Final Report

Lingo Mingle

Group: Bytecoders

Course: Human Computer Interaction

Academic Year 2023/ 2024

Summary

1.Project Name: LingoMingle

Group name: Bytecoders

Team members:

-Vittorio Sanfilippo s317408

-Marianna Francesca Amalfi s317407

-Salvatore Cavallaro s317842

-Luca Tamburo s303907

The Name:

Lingo because it invokes language, while mingle refers to the union of multiple minds to achieve high learning goals by improving together.

Value proposition:

LingoMingle: Where language learners unite to break barriers and excel together

2.Problem/solution overview

Problem: The fundamental problem from which our analysis started is the difficulty of studying to learn a new language. It is difficult to have the right resources and direct daily contact with the new language and then have the confidence to speak it in public because one of the biggest obstacles during learning is the shame of speaking

Solution: Our solution involves a mobile application that through contact with other users enables awareness in the study of the new language

3.Needfinding

Domain of interest

Young adults who are learning for the first time a new language by self-taught.

We chose this domain of interest because it is a current topic and affects both the working life and possibilities of young adults.

Interviews

We interviewed six users in total, including four immediate users, one lead user, who in this case, also plays the role of extreme user, and one domain expert.

We selected them because they offer diverse perspectives and possess various experiences within the field.

Regarding the Immediate user one of them was choosen at Politecnico, one at Unito and two of them have been known in language exchanges.

- **Immediate user:**
  - o A 23-year-old Italian boy who is learning French
  - o A 24-year-old Iranian girl who is learning Italian
  - o A 25-year-old Russian girl who is learning Italian
  - o A 21-years-old French girl who is learning Spanish
- **Lead user/Extreme User:** A 40-year-old Canadian girl who knows many languages.
- **Domain expert:** A 28-year-old woman who is teaching a language at school.

Methodology: Interviews were conducted online and at the Politecnico di Torino.

Material: We used some tools to conduct the interviews more easily and efficiently.

In particular, we used:

- o Cell phone to record
- o iPad for taking notes
- o Computer for video conferencing

Team member roles for each interview:

- o Salvatore interviewed the Iranian girl, Vittorio took notes, and Marianna recorded.
- o Vittorio interviewed the Italian boy, Marianna took notes, and Luca recorded.
- o Luca interviewed the Russian girl, Salvatore took notes, and Vittorio recorded.
- o Marianna interviewed the French girl, Luca took notes, and Salvatore recorded.
- o Marianna and Vittorio interviewed the lead user, Luca took notes.
- o Salvatore interviewed the domain expert, Marianna took notes, and Vittorio recorded.

List of question:

Immediate/Lead user

- o How many languages do you currently speak? (Only for LEAD Users).
- o Which ones are they? (Only for LEAD Users)
- o Which new foreign language are you learning at the moment? (Only for IMMEDIATE Users)
- o What are the reasons that made you start learning it?
- o Why did you choose to learn the language self-taught and not any other way?
- o Could you please tell me what are the at most three easiest things and also the three most difficult things that you experienced while learning this new language?
  - ▪ What is/are the difficulty/ies related to?
  - ▪ How do you act to overcome this/these difficulty/ies?
- o Where do you prefer to study?
- o At which moment of the day do you prefer to study?

- Whenever you approach to a new language, what are the steps that you usually follow?
- What are the resources that you're using to learn this language?
- Why did you choose these learning resources?
  - *In the case of learning books*
    - How is the book structured?
    - Which type of exercises did you prefer and which did you find to be more complicated?
  - *In the case of podcasts/TV series/music.*
    - What kind of podcasts/TV series/music do you listen to?
    - Do you use subtitles to facilitate understanding?
  - *In the case of entertainment books*
    - Do you have any strategies you use while reading to improve your language comprehension?
  - *In the case of app*
    - How is the app structured?
    - What aspects of this app do you find most useful for your learning?
    - What challenges or limitations have you found in using this app?
- Have you noticed an improvement in learning since using this resource(s)?
- When you encounter new terms, what do you do to understand their meaning and memorize them?
- Could you please describe a situation or a moment when you noticed a progress in the learning process of this new language?
- How do you manage moments of struggle that may occur throughout the learning process
- What method do you use for self-evaluation?

Domain expert

- How many languages do you currently speak?
- Which ones are they?
- Why did you decide to learn them?
- Could you please tell me what are the at most three easiest things and also the three most difficult things that you think may occur while learning a new language?
  - What is the difficulty related to?
  - How do you act to overcome this difficulty?
- What are the steps you followed to learn the language you teach?
- Whenever approaching a new language, according to your experience, what strategy you'd suggest to adopt?
- Could you please describe a situation or a moment when you noticed a progress in the learning process of the languages you speak?
- How do you managed moments of struggle that may have occurred throughout the learning process ?
- Can you tell me about how your course is structured?
  - What tools do you use within your course?

- o What techniques would you recommend to enrich vocabulary?
- o What resources or tools do you recommend to support study outside of class?
- o Could you please tell me what are at most the three easiest things and also the three most difficult things that you think may present while teaching a new language?
  - ▪ What is the difficulty related to?
  - ▪ How do you act to overcome this difficulty?
- o According to your experience, what are the most common struggles that you detected your students went through while studying the language you teach?
  - ▪ How did you help them dealing with said struggles?
- o How do you recommend measuring progress in language learning?

Results:

Pictures and relevant artifact
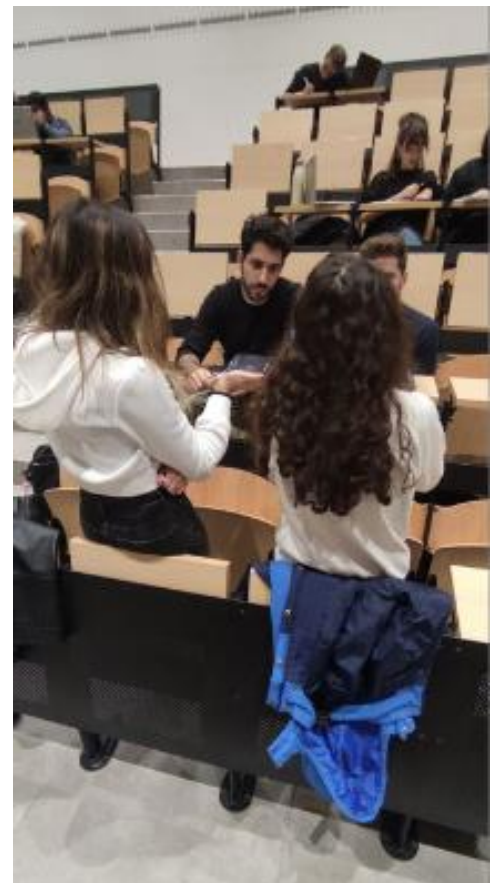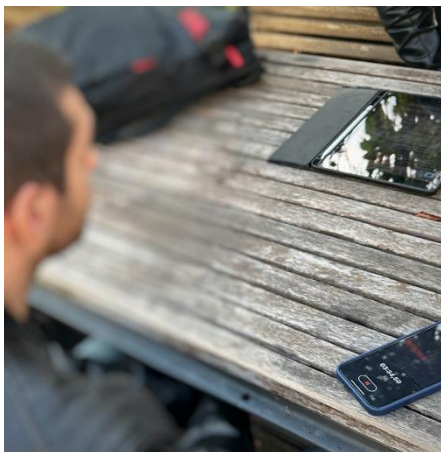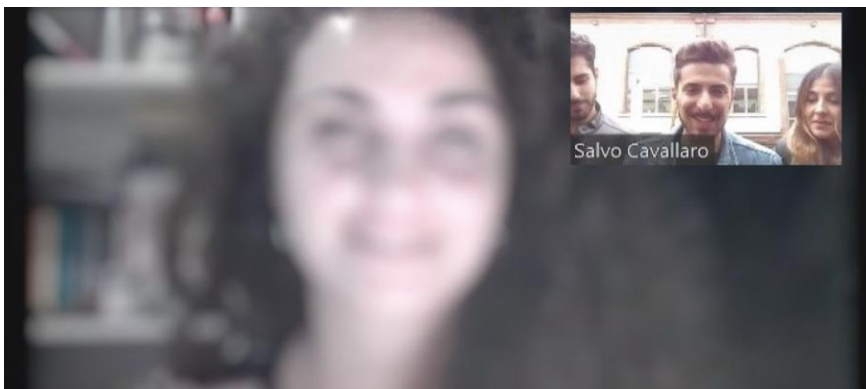
Summary of the answer and Key quotes:

1. "I **wrote a glossary** where all the new words, I would put them there, contextualizing and then giving an example in a very specific context. Definitely all of this in-depth study work was complemented by

daily viewings of movies, podcasts, watching videos, music, reading.” *-Domain Expert and 4 Immediate users*

2. “In my opinion, the **use of media** is also crucial,(...). So social media, cell phone, for example even something seems stupid, **setting your cell phone** to language**, can be helpful in learning some words**.” - *Domain expert and 3 Immediate users*

3. “I realize that I **improve when I'm really immersed** in a context where I can't speak any other language, after a while a few days I notice that I've really improved.” - *Lead user*

4. “With Japanese it's a long story because really I learned it a little bit in college **and then due to not having anyone to practice it with, I abandoned it**.”- *Lead User*

5. “(...) plus, listening to a native speaker at home and watching the news.”- *Immediate User*

6. “Definitely in the beginning you have to do well a little bit on grammar, sentence structure, how to organize in a language the sentence because not all languages work the same way, so sentence order starts from there.” - *Domain Expert*

7. “For time reasons, because I have two children there, because I work. Then, at my age, the idea of going back to school, I don't really have the desire or the energy. If **I do it self-taught, I do it in my spare time**, so it really suits me compared to taking a course, which has to be at a certain time, maybe not so flexible.” - *Lead User and 2 Immediate users*

8. “Okay, I have experience going to an English class for learning English, but actually **I don't have time for that now**. When you register to a class, you should be able to attend a class in just, you know, at the exact time, exact days of the week, it's not something that I could change it.” - *Immediate User*

9. “The **hard part, definitely speaking**, but it wouldn't blame that on the language itself. It's more like my own issues than grammar”. - *Immediate User*

10. “I prefer grammar ones. I mean, most books, they are fine. It's, I guess, a needle problem, but sometimes it feels like the textbook. I understand that their job is to make it the way that even the average, even if it's accessible and easy to understand even for the dumbest student, **but sometimes it just feels like the book treats you like you're a little bit too far behind**” - *3 Immediate Users*

11. "Another more **difficult aspect**, certainly is also **to delve into the cultural aspects of a language**, because without knowing the culture it is difficult to identify with a language, so you have to learn the culture and everything as well. You have to immerse yourself, in the real sense of the word, understand how you reason,(…), so knowing in that culture what is wrong and what is a correct,(…).And then still speaking a language and understanding what you are saying, in the real sense the word. That is, what you are conveying, beyond the words you say". - *Domain Expert*

12. "I read books in Italian written by a woman from Palermo, they are detective stories. The character is from Palermo, but she lives in Catania, and there are dialects when she writes and so I start to understand certain things that I didn't know before." -*Lead User*

13. "**I've been listening to podcasts. To listen to some news**. The news podcast in the language **I am interested in to listen to the accent**, and I am specific in looking for the kind of accent that I like. For example, for the Brazilian one, I like the southern one, then I listen to the São Paulo news and not the Rio news. Because the accent is not the same." - *Lead User*

14. "Okay, I live in Italy, so I need to learn Italian in order to be able to contact the people and do the work that I need on a daily basis. **(..). I am more comfortable not talking in person, but also I like when I can talk with Italian people**, like for example in a store, **when one old lady asks me something, I like to be able to answer her**." - *Immediate User*

15. "**Shame is a very important factor**, **in holding you back, in fear in the fact that if you're talking to a stranger using a new language you don't trust what you're going to say for fear of being wrong or not knowing how to answer a question**. I think that's a factor not to put aside because you have to talk about how it feels when you pronounce things and people look at you if you don't pronounce it right. So **I think shame affects a lot and it's a shame because it holds you back from trying to practice the language and improve**." - *Lead User and 2 Immediate Users*

16. "I also tried to read a book in Spanish with my nephew, **but he was laughing because of my accent**. For this reason I will not do it again." - *Immediate User*

17. "The common difficulty in my opinion is just the pronunciation, that is, they don't understand, while I'm speaking, while I'm putting on a video, they really have difficulty because they **are probably not used to hearing English**" - *Domain Expert*

18. "Yes, Tandem is a language exchange application and I offer to teach whoever is interested in Italian, whoever is interested in learning Italian teaches me French, so there is this Italian-French

exchange in my case.[...]It's a very natural thing, it comes out of the box of academia, I have been taught words, terminologies that in a book I would never have found. I learned uncommon words that I would never have found in a French-Italian dictionary."- *Immediate User*

19. "So I started with French subtitles and I will continue to keep them until I feel confident enough to remove them. - *Immediate User*

20. "The most difficult things to convey to the learner, **teaching a language is not so easy because you also have to make them identify with the culture of a language**, so explain certain things. Another thing also that I am struggling with lately is not being able to speak English because the students for example don't really understand, so for me this is difficult because I would like to speak in English, however I understand that there is an underlying difficulty." - *Domain Expert*

21. "I think understanding just an academy lecture is easier than the daily talk. You know, in your daily talk, you are just so quick. You speak quickly and I can't understand. When it's an academy call, the person who is speaking is also thinking. And it makes them a little slower and in that way I can understand better." - *Immediate User*

22. "It's easier for me to read, because then I can understand, based on what I'm reading, in my own time, how I want, I can understand the message. Instead, when I hear someone else speak, maybe they are speaking to me very fast or in dialect and I can't make it." - *Immediate User*

What we learned

We learned to extrapolate, from what may seem to be simple actions to which a user gives no weight, useful data to understand what people's particular needs are during language learning.This was also possible thanks to the questions that allowed us to get deep into the learning process of different people.

One of the things we learned and found very interesting was to notice that despite the fact that the people we interviewed had totally different social and cultural backrounds and experiences, many gave similar answers, attributable to the same difficulties and needs while learning a new language. It was precisely this whole process that allowed us to extrapolate in the next stage the needs.

