

The background is a dark blue-grey color. It features several thin, gold-colored lines that form abstract, angular shapes. These lines radiate from the central text area, extending towards the corners and edges of the frame. Some lines form sharp, pointed shapes, while others are more horizontal or vertical, creating a dynamic, architectural feel.

# RecAppME

By Greta Aquilina, Daniele Calisi, Simone Giordano

# ABSTRACT

This project is about the development of a mobile app called RecAppMe, whose main purpose is to provide a **student-to-student model to support the study of students with dyslexia**. The core of the App are the **recorded files** that non-dyslexic students can upload **to summarize subject topics** or book chapters. These recordings are then listened by dyslexic students to easily grasp the concepts and to make the comprehension faster. The system is designed ad hoc to overcome the difficulties that students with dyslexia must face during their study and their daily lessons. Due to a possible collaboration with the local schools, to guarantee a reliable system, the teachers can certify the quality of the audio contents thanks to special permissions.

# MAIN ROLES



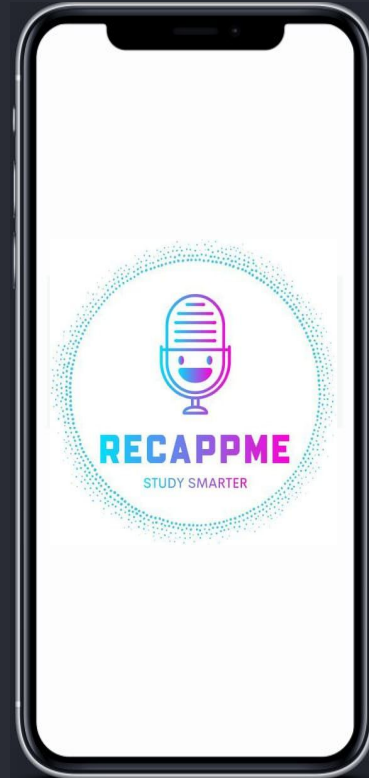
NON-DYSLEXIC  
STUDENT

Uploads recordings



TEACHER

Certifies recordings



Listens to recordings

Gives feedbacks



DYSLEXIC  
STUDENT

# COMPETITORS ANALYSIS

	Skuola.net	YouTube	Ad Hoc textbooks	Educreations Whiteboard	ePico!	RecAppMe
Community	✓	✓	✗	✓	✗	✓
Audio Notes	✓	✓	✗	✓	✓	✓
Text-to Speech Reader	✗	✗	✗	✓	✓	✓
Availability	High	High	Low	Medium	High	High
High Readability text	✗	✗	✓	✗	✗	✓
Teacher Certifications	✓	✗	✓	✗	✗	✓
Cost	Free	Free	High	Free	High	Free

# USER PROFILES



STUDENT

**Age:** 11-19

**Gender:** 50% male/female

**Category:** 3% dyslexic, 97% non-dyslexic

**Education:** Attending middle or high school

**Location:** anywhere in Italy

**Technology:** great computer and smartphone experience, 4G/5G mobile internet connection



TEACHER

**Age:** 30-65

**Gender:** 17% male, 83% female

**Job Title:** Teacher

**Education:** Bachelor degree to master degree

**Location:** anywhere in Italy

**Technology:** some computer and smartphone experience, 4G mobile internet connection

**Family:** Single or married (Predominantly married with at least one child)

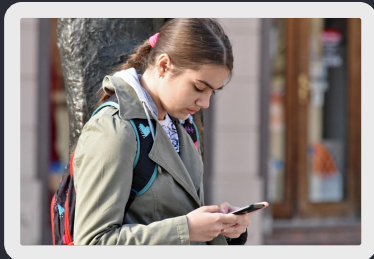
The image features a dark blue background with abstract, thin, light-colored geometric lines in the corners. In the top right, there is a complex arrangement of overlapping lines forming a series of triangles and polygons. In the bottom left, a similar but simpler geometric structure is visible. The central text is in a clean, sans-serif font.

