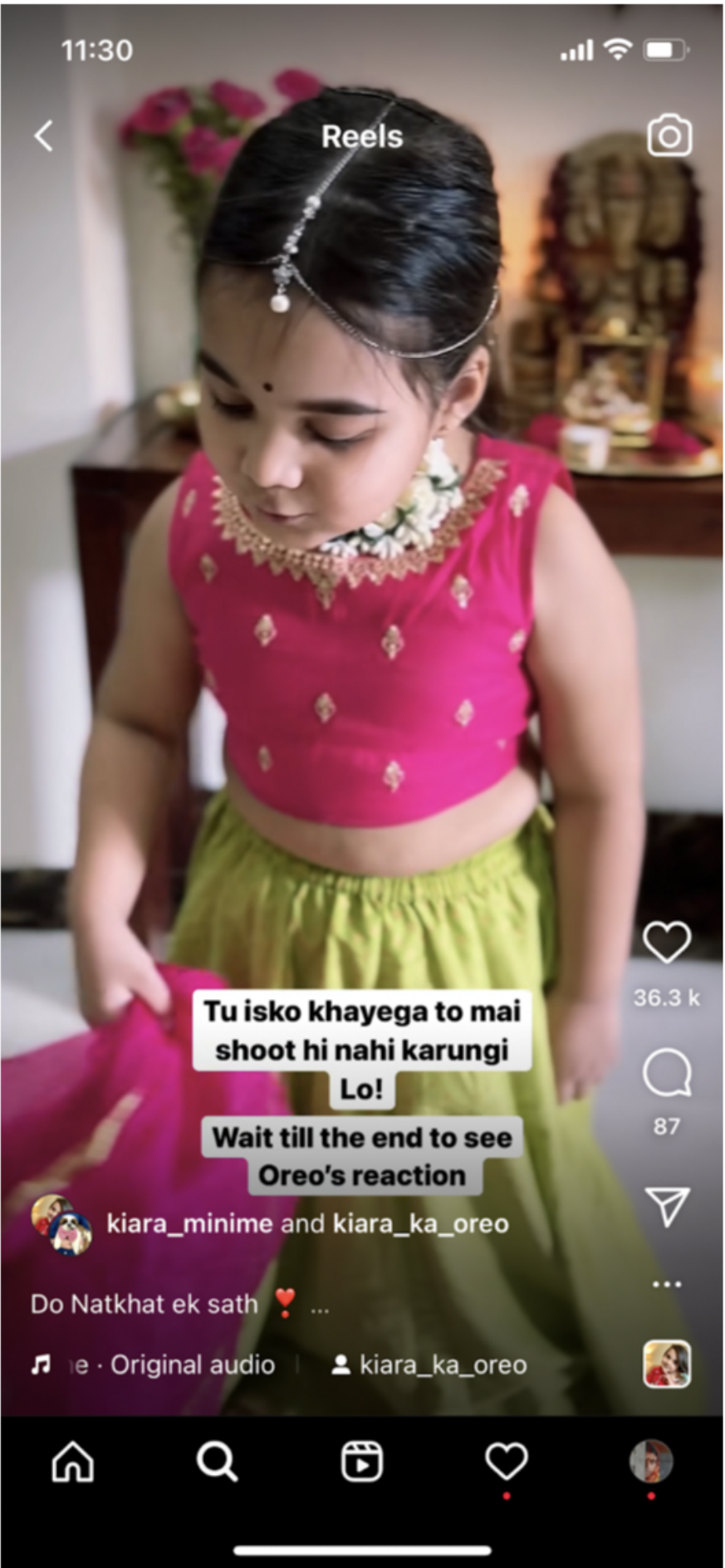
Title text: 30 sec
Spoken words: 30
Written words: 5
Ratio: 80%



Subtitles: 50 sec
Spoken words: 100
Written words: 60
Ratio: 10%



Subtitle: 60 sec
Spoken words: 80
Written words: 80
Ratio: 50%



Subtitles: 35 sec
Spoken words: 40
Written words: 45
Ratio: 20%

Design Idea 2: Long videos

After speaking to the participants and understanding their usage of phone, I realized that all the participants actively use youtube on their phones for entertainment purposes, to learn new skills and at times as a search engine as well. This opened up an opportunity to leverage the massive library of videos on youtube for pedagogical purposes in a systematic manner.

As per datareportal.com report 2022 [17],

1. India has 467.0 million active YouTube users
2. 45.6% of YouTube's global users are female
3. Largest share of users: 25 to 34 years
4. 1149 million users aged 35 and above (46.4% of total ad audience)

Subtitles and captions feature in youtube allow users to share videos with a larger audience, including deaf or hard-of-hearing viewers and viewers who speak another language.

For viewers: To turn on the captions users simply have to click the button and if the closed captions (CC) are available, they will be visible on the bottom right of the video player. To turn off Captions, the user should click the same button again. Youtube also provides option to turn on the captions by default and changing the style in which captions appear.

For content creators: They can create subtitles and captions for their videos by signing in to YouTube Studio, select Subtitles, adding their preferred language, and adding subtitles to the video they would like to edit.

They get an option to

1. Upload a subtitle file with time stamps, position and style info
2. Auto-sync the subtitle file by typing and syncing as you watch the video. Transcript text is automatically synchronized to the video and it must be in a language supported by youtube's speech recognition technology. The transcript must also be in the same language that's spoken in the video.
3. Type or paste manually, with this option, your subtitle and caption timings will be set automatically.
4. Auto-translate, YouTube can use speech recognition technology to automatically create captions for your videos. If automatic captions are available, they'll automatically be published on the video.

Opportunity area:

As youtube provides a wide range of options for subtitles and captions, there is immense scope to work on the way captions appear on screen for reading engagement. Upon testing, I found out that auto-translate and auto-sync work fairly accurately for videos spoken in English, it does not work effectively for other Indian languages and accents. Furthermore, I found out that captions are not always accurately synced with the spoke words creating a gap between the reader and the speaker.

Initial testing

After listing down most popular categories of videos among the participants in in four genres such as Entertainment, Self-care, Tutorials and Self-help we found 10 main categories of video which were very popular among the participants. They were songs/Bhajan, comedy, meditation, cooking, beauty/skin-care, gardening, stitching, news, medical updates and as a search engine.

For the test run, I went ahead with cooking videos because they are:

- Common Interest
- Fun and Exciting
- Building on to pre-existing knowledge

Amongst cooking videos, I short-listed popular Indian content creators who deliver their content in English as well as in hindi mixed with english.

- Kabita's Kitchen
- Ajay Chopra
- Ranveer Brar
- Vahchef
- Bake with Shivesh

And amongst these I chose a Ranveer brar recipe for Easy Tawa Pizza at home without oven without yeast. The only limitation of this video was that the video had no captions.

The video was chosen because of following reasons:

- Widely Popular: 10 million+ views
- Beginner friendly and slow paced: <100 wpm
- Fun, Exciting and can be made at home
- Includes recipe, history of Pizza and several stories related to pizza



Source: Ranveer Brar, Youtube

Video Statistics:

Duration: **13 min 30 sec**

Total words: **1500**

English words: **300**

English Sentences: **5**

H:E percentage: **20%**

Ideation

There were 3 primary goals for this project — finalizing options for fonts appropriate for all languages, creating a system where novices can read along the video without deviating much attention from the visuals or increasing cognitive load, and providing engaging and helpful features to improve learning experiences. Each of these needed to be systematically addressed and hence, systematically ideated on.

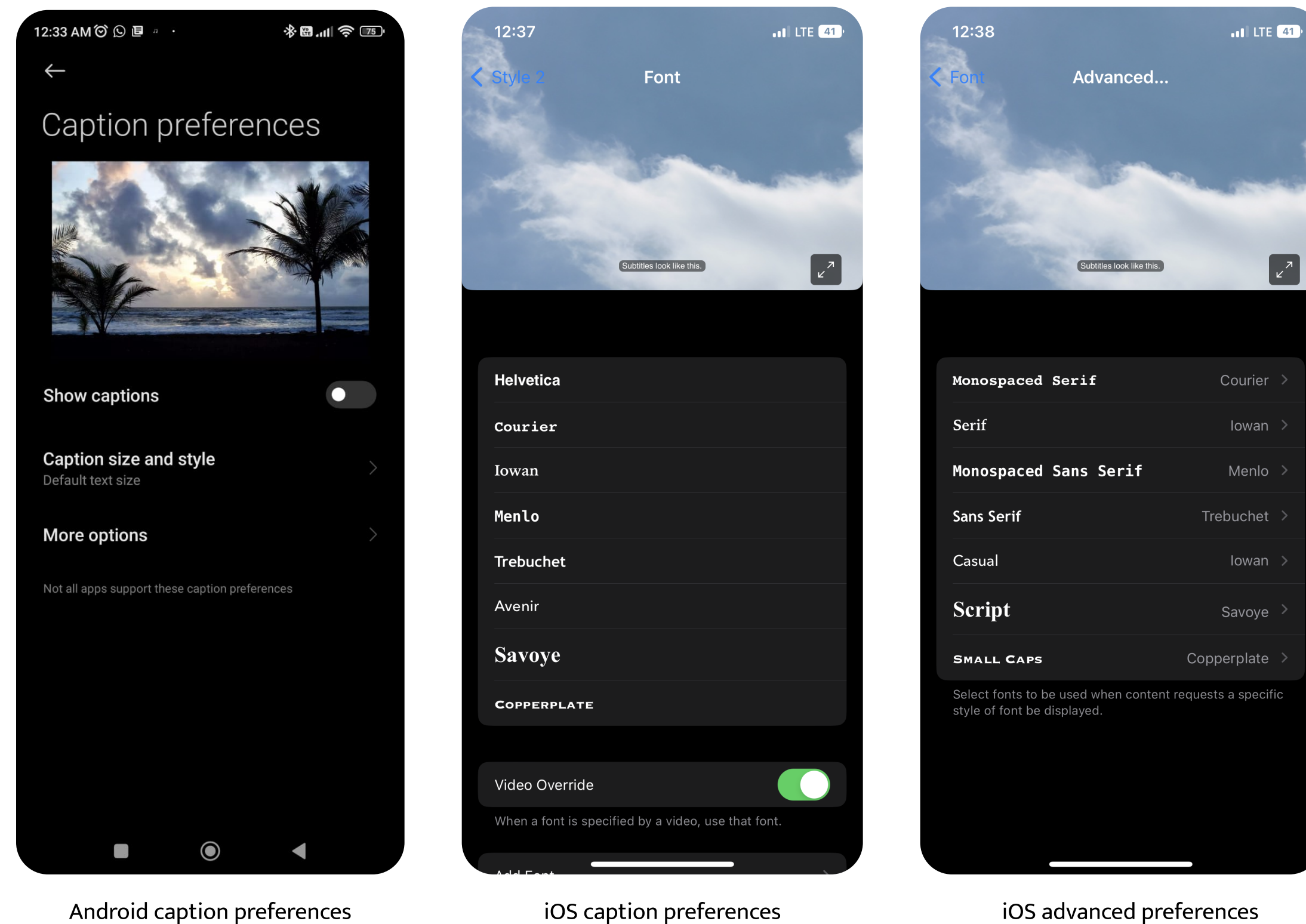
Additionally, the scope of this project also extends to content creators to help them create and sync the subtitles on their videos with ease.

Appropriate font

Default font used by youtube currently for their subtitles works well for roman letters but for devanagari the legibility reduces significantly, considering small screen size on smart phones.



There are couple of default font options provided on iOS for captions and subtitles but there were none on android devices. These fonts can be manually chosen to override the font settings on any video.



In either case, users can choose to change the font size and style which includes text color, background color and opacity.

After careful analysis, I chose Mukta font for my subtitles as it is modest and versatile, it can be used across media, content and point sizes. And since it is the libre licensed version of Ek Devanagari and Ek Latin, it has been designed to work harmoniously with other scripts in the Ek multi-script family. The font was tested in all sizes for its legibility.

Mukta, Bold, 25
एक पतला सा dough बनाना है।

Mukta, Bold, 50
एक पतला सा dough बनाना है।

Mukta, Bold, 50
एक पतला सा dough बनाना है।

Fonts currently being used have a strong disagreement in visual grammar for words in different languages. The size and style both doesn't match and words written in English generally stand out more as compared to words written in any other language.

Improving reading engagement

For improved reading engagement, color of subtitles had to be designed to change in perfect timing with the video to facilitate even a non-scriptate's identification of the individual word being sung.

The subtitles appeared on the screen were taken as reference where initially text was highlighted in red. Each word is then highlighted in white in time with the audio track, to make it easier for the reader to follow along. The subtitles must also be in the safe screen zone; the safe screen zone is described as the area of the screen that can be seen on a phone screen. This means that the subtitles must be in an area of the phone screen that can be comfortably viewed by the user.



