

Visualization to enhance communication in Online Psychological Counselling



Master thesis

Integrated Product Design

Qixiu Zhang 5501849

Visualization to enhance communication in Online Psychological Counselling

Author

Qixiu Zhang

Master thesis

Delft University of Technology

MSc. Integrated Product Design

Faculty of Industrial Design Engineering

October 2023

Supervisory Team

Chair

Prof. dr. Catelijne van Middelkoop

Mentor

Ir. MC Havranek

Table of Content

Abstract	4		
1 Introduction	5	6 Final Design	52
1.1 Background	6	6.1 Requirements	53
1.2 Problem Statement	6	6.2 Self-expression tool	54
1.3 Aim	7	7 Prototype	63
1.4 Scope	7	7.1 Goal	64
1.5 Method	9	7.2 Speech emotion recognition on the clients' side	64
		7.3 Reflection page prototype	65
2 Literature Review	10	8 Evaluation of the final concept	66
2.1 Psychological counselling	11	8.1 Introduction	67
2.2 In-person counselling	11	8.2 Evaluation questions	67
2.3 Online Counselling	11	8.3 Procedure	68
2.4 Compare the in-person and online counselling	12	8.4 Results	69
2.5 The therapeutic alliance	12	8.5 Iteration	71
3 Context research	14	9 Conclusion	74
3.1 How can people get online counselling? - The current service provider	15	9.1 Design Process	75
3.2 Interview	18	9.2 Concept	75
3.3 Interview insights	22		
	25	10 Discussion	76
4 Design phases		10.1 Feasibility	77
4.1 Direction	26	10.2 Limitation	77
4.2 Inspiration	27	10.3 Future recommendation	78
4.3 Initial ideas	29	10.4 Reflection	79
4.4 Brainstorming session with people	31	Acknowledgement	79
5 Concept development	38	Reference	80
5.1 Design Vision	39	Appendix	82
5.2 Concept development	39		
5.3 Prototype & Evaluation	40		
5.4 Final concept generation	46		

Abstract

How to enhance communication between people is always an interesting topic in the design area. After going through the research, the author set the specific context for online counselling due to the increasing demand for online counselling during the COVID-19 pandemic. The online format limits a lot of non-verbal information like body language, vocal tones, facial expressions, and posture (Keynan et al.) that is only available in face-to-face communication.

This limitation is critical as counselling clients have broad expectations for assistance in various life aspects (emotional, social, vocational, educational, and physical) (American Psychological Association, 2008) and the effectiveness of counselling hinges on the relationship and trust between the counsellor and the client, making effective communication especially vital in the online counselling environment.

The current online counselling service providers were studied to understand how people access relevant services. After conducting interviews with clients and counsellors experienced in both online and in-person counselling, it became evident that there were notable differences in the counselling process phases: before, during, and after the session. The during-session and after-session phases were selected for focused attention since the during-session is vital for communication between the parties, and the client requires a mental shift to effectively transition from this phase after the counselling.

Following the creative sessions and initial testing, the design vision was established: enhancing interactivity and connection in online counselling by augmenting sensory perception between the client and the counsellor.

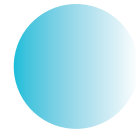
A system for monitoring and generating content assisted by artificial intelligence was conceptualized. The system could monitor the client's emotion and convey it to the counsellor, use the generated content to improve review and reflect activity, and help them better foster interaction and connection between the involved parties. The envisioned system aims to:

1. Enhance the client's perception of self-emotions and counsellor's engagement
2. Deepen the counsellor's understanding of the client's emotions, reduce their workload and improve engagement
3. Provide effective session reflection for the client, a unique advantage of the online system.

The feasibility and limitations were analyzed in terms of the emotion recognition technology and ethical issues. This concept could be integrated with current online video platforms or online counselling service websites, and the design of this work could provide valuable insights and opportunities to enhance the entire online counselling process and potentially extend its benefits to other online communication environments.



I Introduction



The title of the graduation report, "Visualization to Enhance Communication in Online Psychological Counselling," will provoke some questions among readers. These questions are for example:

What is online psychological counselling?

Why does a communication challenge arise in the context of online counselling?

How can visualization be defined, and what role does it play in addressing this issue?

In the introduction chapter, it will explain the background that prompted the project and the problem statement. Additionally, the aim of this project and the approach to be applied will also be introduced.

1.1 Background

With the development of society, the value individuals attribute to their mental well-being has been appreciated. At the same time, counselling services have gained significant attention, providing individuals with a platform to seek assistance from a wide range of areas including emotional, social, occupational, educational, and physical dimensions across the entirety of their lives. This awareness emphasizes the growing significance of seeking guidance from counselling on different aspects to promote comprehensive and sustained well-being.

Typically, this type of counselling is conducted in a face-to-face manner, where individuals seeking help can engage in personal and emotional discussions with a trained mental health professional, such as a licensed counsellor or psychologist. Beyond those who experience mental health problems, many individuals also seek counselling for issues related to life and emotions, making this experience quite common.

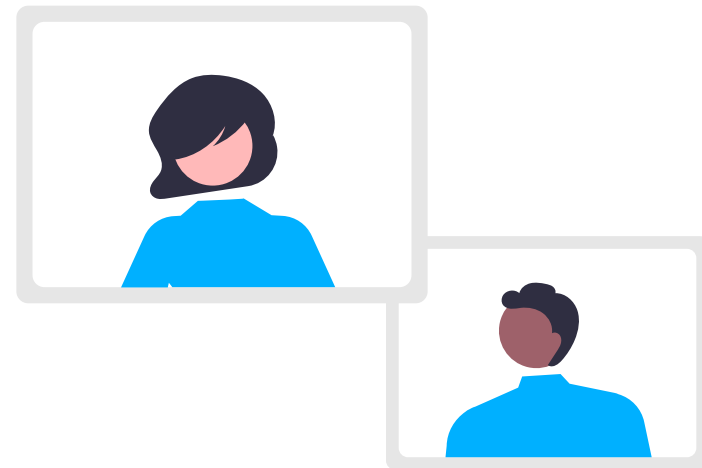
Although typical counselling is offered in the format in-person, some certain situations can necessitate online counselling. During the Covid-19 outbreak, mental health issues such as anxiety and depression increased by 20-30% compared to the prior period (Wang et al., 2020). Together with lockdown restrictions, 85% of counselling sessions were conducted through online platforms in May 2020 in America (American Psychiatric Association, 2020). In addition to this, there are other demands, such as using online counselling to gain remote access to a native-speaking counsellor in a different country who shares the same cultural background and understanding, or the individual already has a trusted counsellor but they are far apart, etc.

Nowadays, online counselling is regarded by many researchers as a novel, flexible way with the potential to enhance and complement other therapy methods (Harrad & Banks).

1.2 Problem Statement

What's the communication problem with the online counselling process?

Within the limitations of remote online counselling, people cannot communicate as well as in in-person counselling, especially when it relates to conveying empathy and expressing emotions. This is because, during face-to-face communication, emotions are expressed verbally and visually through body language, vocal tones, facial expressions, and posture (Keynan et al.) while not all of the communication's details are entirely displayed on the screen during the counselling. This inadequate communication cannot be helpful in establishing the therapeutic alliance between client and counsellor, which is an important factor in determining the success of therapy (Smith & Gillon, 2021) thus affecting the results of the counselling. Therefore, this project seeks to improve communication and emotional conveyance between clients receiving psychological counselling online and the counsellors providing it. It does this by using visualization methods to enhance the communication experience for the clients.