# PERSONAS AND SCENARIOS

# NON DYSLEXIC STUDENT

## PERSONA

Paola is 16 years old who lives in Verona where she has been attending the artistic high school for three years. She is passionate about what she studies, so she spends a lot of time learning from art history books to then put into practice the new concepts. Often in free time she uses his smartphone with 4G mobile internet to share her creations on social networks and to give some advice to the ones that ask for it.



## SCENARIO

It is Friday evening, Paola has finished her homeworks for the week, so she takes the smartphone to see if there are new comments below his Facebook posts. She realizes that one student who commented about a painting technique used by Dalí has not grasped the concept well. Discussing with him, Paola gets to know that the student is dyslexic, and that he has difficulties in understanding his art history book. To help him, Paola makes an audio recording in which summarizes Dalí main techniques, therefore she shares the link with the student, who answers with a big thanks.

# DYSLEXIC STUDENT

## PERSONA

Mattia is a 13-year-old boy who attends the eighth grade in a school in Latina. His diagnosis of dyslexia was not recognized until the end of the fifth grade. He doesn't like foreign languages, but he really likes to draw. He prefers to go out with friends in the afternoons rather than doing his homework. This affects his academic performance which is mediocre.



## SCENARIO

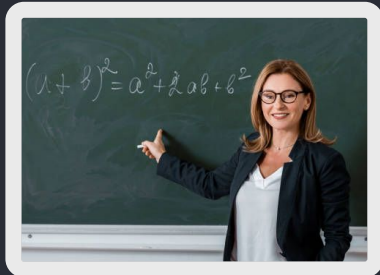
During the history hour Mattia often gets distracted or loses attention because events presented by the teacher appear confused and disconnected from each other. He has difficulty in understanding cause/effect relationships since he has not been able to consolidate the arguments already addressed. He cannot understand the meaning of specific terms in the book or used by the teacher and he does not even pay attention to the questioning of his classmates because he is distracted and disinterested. At home, while studying, he finds himself alone and confused and he would need an ad hoc explanation made with simple and immediate terms, but he has no possibility of establishing peer-to-peer learning with a classmate.



# TEACHER

## PERSONA

Letizia is 57 years old, she comes from Rome and works as a teacher of literature in two classes of a secondary school in Latina. She is not very familiar with technological devices, so she is trying to better learn the use of the interactive whiteboard recently installed in her classrooms. She is aware that her pupils show more interest and interaction if she accompanies her explanations with images and/or videos.



## SCENARIO

Both classes are very numerous and present a heterogeneous reality as a small number of autonomous pupils in the study is opposed by a majority who present, for various reasons, learning and attention difficulties. Among these there are some dyslexic students who cannot follow the explanations at the same pace as the others and to whom the teacher cannot devote particular attention due to both the high number of students in the class and the different types of the same. Together with the principal of the school, she realizes that these students especially need support during the afternoon tasks that they are not able to carry out independently.

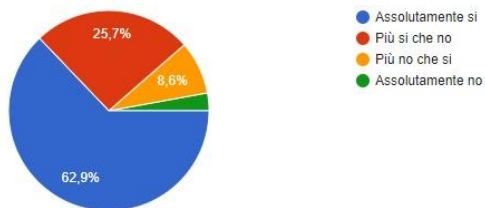


# QUESTIONNAIRES

# STUDENTS QUESTIONNAIRES

Saresti disposto ad aiutare nello studio un tuo compagno/a dislessico/a creando brevi riassunti audio relativi ad alcuni argomenti trattati durante le lezioni?

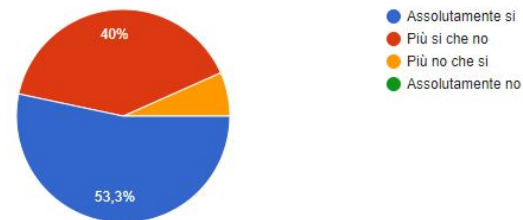
35 risposte



Non-Dyslexic  
Student

Pensi che dei riassunti audio fatti da altri studenti possano aiutarti nello studio?