Synthesis

Based on the interviews conducted and by paying attention to the key quotes obtained, after initial brainstorming we obtained this result:
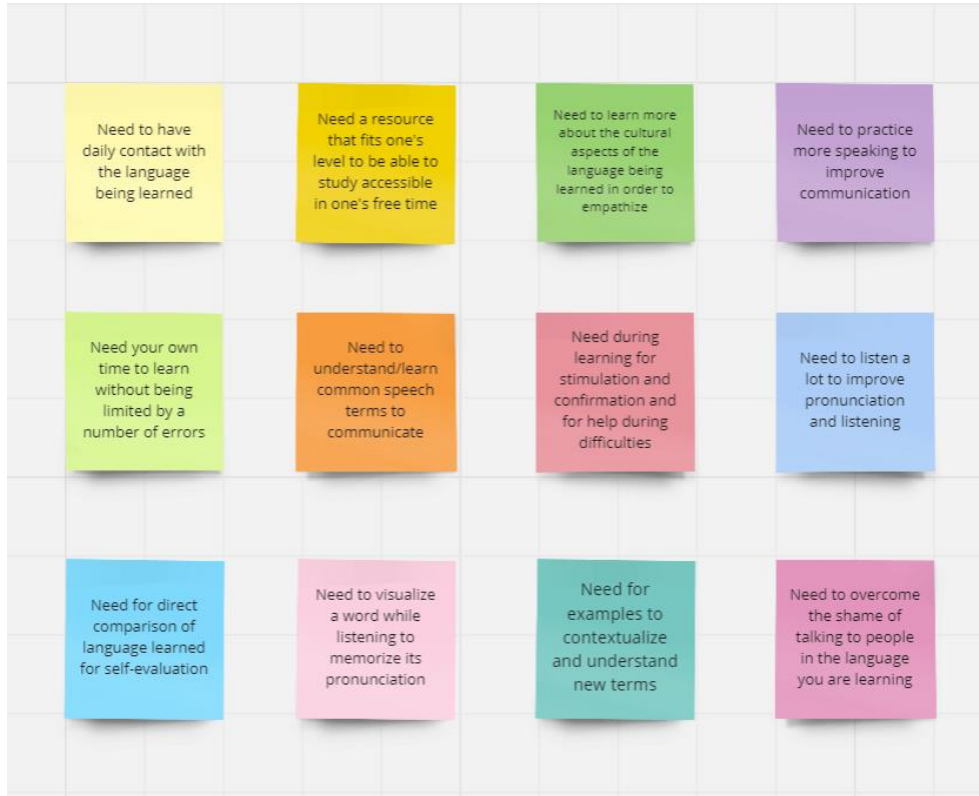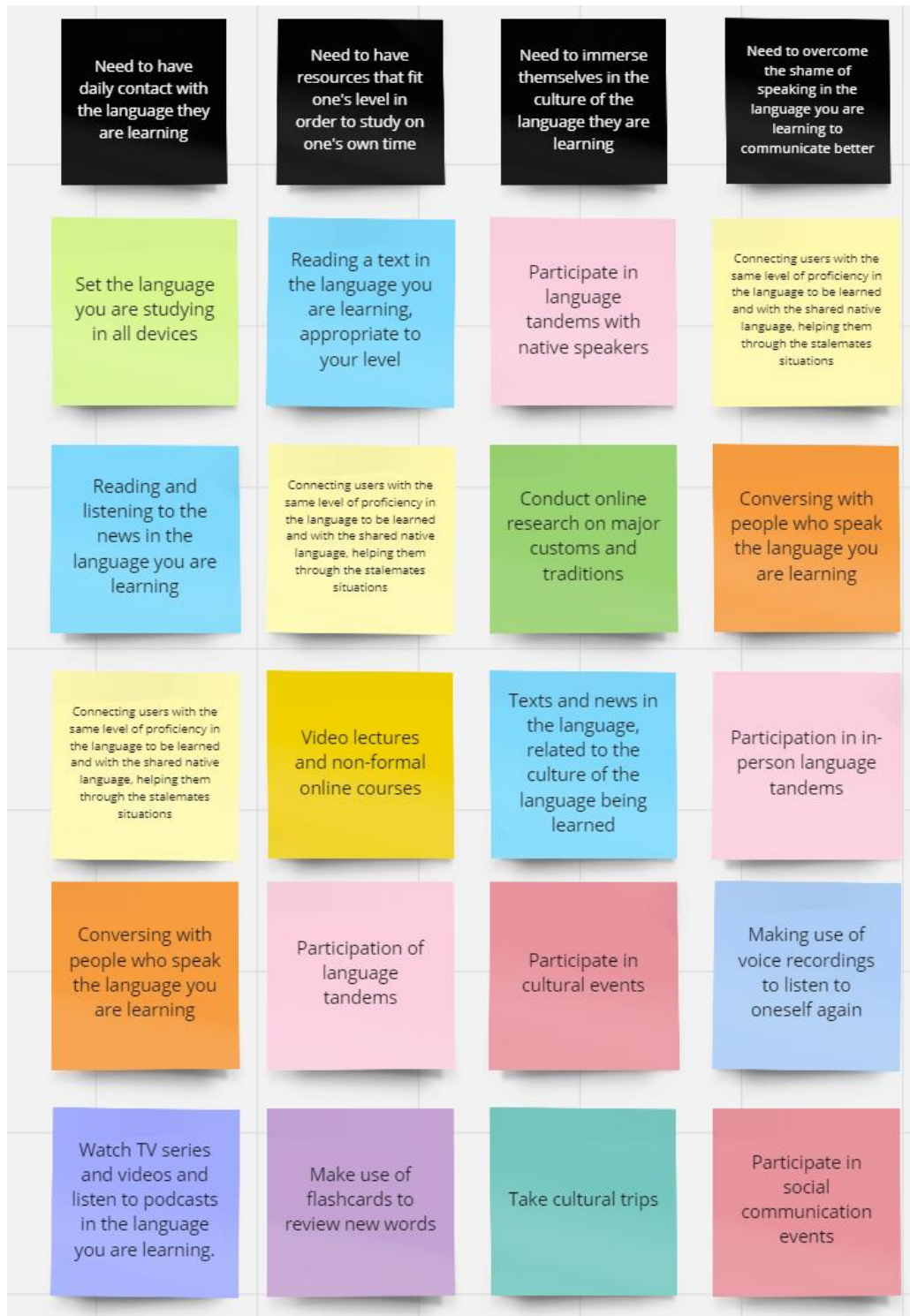

After a second brainstorming session, we identified the deep needs and specified which quotes are related to.

DEEP USER NEEDS:

- Need to have daily contact with the language they are learning.
  (Key Quotes: 1, 2, 4, 13, 17)

- Need to find resources that fit one's level in order to study on one's own time.
  (Key Quotes: 7, 8, 10)

- Need to immerse themselves in the culture of the language they are learning.
  (Key Quotes: 3, 11, 20)

- Need to overcome the shame of speaking in the language you are learning to communicate better. **(Key Quotes: 9, 14, 15, 16)**

Solution

After finding the deep user needs, we brainstormed to reason and look for some possible solutions. Each solution below is the result of comparing and reflecting on what emerged during the interviews. We also focused on solutions related to daily actions that may seem simple but if addressed and used in the right way can help the user with language learning and solve the main deep user needs identified.

Need to have daily contact with the language they are learning	Need to have resources that fit one's level in order to study on one's own time	Need to immerse themselves in the culture of the language they are learning	Need to overcome the shame of speaking in the language you are learning to communicate better
Set the language you are studying in all devices	Reading a text in the language you are learning, appropriate to your level	Participate in language tandems with native speakers	Connecting users with the same level of proficiency in the language to be learned and with the shared native language, helping them through the stalemates situations
Reading and listening to the news in the language you are learning	Connecting users with the same level of proficiency in the language to be learned and with the shared native language, helping them through the stalemates situations	Conduct online research on major customs and traditions	Conversing with people who speak the language you are learning
Connecting users with the same level of proficiency in the language to be learned and with the shared native language, helping them through the stalemates situations	Video lectures and non-formal online courses	Texts and news in the language, related to the culture of the language being learned	Participation in in-person language tandems
Conversing with people who speak the language you are learning	Participation of language tandems	Participate in cultural events	Making use of voice recordings to listen to oneself again
Watch TV series and videos and listen to podcasts in the language you are learning.	Make use of flashcards to review new words	Take cultural trips	Participate in social communication events

Top Solution

Connecting users with the same level of proficiency in the language to be learned and with the shared native language, helping them through the stalemates situations.

- Need to overcome the shame of speaking in the language you are learning to communicate better.
- Need to have daily contact with the language they are learning.
- Need to find resources that fit one's level in order to study on one's own time.

After a brainstorming session, we chose this solution because it covers more of the users' deep needs and because we believe it can meet the need to overcome the shame of public speaking that is one of the biggest obstacles to language learning, as it prevents people from improving their vocabulary, accent, listening and challenging themselves.

4.Tasks and Storyboard

Tasks

We chose this simple task because we think it is the first fundamental step that every user should take in order to engage in learning the new language to improve fluency in speaking and pronunciation, overcoming the shame of talking to other people for fear of others' judgment.

As for the moderate task, we reasoned that some users may experience problems during a conversation that may be related to shyness or lack of knowledge of some terms that would enable them to carry on a constructive dialogue, so we thought the task should be based on overcoming these stalemates.

Finally, for the complex task, we thought it possible that perhaps some users sporadically want to be able to schedule an in-person meeting with another user because perhaps a friendship has been formed or that they have free time to organize and feel ready to test themselves by speaking in presence and not from behind a screen.

- **Simple Task:** Carrying out a conversation.

- **Moderate Task:** Overcoming a stalemate during a conversation.

- **Complex Task:** Scheduling an in-person meeting.

Storyboard

We chose this storyboard because we think it is impactful and very explanatory for the solution we are dealing with. Indeed, its strength is to show how the shame of public speaking, which can occur in everyday life precluding the possibility of having one's knowledge of the language improved, can be overcome by connecting the user with other people who have the same level of knowledge of the language and helping them when embarrassment arises in moments of silence, allowing him to take advantage of this at any time of the day and in any place he prefers. A weakness of this storyboard is that it does not reflect the time needed for overcoming the shame of talking to someone, which being subjective, may need to vary depending on the user.

As we will see from the next storyboard, our representation sees the native English-speaking user who would like to talk to other users in the language he is learning, Spanish. Starting from the left, we see the user's need to overcome shame, followed by the need to have a resource they can use during their free time consistent with their level of knowledge. Next begins the representation of a conversation that mirrors the *simple task*, and then follows a moment of embarrassment that is resolved through a game that starting automatically at the moment of stalemate, represents the *moderate task* but more importantly saves the conversation and helps the user have a fun and informative experience.
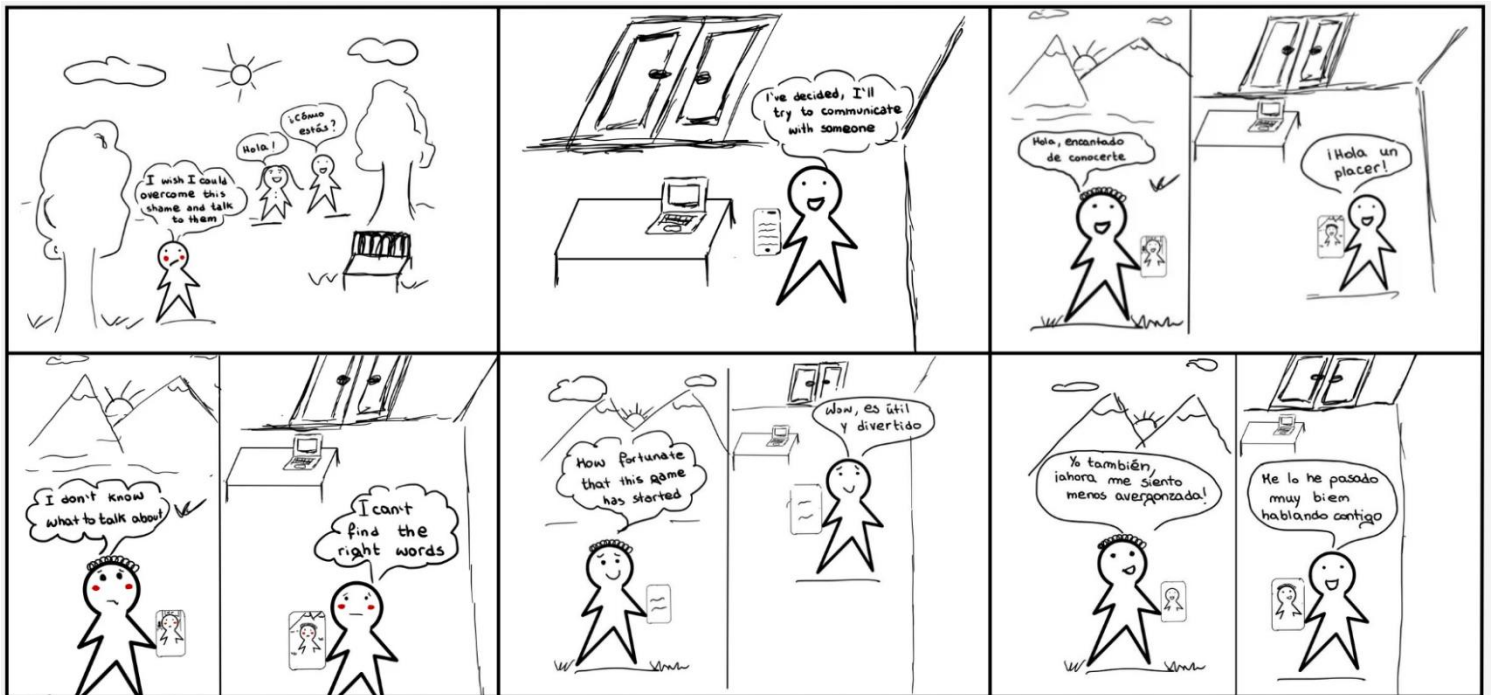
5.Low-fidelity Prototypes

Modalities exploration

We thought about different alternatives for our ideas, since the main focus of our solution is on overcoming shame through video calls to talk to other users, we mainly considered devices that had a camera, i.e. smartphones, tablets and computers.