1.3 Aim

The aim of this project is to:

use visualization techniques to bridge the gap between online and in-person counselling and enhance the online counselling experience, especially emotional conveyance.

To accomplish this aim, the design process will go deep into:

Investigating the way clients and counsellors engage within the context of online and in-person counselling. This research will also emphasize contrasting differences between these two formats, with a particular focus on the disadvantage associated with online communication.

Drawing from the insights derived from the research, ideating innovative concepts that effectively enhance the communication experience. These concepts will then undergo testing to ensure their efficacy in improving the quality of communication and emotional connection.

By systematically following these steps, the project intends to bridge the gaps in online communication in the counselling domain and improve the overall experience for clients and counsellors.

1.4 Scope of the Design

Due to the time limitations of the graduation project (100 days), it is important to define the research scope and focus.

The context of this project

Since online counselling incorporates a variety of media, such as text, phone calls, and videos, to avoid subsequent misunderstandings and conduct the research and analysis in the most efficient way, this design will focus on the field of online counselling, primarily real-time counselling via video platforms. Detailed context research will be carried out in the following Chapter (chapter 3), including the basic model of this kind of service and the experience of both clients and counsellors from the interviews.

Focus on the communication process and experience

Counselling is a complex process. People seeking counselling have different situations and needs, therefore the problems and expressions they bring have a great deal of variability, requiring the counsellor to respond to the specific situation on different needs. And there are many different styles of counselling treatments, counsellors use their treatments also based on their personal style.

There are also wide variables in transferring these situations to the online mode, it is not possible to define the scope of the study as a particular type of mental health problem (e.g., depression or anxiety) or a particular type of treatment modality (e.g., Cognitive Behaviour Therapy).

In this context, the design's primary focus is the client-counsellor communication process. The study tries to research whether the online format influences their experience of communication, emotion conveyance, and overall connection. By diving into these questions, the design aims to uncover insights that can significantly impact the online counselling experience.

Using visualization tool

In the existing psychological and emotional design, people tend to think of tools such as relieving products. However, this design focuses on the experience of the video counselling process, and the design will be completed through visual tools, without incorporating any accompanying physical products. Furthermore, during the research phase, users will be only asked about their conversation process and observation feelings.

Target group

In the context of online counselling, two involved groups emerged: clients and counsellors. However, the specific focus of this design is the client. This decision is based on several reasons. Firstly, counsellors typically get specialized training, making them easier to comprehend and adapt to the online format.

On the contrary, clients usually turn to online counselling when having some confusion and uncertainties in their lives, seeking a way to enhance their mental well-being, therefore necessitating an enhanced counselling experience. This design seeks to cater to the requirements of clients, augmenting their online counselling journey for improved outcomes.

1.5 Approach

As shown in Figure 1.1, the Double Diamond design thinking process (Elmansy et al., 2023) is being used in this project.

This design methodology divides the entire design process into four phases.

The initial **discovery** phase involves comprehensive research conducted within the project's context. This includes literature exploration, the examination of existing models, and interviews conducted with both clients and counsellors.

Secondly, in the **definition** phase, the outcomes of the research are summarised into a journey map and storyline. These insights can be used to generate diverse design directions.

Building on this, a lot of design ideations are **developed**. Throughout this process, the design vision becomes more refined, aligning with the

ideations. Then selection and testing of these ideations result in iterations that further help to adjust the concepts.

Finally, the evaluated and refined concept is ultimately **delivered**.

By following the Double Diamond design thinking process, this project aims to ensure a systematic and holistic approach to the entire design journey, fostering robust and well-informed results.

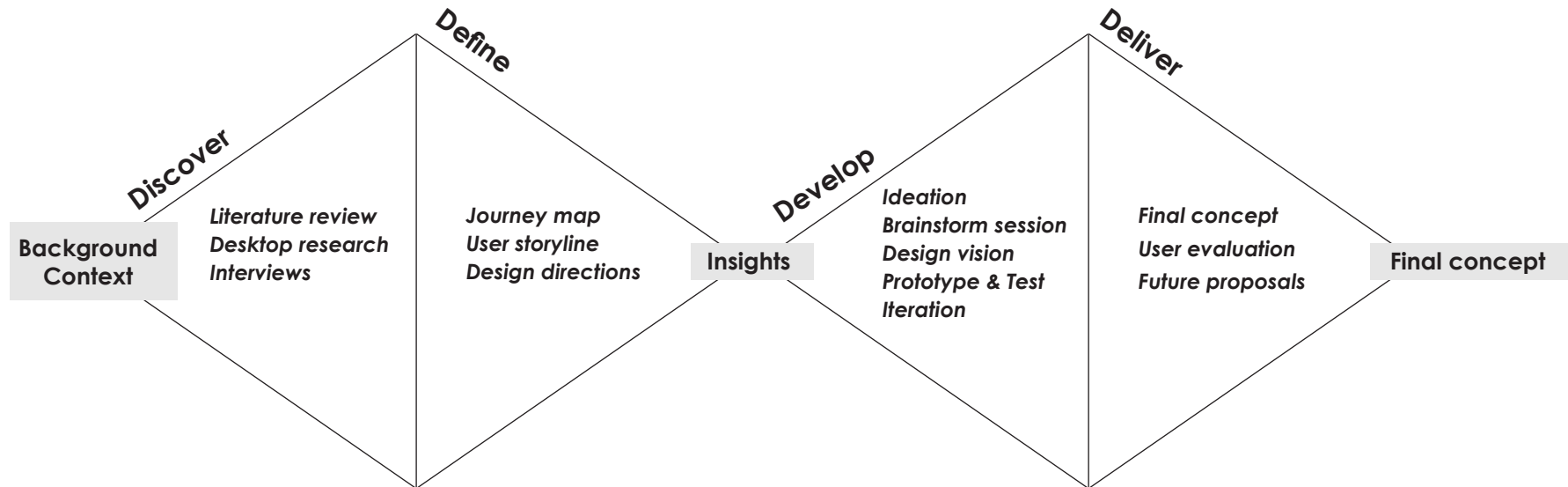


Figure 1.1. The Double Diamond design thinking process

2.1 Psychological counselling

Professional counselling entails a form of talk therapy conducted between trained counsellors and clients. It takes place in a secure and confidential environment, with the primary objective of enhancing mental health and overall well-being. This therapeutic approach also aims to foster self-understanding and effectively address recognized problems. Throughout the counselling process, clients are actively engaged, playing an integral role at each stage of their journey (What Is Psychological Counselling? – Institute of Mental Health (IMH), n.d.).

Counselling can provide valuable support for clients dealing with a range of challenges like depression and anxiety. It is also effective in assisting individuals with physical conditions like infertility, navigating through demanding life events such as relationship breakups or high-stress careers, managing challenging emotions, and addressing various difficulties including matters related to sexual identity. (NHS, 2021).

The concept of "counselling" has been used to describe a wide range of procedures, including giving advice, aiding when needed, encouraging, sharing information, and interpreting test results. (Adoga, 2020)

There are many different therapeutic approaches available, often related to the counsellor's training and the client's specific situation. Some common approaches are listed here: Interpersonal Counseling, Cognitive-Behavioral Therapy, Constructionist Therapy and so on (Lonczak, 2023).

2.2 In-person counselling

Through in-person conversation (Figure2.1) with a qualified counsellor, traditional in-person therapy offers mental health help. Frequency is usually once a week or a few weeks, lasting 45 minutes to an hour at a time and taking place in an office setting.