Source: PlanetRead, Brij Kothari experimental studies

Subtile style in popular TV shows such as chitrahar and rangoli, as designed by PlanetRead:

एक पतला सा dough बनाना है।

Instead of red font with white strokes, we chose high-chroma colors that provide good contrast and lgibility for text on darker backgrounds. These colors also result in less eye fatigue which usually occurs while reading tet on black background.

Yellow text with white highlight:

----->

एक पतला सा dough बनाना है।

White text with yellow highlight:

----->

एक पतला सा dough बनाना है।

Instead of linear smooth highlight transition of text (like in Karoke-style), we chose word to word highlighting as the videos we are targetting are being spoken and not sung. Spoken words are generally faster and crisper as compared to words that are sung.

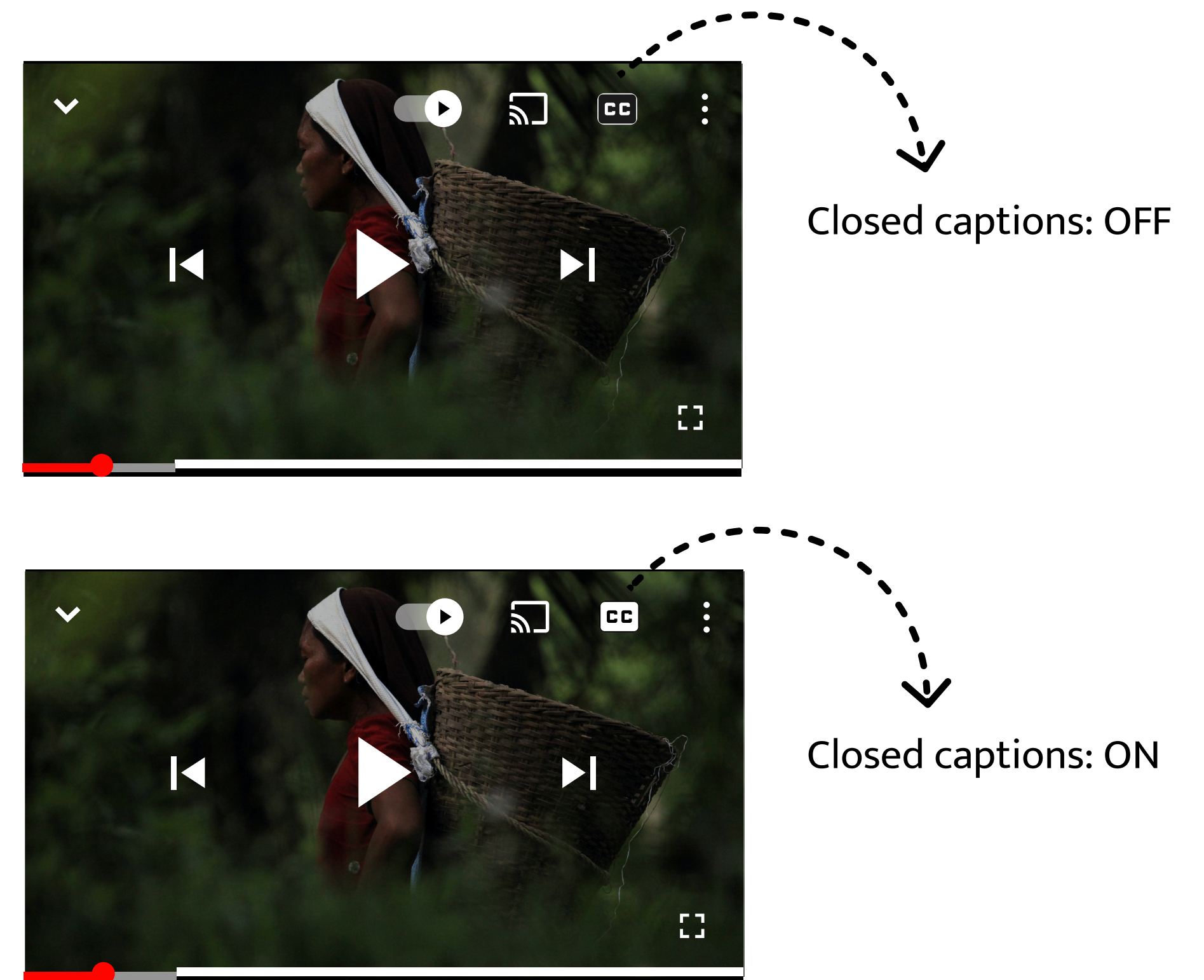
White text with yellow word-to-word highlight:

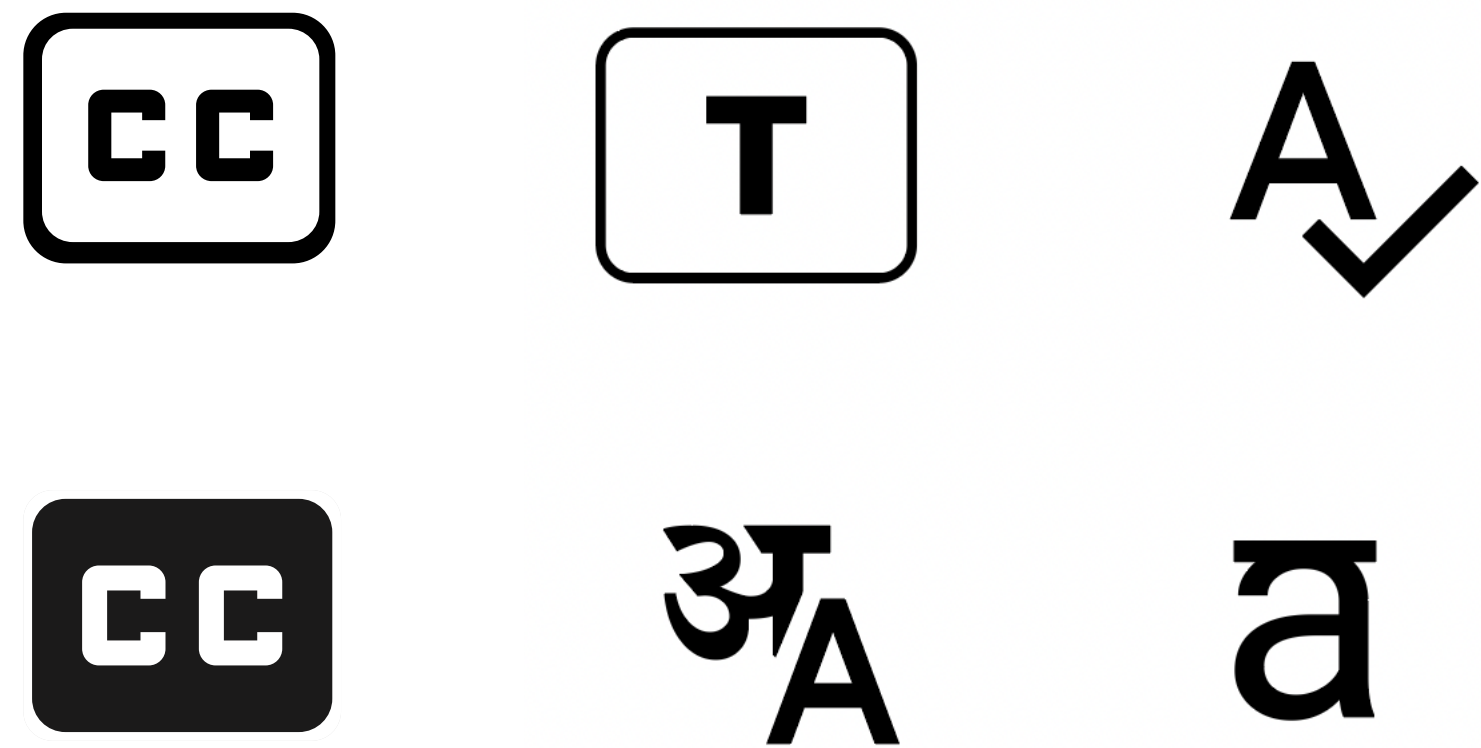


English text: Words in english or any other language were tested where they were highlighted with a separate colours, but that instead of working as an aid was distarcting the users away from the written text. The idea of this project is to improve reading engagement irrespective of the language. Similar weightage is given to all the words in a sentence. The same idea reflects in the font selection also where the words in different languages have same visual grammar and merge together seamlessly.

Advanced features

Currently, there are several different ways in which closed captions can be applied. Option to turn on or off the caption is present on the main display screen. The button turns white from black when the closed captions are turned on as shown below:



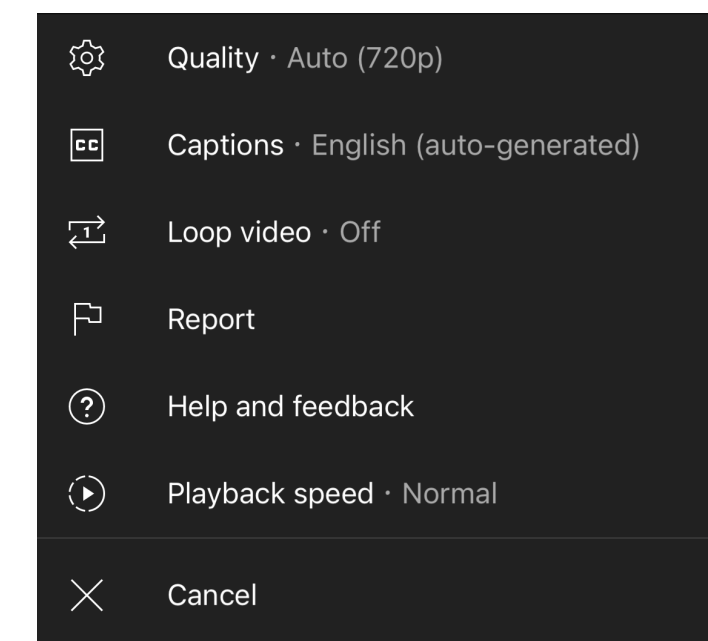


Icon Exploration for different subtitles

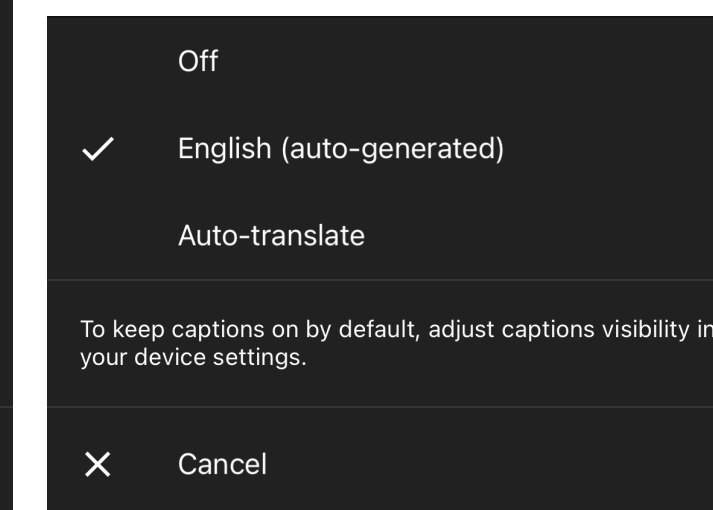
Without bringing much changes to the existing layout, we ideated on making the same button clickable for synced subtitles as well. Since youtube is used by millions of users, it is inevitable that we cannot hard code or embed the captions to the video. Users should get an option to toggle away from the synced subtitles but turning it on by default will give the correct statistics on the impact, the intervention will bring.

The idea stems from the 2020/21 study from NESTA which involved 450,000 children watching videos showed that 98% of viewers did not change the setting and there were zero complaints at having subtitles on screen. 40% of children already watch BBC iPlayer with the subtitles on without complaint.