15 risposte

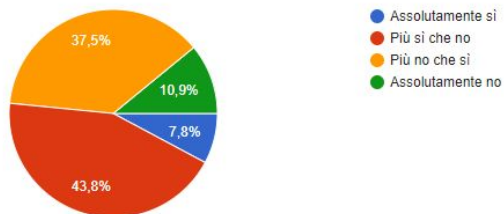


Dyslexic  
Student

# TEACHER QUESTIONNAIRES

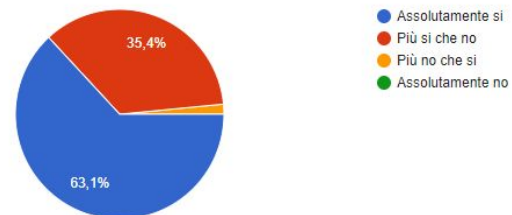
Sei soddisfatto/a dei sussidi didattici disponibili nella tua scuola per l'insegnamento a ragazzi dislessici?

64 risposte

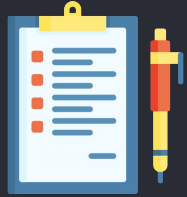


Pensa che l'ascolto di brevi audio riassunti, creati da studenti, possa agevolarli nel lavoro a casa?

65 risposte



# QUESTIONNAIRE RESULTS

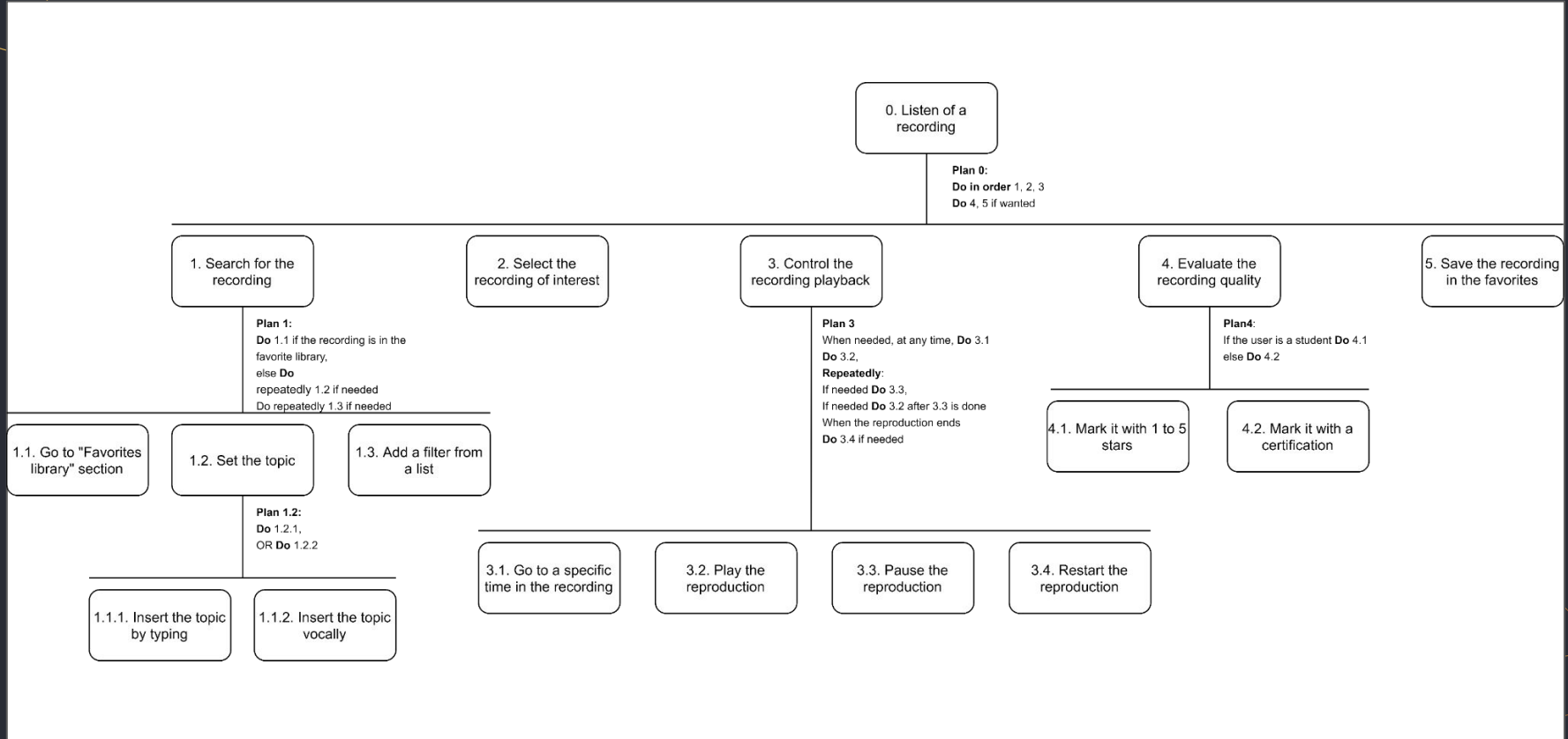


- Non-Dyslexic students would love to help students in difficulties
- Dyslexic students would like to take advantage of an eventual service providing supporting audio material for their studies
- Teachers would be glad to improve the quality of the recordings in the app because they are unsatisfied of the materials provided to the Dyslexic students by the schools