2.3 Online Counselling

According to LMSW and Shea (2023), online counselling, also referred to as online therapy, involves providing counselling services through various digital mediums, including text, audio phone calls, video conferencing, and emails. The technology and infrastructure supporting online counselling have been evolving since the 1990s, and nowadays, many clients consider it a standard practice (National Academies Press (US), 2012).

However, online counselling attracted more attention during the pandemic. On one hand, the pandemic significantly impacted people's mental health, as highlighted by a study (Wang et al., 2020) indicating a 20–30% rise in depression and anxiety rates compared to pre-pandemic levels. On the other hand, due to limitations on traditional in-person healthcare during the Covid-19 era, many counselling sessions transitioned to online platforms. Since the onset of the pandemic, searches for "counselling online" have surged by 124% (Hazlegreaves, 2020).



Figure2.1 In-person Counselling

2.4 Compare the in-person and online counselling

In in-person counselling, the clients could get a sense of physical proximity which makes them feel they are facing a real person, the communication between counsellor and client can be conveyed through many non-verbal information, like visual cues, vocal qualities, facial expressions, and body postures in addition to verbal expression. Those non-verbal cues could allow counsellors to get more understanding of the client's status and help the clients to get enough emotional support and empathy from the counsellors (Writers, 2022). Moreover, certain mental health concerns, such as those requiring direct engagement like music and art therapy, can be effectively addressed through in-person modalities (Writers, 2022).

When compared to in-person counselling sessions, online counselling comes with certain limitations. These address the potential absence of non-verbal cues and physical proximity in conversations, the possibilities of distractions and technical issues due to internet connectivity problems, and the potential unsuitability for specific counselling treatments.

However, online counselling also offers distinct advantages that traditional face-to-face counselling may not fulfil. Firstly, online counselling is exceptionally convenient, not influenced by limitations of time and distance. This enables clients to access services from their native counsellors situated in different countries and time zones, often sharing cultural backgrounds and languages that facilitate effective communication. Furthermore, compared to in-person counselling, online counselling tends to be more cost-effective, reducing the access threshold for individuals seeking psychological support.

Regarding the effectiveness of online counselling for specific mental health concerns, research indicates that it is similar to face-to-face counselling in addressing disorders like anxiety and depression (Andrews et al., 2011; Wagner et al., 2014). Moreover, counsellors often exhibit enhanced reflective abilities within the online counselling environment, aiming to transfer empathy, refine communication, and elevate intervention quality through the utilization of online tools and techniques (Anthony & Goss, 2009; Owen-Pugh, 2013; Tsalavouta, 2013). This improvement in skills like listening, writing, and attentiveness.

2.5 The therapeutic alliance

In psychological counselling, an important concept known as the therapeutic relationship is present (see Figure 2.2). And it is an important factor in the success of the therapy. The therapeutic alliance is made up of three essential components: goal agreement, task agreement, and rapport formed by reciprocal positive emotions. The remaining two components of the alliance rely on a personal relationship of trust and respect. Without a sense of confidence and regard between the client and counsellor, it is difficult to establish agreement on goals and tasks. Both the client and the counsellor must have faith in each other's abilities for the relationship to be successful (Ardito & Rabellino, 2011).

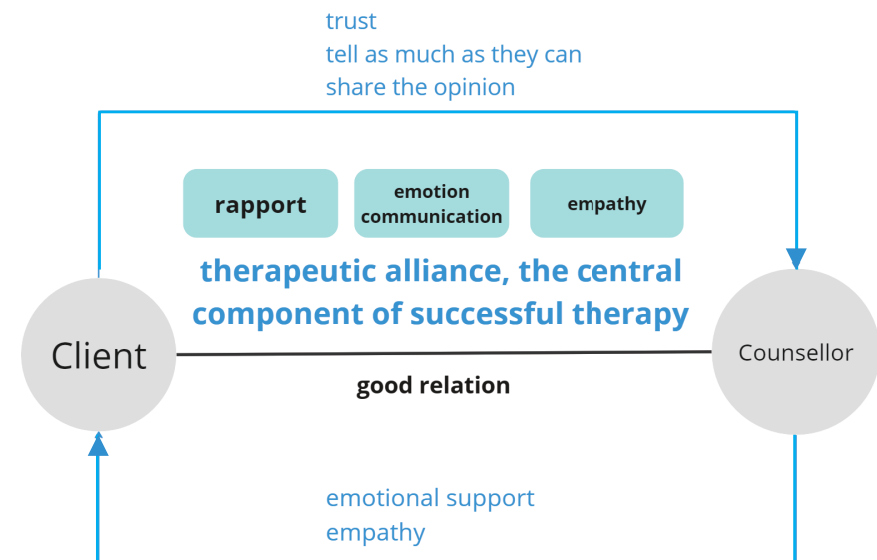


Figure 2.2. The therapeutic alliance

Conclusion

This chapter summarizes the concepts of counselling, in-person counselling and online counselling. It further goes into an analysis of existing research highlighting differences between these two experiences. In counselling, the therapeutic alliance is very important. Rooted in a strong rapport and shared objectives between the client and counsellor, this alliance relies heavily on mutual trust. Establishing such a bond can be challenging work, as it requires effective emotional transfer and communication. This challenge is particularly shown in the online format, in this case, the lack of physical presence may hinder the seamless emotional exchange and communication dynamics between client and counsellor.



III Context research



In this chapter, the research and analysis will be focused on existing models of online psychological counselling services. The scope of providers, delivery formats, and processes will be examined to enhance the understanding of online counselling services. Furthermore, interviews were conducted with clients and counsellors who have experienced both online and face-to-face counselling, aiming to gain insight into their experiences. The objective is to gather insights from different perspectives and identify aspects of online counselling that should be improved.

3.1 How can people get online counselling? - Service provider

People have different ways of accessing online counselling. Firstly, many individuals visit counselling clinics referred by their general practitioners. When meeting their regular counsellor in person is inconvenient, they opt for online counselling from the same clinics.

Additionally, there's a growing number of websites providing online counselling services in these years. These websites enable people to quickly connect with a counsellor through a swift matching process. Three main types of such service websites have been categorized as follows:

Most mainstream sites internationally: Take *BetterHelp*, *Talkspace* as the example

They have millions of users all around the world, mostly served in the USA, they only provide online service with the Qualified counsellors

Europe (NL) sites: *Mantracare*, *complicated. life*, *Open-up*,
Mainly serving European countries, they only provide online service with Qualified counsellors

Small-scale counselling agency sites: They offer both the online and in-person services

Professional online counselling sites usually follow a series of matching processes (see Figure 3.1), starting from filling out the questionnaire until the counsellor is matched based on the selected filter or algorithm. After a client has spoken to a counsellor, they can still change counsellors based on their personal circumstances.

A more detailed analysis involves a comparative analysis of these three different site types in several dimensions. This includes an evaluation of their user base scale, the matching mechanism they employ, their service framework, the range of mental conditions they address, the treatment modalities they provide, as well as considerations regarding pricing and the procedure for counsellor changes (see Table 3.1).