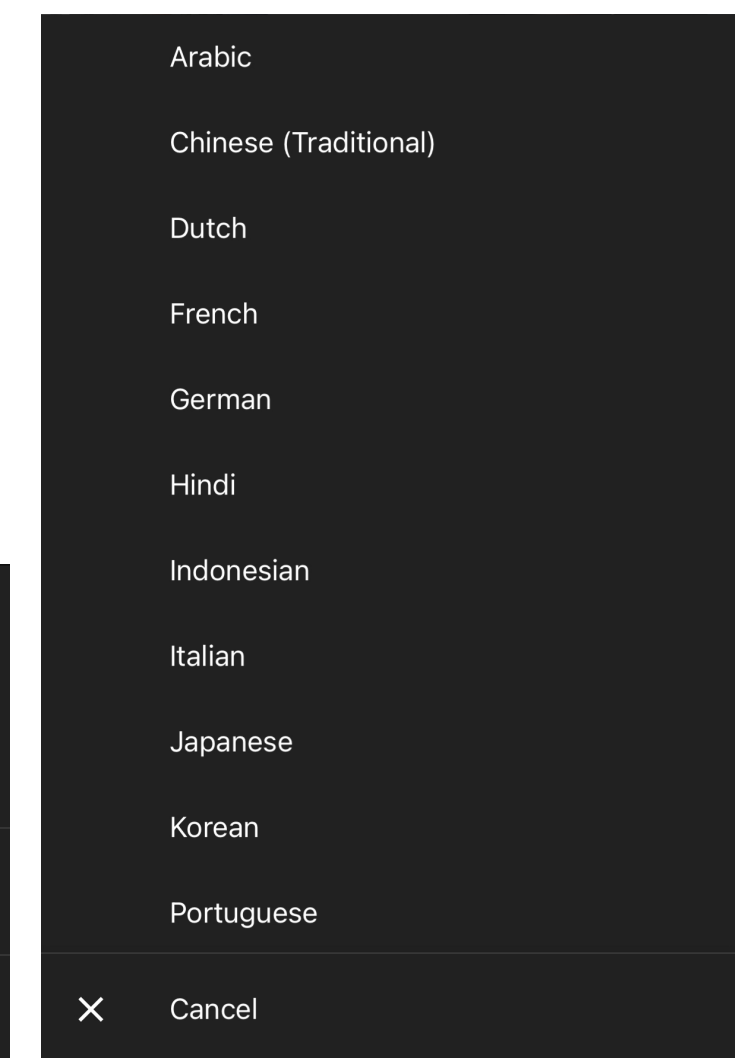
Furthermore, we made a list of kinds of subtitles available on youtube currently. Currently you can turn on captions in English, which is auto-generated (or added by the content creator) or subtitles which are auto-translated. There are many languages available for auto-translation as shown below:



Youtube Settings



Caption options



Auto-translate options

Sometimes the auto-translated texts are very accurate and perfect, but other times, for example, if there is someone who speaks very fast, the autocorrect goes haywire and occasionally create random sounds. This is especially true for language other than English.

So, we made a list of type of captions users might need access to:

- **Same language subtitles:** This features will provide subtitles in exactly the same language as it is spoken in. Hindi words are written in devanagari script, while english words will be written in roman script.

एक पतला सा dough बनाना है।

- **Transliterated subtitles:** This features will provide subtitles in the same language as it is spoken, but only in roman. Thsi feature is introduced taking into consideration how we generally read and type these days considering roman keyboard available on our phone.

ek patla sa dough banana hai.

- **Translated subtitles:** This features will provide subtitles in the language the user desires in order to understand the content better in the language they are comfortable with.

we have to make a runny dough.

- **Titles only:** This features is for people who need some but not much assistance while reading. For them highlighting few key words while watching a video works in a better way than, showing the entire sentences as text. The keywords will be highlighted as and when the speaker says that particular word.

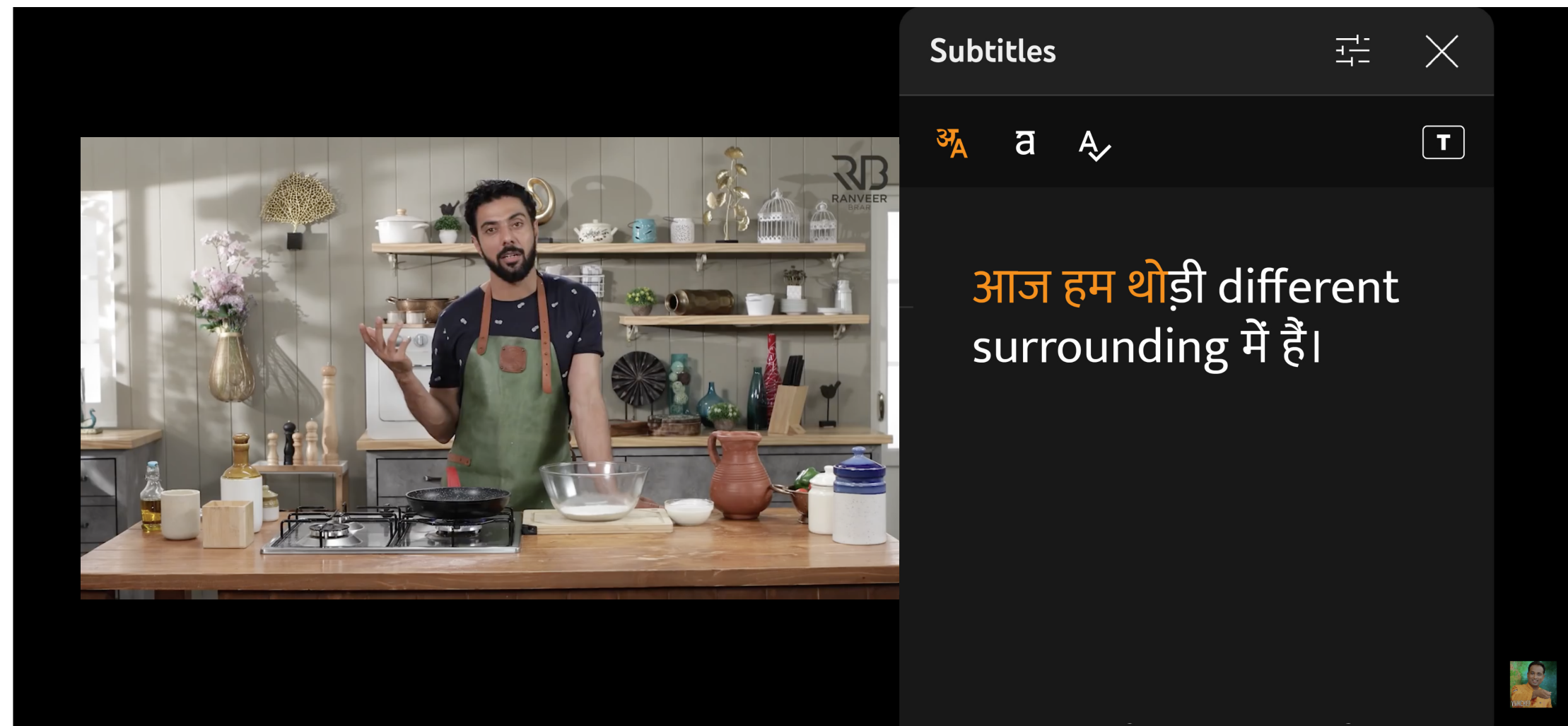
runny dough

In order for these subtitles to be accurate, it will require community contribution. To reduce the load from the content creators only, we propose a an option for anyone to suggest an edit to the given subtitles which will be checked and updated by a dedicated set of team. This data can further be used to improve aut-translate, voice-recognition and voice-to-text engines to provide better and improved outcomes. The interface for both are shown in the next section.

We also ideated on how subtitles can be made enagaging when learner clicks on the words on screen. Clicking on words will provide following results:

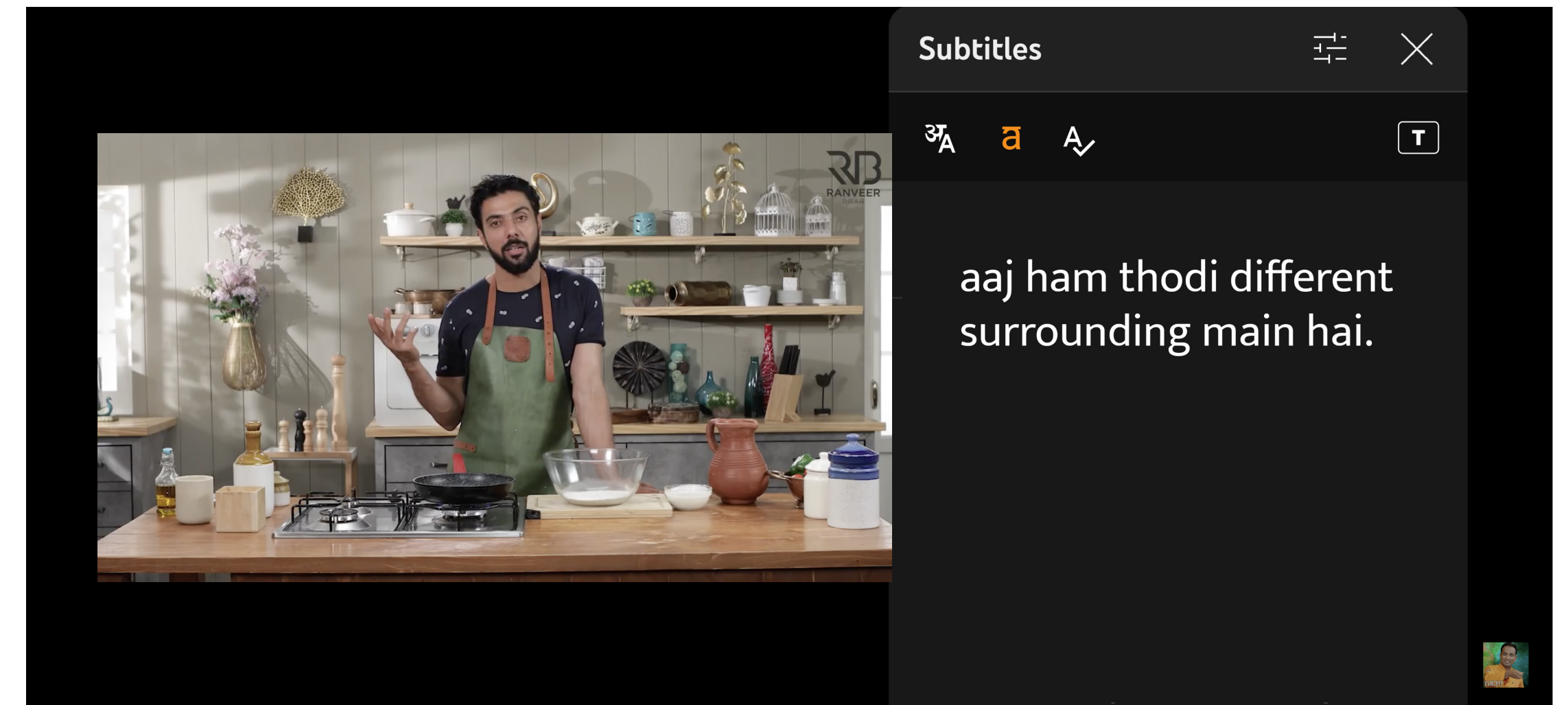
- Translation in their chosen language
- Meaning
- Pronunciation
- Different usage of the word

Same language subtitles



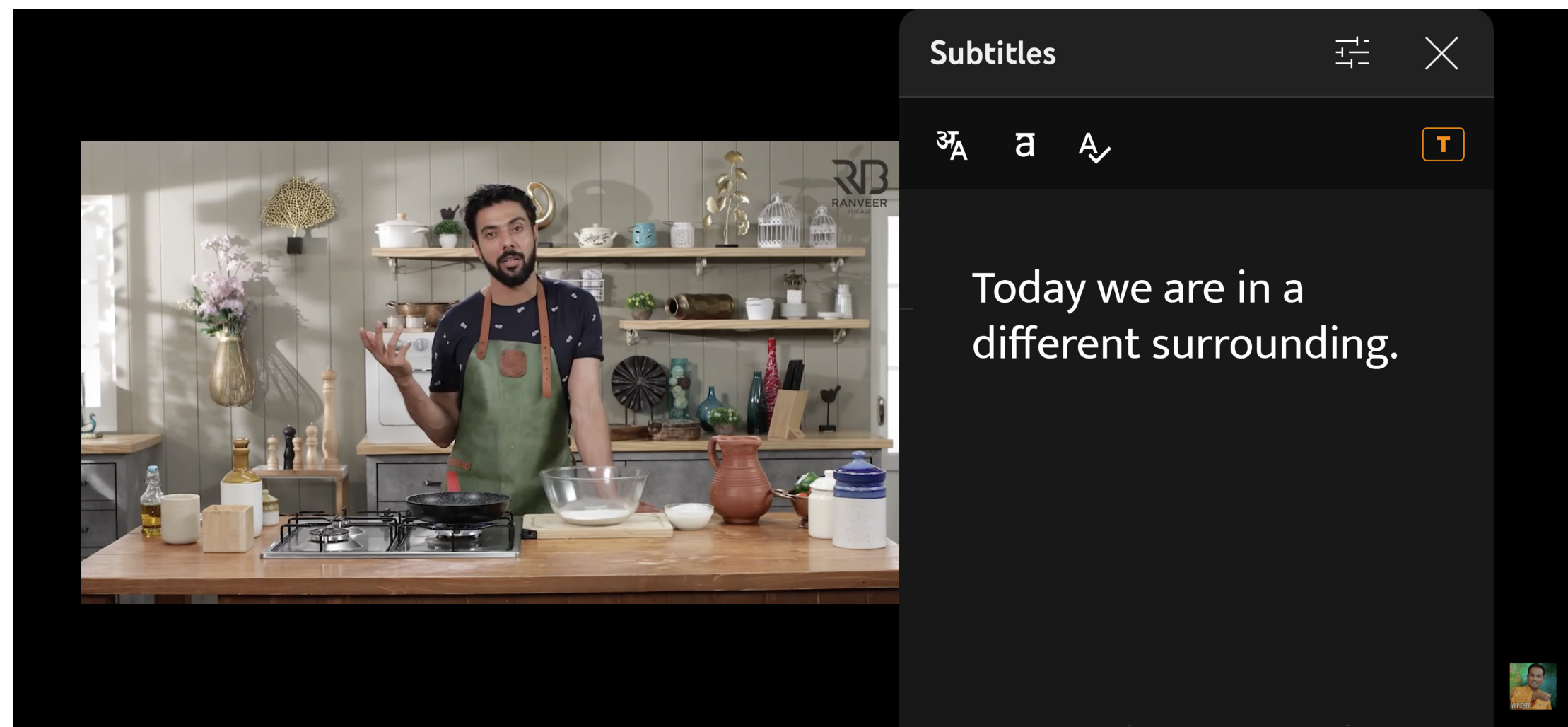
The screenshot shows a video player interface. On the left is a video frame of a man in a green apron standing in a kitchen. On the right is a 'Subtitles' panel with a dark background. The subtitle text is in Hindi: 'आज हम थोड़ी different surrounding में हैं।' (Aaj ham thodi different surrounding mein hai). The panel includes a language selector at the top with 'अ' (Devanagari), 'a' (Latin), and 'A' (English) options, and a 'T' icon in a box.