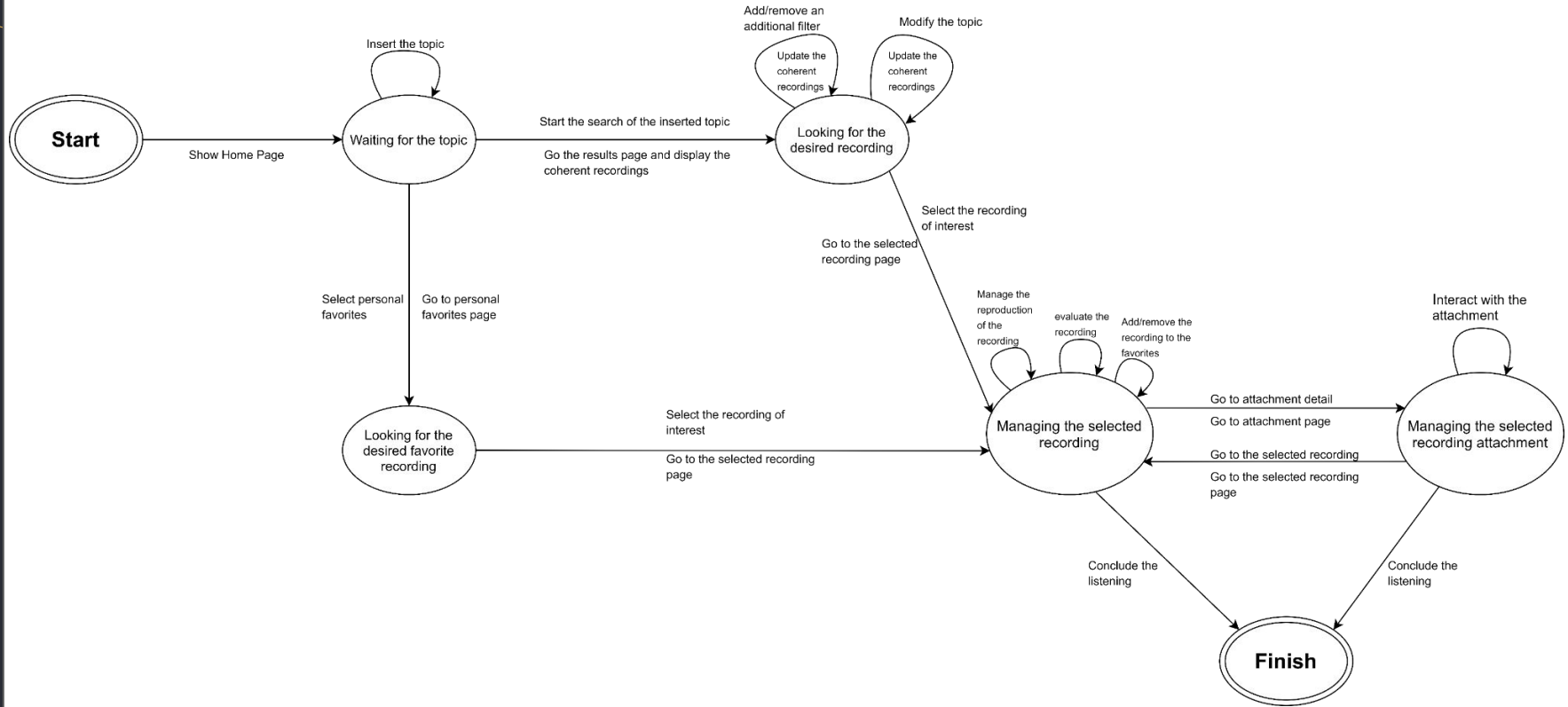


# HTA, STN AND MOCK-UPS

# LISTEN OF A RECORDING - HTA



# LISTEN OF A RECORDING - STN





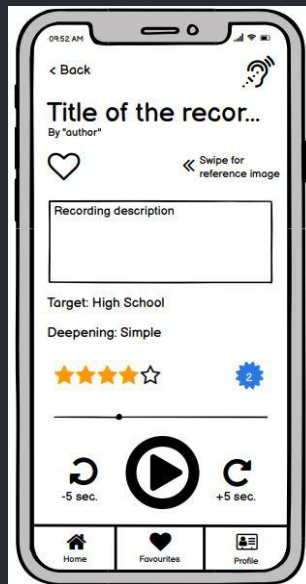
# LISTEN OF A RECORDING - MOCK-UPS



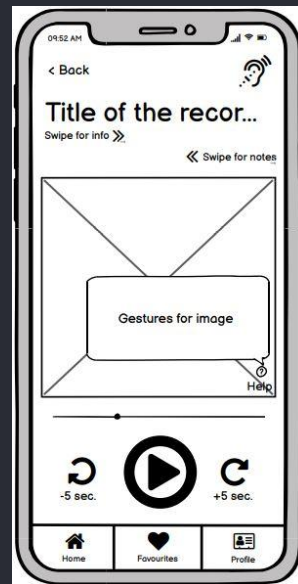
Home page



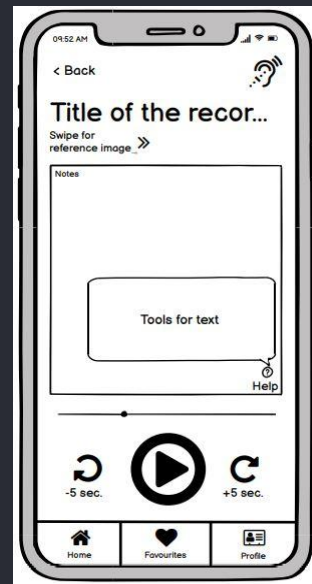
Search results page



Main page of listen  
of the recording



View page of  
attached image



View page of  
attached notes




# EXPERT BASED EVALUATION

# HEURISTIC EVALUATION



The evaluation of our system was made by Professor Valeria Mirabella by using Jakob Nielsen's 10 heuristics. In our initial Mock-Up, we have violated a total of four different heuristics.