Counselling matching process

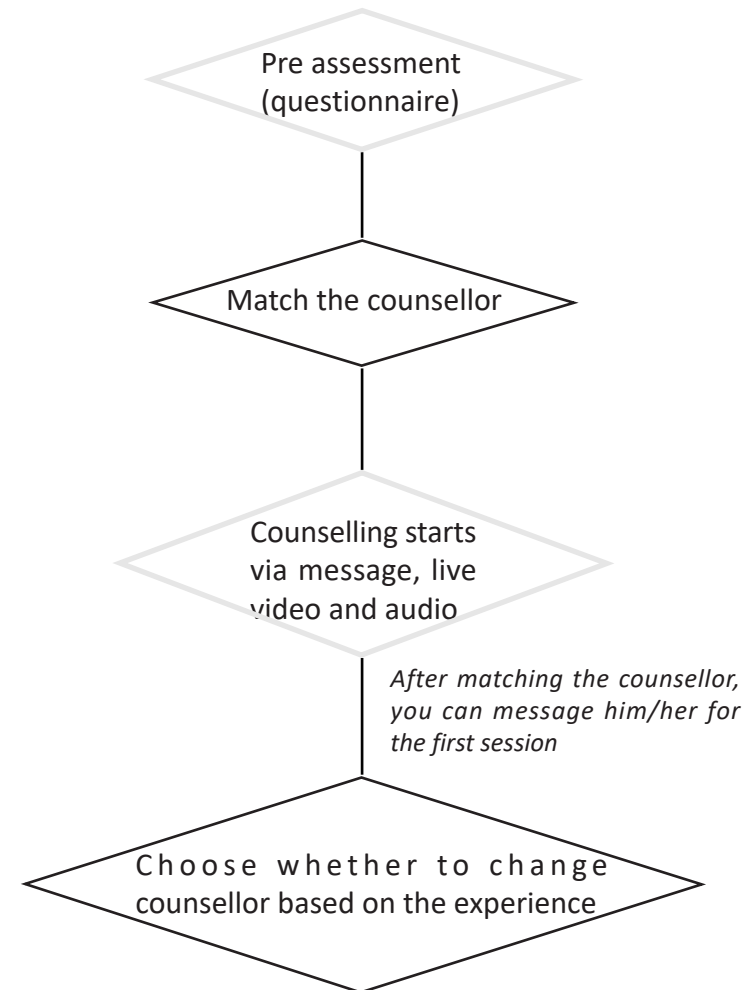


Figure 3.1. Thecounselling matching process

Online counselling service provider	Scale	Process	Match approach
<p>BetterHelp (US)</p> <p>Quality of Care and User Satisfaction</p> <p>Therapist Qualifications</p> <p>verywell</p>	<p>27,000 therapists over three million people across the US and in over 200 countries.</p>	<p>Questionnaire</p> <ol style="list-style-type: none"> 1.Mental health history and reasons 2.Your expectations from the therapist 3.Some question from the Professional Scales 4.Preferance for the communication way 5.Preferences for your therapist <p>Match the therapist</p> <p>Message</p> <p>Live session</p> <p>Switch your therapist</p> <p>Pausing or canceling</p>	<p>Members can filter their search for a counselor based on gender, race, years of experience, types of therapy practiced, and more.</p>
<p>Talkspace (US)</p> <p>Overall User Rating</p> <p>verywell</p>	<p>Since 2012 one of the largest online therapy providers serving over 1 million people</p>	<p>Question</p> <ol style="list-style-type: none"> 1.Clients take online assessment of current mental health 2.Fellow questions like: why you're looking for help, what your current sleep habits and physical health are like, ... <p>Match the therapist</p> <p>Message</p> <p>Live session</p> <p>Switch your therapist</p> <p>Pausing or canceling</p>	<p>Match patients with a therapist using questionnaires and algorithms After you are matched with your therapist, you are able to view their profile with their qualifications and professional experience.</p>
<p>Mantracare (NL)</p>	<p>10,000+ Customers Netherlands & the world</p> <p>500+ therapists at MantraCare, Netherlands</p>	<p>5-min online assessment and enrol in the therapy program in NL</p>	<p>the website will match clients and therapists</p>
<p>Openup(EU)</p> <p>Cooperation with many European companies</p>	<p>Trusted by 850+ companies in Europe</p> <p>90+ certified psychologists and physicians</p>	<p>Filter the laguage</p> <p>Book the available time</p> <p>The assessment is not mandatory on this website, but they provide it</p>	<p>The clients can filter the language and time to choose the counsellor</p>
<p>Denkpro (NL)</p> <p>A counselling agency with two professional counsellors-online/F2FC</p> <p>9/10 Found a therapist through this platform</p> <p>95% of our clients would recommend this platform</p>	<p>2 professional counsellors</p>	<p>Send a message/email/phone call</p>	

Service mode	Therapy for	Therapy approaches	Price	Switch therapists
The BetterHelp services can be accessed via phone, video chat, and messaging apps.	The majority of BetterHelp users looked for services related to anxiety (63%) and depression (62%). Relationship issues Family conflicts Grief Depression Trauma and abuse ...	Attachment-Based Therapy Cognitive Behavioral Therapy (CBT) Dialectical Behavior Therapy (DBT) Mindfulness Therapy Motivational Interviewing Narrative Therapy Solution-Focused Therapy	\$40 - \$70 per week	10-20 available therapists to choose from, you can read through their profiles and specialties to see who you want to work with.
message, phone call, live video *Talkspace can prescribe mental health medication with the exception of controlled substances	Depression Relationships Anxiety Parenting stress OCD Grief Trauma ...	Cognitive Behavioral Therapy (CBT) Dialectical Behavior Therapy (DBT) Emotion-Focused Therapy (EFT) Exposure Therapy Grief Counseling Humanistic Therapy	\$65 per week	ask your experiences so far, your reason for switching and what you like for the next person. Then, you will get three therapist options —or if you don't like any of them,see three more options.
Text-based, Voice messages, or Video Calls, based on your preference	Online therapy in Netherlands for many different mental health issues. Depression, Stress, Anxiety disorders, Relationship problems, trauma, grief, loss, work or office issues, School or Teen issues, Mental health issues, Couples issues, Marriage Issues, LGBTQ issues, Anger issues, Dementia/ Alzheimer's & Panic Attacks		between €50 and €100	
Group session 1:1 session video sessions chats	Self-confidence Stress and anxiety Work performance Finding purpose Relationships Lifestyle Sleep Mindfulness			
	Burnout Anxiety and panic Trauma Low mood and depression Coaching,...	Based on their own experience	various	

Table 3.1. Detailed analysis of the counselling service website

3.2 Interview

To further draw insights from both in-person and online counselling experiences, interviews were conducted with both counsellors and clients. The research addresses the following questions: **(See full question list in Appendix B)**

For client:

What are the reasons for clients to choose online counselling?
What is the duration and frequency of their online counselling?
What is the process of online counselling?
What is the experience of online counselling?
What about the relationship between the clients and counsellors?
How do clients view online counselling?
What is the difference between online and face-to-face counselling?

For Counsellor:

How long do counsellors conduct face-to-face and online counselling?
What's the communication process?
How do counsellors view online counselling?
What are the perceived differences between online counselling and in-person counselling?
How do you experience the online therapeutic relationship with counsellors?

Method

Individual interviews were conducted, involving 7 clients and 3 counsellors. The interview guides for the two sides expand on the research questions described above. Each interview session takes a duration of approximately 30 to 40 minutes. The interviews were recorded in audio format after obtaining informed consent from the participants. These recordings were subsequently transcribed and anonymized to ensure confidentiality and privacy.

The detailed conversation scripts of these interviews can be found in **Appendix C**.

Participants

Participants for the client group were recruited from TU Delft students from Industrial Design Engineering faculty, Aerospace faculty and Civil Engineer and Geosciences Faculty.

The counsellors were sourced from both the TU Psychological Center and the online counselling provider website: *Open-up*.

Results

The quotes and results of the interview are presented in the figure 3.2, 3.3, 3.4 below.