Transliterated subtitles



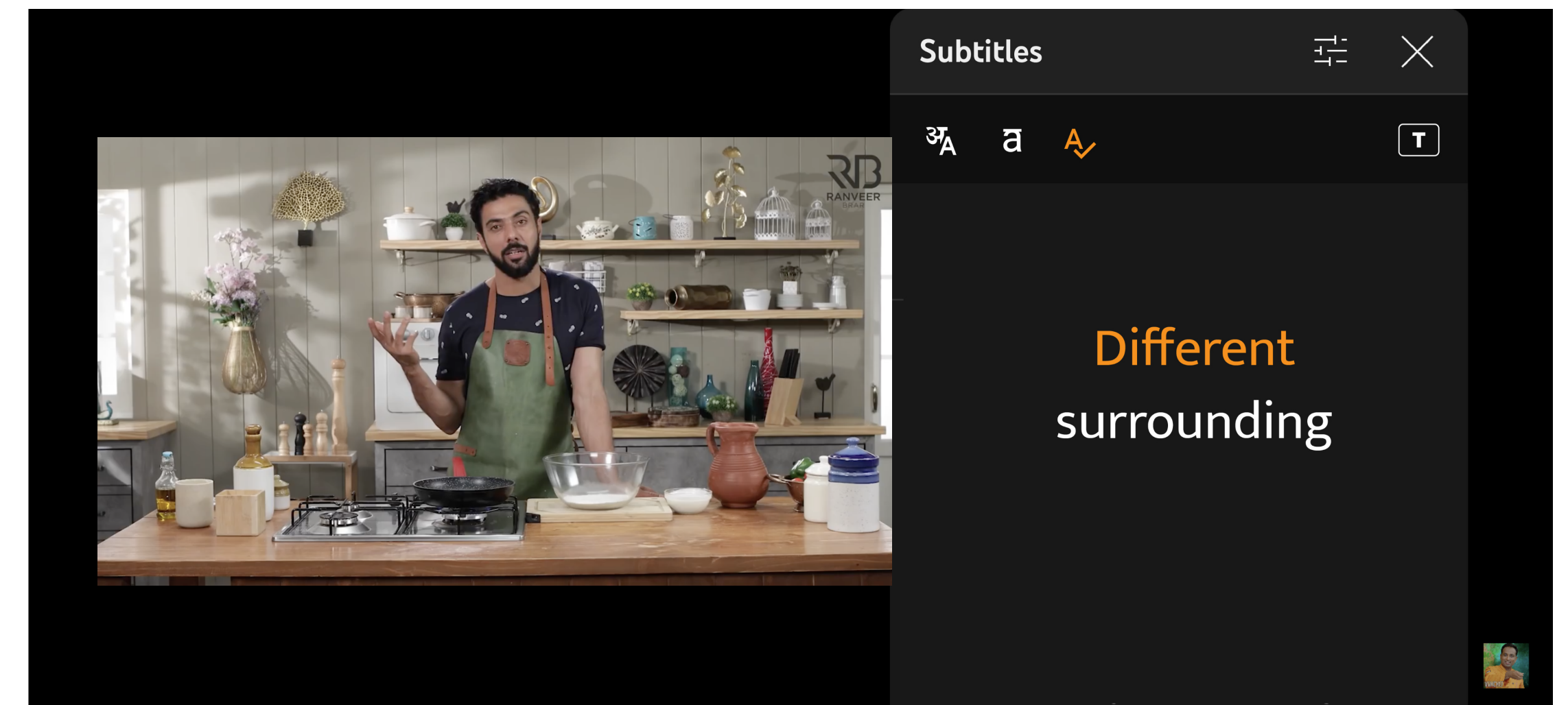
The screenshot shows a video player interface. On the left is a video frame of a man in a green apron standing in a kitchen. On the right is a 'Subtitles' panel with a dark background. The subtitle text is transliterated Hindi: 'aaj ham thodi different surrounding main hai.' The panel includes a language selector at the top with 'अ' (Devanagari), 'a' (Latin), and 'A' (English) options, and a 'T' icon in a box.

Transalated subtitles



The screenshot shows a video player interface. On the left is a video frame of a man in a green apron standing in a kitchen. On the right is a 'Subtitles' panel with a dark background. The subtitle text is in English: 'Today we are in a different surrounding.' The panel includes a language selector at the top with 'अ' (Devanagari), 'a' (Latin), and 'A' (English) options, and a 'T' icon in a box.

Title only subtitles



The screenshot shows a video player interface. On the left is a video frame of a man in a green apron standing in a kitchen. On the right is a 'Subtitles' panel with a dark background. The subtitle text is in English: 'Different surrounding'. The panel includes a language selector at the top with 'अ' (Devanagari), 'a' (Latin), and 'A' (English) options, and a 'T' icon in a box.

Final Concept

My proposal is for the permanent addition of karaoke-style same language subtitles within Youtube. For this project, I will be focusing on the addition, integration, and functionality of the feature to enhance reading engagement of the users.

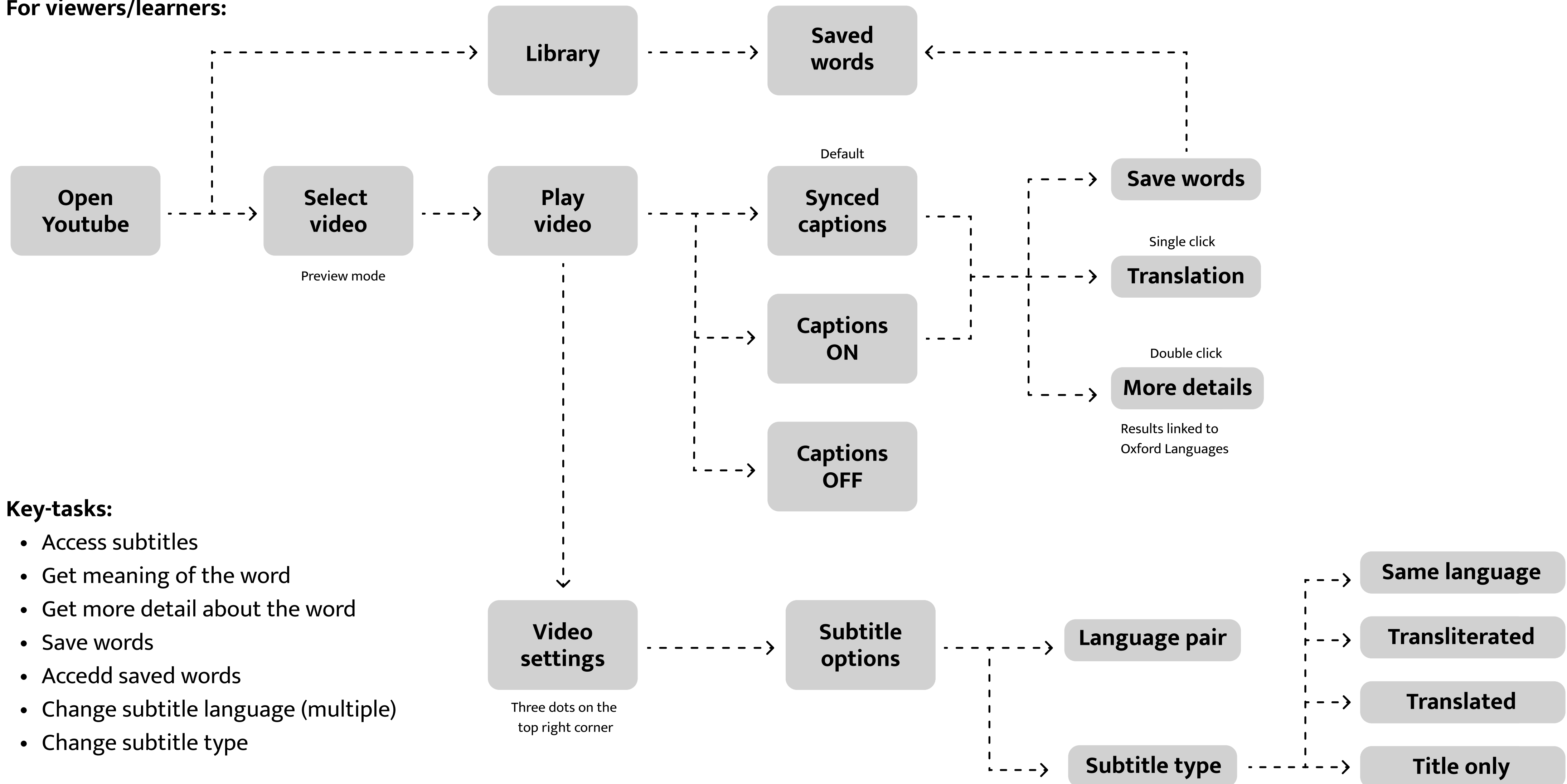
User flow

Path taken by a prototypical user on a the youtube app were made. The user flow to achieve the tasks are kept as simple as possible so that it can be easily understood. It takes them from their entry point through a set of steps towards a successful outcome and final action. The features are seamlessly integrated with the previous settings and features so that users don't find difficulty navigating through them. To increase the probability and enhancing the ease of movement through the platform, I have made sure the user's time isn't being wasted looking for where to find the feature and what to do next.