Frame	Heuristic violated	Severity	Description / Comment
Sign-in	Flexibility and efficiency of use	2	Consider offering alternative methods of registration such social login or Google login
Choose your profile type	Match between the system and the real world	2	Consider having two mail groups: Students and Teachers and a flag "I am dyslexic"
Certificate code	Error prevention	3	Supply some details on where and how to find the code
Target: High School Deepening: Simple ★★★★☆ 	Recognition rather than recall	3	Make clear the meaning of the numbers

## Heuristic used

1. Visibility of system status
2. Match between the system and the real world
3. User control and freedom
4. Consistency and standards
5. Error prevention
6. Recognition rather than recall
7. Flexibility and efficiency of use
8. Aesthetic and minimalist design
9. Help users recognize, diagnose and recover from errors
10. Help and documentation

0 = I don't agree that this is a usability problem at all

1 = Cosmetic problem only

2 = Minor usability problem

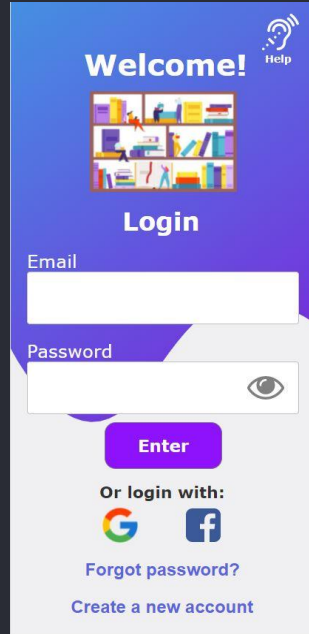
3 = Major usability problem

4 = Usability catastrophe

# ERROR CORRECTION AND FIRST PROTOTYPE

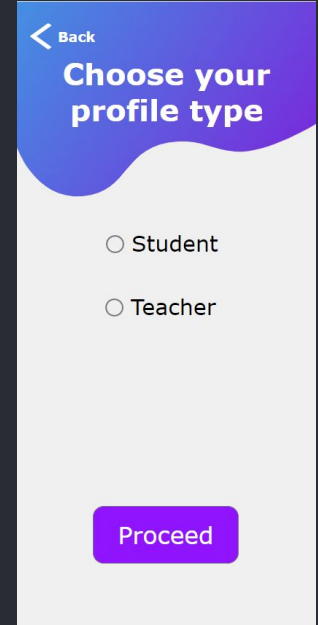
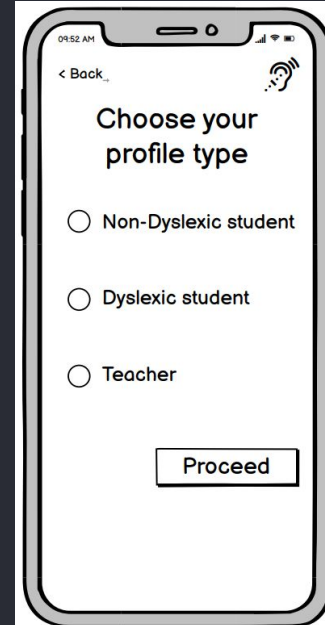
First violation:

"Flexibility and efficiency of use"



Second violation:

"Match between the system and the real world"



# ERROR CORRECTION AND FIRST PROTOTYPE

Third violation:

"Error prevention"

09:52 AM

< Back

**Certify your dyslexia**

Certificate code

Proceed

Email address\*

Password\*

Confirm your Password\*

Please report here the ID of your dyslexia certificate. You can find it in the upper-right corner of your certificate

Certificate code ?

Submit

Fourth violation:

"Recognition rather than recall"

09:52 AM

< Back

**Title of the recor...**  
By "author"

Recording description

Target: High School  
Deepening: Simple

★★★★☆ 2

-5 sec. 00:00 +5 sec.