Client

"I always try a little bit before the session starts to think of what I want to do and to kind of relax. And I like to be alone. I don't want to be with somebody else right before I have to do this."

"I see her face to face and as she has their facial expressions, and she's very like kind, she smiles a lot. So I have the feeling that helps. But I have the feeling it helps mostly because we had this physical meeting."

"she tries to show me examples or tries to explain things to me, she draws it on a paper and holds it for the camera. That's super annoying because I can't always see it."

"Clients are ease into the session in face-to-face situation because they have some routine like leaving the house, go to the therapy while online people are urged actually to dive into the session directly."

"I always try to make, give them a safe space. Tell them if there's anything I can do to make them feel more safe that they can let me know. And usually they really start opening up already in the first session, very intensely and often also very emotional."



Client

"it wasn't visible for her than a misunderstanding. So which might be visible in person."

"I have my tabs open on my laptop, I have my WhatsApp on my side and I keep getting notification. And for her also, I feel that she is a little not that much into it, which I think you can't help it because it's online, but it happens."

I think it's kind of nice that I actually, when I'm done, I'm still in my room and I can just do it. I can do some self-care.

"The difference for both formats is possible when you meet someone in real life, you cannot only use your eyes but you can actually use all your senses. And that is a big addition. So I didn't think one is worse than the other is better. But the information that you get is different."