I have created user flows for following three scenarios:

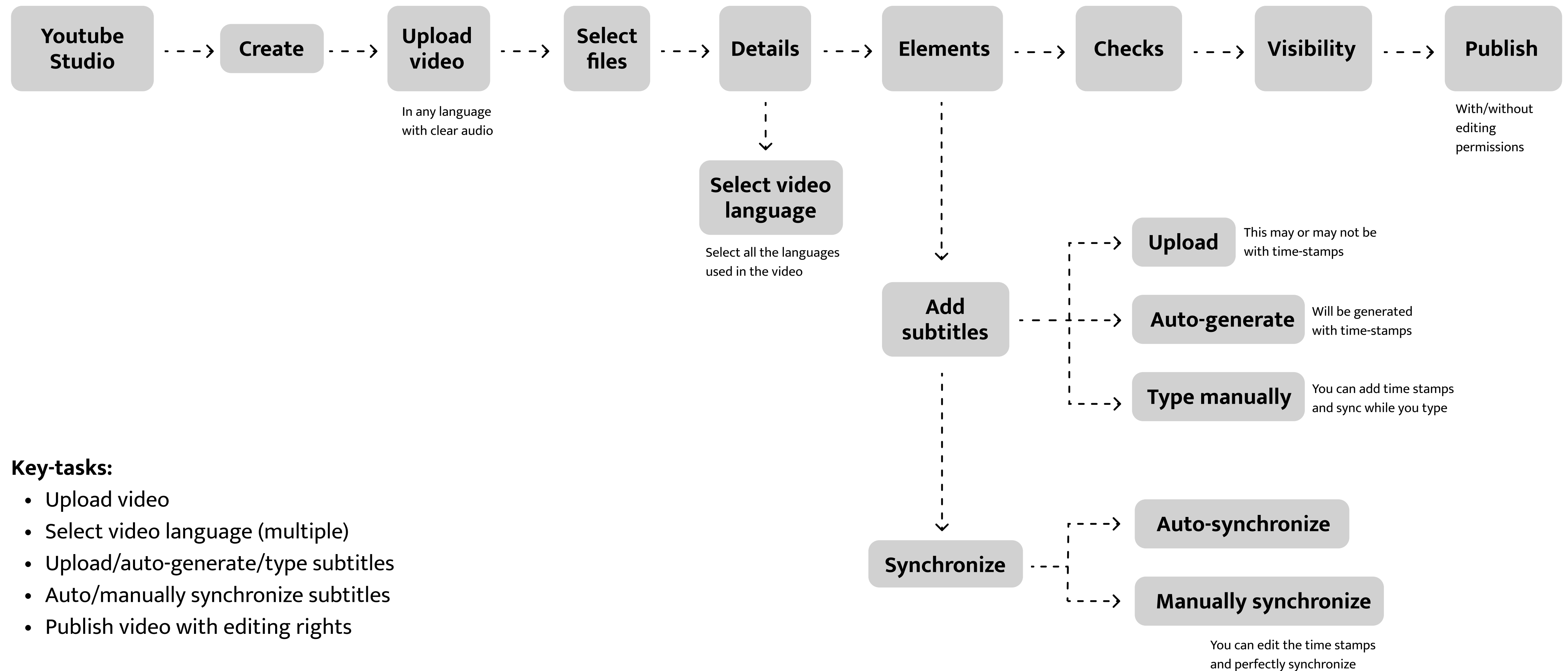
1. **Viewer:** to be able to read through the subtitles, find more details about the words used, save the word, access the saved words and change the subtitle type when needed.
2. **Editor:** to be able to read through the subtitles and suggest edits
3. **Creator:** to be able to easily update and synchronize subtitles.

For viewers/learners:

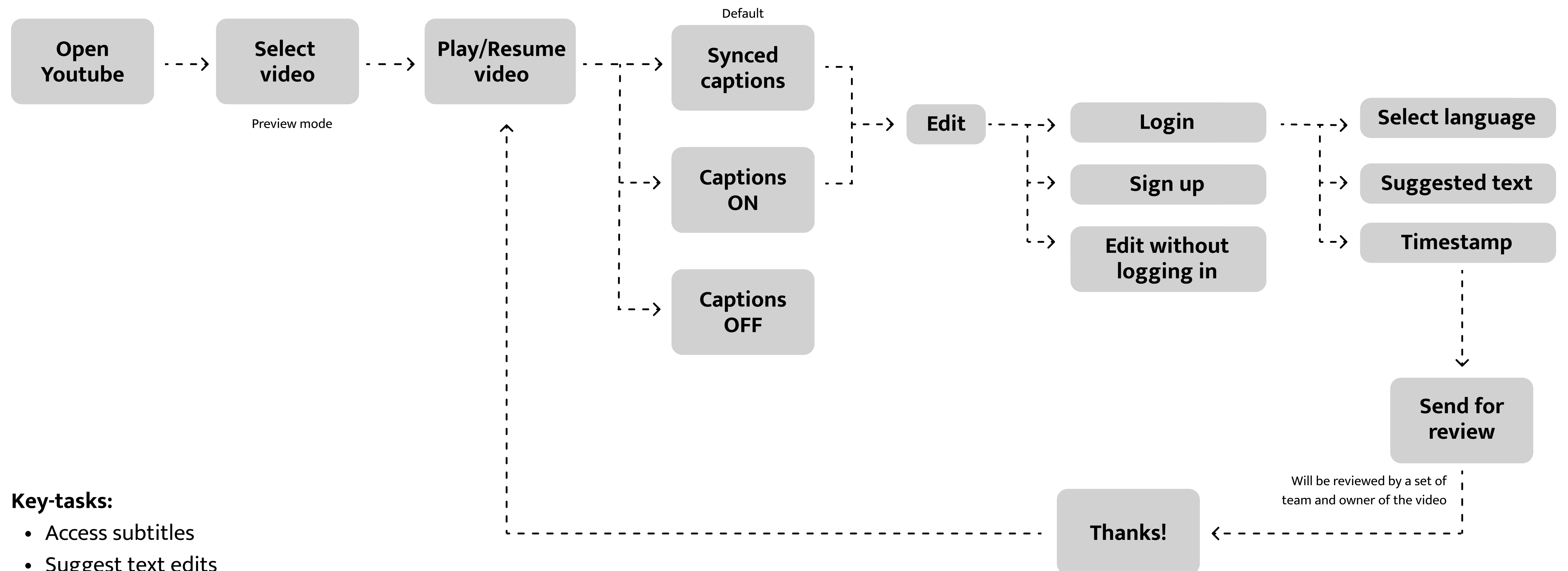


Key-tasks:

- Access subtitles
- Get meaning of the word
- Get more detail about the word
- Save words
- Accedd saved words
- Change subtitle language (multiple)
- Change subtitle type

For creators:**Key-tasks:**

- Upload video
- Select video language (multiple)
- Upload/auto-generate/type subtitles
- Auto/manually synchronize subtitles
- Publish video with editing rights

For editors/contributors:**Key-tasks:**

- Access subtitles
- Suggest text edits
- Suggest timestamp edits

Final Feature set

Synced subtitles, closed captions and no captions can be toggled with a same button. The three options will appear in the sequence shown below:



Synced captions (default)
Captions are synced and highlighted on a phonemic level to the spoken words.

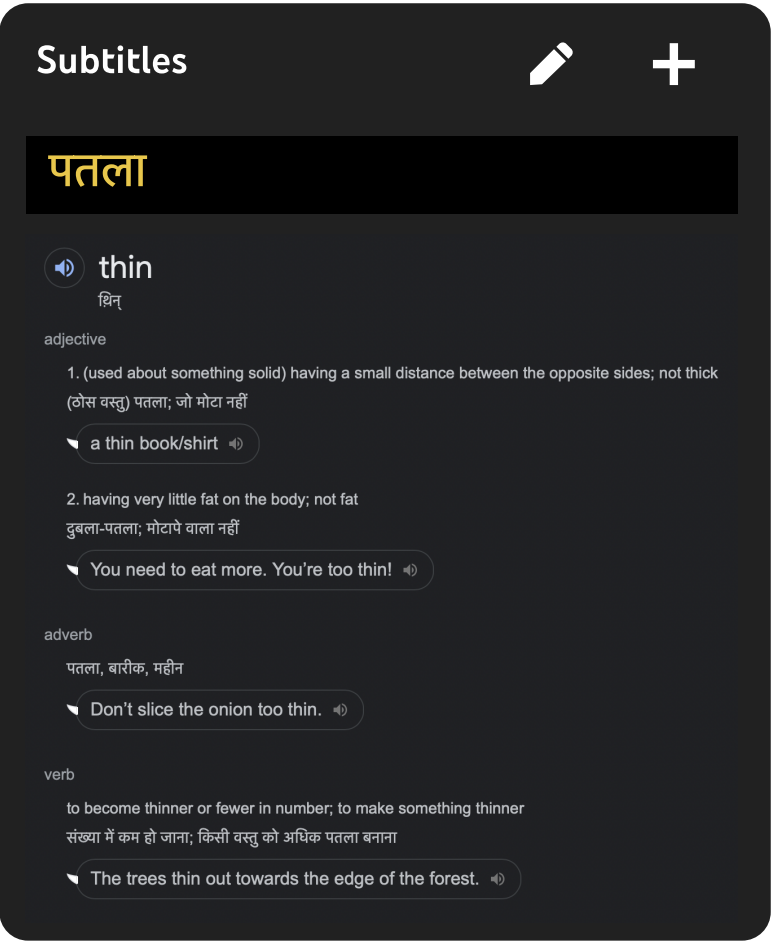


Closed captions: ON (first click)
Captions are provided in which stay static for the duration of that sentence.



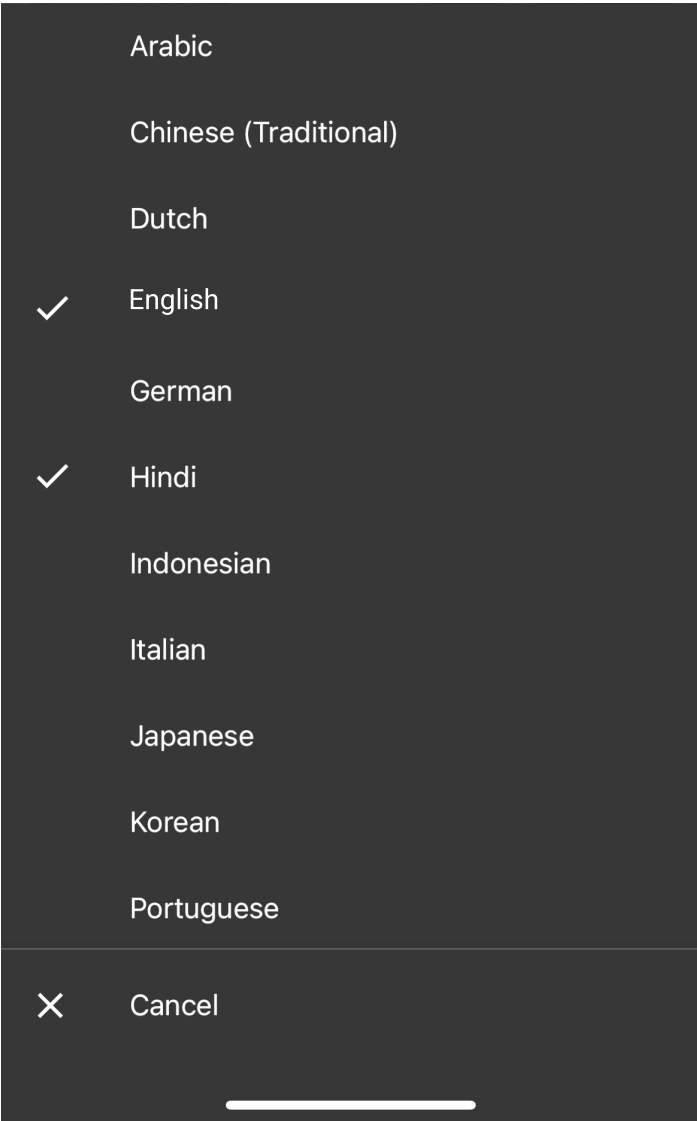
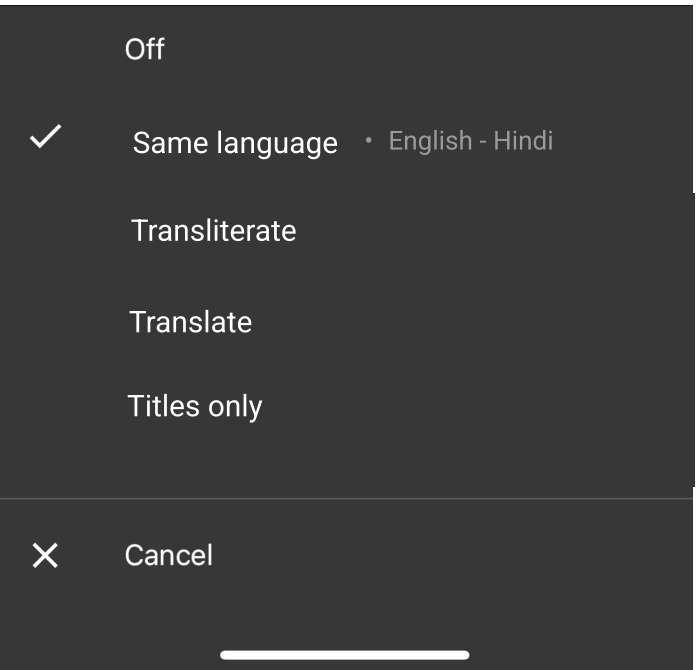
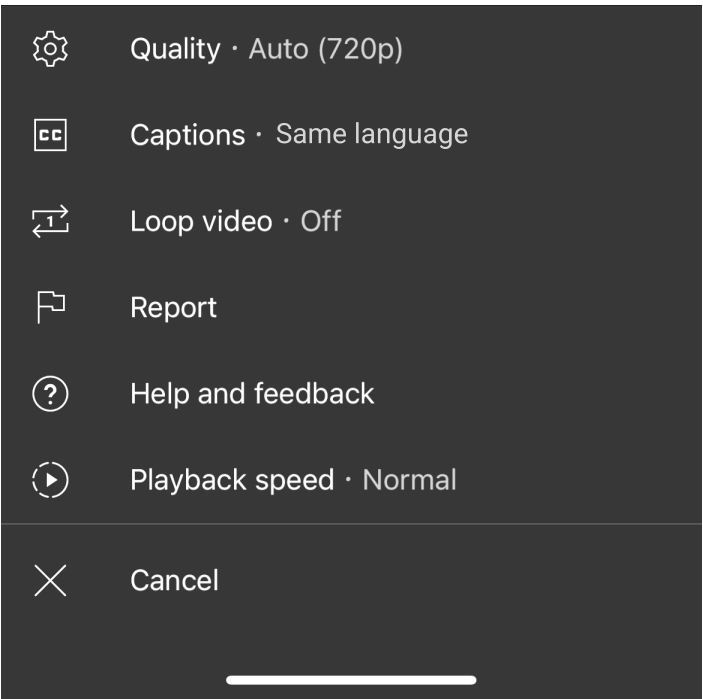
Closed captions: OFF (second click)
Captions can be turned on off if the user does not prefer having written words coming on screen.