Home Favourites Profile

< Back

**Divina Commedia, Inferno**  
By LordGiordi122

Notes Image

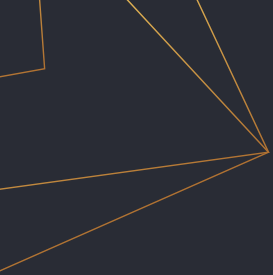
Info: Description:  
A short summary of the Inferno part in Divina Commedia by Dante Alighieri

Target: Middle School  
Deepening: Low  
Students Rating: 2.3 ★  
Teacher Certifications: 15

Your Rating: ☆☆☆☆☆

00:00 -5 sec. 02:14 +5 sec.

Home Favourites More



# USER BASED EVALUATION

# THINK ALOUD SESSION



We made a think aloud session using our initial prototype. We chose a group of twelve people, that more specifically was composed of: four non dyslexic-students, four dyslexic students and four teachers. Each user performed two different tasks individually.

The selected tasks for the examination were:

- **Listen of a recording (starting from search)**
- **Upload of a recording**

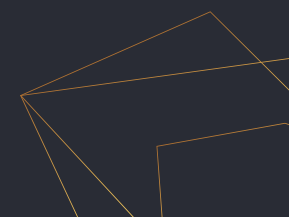


# THINK ALOUD - LISTEN OF A RECORDING

## PROS

- Presence of attachments to intensify the learning phase during the listening phase
- Helper guide for dyslexic-students to understand the content of the page

## CONS

- Lack of visibility of the favourites icon
  - When listening to a recording with missing attachments, the card layout without the contents was distracting or not useful
- 



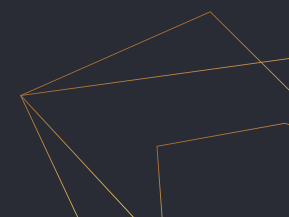


# THINK ALOUD - UPLOAD OF A RECORDING

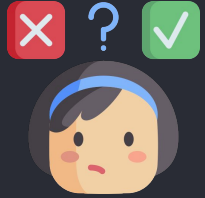
## PROS

- Multiple methods for the upload of the recording
- Opportunity to listen again the created audio and, possibly to make it again

## CONS

- Poor visibility of the informations fields during their filling
- 

# CONTROLLED EXPERIMENT



As **INDEPENDENT VARIABLES** we considered two interfaces for the “creation of a recording” task:

- The first interface is based on: guiding text to explicit what the user should do; a timer, always visible, for the recording duration; and standard buttons to start the recording, stop the recording, conclude the creation (“Yes, proceed” button) and discard the recording.
- The second interface aims to simplify and speed up the feature by removing some textual content, and by modernizing the buttons. The “start recording” button is indeed transformed into an icon that can be slid to start the recording. Also the “Yes, proceed” button and the “No, record again” button are converted into a swipe based approach.

As **DEPENDENT VARIABLE** we considered the time to complete the task

The **HYPOTHESIS** was that the second interface was simpler and therefore the task was faster to execute

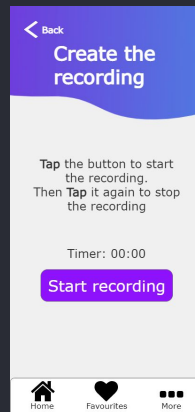
The **SUBJECTS** that we reached were a total of twenty people, from eleven to nineteen years old

**First Interface**   **Second Interface**

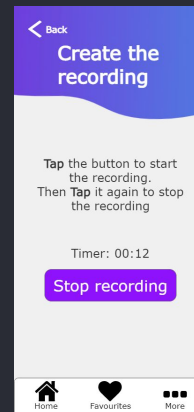
15	9
13	8
14	8
14	10
12	9
14	10
16	14
12	10
11	8
9	6
10	11
9	11
10	12
11	10
12	12
10	9
9	10
7	8
9	11
8	10