Counsellor

Figure 3.2. Interview quotes

Client Journey - Online session

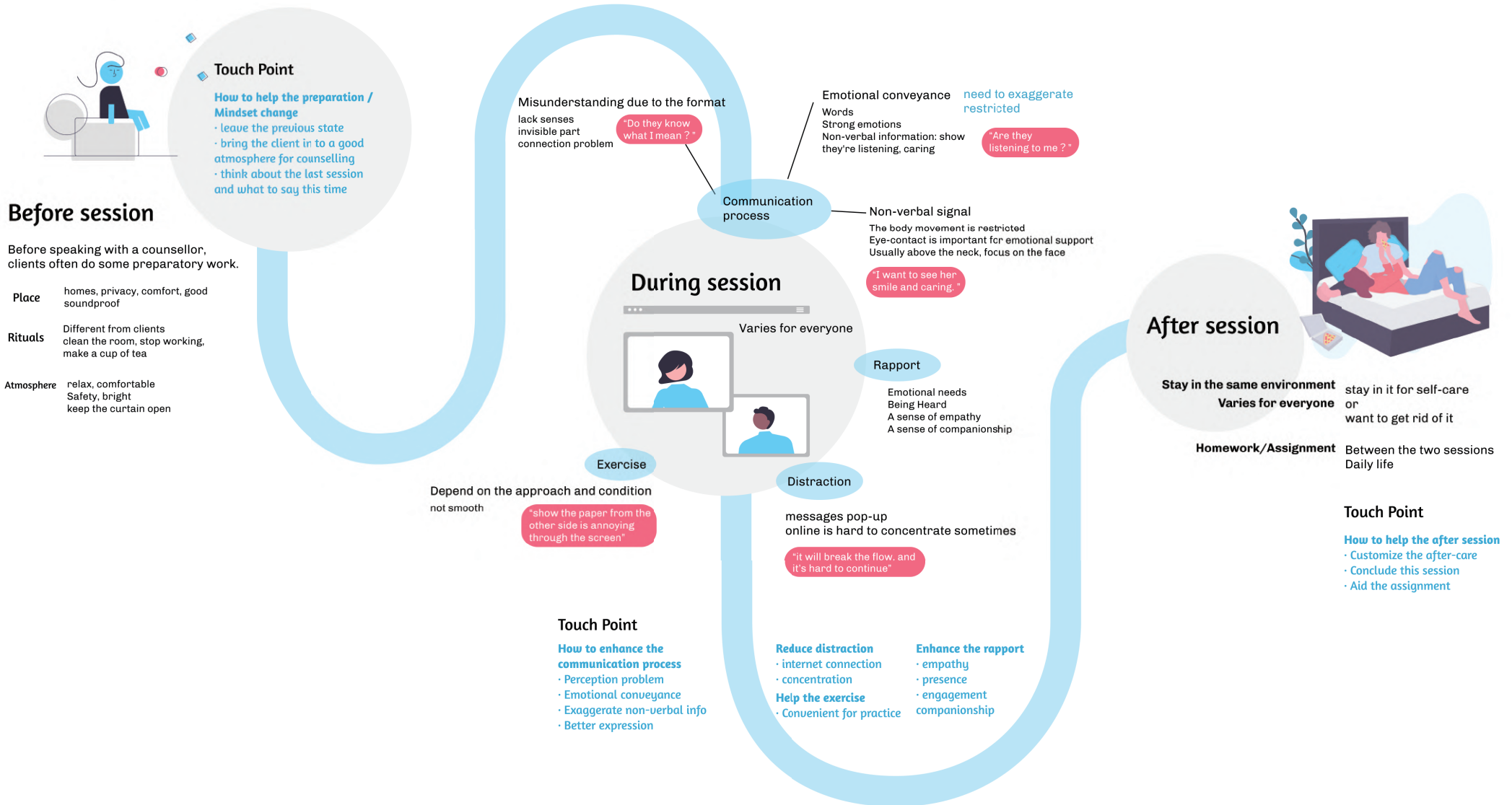


Figure3.3. Client journey map
20

Counsellor Journey - Online session

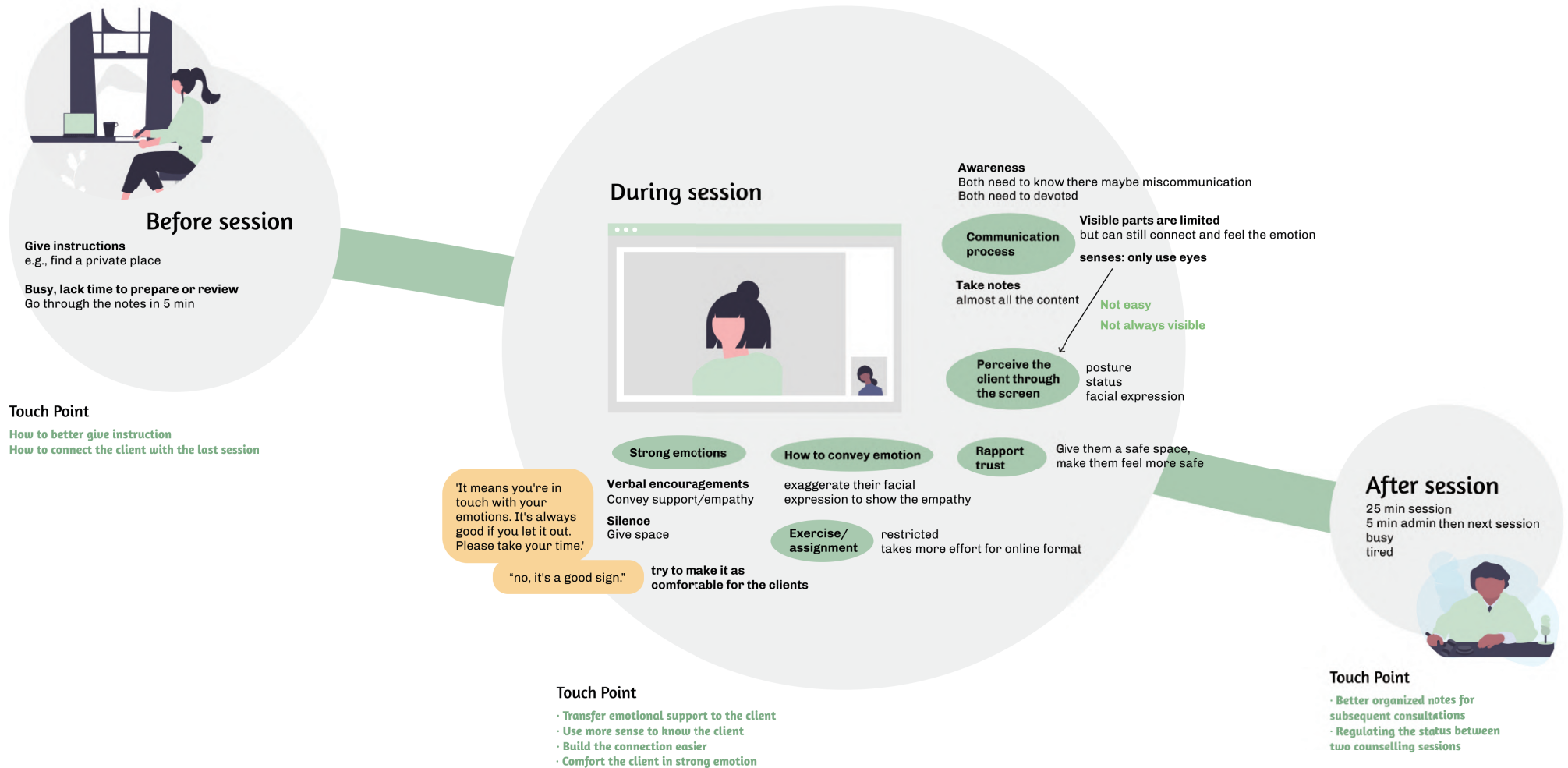


Figure 3.4. Counsellor journey map

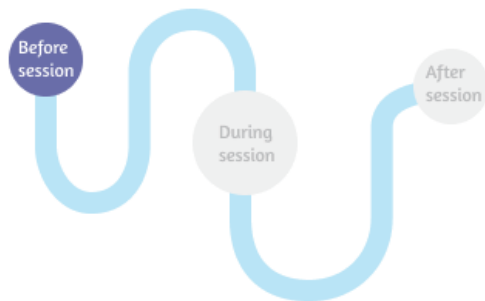
3.3 Insights from the interview

Following the transcription of the interviews and the data analysis, a lot of research insights were formulated in the form of the client/counsellor journey.

The interviews presented the distinctions between online and face-to-face counselling across three different stages: Before-session, during-session, and after-session.

From these stages, several design touch points were identified based on the perspectives of clients and counsellors, thereby generating a comprehensive understanding based on the clients'/ counsellors' points of view.

3.3.1 Client



Before session stage

Before starting an online session, clients often undertake various preparation actions. These may include activities to find a quiet and secure environment, engaging in rituals that facilitate a shift in mindset to enhance their engagement in the session, and making personalized adjustments according to their needs. Drawing from these valuable insights, the design touch points were shown as follows (see Table 3.2):

Help the preparation /mindset change	
	leave the previous state
	bring the client into a good atmosphere for counselling
	think about the last session and what to say this time

Table 3.2. Before session

During session stage

During online sessions, clients encounter challenges in communication with their counsellors. They are unable to capture complete non-verbal cues from their counsellors, leading to potential misunderstandings and perceptual challenges. This can result in uncertainty about whether they are expressing themselves fully and whether their counsellor comprehends them accurately. Additionally, subtle counsellor reactions and responses might not be entirely visible, impacting emotional expression and rapport establishment.

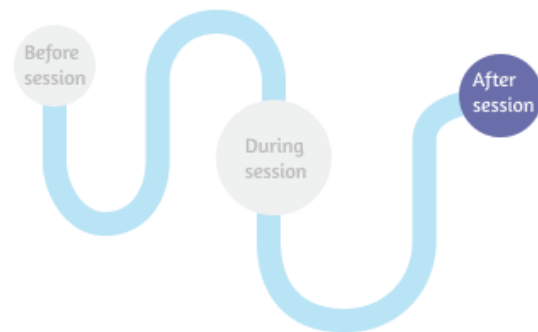
Furthermore, practical issues exist within the format of online counselling. Activities such as exercises are hindered by visual obstructions, restricted body movements, or difficulty in observing tools employed by the counsellor via the screen. Distractions from message pop-ups or background noise can also disrupt the session.

Considering these insights, the design touch points were shown as follows (see Table 3.3):

How to enhance the communication process	
	Perception problem
	Emotional conveyance
	Exaggerate non-verbal info
	Better expression
Reduce distraction	
	internet connection
	concentration
Enhance the rapport	
	empathy
	presence
	engagement
	companionship
Help the exercise	
	Convenient for practice

Table 3.3. During session

After session stage



The last stage is the time that the clients just finish the session. And people have different preferences for this time duration. Staying in the same environment as counselling will affect people differently, some will want to continue with self-care, but others will want to get out of the atmosphere quickly and switch mindsets. Meanwhile, some counsellors will leave tasks or homework for the clients to finish during the time between sessions.

Based on these insights, the design touch points were concluded as follows (see Table 3.4):

How to help the after session	
	leave the previous state
	bring the client into a good atmosphere for counselling
	Aid the assignment

Table 3.4. After session

3.3.2 Counsellor:

Before session stage

The interviews revealed that counsellors serving online counselling websites work differently from those working in counselling clinics. Online counselling sessions are typically limited to 25 minutes, leaving counsellors with as little as 5 minutes at the end of each session for administrative tasks or to review notes, preparing for the next visitor. The online session is more direct while people have little time to transfer to the status. From the counsellor's point of view, both the counsellor and the client need to be better prepared to conduct counselling for better results.

During session stage

In contrast to in-person counselling, online counsellors must gather more comprehensive information from clients to accurately assess their status. In Face-to-face sessions, counsellors can make observations about a person's body language and posture, which may not always be clearly visible in online settings. Hence, counsellors emphasize the importance of both parties being aware of the potential for miscommunication during online sessions.

When it comes to how counsellors deal with strong emotions from their clients, they usually do the following behaviours:

They will wait, give the client time to calm down, and use a few verbal encouragements like:

'No, it's a good sign.'

'It means you're in touch with your emotions. It's always good if you let it out. Please take your time.'