We also focused on the devices that we considered to be most widespread and which almost the entire population now owns, as every household has at least one, if not more, computers and/or smartphones that they use on a daily basis.
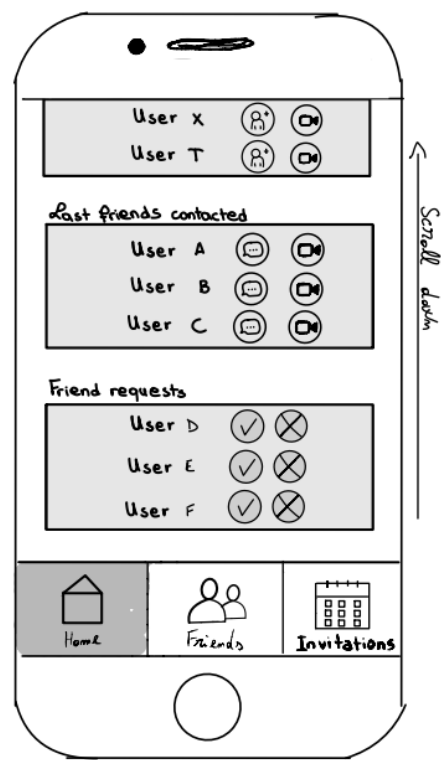
For the realisation of our paper prototypes, we selected **desktop interface** and **mobile interfaces**, so as to create prototypes for the devices most likely to be used by the possible users of this application, both for a matter of convenience and comfort, considering them the most effective for video calls, audio and the possibility of interactivity.

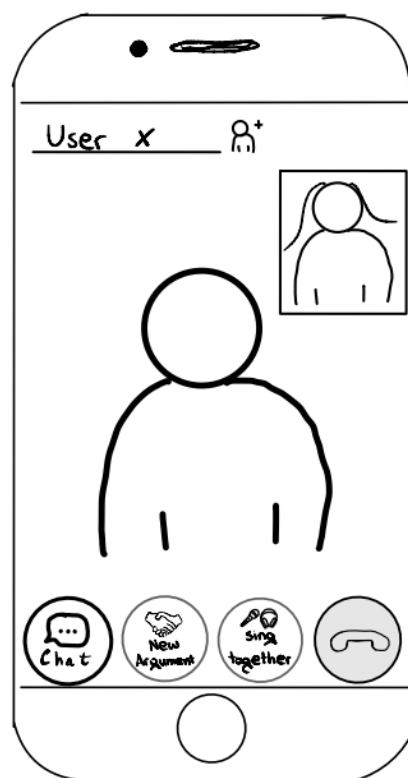# Paper Prototypes
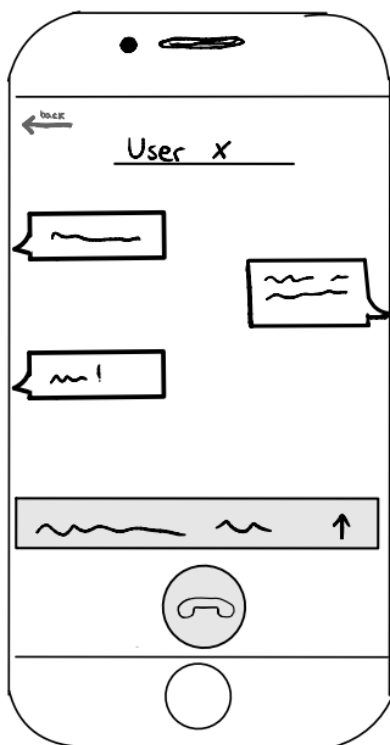
Mobile paper prototype
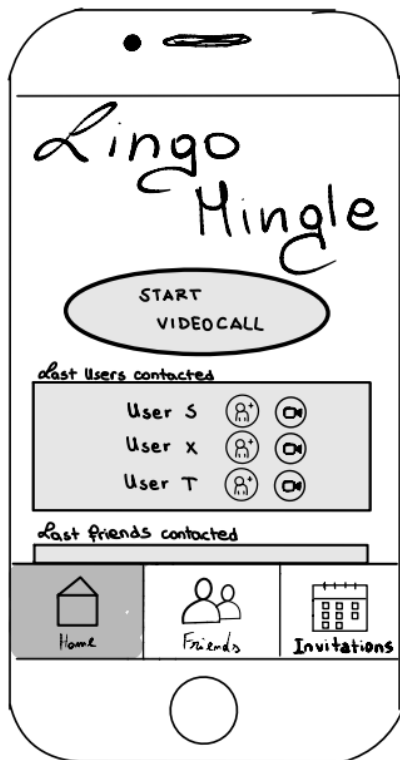
Screen 2

Screen 2

Screen 3

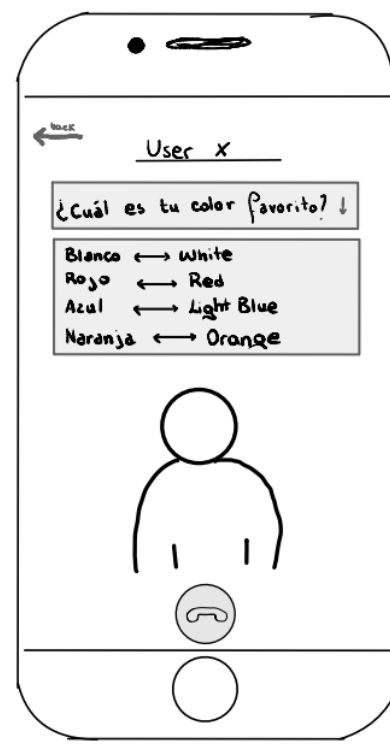*Screen 4*

Lingo Mingle

You are going to be connected with another user on Videocall.

CONTINUE   EXIT

Home   Friends   Invitations

User X   👤⁺

Chat   New Argument   Sing together

Screen 5

Screen 6

User X
User T

Last friends contacted

Are you sure you're rejecting the friend request of user D?

✓ ✗

Home   Friends   Invitations

User X
User T

Last friends contacted

Are you sure you accept the friend request of user D?

✓ ✗

Friend requests

User E
User F

Home   Friends   Invitations

Screen 7

Feliz Navidad

Feliz Navidad, Feliz Navidad
Prospero año y . . . . . .

felicidad|

Screen 8

¿Cuál es tu color favorito?

Screen 9

¿Cuál es tu color favorito?

Blanco ⟷ White
Rojo ⟷ Red
Azul ⟷ Light Blue
Naranja ⟷ Orange

Screen 10
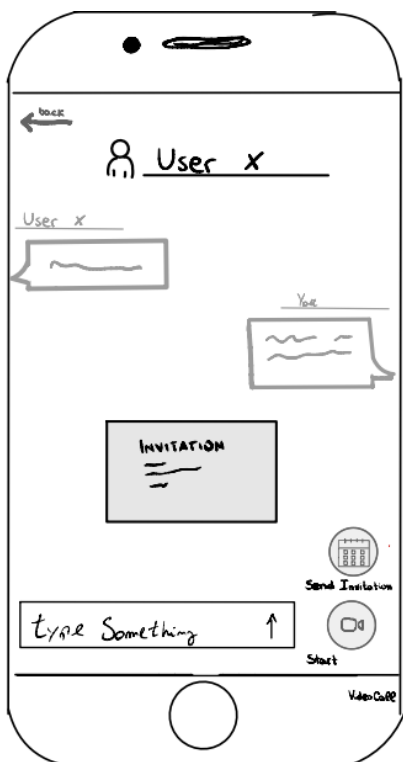
Screen 11

Screen 12
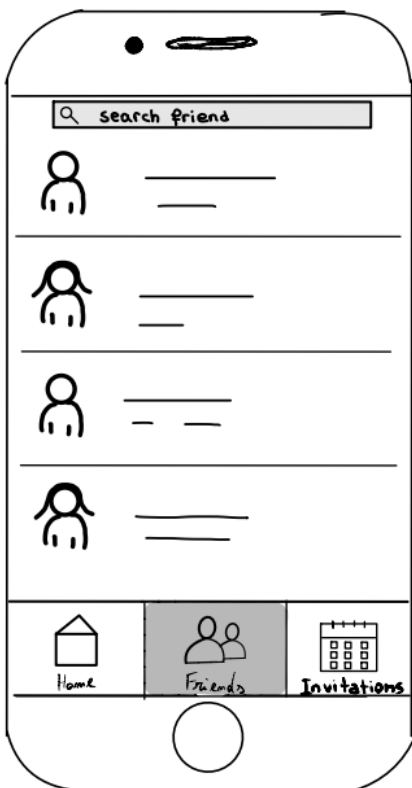
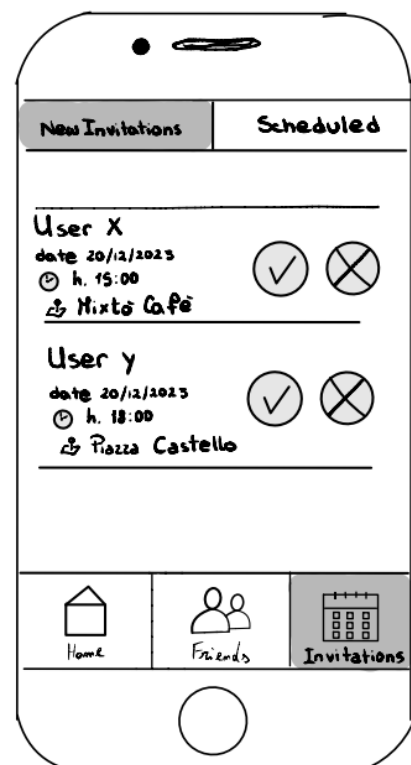*Screen 13*
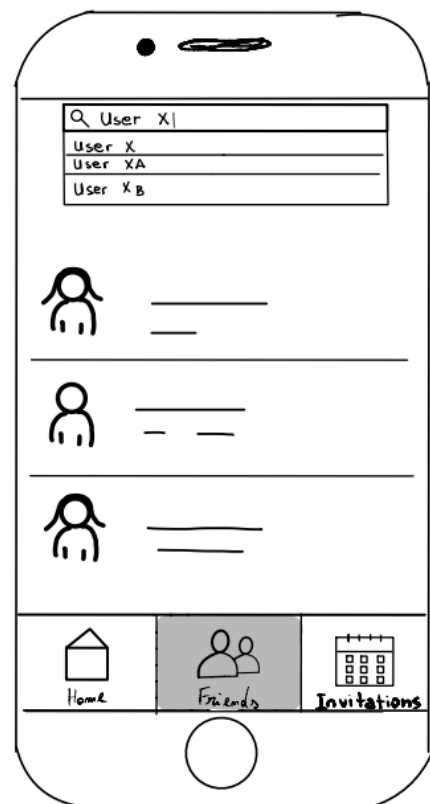
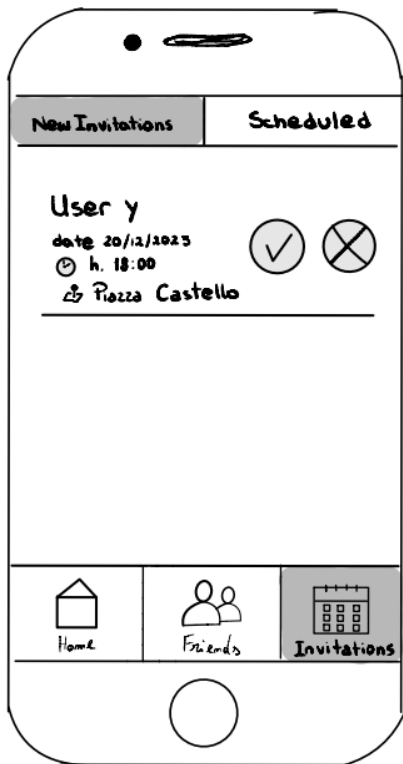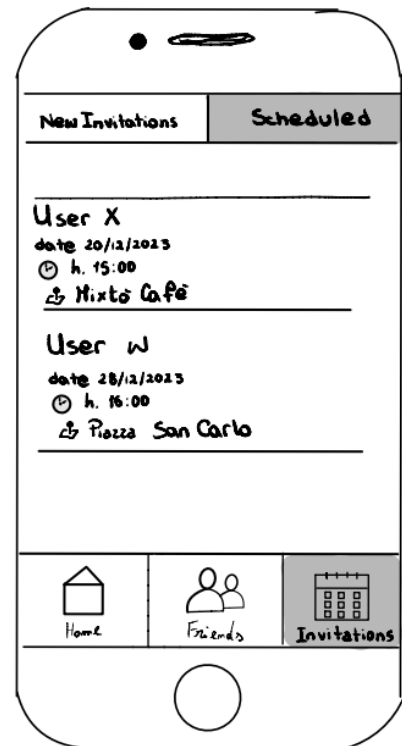*Screen 14*
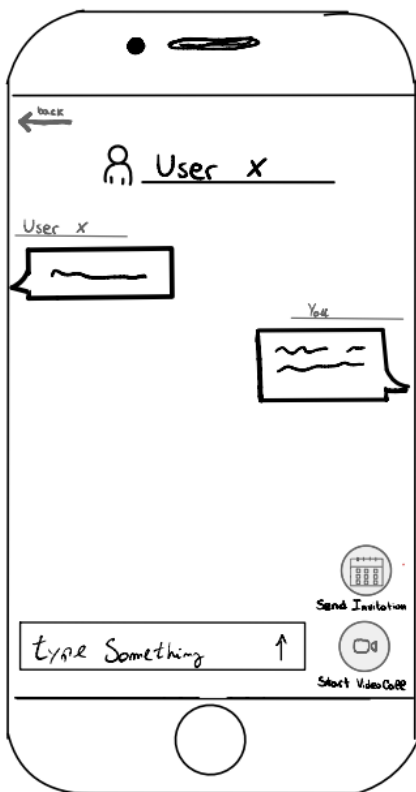
Screen 15
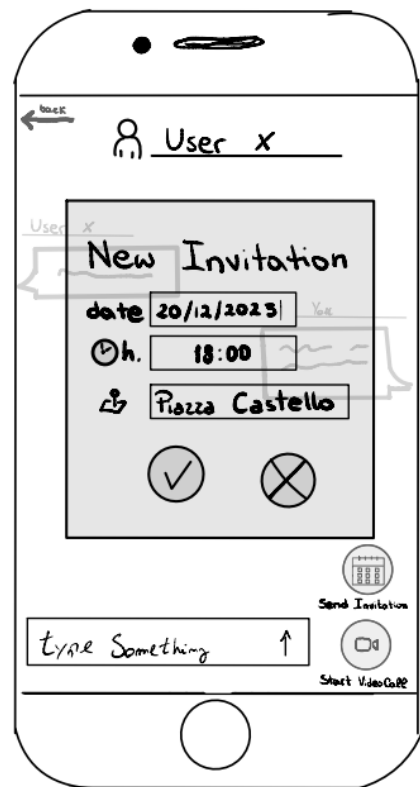
Screen 16