# CONTROLLED EXPERIMENT

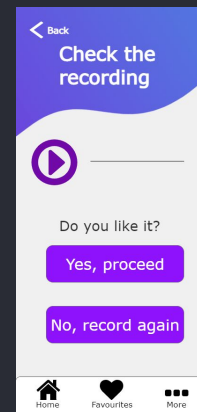
**First Interface**



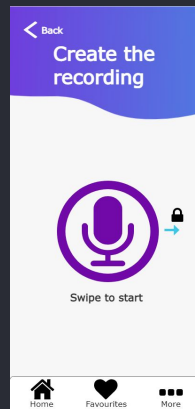
After the **tap** on "Start recording" button



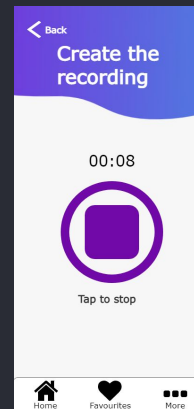
After the tap on "Stop recording" button



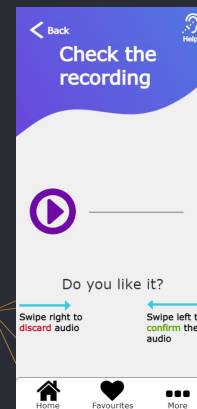
**Second Interface**



After the **swipe** to right of the microphone



After the tap on "Stop recording" icon



# ANOVA STATISTICAL ANALYSIS

## SUMMARY

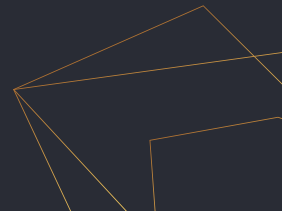
Groups	Count	Sum	Average	Variance
Column 1	20	225	11.25	6.1973
Column 2	20	196	9.8	3.2210

The F is bigger than the F-critic ( $4.464655 > 4.098172$ ), then we can reject the null hypothesis.

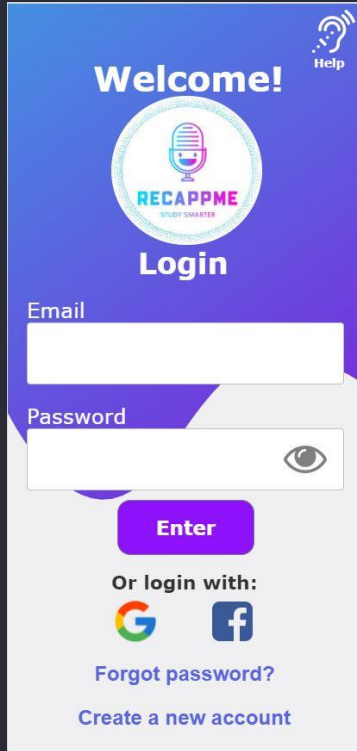
This mean that our hypothesis was true, so the change of interface produced a substantial difference of execution time

## ANOVA

Source of Variation	SS	df	MS	F	P-Value	F crit
Between Groups	21.025	1	21.025	4.464655	0.041228	4.098172
Within Groups	178.95	38	4.709211			
Total	199.975	39				



# FINAL PROTOTYPE



A mobile app login screen with a blue-to-purple gradient header. At the top left is the text "Welcome!". At the top right is a "Help" icon. In the center is a circular logo for "RECAPPME" with a microphone icon and the tagline "STUDY SMARTER". Below the logo is the word "Login". There are two input fields: "Email" and "Password". The "Password" field has an eye icon for toggling visibility. Below the fields is a purple "Enter" button. Further down, it says "Or login with:" followed by Google and Facebook icons. At the bottom, there are links for "Forgot password?" and "Create a new account".

Welcome!

Help

RECAPPME  
STUDY SMARTER

Login

Email

Password

Enter

Or login with:

Google Facebook

[Forgot password?](#)

[Create a new account](#)

Let us start executing the final prototype