Subtitles will appear on screen in white color and will be highlighted in yellow synced with the audio (irrespective of the language). Upon clicking any word, its immediate translation in the language chosen will appear like shown:



Users can again click on the word or the translation to get a detailed summary (linked with oxford dictionary) of the word which includes meaning, pronunciation, usage in sentences. Users also get the ability to save the word for future references and suggest edits in case of discrepancies which will be later sent for review before getting published on the video.

Furthermore, option to change subtitle language and subtitle type is right there in the video and app settings which can be changed anytime.



Interface Design

In this process I built interfaces of the youtube application integrating the proposed features, focusing on ease of use, familiarity and visual grammar of the application. Aim to create interfaces which users find easy to use and pleasurable. I have tried to keep all the features invisible so that they don't distract the user's experience of video streaming and user don't spend their energies on the interface.

Turning on/off the captions: Synced caption, closed captions and no captions can be toggled with a same button. There is an addition of the synced caption button (in yellow) in the same set of closed caption button which is there currently. The synced caption is turned on by default and user can change it to normal captions without highlight by clicking the button once and turning the caption completely off by clicking again. This entire set of features appear on every video screen (if captions are available) from home page, preview screen, portrait mode and landscape mode.

Synced captions (default)
Captions are by default turned off and can be turned on if the user does not understand the spoken language (and if they are available)



Closed captions: ON
Captions are provided which stay static for the duration of that sentence.



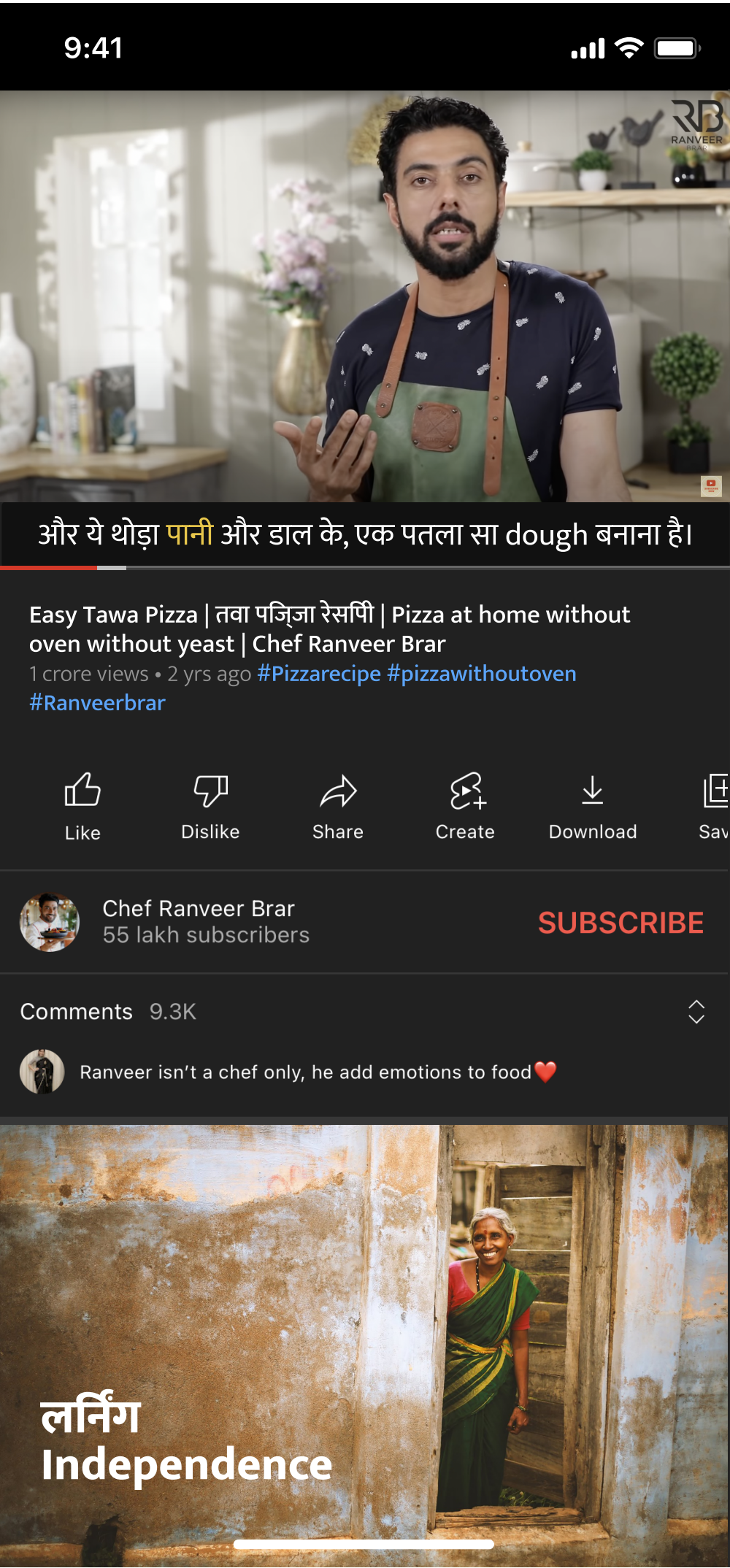
Closed captions: OFF
Captions are by default turned off and can be turned on if the user does not understand the spoken language (and if they are available)



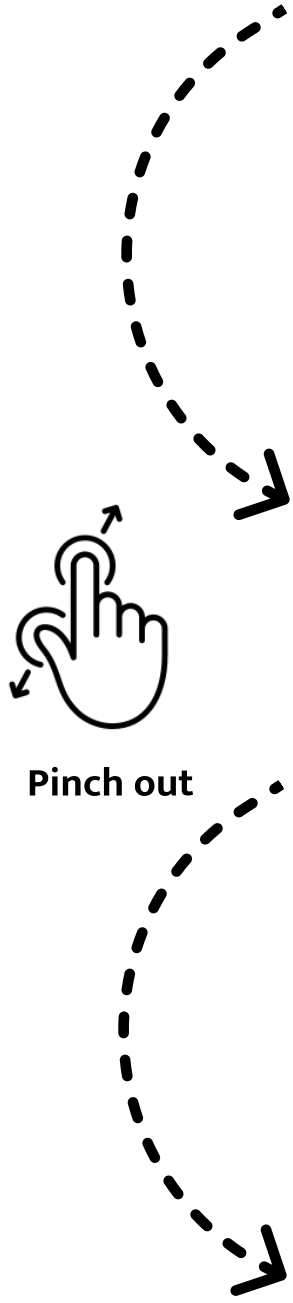
Subtitles: Display of subtitles in the portrait and landscape (full screen) mode are shown.

In portrait mode since the video size is small, subtitles are placed below with no overlapping.

In full screen mode, subtitles and video size can be further adjusted by pinch in and pinch out gestures. Medium and large layouts are currently available on youtube.



Layout - Portrait
Subtitle and video get enough space to be clearly read and viewed with no overlapping



Layout - Small
Subtitle and video get enough space to be clearly read and viewed with no overlapping



Layout - Medium
Video is fit-to-height to the phone screen where subtitles overlap the video



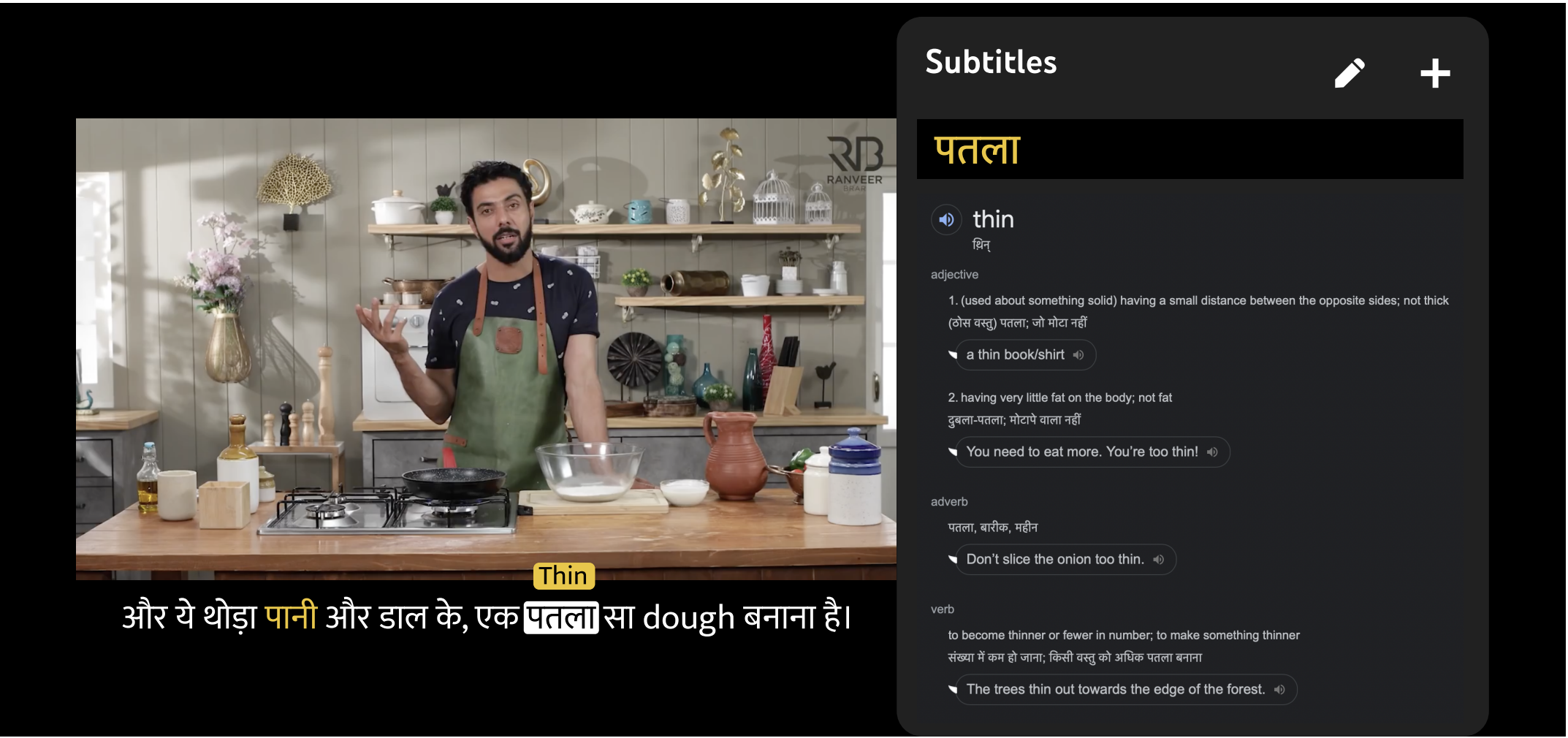
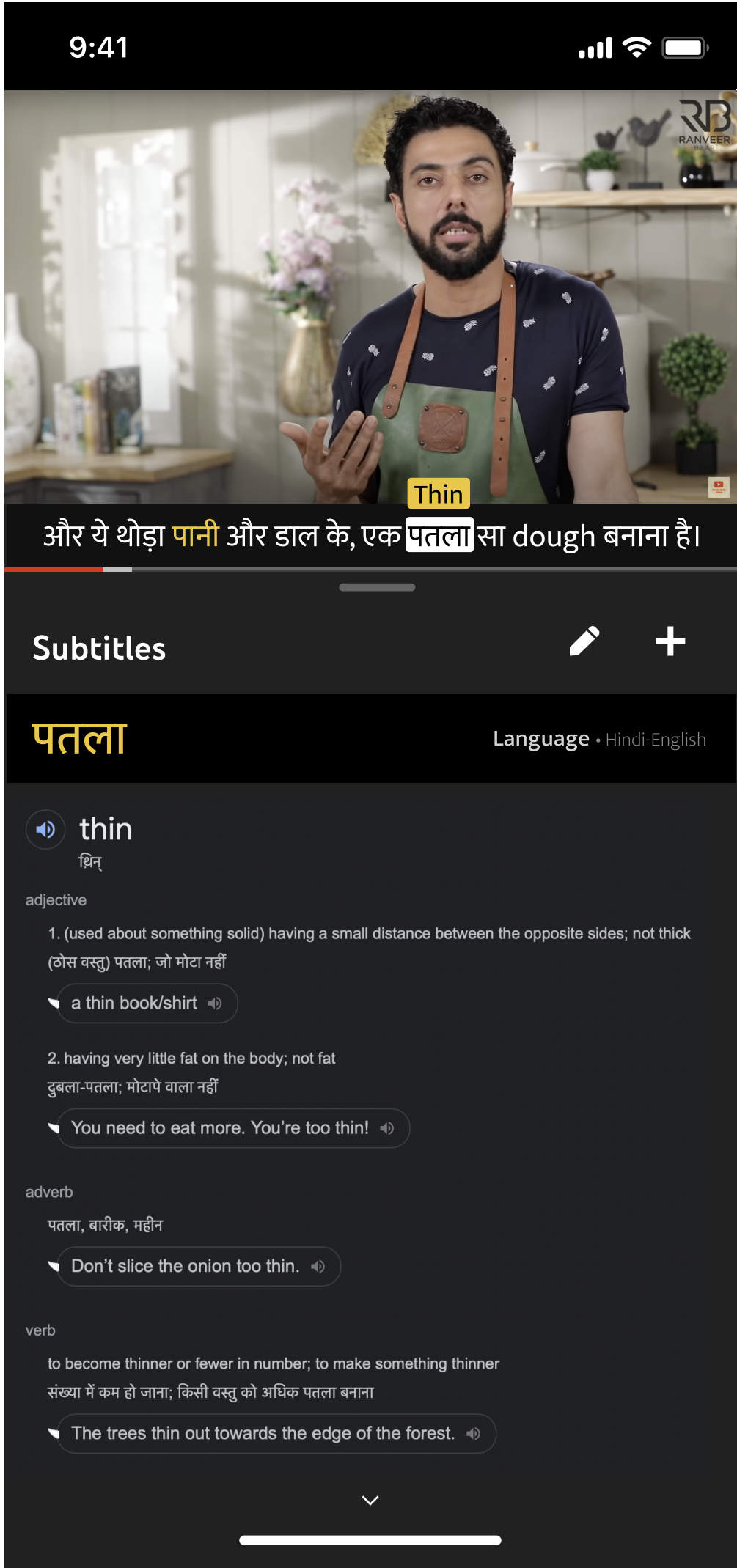
Layout - Large
Video is fit-to-width to the phone screen where subtitles overlap the video and are smaller