Screen 17

Screen 18

Screen 19

Screen 20
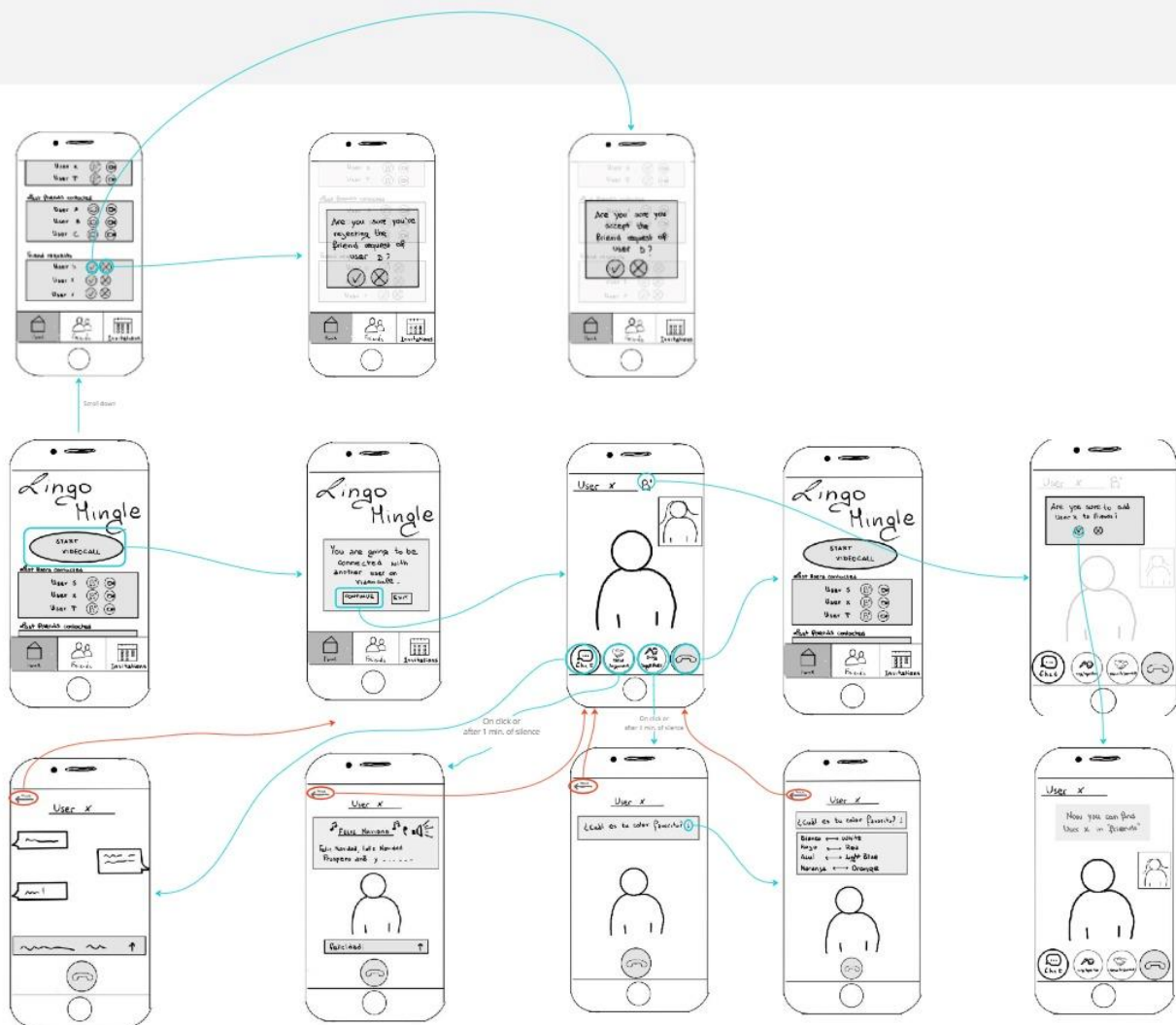
Connection with the storyboard

- Prototype screens #1 and #2 are connected to Storyboard frame #2
- Prototype screens #3 and #6 are connected to Storyboard frame #3
- Prototype screens #7, #8 and #9 are connected to Storyboard frame #5

Connection with the task

- Prototype screens #1, #2, #3 and #6 are connected to Simple Task
- Prototype screens #7, #8 and #9 are connected to Moderate Task
- Prototype screens #5, #10, from #11 to #18 are connected to Complex Task

Link to High Level flow diagram

- [Link to Mobile Prototype flow diagram](#)
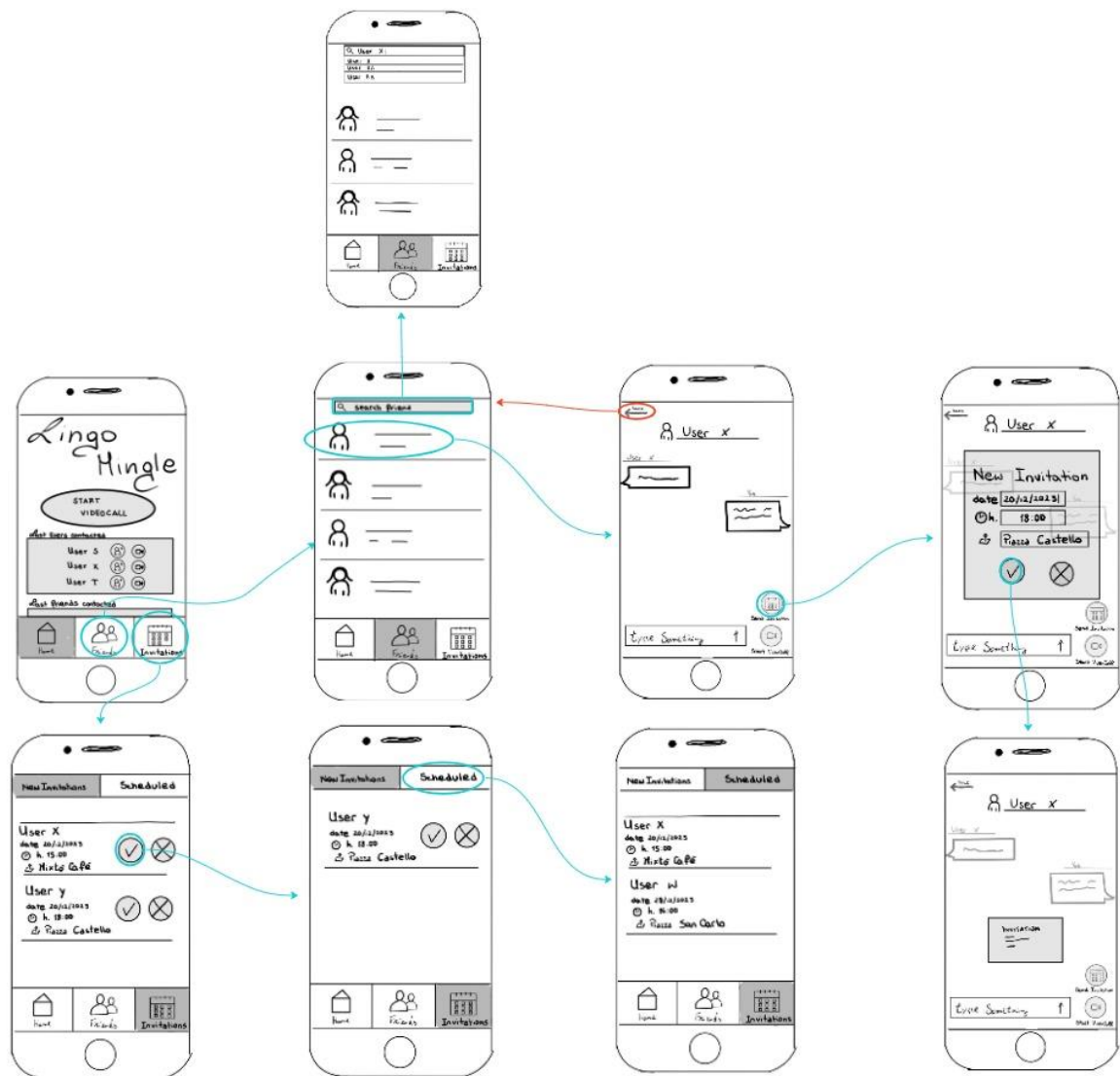
Desktop paper prototype
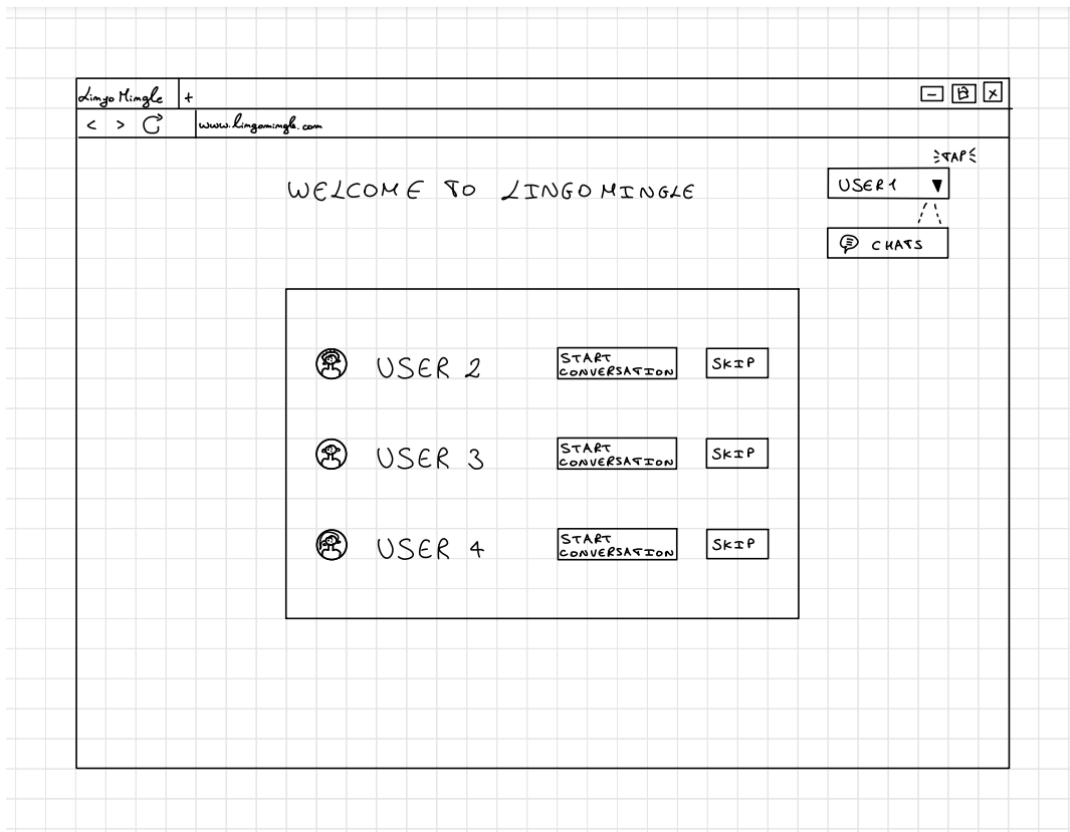
Screen 1
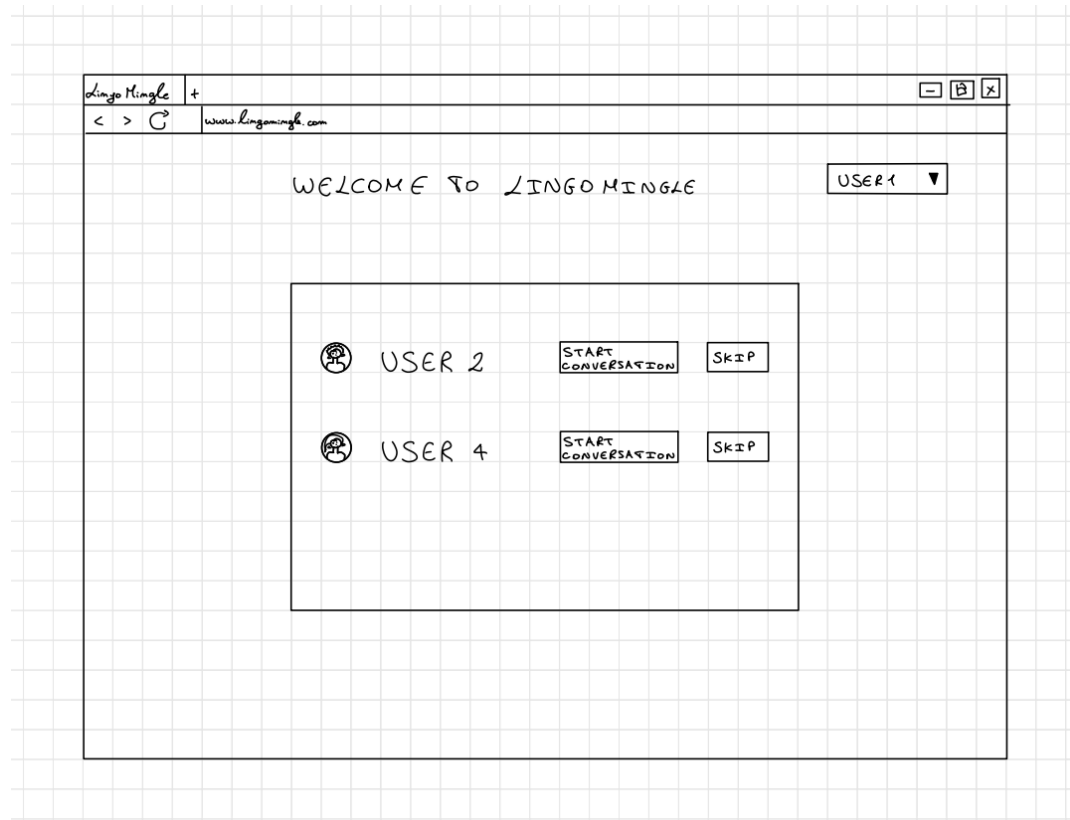
Screen 2