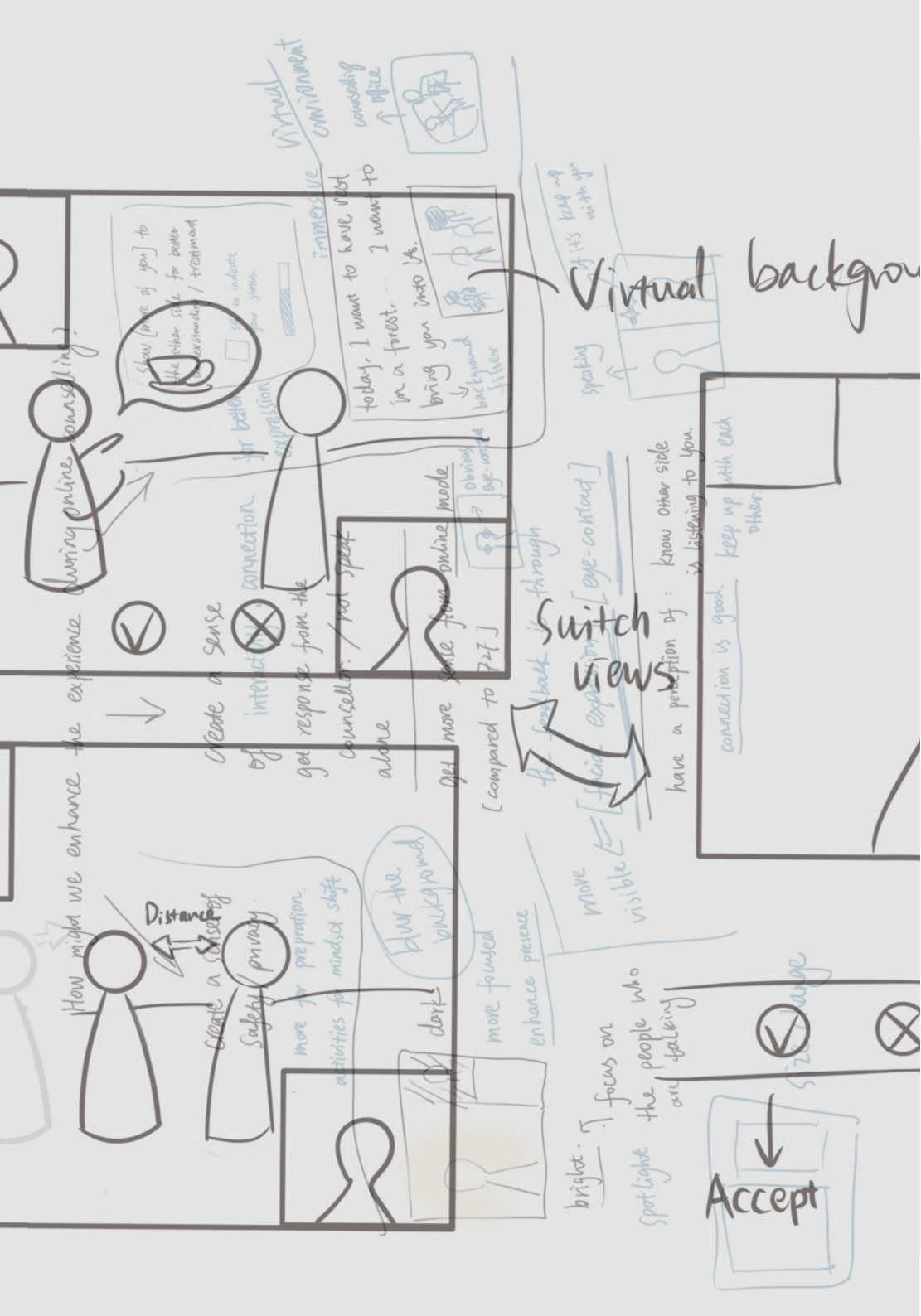
In-person has many advantages that online counselling cannot achieve:

- i. A stronger sense of feeling you're not alone and someone is literally there for you.
- ii. More transparency of emotions
- iii. Emotional support from nodding, hug, gentle voice

Since this design initially focuses on the client as the target group, the insights gathered from the interviews with counsellors primarily serve as supplementary information. They help us understand the limitations that counsellors face in their interactions with clients in the online format and inform us how the subsequent design can address these issues. While some considerations regarding how to support counsellors during the counselling process may be mentioned, it's important to note that the primary focus of this design is on enhancing the client's experience.

Conclusion

In this chapter, the focus is on the study of online counselling's context. Initially, the current avenues for online counselling services are explored, encompassing professional counselling websites and online counselling services offered by certain clinics. From the moment a user accesses the website until their ultimate online session with the counsellor, they undergo a matching process involving assessing the client's situation, the counsellor's identity, and individual preferences. Through interviews with individuals who have experienced both online and in-person sessions, including clients and counsellors, it was revealed that online counselling entails more than just video time between the two parties. It significantly differs from in-person counselling in its pre-session and after-session phases, thus forming a comprehensive client and counsellor journey. This journey yielded valuable insights for the subsequent design phase.



IV Design phases

After conducting a thorough analysis of the literature and conducting comprehensive research into the context of online counselling, a lot of design points were identified in the previous chapter. The objective of this chapter is to consolidate some directions from these various points, these directions will serve as a base for a creative brainstorming session aimed at generating a concrete and specific innovative concept.

4.1 Directions

After the analysis of the context research, there are 5 directions from the before-during-after stages generated based on the touch points in Chapter 3 (see Table 4.1).

Phases	Directions
Support Preparation	Mindset shift
	A break from previous work or other activities
	Switching to the counselling mindset, think about the last session and what to talk for this time
	Environment/atmosphere preparation
	Find a comfortable/privacy/safe place that no one can hear the counselling conversation
Enhance the connection and interactivity during online session for clients	Different rituals, like clean the background or draw the curtains to let in natural light
	Better expression of the client (emotions, status)
	Helps to present the client's mood or non-verbal info
	Help the client feel the comprehensive interaction from the counsellor, close experience to F2F counselling
	Perception
Presence/ Engagement/ attention	Let clients know that the counsellor is actively involved in the conversation and paying attention to them The client get instant response from the counsellor
Emotional conveyance	Enhance the feeling of support/empathy (usually transfered by the non-verbal information) from the counsellor
After-session Assistant	Adjust mindset after the session and help the time during the two counsellings

Table 4.1. Concluded direction

4.2. Inspiration

After summarizing these directions, research was undertaken to source relevant inspiration from the internet. The findings were classified into the following categories:

Mixed reality technology

Virtual Reality, Augmented Reality

Exploring virtual reality technology is a promising way to bridge the gap between online counselling and face-to-face sessions, aiming to create a more immersive counselling experience.

Virtual reality technology has the potential to unite individuals across far distances, placing them in a shared virtual environment. For instance, the concept of a virtual meeting room, as depicted in the Figure 4.2 below (Kholin, 2023), allows participants to present themselves as avatars or incorporate elements of their actual appearance within the virtual space. This environment can be customized to create a more immersive and engaging atmosphere for the meeting participants.

At the same time, this technique places higher demands on the required equipment for participants to engage effectively.



Figure 4.2. Virtual meeting avatars

Holographic projection technology

Another technology that provides inspiration is holographic projection technology. Unlike the usual virtual reality, this approach presents itself as a high-definition image incorporating augmented reality elements (see Figure 4.3). An example of this is Project Starline (see Figure 4.4) developed by Google (Bavor, 2021). This innovative system employs three-dimensional projection to render conference participants as life-size, three-dimensional figures within a shared space, facilitating natural and interactive interactions.



Figure 4.3. Holographic projection tech



Figure 4.4. Project starline by Google

Augmented video effects

Video conferencing platforms like Zoom and Teams have also incorporated numerous enhancements to elevate the quality of video calls. These improvements encompass a variety of features, including augmented reality (AR) video filters (see Figure 4.5), enhanced lighting effects, and various other enhancements designed to enhance the overall video call experience. (TanmayPatange@TWCN & TanmayPatange@TWCN, 2020b)



Figure 4.5. Video meeting effects

Another way for enhancing the video conferencing experience draws inspiration from the WWDC2023 Apple conference (Apple Inc., 2023). Given the significance of video communication in the modern era of information and globalization, this domain gains more and more attention. Apple's latest conference introduced a range of features to elevate the video meeting experience:

Gesture Recognition and Virtual Emojis:

Apple integrated gesture recognition into online video meetings. For instance, when users perform a thumbs-up gesture during a video conference (see Figure 4.6), the system automatically generates a celebratory fireworks effect as a backdrop. Likewise, forming hands into heart shapes triggers the generation of heart effects. This innovation injects an element of playfulness and emotion into the communication.