More details: More details about the subtitled word can be viewed by clicking on the word. These interfaces follow the same language as the existing features on the application.

In portrait mode since the video size is small, meanings and further details are shown below the video.

In full screen mode, video size reduces and shifts to the left side providing space for the meaning on the right.

To save or suggest changes, two corresponding buttons are provided on the top right corner of the pop-up screen.

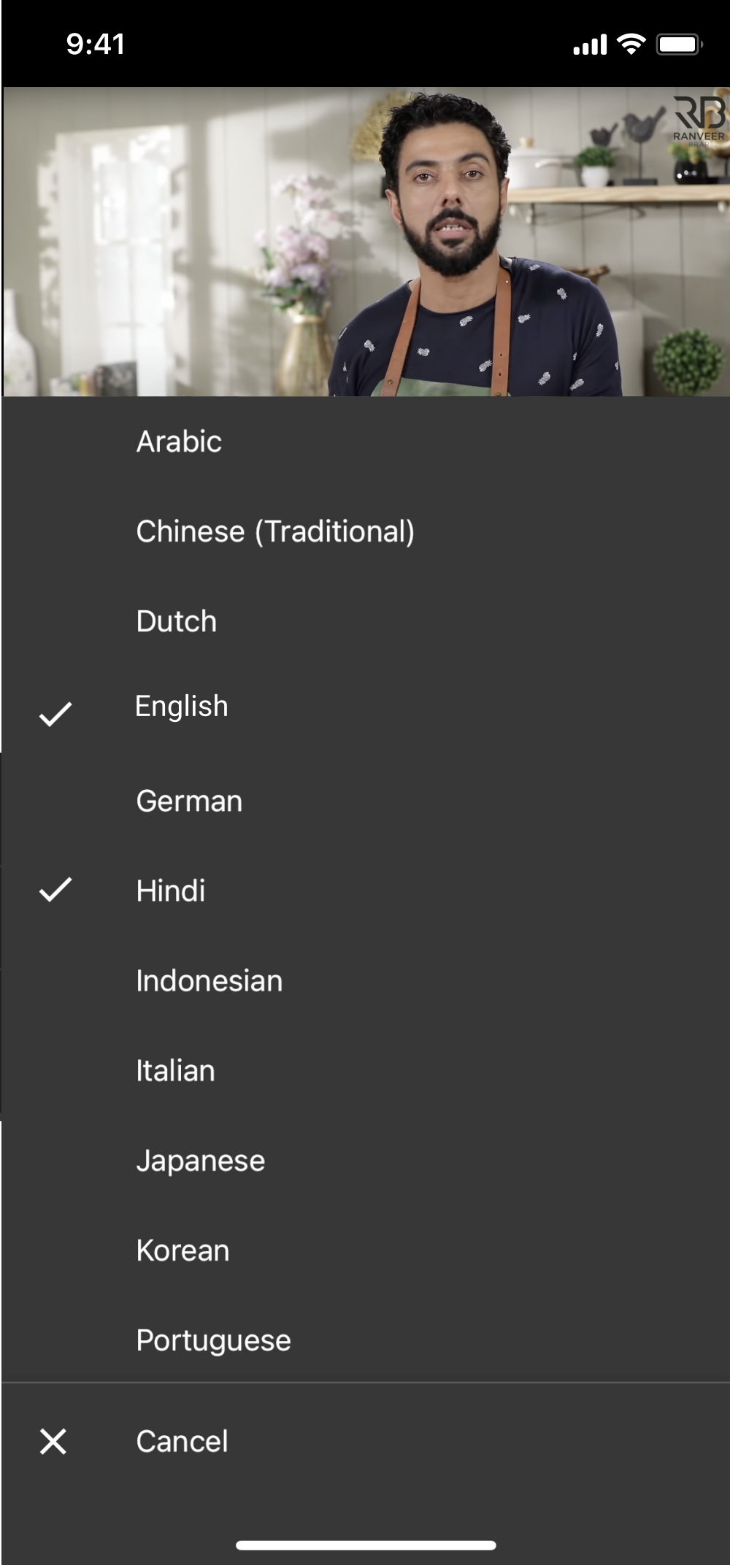
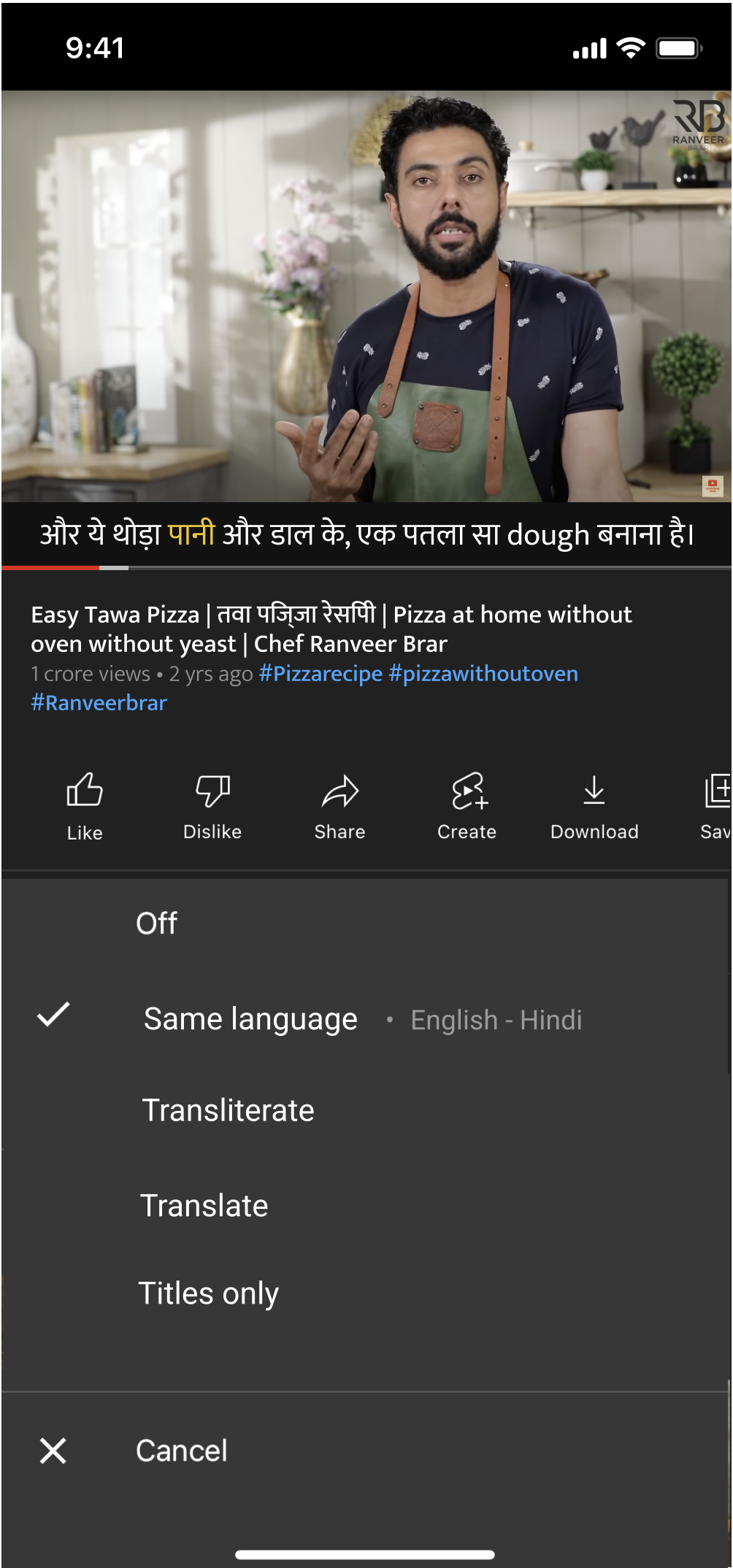
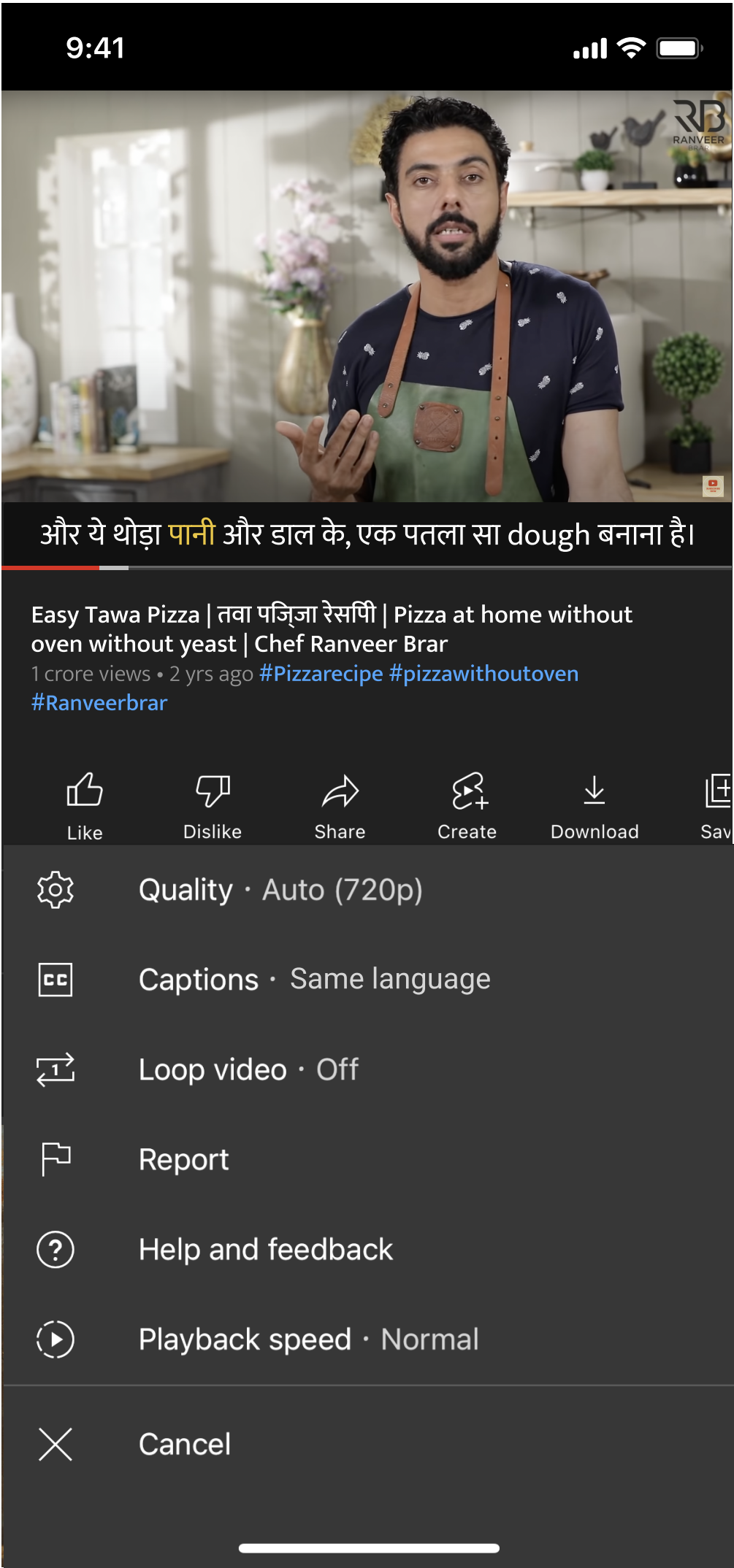


Video settings: To further change the subtitle language and subtitle type, user need to click the three dots on top right corner of the vidoe. This opens a slide-up options window.