Screen 3
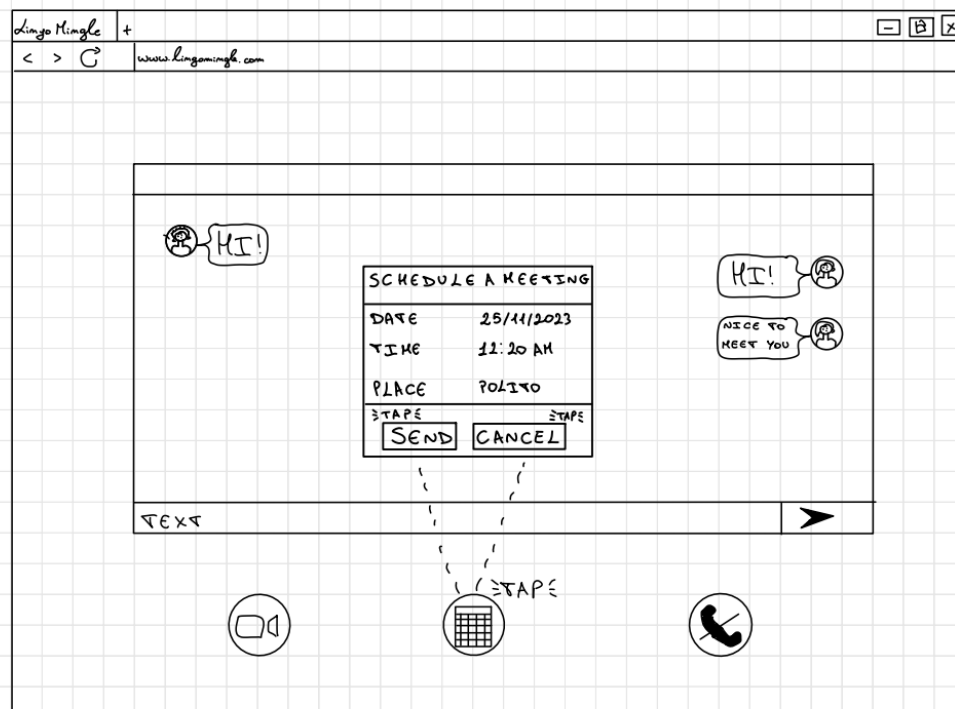
Screen 4
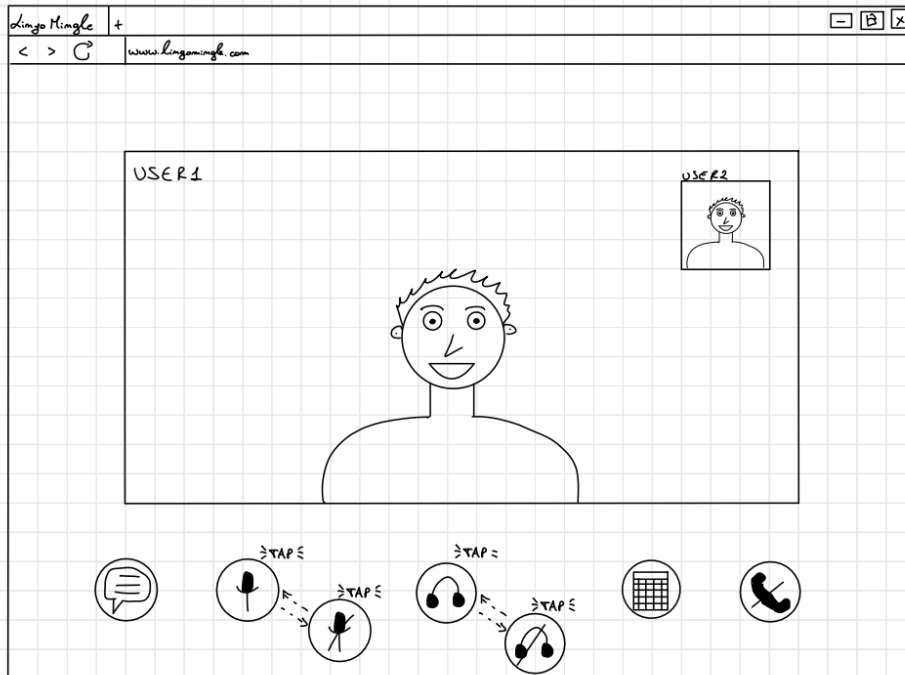
Screen 5

AFTER 30 SECONDS OF NO ACTIONS
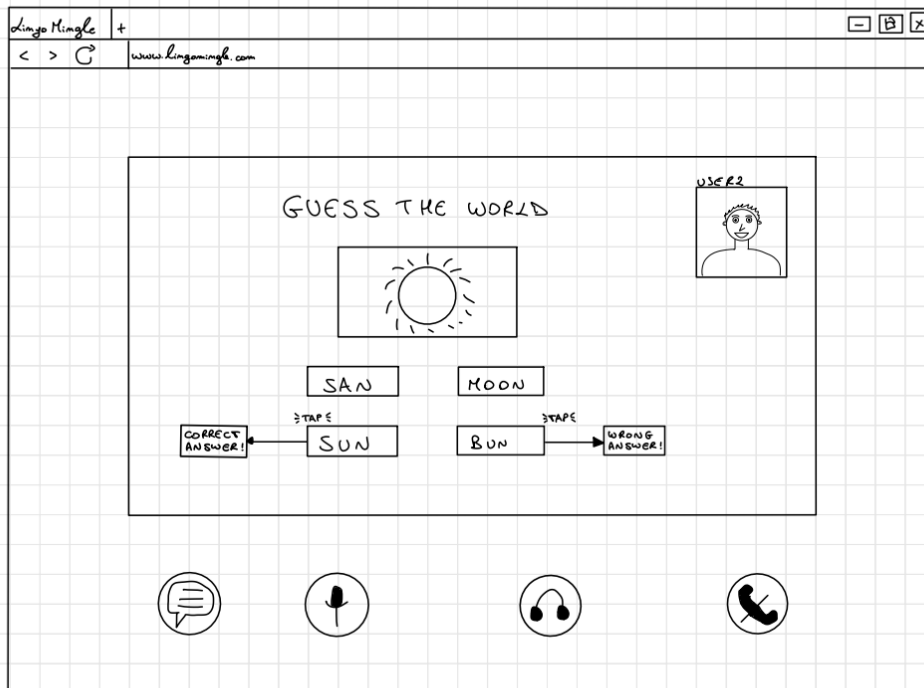
Screen 6
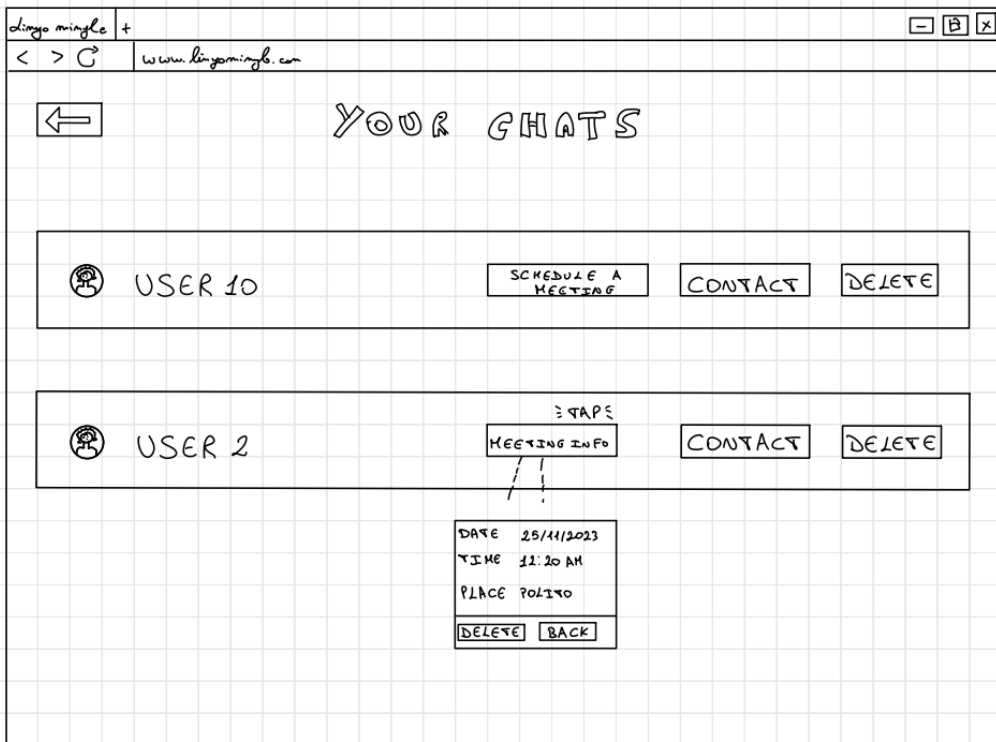
Screen 7
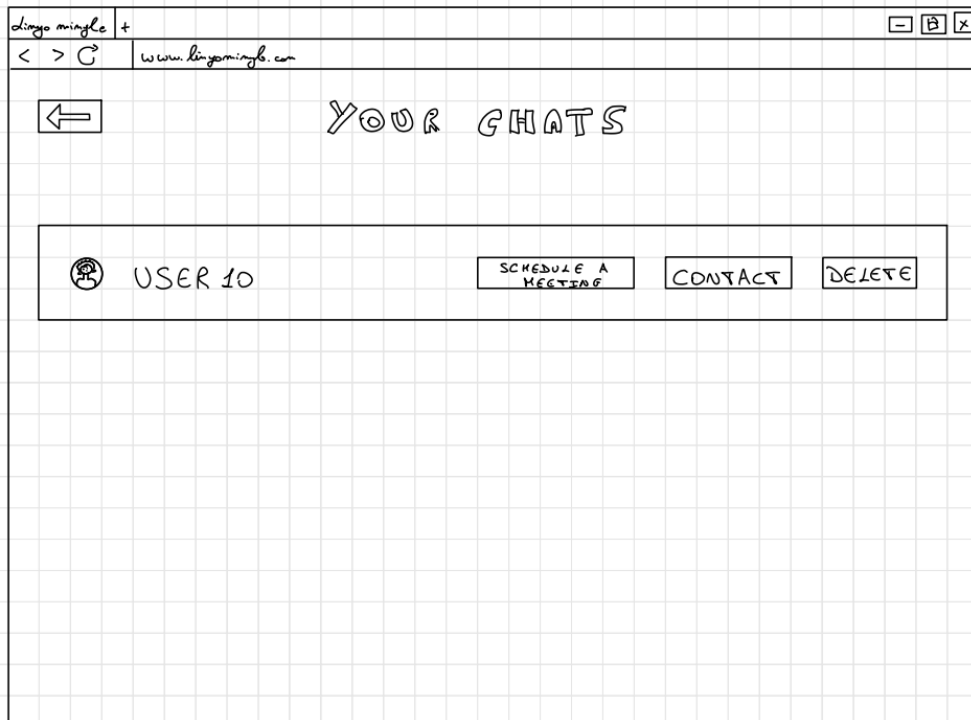
Screen 8
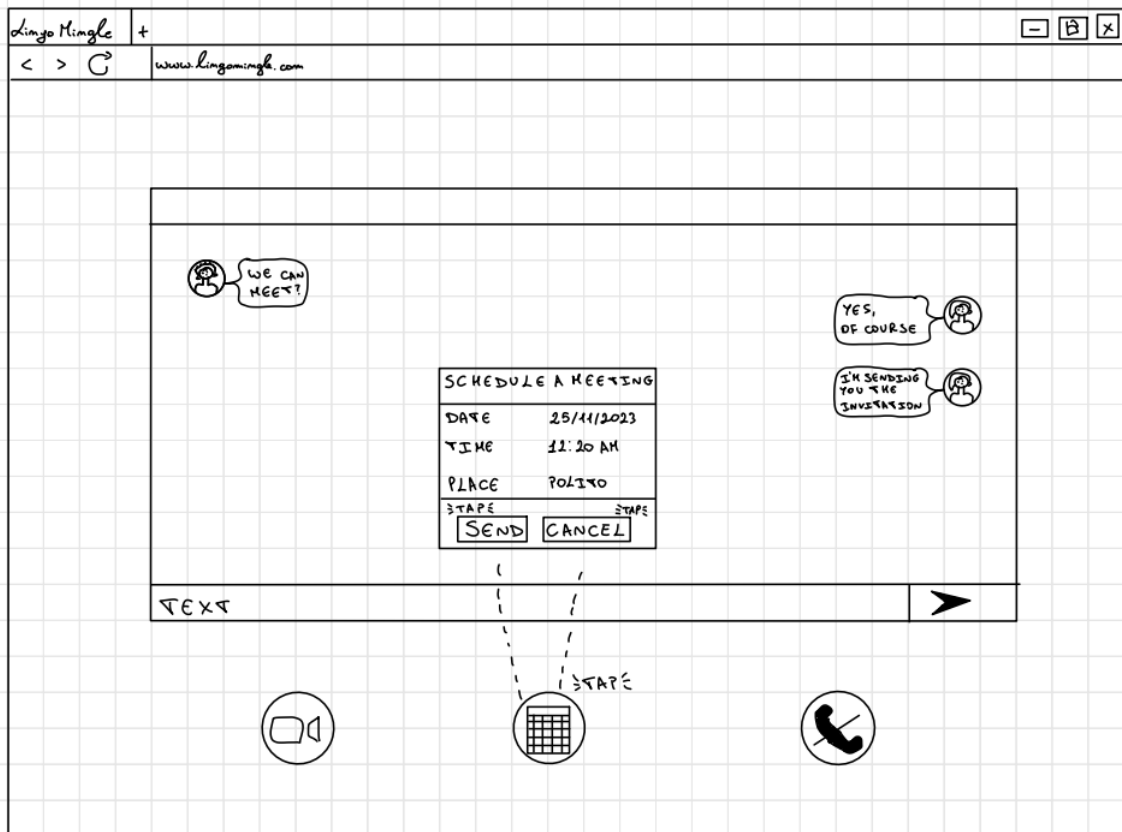
Screen 9

Connection with the storyboard

- Storyboard frame #2 is connected to prototype screens #1 and #2
- Storyboard frame #3 is connected to prototype screens #3, #4, #5
- Storyboard frame #4, #5 is connected to prototype screen #6

Connection with the task

- The simple task is implemented by the screens #1, #2, #3, #4, #5, #6
- The moderate task is implemented by the screen #6
- The moderate task is implemented by the screens #4, #7, #8, #9

Link to High Level flow diagram

- [Link to Desktop LoFi Prototype](#)
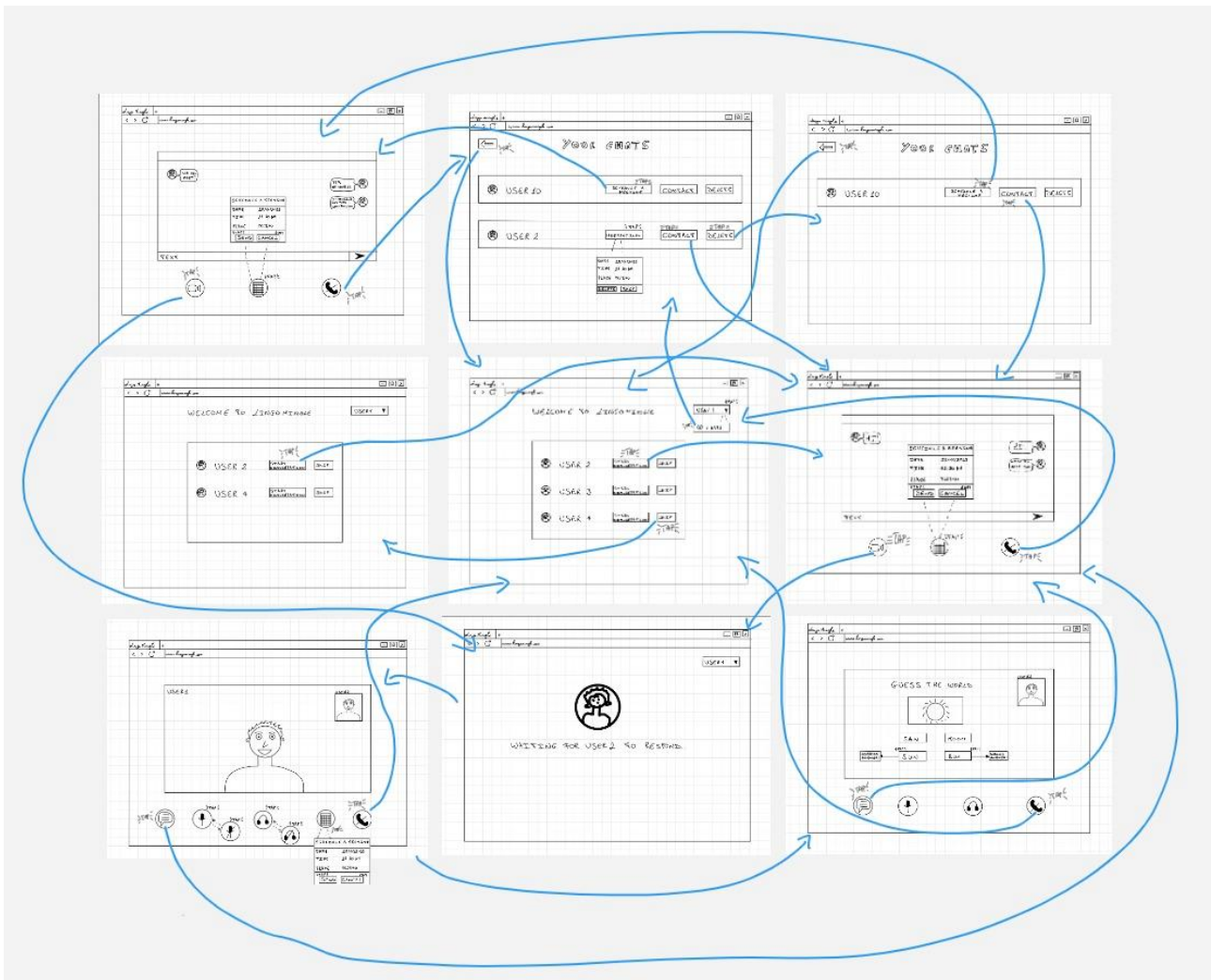
Heuristic Evaluations

To conduct the heuristic evaluation, each of the two subgroups printed their prototype on paper to have it evaluated during lab hours.

For each evaluation, the facilitator introduced the context of the prototype to the evaluator, explained what the solution consisted of, and explained what tasks were to be performed. The student acting as a computer merely presented the individual sheets of paper of the prototype after the evaluator performed an action.

We received a total of 5 heuristic evaluations for our propotypes, 2 for Mobile prototype 3 for Desktop prototype.

Heuristic evaluations - Mobile prototypes

First Evaluation

- Vittorio acts as computer
- Marianna acts as facilitator.

Click Here to see the evaluation.

Second Evaluation

- Marianna acts as computer
- Vittorio acts as facilitator.

Click Here to see the evaluation.

Heuristic evaluations - Desktop prototypes

First Evaluation

- Luca acts as computer
- Salvo acts as facilitator.

Click Here to see the evaluation.

Second Evaluation

- Luca acts as computer
- Salvo acts as facilitator.

Click Here to see the evaluation.

Third Evaluation

- Salvo acts as computer
- Luca acts as facilitator.

Click Here to see the evaluation.

Heuristic evaluations – List of Violations

Desktop application prototype

1. **H4 Consistency and standard**

    Where: "Meeting info" button in "Your chats" page.

What: The app uses "Delete" both for deleting a contact from the page and to cancel a scheduled meeting.

Why: Same terminology for different functions in the application, causing confusion.

Severity: 2

2. ***H3 User control and freedom***

    Where: "Conversation" page

    What: No button to start an audio conversation, only chat or video-chat available.

    Why: Useful for users wanting more than a simple chat but not a video call.

    Severity: 3

3. ***H4 Consistency and standards***

    Where: "Your Chats" page

    What: Dropdown menu from Homepage has a generic button "Chats," pointing to "Your Chats" page.

    Why: Lack of consistency, may confuse users.

    Severity: 2

4. ***H4 Consistency and standards***

    Where: "Your Chats" page

    What: Using "Your Chats" to refer to a collection of previously encountered contacts.

    Why: Confusing terminology, doesn't accurately describe the function.

    Severity: 3

5. ***H1 Visibility of system status***

    Where: "Conversation" page

    What: No time counter to track the conversation's duration.

    Why: Helpful for setting time goals or being informed about the call duration.

    Severity: 2

6. ***H1 Visibility of system status***

    Where: "Conversation" page

    What: Ice-breaker game appears unexpectedly during conversations.

    Why: Users aren't informed about the need to maintain conversation engagement.

    Severity: 2

7. ***H5 Error prevention***

Where: Ice-breaker game in "Conversation" page

What: Ice-breaker game assumes users are on a video call.

Why: Functionality breakdown if users switch to chat, unable to return to the game.

Severity: 4

8. **H7 Flexibility and efficiency of use**

    Where: "Schedule a meeting" button in "Your chats" page

    What: Initiates a chat instead of directly sending a meeting request.

    Why: Lengthens scheduling process, redundant button.

    Severity: 3

9. **H7 Flexibility and efficiency of use**

    Where: Homepage

    What: No button to refresh the list of users, only a "Skip" button for each user.

    Why: Inconvenient process to refresh, requiring browser refresh.

    Severity: 2

10. **H1 Visibility of system status**

    Where: "Conversation" page

    What: No feedback after scheduling a meeting.

    Why: Lacks confirmation for successful meeting scheduling within the conversation.

    Severity: 2

11. **H5 Error prevention**

    Where: "Delete" button in "Your Chats" page

    What: No confirmation before deleting a user, leading to potential loss.

    Why: The user could press the button by mistake and it would be more correct to have a way to prevent them from making mistakes also random matching increases the risk of unintentional user removal.

    Severity: 3

12. **H5 Error prevention**

    Where: "Schedule a meeting" process

    What: No prevention for sending requests with wrong or missing fields.

    Why: Risks sending erroneous meeting requests due to lack of validation,To solve them, the users should open a chat and recover from the errors and clarify the right information of the meeting, which is more time and effort consuming.

Severity: 2

13. ***H7 Flexibility and efficiency of use***

    Where: Homepage

    What: Missing shortcut for accessing a page with scheduled meetings.

    Why: Inconvenient process to check scheduled meetings individually.

    Severity: 2

14. ***H10 Help and documentation***

    Where: Design

    What: App design lacks guidance and hints for first-time users.

    Why: Confusing experience without adequate user guidance.

    Severity: 2

15. ***H10 Help and documentation***

    Where: Buttons

    What: Some buttons lack labels or clear descriptions.

    Why: Users need to discover button functionalities without clear captions.

    Severity: 2

16. ***H9 Help user recognize, diagnose, and recover from errors***

    Where: "Icebreaker" game

    What: No recovery or encouragement if users don't respond.

    Why: Lack of engagement if users don't participate in the game.

    Severity: 2

17. ***H4 Consistency and standards***

    Where: "Chat" button on the conversation screen.

    What: Clicking the button during a video call stops video and switches to text conversation.

    Why: Inconsistent functionality, could be confusing for users.

    Severity: 3

18. ***H7 Flexibility and efficiency of use***

    Where: "Your Chats".

    What: No shortcut to start a video call with a user directly.

    Why: Inconvenient process for initiating video calls.

Severity: 1

19. ***H1 Visibility of system status***

   Where: "Your Chats".

   What: No feedback after two users meet on a scheduled meeting.

   Why: Lacks information on scheduled meetings' outcomes.

   Severity: 2

20. ***H1 Visibility of system status***

   Where: Homepage.

   What: No indicator for the user's current language level.

   Why: Useful for tracking language progress and matching users.

   Severity: 1

21. ***H5 Error prevention***

   Where: Skip button in homepage, landing view.

   What: When you press "Skip," the user is automatically deleted without showing a confirmation option asking the user if they are sure they want to delete that selected chat.

   Why: The user could press the button by mistake and it would be more correct to have a way to prevent them from making mistakes. There is no way to recover from this error and chat with that user.

   Severity: 3

22. ***H7 Flexibility and efficiency of use***

   Where: Throughout the whole web application prototype.

   What: A navbar is missing.

   Why: There is no way to go to a page from another page. For example, if I am in the "Your chats" view or in a text chat with a user, I cannot go back to the homepage to perform other actions, apart from clicking on the back button in the browser tab, the navigation of the website is not efficient.

   Severity: 4

23. ***H3 Aesthetic and minimalist design***

   Where: Dropdown selection in the welcome page.

   What: The dropdown, when clicked, displays only the Chats option.

   Why: It is not clever to use a dropdown feature with just one option to be clicked, as it adds overhead for no reason and with no advantage. In this way, if the user wants to navigate to the Chat view, they will have to click two times, whereas it would be sufficient to add a singular button and make the user click one time only.

Severity: 1

24. ***H4 Consistency and standards***

    Where: Button with crossed out telephone in chat interface and video call interface.

    What: The button rendered is the same but it has two different meanings in each of the two pages.

    Why: It doesn't comply with consistency in a layout. The user could be disorientated to use the same button for different purposes.

    Severity: 2

25. ***H2 Match between system and the real world***

    Where: Chat/text interface

    What: Button with crossed out telephone with a different meaning than what a user is familiar with.

    Why: The real-world conventions would suggest that a crossed out telephone is used to exit a video or voice call. In this case, it is used to just exit a text conversation. A button showing an "X" would be more familiar for a user for the purpose.

    Severity: 3

26. ***H1 Visibility of system status***

    Where: Every time "Schedule a meeting" button is rendered and every time we perform the task of scheduling a meeting

    What: Once the meeting is accepted, I don't see a recap of the meeting I have just scheduled, with date, time, and place information.

    Why: It doesn't show the user what will happen after they send the invitation for an in-presence meeting. In this way, the user doesn't know when a task has been finalized.

    Severity: 3

27. ***H3 User control and freedom***

    Where: Landing page rendered when you video call a user and wait for them to respond.

    What: Exit/Back/Undo button is missing.

    Why: A user could have pressed the video call button by mistake and should be able to have an "emergency exit" before the other person gets on the call. Otherwise, the user should wait for the other to respond and only after they can click on the crossed out telephone button to leave the call.

    Severity: 3

28. ***HN Non-heuristic issue***

    Where: When the user is chatting with another one and an ice breaker game starts playing

    What: Mute/unmute microphone and activate/deactivate audio buttons are rendered even if users are not on a video call.

Why: There is no point in having those rendered in a chat mode.

Severity: 3

29. ***H3 User control freedom***

Where: "Your chats" view

What: When you press delete, the chat is automatically deleted and there is no way to go back to the previous state with the chat still present in the view

Why: The user could press the button by mistake and there should be a history dialogue where you can recover previously deleted chats and undo operations.

Severity: 3

30. ***H4 Consistency and standards***

Where: Message button displayed when you are in a video call

What: The message button is used to close the call and go back to the text chat. The crossed telephone button is used to close the call too.

Why: The two different buttons, displayed even in the same page, do the same thing. 45

Severity: 4

31. ***H1 Visibility of system status***

Where: Inside the page of the chat for scheduling a meeting.

What: The page for scheduling a meeting is equal to the page of the regular chat, without any description that explains the difference.

Why: The user may think that it is in the regular chat page and may be confused.

Severity: 3

Mobile application prototype

1. ***H1 Visibility of system status***

Where: Homepage

What: The app does not show what language the user is trying to learn or the user's language level.

Why: If the user is using the app to learn more than one language, he/she must see which language is being referred to and the respective level, otherwise he/she may mistakenly initiate a video call for another language in which he/she is not currently interested.

Severity: 2

2. ***H1 Visibility of system status***

Where: Chat

What: It is unclear whether the video call is still active or I have switched to a chat-only communication.

Why: It is unclear if the two users still have their cams and microphones on or if the conversation has become text-only.

Severity: 3

3. ***H1 Visibility of system status***

   Where: Videocall

   What: Mini-game that starts after 60 seconds of silence

   Why: After 60 seconds of silence, one of the two available mini-games is started but without any warning to the user. In fact, there is nothing in the screen to let the user know what is about to happen.

   Severity: 3

4. ***H3 User control and freedom***

   Where: Chat

   What: The user cannot edit previously posted messages

   Why: Users cannot edit any errors but must send another message with the correction

   Severity: 2

5. ***H3 User control and freedom***

   Where: Scheduled Invitations

   What: The user cannot edit/delete scheduled invitations

   Why: Lack of flexibility due to the absence of edit and delete buttons.

   Severity: 3

6. ***H3 User control and freedom***

   Where: Friends list

   What: The user can't delete a friend from the list.

   Why: Lack of flexibility due to the absence of delete button.