Here user can select the the type of captions they want from the options below:

- Same language
- Tranliterated
- Translated
- Titles only

Furthermore, users can chose languages (more than one) for their subtitles acording their preference.



Evaluation and Findings

Methodology

An evaluation plan was detailed out consisting of 2 methods —Heuristic analysis with experts, and task-based user evaluation with novices (target audience). The heuristic analysis was conducted first to check the validity of the concept and to get initial feedback on the information structure. The user evaluation was conducted with a small group. next but was postponed to beyond the scope of the project in the face of lots of suggestions from the heuristic analysis.

Heuristic evaluation

The heuristic evaluation of the prototype was conducted by two senior communication design students and one teacher who takes language learning classes for adults. Each session lasted an hour and involved a cognitive walkthrough of the interface prototype. The evaluators were provided with a youtube video link with same language subtitles, and taken through a scenario of a learner trying to learn a new recipe. Being experienced with this scenario and having an understanding of the language as well as the interface, the evaluators were able to give more pointed feedback in addition to the overall heuristic evaluations. After the cognitive walkthrough, the evaluators were left to interact with the prototype and note down their feedback. There was a follow-up discussion with each evaluator, addressing their feedback and ideating on possible alternatives to any identified issues.

User Evaluation (partially conducted)

A small group of four participants were given the same recipe video to watch. Two of the users were given a video with normal captions turned on, while two users were given videos with synced subtitles. Both pair of participants watched the videos in their own time and a follow-up discussion was conducted. Later, the subtitled videos were exchanged and first pair was asked to watch video with synced subtitles and second pair was asked to watch video with normal closed captions. Both the videos were in same language as the audio. ANother feedback session was conducted after all of them finished watching the video.

While the complete evaluation could not be conducted within the scope of this project, in consideration of the feedback from the heuristic analysis, a plan had been formulated beforehand. The plan for the study involved using a digital prototype of the proposed tool. The prototype would be integrated into youtube or similar looking app's interface as proposed. Users would be recruited based on the scenarios the tool hopes to accommodate, anyone who has basic understanding of the english language. The user would be asked to interact with the subtitles and read along the video (provided by the researcher) relevant to their scenario. The prototype interactions would be simulated via a wizard-of-oz method [17]. The researcher would open the assets the user thinks they are interacting with since the prototype is only an interface and has had no actual development.

The interview that will be conducted further will be semi-structured and hopes to gauge whether any value was added to the users' functional or mental understanding of the language. Sample questions for the follow-up interview:

1. Were you able to follow through the entire video?
2. Was there any part of the video where you felt you didn't understand what the speaker was saying?
3. Do you think you were able to read and watch the visuals at the same time?
5. Is there anything you wished you could do with the tool that wasn't there?
6. Do you think the document you created with the tool was any different from what you would have been able to make with normal Google Docs?

Action plan: I plan to conduct more heuristic evaluations and user evaluations with a larger set of people to get detailed feedback on the project. For learners a pln has been formulated in which they will be asked to read a paragraph on a particular topic in english and their reading fluency and comprehension skills will be evaluated. Later, the user's will be asked to watch a video on same topic with synced subtitles and meanings a couple of times. Then a different paragraph on the same topic will be given to them to read. Same kind of tests will be done for the same users on different topic but with videos which do not have subtitles or have closed captions.

Findings

- Evaluators collectively appreciated that the principle of user control was strategically upheld.
- The breakdown of appearance options and the advanced options was found to be user-friendly and limited cognitive load according to them.
- The implementation of providing meanings and save word feature was highly effective as per the evaluators.
- The tool should feel completely integrated with youtube to build a successful conceptual model. The current interface needs color improvements to reinforce this.
- User's were able to clearly understand the content of the video without any hindrance or distraction.
- Almost all of them noticed and partially read the subtitles provided.
- Layout where text does not overlap with the video and is placed separately was preferred by most.

Future steps

I have faith that this project has immense potential in improving reading engagement among people and improve on their functional literacy skills. The fact that no such tool exists on such a large scale number of videos gives the learners freedom to learn while watching anything they love watching. Looking ahead there are many ways to see this project evolve further.

User Evaluation

Firstly, of course, the proposed tool needs to be evaluated by potential users. A longitudinal study is ideal in this case to evaluate the proper outcomes however, next action plan is to test this feature in schools and organizations among people who have just started to read and write. An evaluation plan will be laid out, conducted and the findings will be analysed. This is crucial to grounding this project further in user needs and understanding.

Further integration

Within the scope of this project's prototyping, I have only explored Same Language Subtitling integration within Youtube. To validate the concept further we must see how these tools would integrate within other video platforms like Instagram, Netflix, or other learning apps. I uphold that the principles proposed are sound and should carry over to any such software with ease. The challenge is merely integration.

Web development

The proposed tool-set would also work well as an online web tool on all the videos. Development of this tool would require highly accurate transcription and synchronization of the audio files in the video. This is something that can be achieved with the most advanced auto text-to-speech conversion technologies. Content creators should be able to hop onto the youtube studio, upload their video, auto-transcribe it, give a quick check and publish their content. This currently possesses a challenge because it requires a lot of manual effort in order to achieve accurate result especially when the audio language is any other than English.

Moreover, the same technology can be applied to other video streaming applications and websites to make the tool even more accessible. In this case, the interface design within this application would not have to adhere to any existing systems and could focus on a system built around the intention of accomplishing accurate synchronised subtitling for improved reading engagement across all platforms.

Summary

As a native Hindi speaker and someone with a keen interest in communication design, I was drawn to the idea of designing something which bridges the gap between the designs and the users. This gap is more often than not because of language and I have experienced as well as observed the challenges that one faces when they try to attain fluency in a language. I am in a unique position as someone who enjoys interaction design, and striving to solve a communication problem through interfaces. Through this project I am trying to leverage my sensibilities as a communication designer, my language competence, and my inquisitive desire to design for the benefit of everyone. One always wishes they had more time for user studies or ideation or evaluation and so did I, but I am satisfied with what I have been able to address within my decided scope and timeframe.

Learnings

This project was an interesting case study in understanding the challenges of the early readers and analysing the roadblocks in their process, identifying enormous possibilities of Same Language Subtitling, conceptualizing the idea into a popular and automated platform and creating a holistic integration with an existing video streaming application. My primary learning objective for the project was to create a design artefact which will help adult indian women gain some understanding of the english language and how the project evolved to an audience which is of any age, gender, region, proficiency level

was an overwhelming journey. Getting to see the world from the perspectives of those who fear a language which is so actively used across media helped me engage with the problem with a fresh outlook. I got the chance to analyse aspects of learning that I had taken for granted with experience. Instead of just operating by intuition, now that I was expected to design for early literates, I had to articulate the process with immense clarity. This pedagogical learning-by-doing approach helped me identify my own preferences and biases better.

Limitations

Development of this tool would require highly accurate transcription and synchronization of the videos. With the current advancements in technology, transcription in english language works pretty seamlessly across platforms, however, hindi language text-to-speech recognition is not up to the mark and yielded output contains a lot of gibberish. Therefore, there was a lot of manual intervention required at this point of time. This project also lacks concrete user studies and relies mostly on the longitudinal studies conducted by experts [6], [14], [15]. This happened due to a lack of availability of study participants and improper planning on my part. There were unforeseen limitations with the project scope that had to be revised constantly. With better planning and a stable foundation of user studies, this project could have accommodated a more appropriate evaluation, offering much richer insights

than what we have been able to accomplish now. Having mentioned this, I believe that the current project has still been conducted and conceptualized to the best of my abilities. I have attempted to employ the design sensibilities imparted by IDC and I believe that the ideas I was able to identify are still unique and interesting. Looking back I also wish I had kept a document throughout. The linear format afforded by writing in a document is usefully restrictive, it compels the author into moulding their ideas into coherency.

Impact

SLS is a deceptively simple innovation that is already delivering regular and inescapable reading practice to many worldwide. The application of this idea to a platform with a user base of 2.29 billion users holds a massive impact. In india alone active youtube users are 467 million. Even though the scope of this project was small, the impact this project might have will positively be huge.

References

1. UNESCO Institute for Statistics, 2015
<http://uis.unesco.org/en/country/in>
2. Kothari, B., & Bandyopadhyay, T. (2014). Same language subtitling of Bollywood film songs on TV: Effects on literacy.
<https://www.planetread.org/images/pdf/research/SLS-Effects-on-Literacy.pdf>
3. Annual Status of Education Report (Rural) 2018 - ASER Centre
<https://img.asercentre.org/docs/ASER%202018/Release%20Material/aserreport2018.pdf>
4. Tanushree Chandra, “Literacy in India: The Gender and Age Dimension”, ORF Issue Brief No. 322, October 2019, Observer Research Foundation.
https://www.orfonline.org/wp-content/uploads/2019/10/ORF_IssueBrief_322_Literacy-Gender-Age.pdf
5. National Readership Studies India - NRS - 2006
<https://www.slideshare.net/targetseo/national-readership-studies-india-nrs-2006>
6. Brij Kothari, Joe Takeda, Ashok Joshi & Avinash Pandey (2002) Same language subtitling: a butterfly for literacy?
<https://www.tandfonline.com/doi/pdf/10.1080/02601370110099515?needAccess=true>
7. Newzoo Global Mobile Market Report 2020
<https://newzoo.com/insights/trend-reports/newzoo-global-mobile-market-report-2020-free-version>
8. Internet Adoption in India ICUBE 2020 June 2021
https://images.assettype.com/afaqs/2021-06/b9a3220f-ae2f-43db-a0b4-36a372b243c4/KANTAR_ICUBE_2020_Report_C1.pdf
9. McCall, W.G. & Craig, C. (2009). Same-Language-Subtitling (SLS): Using Subtitled Music Video for Reading Growth
<https://www.learntechlib.org/p/32055/>
10. Zane Education
<http://www.zaneeducation.com/video-subtitles-captions/subtitle-and-closed-captions-research.php>
11. d’YDEWALLE, G., PRAET, C., VERFAILLIE, K., & RENSBERGEN, J. V. (1991). Watching Subtitled Television: Automatic Reading Behavior.
<https://doi.org/10.1177/009365091018005005>
12. d'Ydewalle, G., & De Bruycker, W. (2007). Eye movements of children and adults while reading television subtitles.
<https://doi.org/10.1027/1016-9040.12.3.196>
13. NESTA/GCSEPod research summary
<https://drive.google.com/file/d/17K1AHK5chaX1g3epiC8CiUr4cFk-PGti/view>
14. Koskinen, Patricia S., et al. “Captioned Video and Vocabulary Learning: An Innovative Practice in Literacy Instruction.”
https://www.jstor.org/stable/20201190#metadata_info_tab_contents

15. Linebarger, Deborah L., and Jessica Taylor Piotrowski. “Structure and Strategies in Children’s Educational Television: The Roles of Program Type and Learning Strategies in Children’s Learning.”
https://www.jstor.org/stable/40800693#metadata_info_tab_contents
16. Datareportal
<https://datareportal.com/essential-youtube-stats>
17. Laskowski, Nicole. Wizard-of-oz method. 2014.
<https://searchcio.techtarget.com/definition/Wizard-of-Oz-prototyping>