   Severity: 3

7. ***H3 User control and freedom***

   Where: Video call screen

   What: There aren't buttons to stop microphone or webcam

   Why: The user cannot control the microphone and webcam, being forced to have to close the call if he wants to protect his privacy

   Severity: 4

8. ***H4 Consistency and standards***

   Where: Video call screen

   What: The position of "New Argument" and "Sing together" is reversed from the other screens

   Why: The user could make a mistake in choosing by starting a different feature, since the positions have been reversed

   Severity: 2

9. ***H4 Consistency and standards***

   Where: New Argument

   What: The arrow pointing down to show the suggestions

   Why: It would be more intuitive for the user to call it "Show suggestions"

   Severity: 2

10. ***H4 Consistency and standards***

    Where: New Argument

    What: The arrow pointing down when a suggestion is already shown

    Why: it would be more intuitive for the user to call it "Hide suggestion" or at least replace it with an arrow pointing upward

    Severity: 2

11. ***H4 Consistency and standards***

    Where: Pop up to start a new video call

    What: The "Continue" label

    Why: The label could be replaced by "Connect me" to have a more consistent meaning

    Severity: 2

12. ***H4*** Consistency and standards

    Where: Pop up to Add a new friend

    What: Labels √ and X

    Why: The labels could be replaced by "Add" and "Don't add" to have a more consistent meaning

    Severity: 1

13. ***H5 Error prevention***

    Where: In all screens where there are box for data entry

    What: Screens for data entry

Why: In the prototype there were no screens for entering, such as date and place ecc. Instead of placeholders, user-entered data were already present, so an evaluation for Error Prevention couldn't be done (for example, if the submit button is initially disabled or other solutions to prevent errors).

Severity: 3

14. **H7 Flexibility and Efficiency of use**

    Where: Friends list

    What: The user can't filter or order the list

    Why: would give the user an "extra path" in addition to the user search by specifying the name via the search bar

    Severity: 2

15. **H9 Help user recognize, diagnose and recover from errors**

    Where: Sing together (specifically in the completion of the song)

    What: The app asks the user to complete a song with the missing word but it doesn't give feedback to the user if an incorrect word is entered

    Why: It is a lack of clarity toward the action the user has just taken. The user may be confused about what to do next

    Severity: 2

16. **H9 Help user recognize, diagnose and recover from errors**

    Where: In all screens where there are box for data entry

    What: Screens for data entry

    Why: In the prototype there aren't error messages in case of an incorrect entry, so the user is not helped in recovery

    Severity: 2

17. **H1 Visibility of system status**

    Where: Closing a video call

    What: The user presses the button with the handset symbol and the video call ends instantly.

    Why: In order to always keep users informed about what is going on, the application should send a feedback of the action that it is about to perform, as it could execute actions that do not correspond to the real will of the user.

    Severity: 2

18. **H3 User control and freedom**

    Where: Start video call button.

    What: Missing a clarification of who I start a video call with

Why: It might be useful for the user to know that pressing the button will start a video camera with a random user.

Severity: 1

19. **H3 User control and freedom**

Where: During the game "new argument"

What: Impossibility to change a question made from the app.

Why: Maybe the user might want the possibility to change the question made by another one by replacing it by pressing a "regenerate" button so that a new one can appear.

Severity: 1

20. **H4 Consistency and standards**

Where: Friends option

What: Is that only a list? Or can I press on my friends icon?

Why: This can create confusion.

Severity: 2

21. **H7 Flexibility and efficiency of use**

Where: Last users contacted

What: Missing chat option

Why: The user might want to contact the user without necessarily starting a video call. The options currently available are "Add to your friends" and "Start a video call"

Severity: 2

22. **H10 Help and documentation**

Where: not found

What: There is not an help documentation

Why: Can be useful help documentation that can be used from the user to better understand how this application works.

Severity: 1

Selection

We select the prototype for the mobile application because, analyzing the reports received and violations found, we believe it to be more powerful and with easily resolved violations.

We also believe that compared to a desktop application, the mobile application is more useful and immediate to use since nowadays most people always have a cell phone with them.

We decided to import from the other prototype the "guess the word" game, which turned out to be easy and intuitive for learning, by inserting a new button with playing dice that opens a menu that allows the user to have more choices about games and select a favorite. We also imported options to turn off and on the microphone and camera during the video call via two buttons having respective icons that also resolve the violation with higher severity that we received.

6.Medium to High-Fidelity Prototype

Tool

To make the Medium Prototype of the two required pages, we have decided to use Figma. It is a collaborative interface design tool used for creating, prototyping, and sharing user interface designs and interactive prototypes.

We decided to represent these two screens as they are the main point of our solution. In fact, the first screen represents the videocall, which in addition to being the actual heart of the application shows the integration of some solutions that were reported to us during the heuristic evaluation, such as the integration of buttons to enable and disable the camera and microphone. The second screenshot, on the other hand, shows the addition that was taken from Desktop Prototype, namely the addition of the new game "Adivina la palabra." More frames have been added that show the actual continuation of the game.

Link to Figma Medium Prototype

Click Here to see the prototype

Plan for the Hi-Fi Prototype

- **Violation #1** will be resolved by adding a section in the settings that allows the user to view and change the language they are learning and its level.

- **Violations #2 and #3** we will add a pop-up in the relevant screens that gives the user information about the status of the system, specifically for #2 a pop-up that says "in call" and for #3 an alert with useful information about the start of the game.

- **Violation #4** will be addressed by adding a way in the chat to edit a message that has already been sent.

- **Violation #5** we will add two buttons next to each scheduled invitation that will allow, one to delete and the other to edit the invitation.

- *Violation #6* as in the one above, we plan to insert next to each friend a button that allows me to remove them from the list.

- *Violation #9* we will change the arrow icon to a light bulb, which we think better indicates the concept of "Suggestion".

- *Violation #10* we will add a button to close the suggestions pop-up.

- *Violation #11* was solved as suggested by colleague, that is, by changing the label from "continue" to "connect me."

- *Violation #12* we decided to use "V" for all affirmative responses and "X" for negative, they will then stand for accept and reject. We will then modify the screen for sending the invitation where these two buttons will be replaced with "send" and "back" buttons.

- *Violation #13* we think does not exist because the example in the prototype paper was precompiled, but the form will obviously be user-compilable with all mandatory fields and there will be handling of any errors and suggestion to fix them.

- *Violation #14* we think is not useful to solve because there is already a bar that allows to search for friends by name and in the home there are shortcuts that allow to see the last contacted friends to reach them more easily.

- *Violation #15* we will insert a pop-up that immediately after submitting one's response tells the user whether the word entered is correct or incorrect.

- *Violation #16* as mentioned earlier, in the prototype paper we used pre-filled examples but in the app all forms that will require text entry will be properly handled by preventing and handling any errors by supporting the user with clear information.

- *Violation #17* we believe is not really a violation because the call termination symbol is a universally known symbol that cannot create misunderstandings, should the user mistakenly click on it by accidentally terminating the video call, he could retrieve the user he was talking to from the shortcut in the home.

- *Violation #18* we believe is partially correct since our application aims to connect users having the same native language and same level of knowledge of the new language being learned randomly between them, we decided to add in the pop app that notifies that you are about to be connected in video call the term "random user" instead of "another user".

- *Violation #19* we will add, as suggested by the colleague who did the evaluation, a "regenerate" button that will allow you to change the game question "new argument" and have other conversation cues.

- *Violation #20* we will add an icon, such as an arrow to the right , which will clarify the action to be taken

- *Violation #21* we think does not exist because the functionality expressed by our colleague is not contemplated in the functioning of our app since chat outside of viodeocall is an option exclusively for people who are already friends.

- *Violation #22* we will add a tutorial that explains the main sections of the app when the app is first started. It can also be repeated later

7.High-Fidelity Prototype

Tools, Frameworks and libraries

React Native

React Native is an open source framework developed by Meta for creating mobile applications using JavaScript and React. It allows developers to create cross-platform applications, such as for iOS and Android with a single code base, improving efficiency and reducing development time.

We used it to make the prototype more realistic and take advantage of the full potential of a real device.
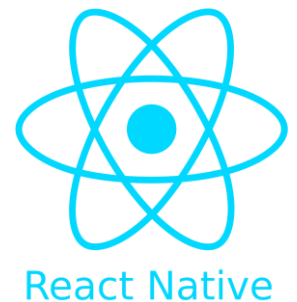
Firebase

Firebase is a comprehensive platform developed by Google that offers a wide range of services for building web and mobile applications. It provides features such as authentication, real-time database, cloud storage, hosting, and more, all as a unified backend solution.

We used it as a real backend to address our APIs, in addition it was used to manage the synchronicity of the whole application.

Get Stream

GetStream.io is a versatile platform offering various services, including a robust Video and Audio section. This feature provides developers with tools and APIs to integrate real-time video and audio communication functionalities into their applications effortlessly.

This is the framework we used to implement video calling in our application by allowing the various users to communicate. It provides basic components for the UI that have been modified by us to fit our needs.

React Native Vector Icons

React Native Vector Icons is a library that simplifies the integration of high-quality icons into React Native applications by eliminating dependence on static image assets. It supports a wide range of popular sets such as FontAwesome, Material Icons and Ionicons, offering developers an efficient way to visually enrich their apps with trendy and easily manageable vector icons.

Expo AV

Expo AV is a universal library included in the Expo mobile development framework that provides separate APIs for audio and video playback.

Link to GitHub repository

[Click here to see the full code](#)

Significant Screens

Among the screens that we think are most representative we definitely find the Home Page, which is our business card for the entire app, a point from which to perform different actions that immediately gives the user an overview about the different features and sections that he or she can find inside the app.

We believe that the three screens showing the list of friends, the chat and the modal for creating an invitation are also important because they reflect very interesting sections for the actions that users go on to take as they become familiar with the app and make progress in overcoming the shame of public speaking by establishing, first a friendship with a user and then a possible in-person meeting.
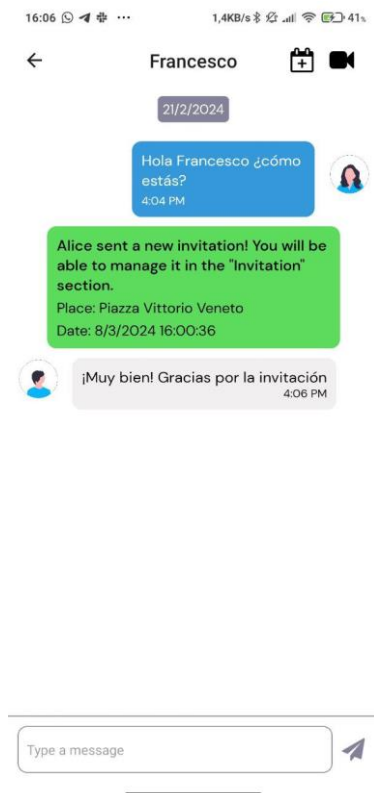
The other two screens that we couldn't fail to mention are definitely the video call screen, which is the main feature of our app, and the games screen, which are one of the most appreciated aspects that are fundamental to achieving the goals we want to achieve with this app.
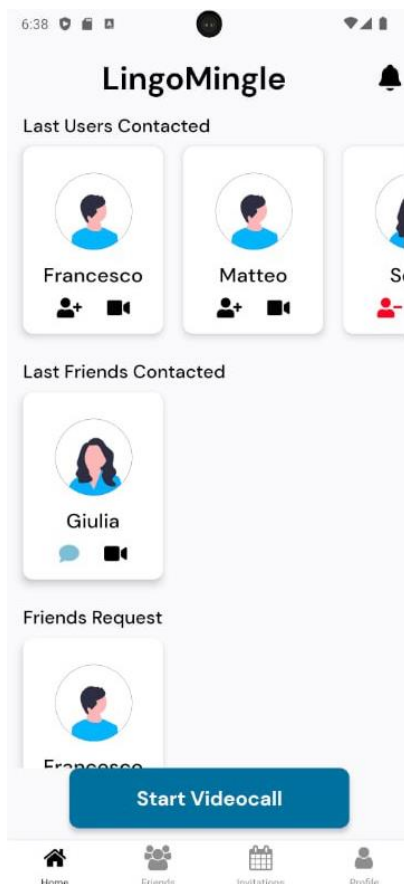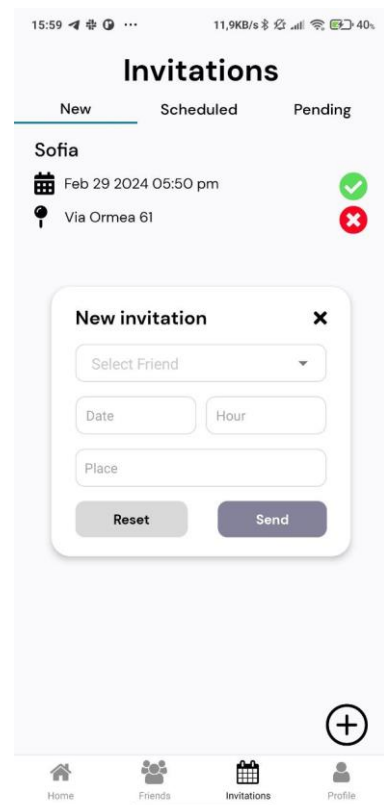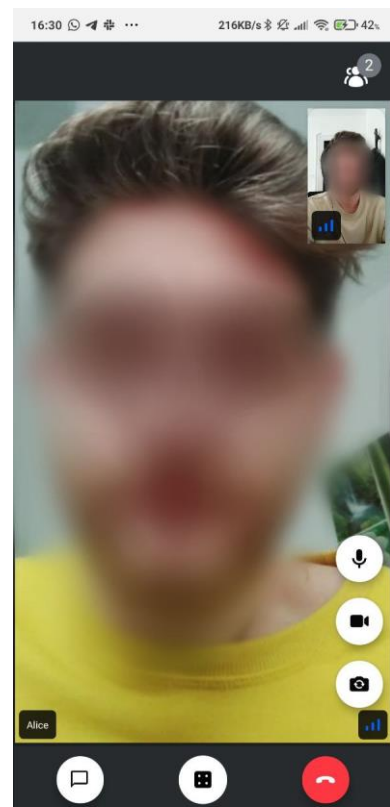

Home Page
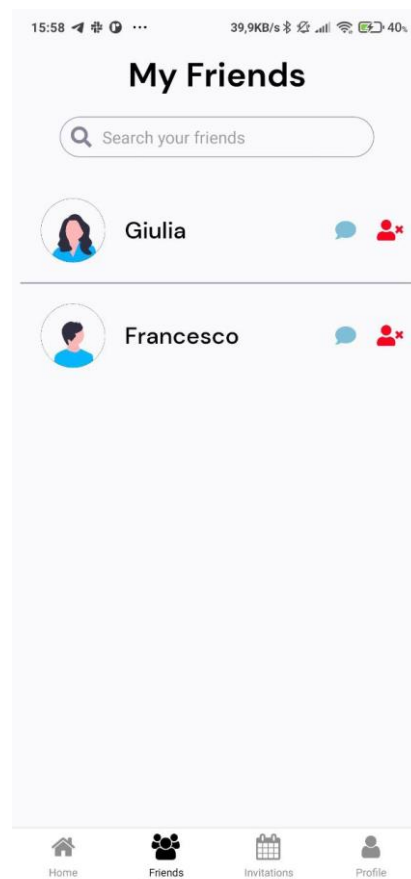
Friends List

Chat

Invitations form

Modal games

Video Call

Hard-Coded Part

Being a prototype, some parts of our project are hard-coded.

Of course, having implemented neither the registration nor the authentication phase, all user data with respective tokens used for authentication on Get Stream are saved in the application (Profile section) and used via a context.

In addition, some features involving video calls are also hard coded:

- Matching between users is done simply by creating a static room id, where anyone who clicks the button on the home page is redirected to the same room. This is also the reason why only users with the same foreign language level and native language are present in the application.
- The game modal that pops up when a stall is detected was handled simply by a 30-second timer. For the time being, the 30-second timer starts when the user turns off the microphone, thus simulating failure to detect audio input.
- All game information is saved on the application, while only the correct answers are on firebase; this allows us to implement a kind of synchrony between the two users during the game

8.Usability Testing

Preparation and Run

Roles

Usability Test 1

- Vittorio will be the facilitator.
- Marianna will be the observer.

Usability Test 2

- Marianna will be the facilitator.
- Vittorio will be the observer.

Usability Test 3

- Salvatore will be the facilitator.
- Luca will be the observer.

Usability Test 4

- Luca will be the facilitator.
- Salvatore will be the observer.

Participants

Target Population: Young adults interested in learning a new language.

Participant 1:

- General information: Medical student
- Age: 23
- Experience in using mobile apps: Medium.
- Experience in studying foreign languages: Basic.

Participant 2:

- General information: Student worker who develops iOS app.
- Age: 25
- Experience in using mobile apps: Expert.
- Experience in studying foreign languages: Medium.

Participant 3:

- General information: Psychology student working in school as an educator.
- Age: 27
- Experience in using mobile apps: Expert.
- Experience in studying foreign languages: Medium.

Participant 4:

- General information: University researcher Psychology.
- Age:27
- Experience in using mobile apps: Medium.
- Experience in studying foreign languages: Medium.

Equipment

- Mobile Phone.
- Internet Connection.
- Tablet for notes.
- Microphone for recording.
- Camera for pictures.

Requirements

- Consent for use of cell phone camera and microphone.
- Application installed on the mobile phone.

Artifacts

- Informed consent form.
- Post-test questionnaire.

Tasks

#	Text of the task	Success criteria	Methodology
T1	Make a conversation with a random user	The application puts the participant in communication via videocall with another user	
T2	Try suggested games during the conversation	The application gives the user positive feedback after entering a response	Cooperative Evaluation
T3	Reconnect with a user you have talked to	The participant tries to re-contact the desired user via shortcut on the homepage	
T4	Establish a friendship with another user	The participant accepts or sends a friend request in the appropriate section	
T5	Texting with a friend	The application shows the chat with the desired user	
T6	Send an invitation to a friend	The application notifies the participant that the invitation has been successfully sent	
T7	Manage an invitation that was sent to you by another user	The participant accepts or declines an invitation via appropriate buttons	

Metrics

- Successful task completion.
- Number of errors (non-critical)

Links

- [Click here to see the testing protocol.](#)
- [Click here to see the consent form template.](#)
- [Click here to see the post questionnaire template.](#)

Results

Usability test 1

METRICS

	Task 1	Task 2	Task 3	Task 4	Task 5	Task 6	Task 7
Successful task completion	Y	Y	Y	Y	Y	Y	Y
Non-critical errors	/	When she tried the game "Nuevo Tema " did not immediately individuate the "i" symbol to get information	/	/	/	She was still in the chat when she tried to send the invitation to his friend, he had not realized that the calendar icon was for scheduling an in-person meeting but for scheduling a videocall	/

Questions regarding Task 2

- Which of the three games did you choose?
  "I tried all three games as I was intrigued by the various options"

- Did it seem easy and intuitive for you to carry out?
  "Yes, especially the first and third, for the second one I had a hard time guessing the word"

- Did you find it instructive enough??
  "Yes, all three are very useful for learning new words"

- Did it help you carry on the conversation?
  "Particularly the third one that gives you cues to talk about, the other two I like but I don't know how useful they are during a video call"

Debriefing

1)What do you like in the app?

"Overall I liked it, I think it is very useful and fun to use"

2)What do you not like in the app?

"I didn't like the calendar icon in chat, it doesn't make it clear that it gives the option to schedule an in-person meeting. In general, the name "Invitation" seems too general to me. I also find it strange that I have to schedule an in-person meeting, they usually schedule meetings online"

3) what would you improve in the app?

"I would give the option to play the games on your own as well, maybe at that moment you don't feel like talking to someone but would like to practice one of the three games"

Usability test 2
METRICS

	Task 1	Task 2	Task 3	Task 4	Task 5	Task 6	Task 7
Successful task completion	Y	Y	Y	Y	Y	Y	Y
Non-critical errors	He first clicked on the invitation tab	/	/	/	/	/	/

Questions regarding Task 2

- Which of the three games did you choose?
  "I tried Nuevo Tema"

- Did it seem easy and intuitive for you to carry out?
  "Yes, because the information provided before starting the game is very clear"

- Did you find it instructive enough?
  "Yes, I think this game helps you quite a bit in finding new words"

- Did it help you carry on the conversation?
  "Yes, I found the color theme very useful"

Debriefing

1)What do you like in the app?

"Simple and intuitive app to use. I appreciated the ability to perform the same actions from different points in the app. Great UI. Good choice of color palette, as they match each other making the experience pleasant"

2)What do you not like in the app?

"I can't find anything specific that I didn't really like, I simply thought that the button showing the number of participants in video chat also showed information about the user

3) what would you improve in the app?

"I suggest adding the functionality to send media to chat as well."

Usability test 3

METRICS

	Task 1	Task 2	Task 3	Task 4	Task 5	Task 6	Task 7
Successful task completion	Y	Y	Y	Y	Y	Y	Y
Non-critical errors	/	/	/	/	/	She did not immediately see the invitation section but went there directly from the chat, but once she asked if she could do it another way she went to the correct section	/

Questions regarding Task 2

- Which of the three games did you choose?
  "I tried only Adivina la palabra"

- Did it seem easy and intuitive for you to carry out?
  "Yes, the instructions were clear enough and maybe the games were too easy"

- Did you find it instructive enough??
  "Yes, they are the right middle ground between instructive and entertaining"

- Did it help you carry on the conversation?
  "Yes, they can be very useful"

Debriefing

1)What do you like in the app?

"I find the application very interesting, I like the especially the simple graphics. I personally have never seen a language learning app like this one"
2)What do you not like in the app?

"The games were too simple"

3) what would you improve in the app?

"I would suggest the addition of more challenging games"

Usability test 4
METRICS

	Task 1	Task 2	Task 3	Task 4	Task 5	Task 6	Task 7
Successful task completion	Y	Y	Y	Y	Y	Y	Y
Non-critical errors	/	Before he clicked the games icon he clicked the button to open the chat, she said that the button is not very intuitive	/	she first went to the "Friends" tab to look up the name of the person she had talked to, later returned to the home page by clicking the correct button	/	/	/

Questions regarding Task 2

- Which of the three games did you choose?
  "I tried Adivina la palabra and Cantemos Juntos"

- Did it seem easy and intuitive for you to carry out?
  "Yes, they were pretty easy to understand"

- Did you find it instructive enough??
  "Yes, you can learn some new word that can be useful also during the conversation"

- Did it help you carry on the conversation?
  "Yes, they can break the initial moment of embarrassment

Debriefing

1)What do you like in the app?

"I really liked the interface in general, very simple and quite intuitive. I also liked the fact that there is the possibility to connect with other users in different ways such as: videocall, chat, invitations. I also find it very interesting that you can send an invitation directly without having to contact the other person via instant messages."

2)What do you not like in the app?

"I don't like that there are so few types of games"

3) what would you improve in the app?

"As I said before I would add other kinds of games, maybe that you can do by yourself, but especially make them more difficult"

Results Post Questionnaire

Questions

Given these statements, rate them on a scale from 1 to 5, where1 corresponds to "completely disagree" and 5 "completely agree".

1. I think I would use this application to learn a new language.
2. I think this application helps overcome the embarrassment of speaking in public in the language that is being learned.
3. I think the application is easy to use.
4. I think I need more instructions to be able to use this app.
5. It was difficult to complete the required actions during the test.
6. I find it reassuring to be able to speak with random people because it makes me feel less embarrassed.
7. I find it useful to be able to schedule an in-person meeting.
8. I find it interesting and stimulating to have interactive games during the video call.
9. I think the application is not very instructive.
10. Overall, I am satisfied with this application.

Average post questionnaire data
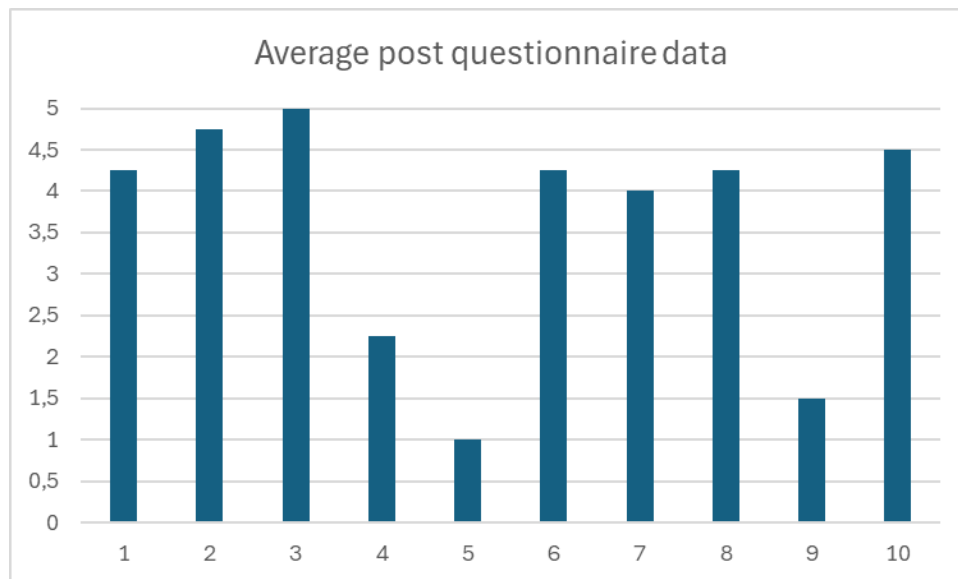
Photos

Discussion

From the results obtained during the usability test, we realized that in general the application is quite intuitive and easy to use by our target users. Nevertheless, from the data that emerged in the post questionnaire, we see that some sections, for example Invitation, require more clarity. This can be improved by including a short tutorial explaining the various sections of the application.

The application was also appreciated for the fact that many operations can be performed from different points in the application such as using the shortcuts present on the home page, which, being intuitive, allowed users who were approaching the application for the first time to quickly reach the different sections by completing tasks without any particular problems.

One of the users who tested the app thought that the button showing the number of participants in the video call might confuse the user and make him think that the video call might be multiple. Since the video call is always only between two people, we decided to remove this button immediately as it was misleading.

All users were able to interact with the games, finding them fun, instructive for acquiring new terms, and valuable aids for sustaining a conversation.

However, we received some criticism regarding their simplicity, this can be attributed to the fact that being a prototype we included only beginner users but in the final conception of the application the games would adapt to the level of knowledge the user enters during the registration phase.

Potential Changes

"I suggest adding the functionality to send media to chat as well."

One user then suggested to add the ability to send media in chat. Although this is not a fundamental feature for our application which aims to encourage users to interject to increase their confidence in the conversation, we believe that it can still be an added value that can be exploited for the sharing of material so that two users who have become friends can continue their language study together. We would therefore like to add a section in the chat next to the sending button that would allow media such as audio photos and videos to be attached.

"As I said before I would add other kinds of games, maybe that you can do by yourself, but specially make them more difficult"

"I would give the option to play the games on your own as well, maybe at that moment you don't feel like talking to someone but would like to practice one of the three games"

Given the high interest and appreciation of the interactive games section, most users expressed a desire to have a greater type of games and a dedicated section outside the video call so that they could use it independently at any time to improve their language and practice before a conversation. We thought this addition could be made by including a button in the bottom tab of the home page to access a section dedicated solely to the different types of games where the user can practice and keep track of improvements made.

9.Conclusions

Main Learnings

During this semester, by taking this course we have learned how to develop a product/application starting from what are the needs of a user, relative to a specific domain of interest.

This is precisely the thing that distinguishes this course from others , putting first the needs of the users who will actually be the potential users of the product.

In fact, this was probably the most difficult phase of the project , that is, going to understand what the actual needs of a user are and distinguishing them from superfluous ones.

On the other hand, it was also the interesting part; we could see how people with totally different cultural background highlighted similar needs when approaching a new language.

As we went on with the course, we learned to place importance on a simple and intuitive interface, discovering that there are real rules to follow to make the user be familiar with the application even if they have never tried it.

In addition, we also looked at the various stages of developing a product, seeing the various types of prototyping and testing, to go in and correct any errors without spending too many resources and time.

Regarding the development of the high-level prototype, we wanted to try our hand at using React Native, a technology that was "unknown" to most of us, but we wanted to use it anyway to develop a prototype as close as possible to a future product and to use the opportunity to learn something else new.

Finally, thanks to the usability test we saw how the perception of those who developed the application is very different from those who have never seen it before, this allowed us to understand what are the strengths of the product and instead what improvements can be made in the future.

Group Feedback

Throughout the course we worked together to complete the various assignments we were given.

Collaboration occurred in a respectful manner creating a pleasant and productive working environment throughout the course. Each of us provided our knowledge and ideas that were taken into consideration and utilized through a constructive discussion.

 The work was divided equally, dividing different tasks to be completed individually or in groups and then review and check the work all together.

Given the friendly atmosphere that was created, despite the different commitments, we managed to collaborate without having any particular discussions but by periodically comparing ourselves and making thoughtful choices, voting in the majority when a precise decision needed to be made in order not to create disguises and to make the work as efficient, pleasant and fair as possible.