Centring User in Visual Field:

Facetime, Apple's video calling platform, introduced the ability to automatically position the user at the centre of the visual field. As the

user moves around, the system seamlessly tracks their movements, ensuring that they remain in view and making it convenient for the other participant to maintain visual contact.

These approaches from Apple exemplify how technology can amplify the engagement and interactivity of video communication.

These inspirations, whether they involve virtual reality, holographic projection, or video effect enhancement, share a common goal of enhancing the user's video experience. They aim to bridge the gap between a virtual interaction and an in-person meeting, while also enhancing the overall entertainment aspect. This segment of analysis establishes the essential groundwork for the subsequent ideation phase.

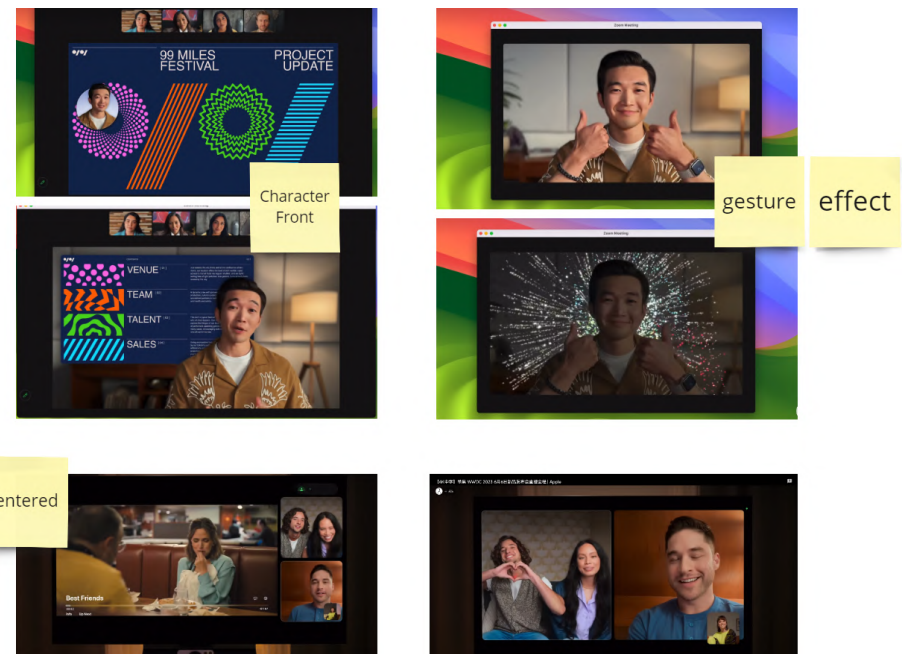


Figure 4.6. Gesture recognition in Facetime

4.3. initial ideas

How might we enhance the experience during the online counselling?

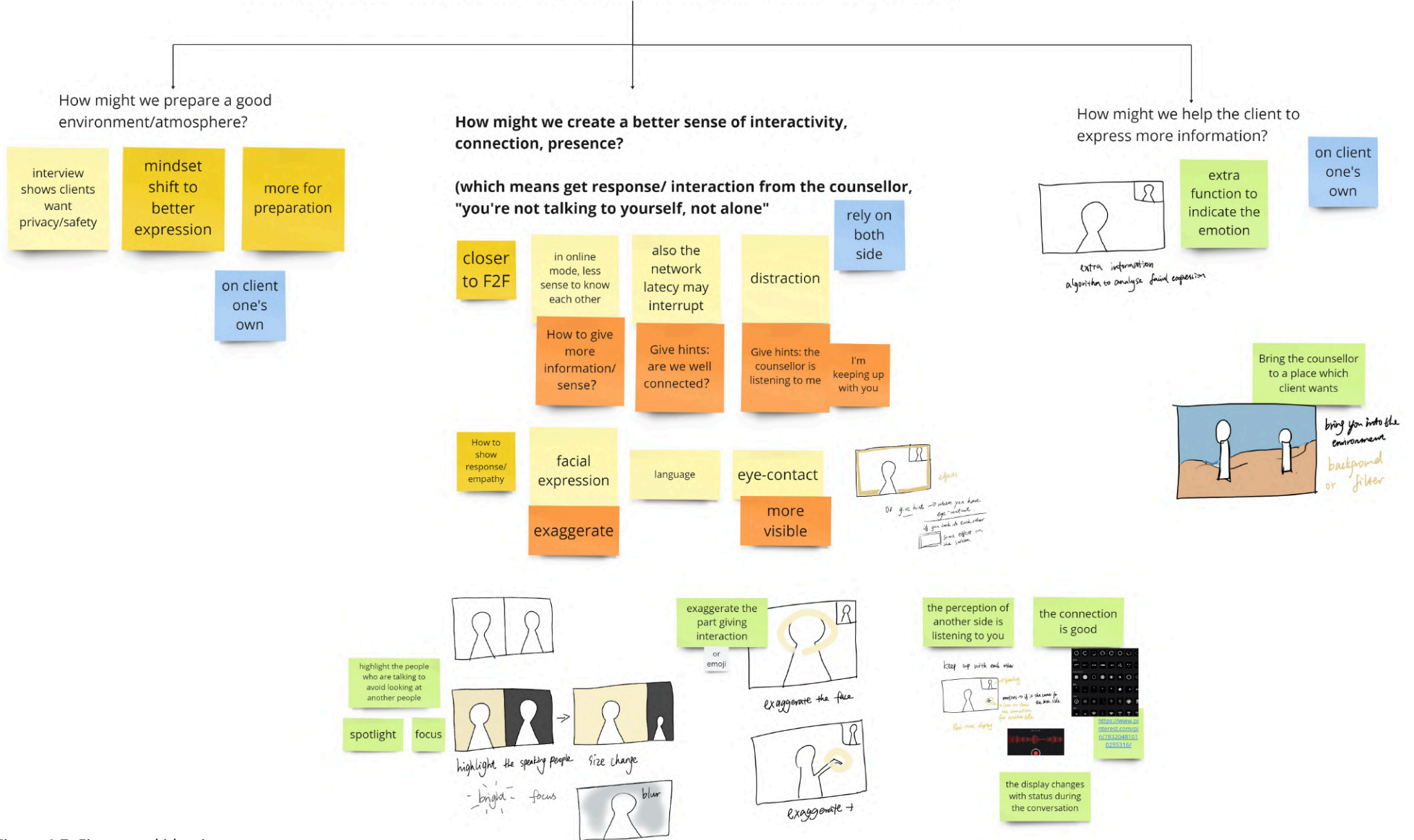


Figure 4.7. First round ideation

An initial ideation brainstorming phase was undertaken for the various directions outlined in section 4.1. The primary outcomes of this phase included (Figure 4.7):

Aid the preparation stage

Develop a pre-session service

Create pre-session services list or activities for client to find a suitable environment or better change their mindset. The activity could be watching a meditative video or go through the last session.

Bringing Counselling Closer to In-Person Experience

Develop a Virtual Meeting Platform

Create a video platform that simulates immersive in-person counselling by providing virtual meeting rooms. Users can customize their environment (e.g., forest, beach) to suit their preferences, enhancing the feeling of being present.

Reduced Distraction for Focused Interaction

Background Brightness Adjustment

Implement a feature that allows users to adjust the background brightness during video calls. This ensures that both the speaker and background are well-lit, enabling clear focus on the speaker.

Enhancing Interactivity and Expressions

Expression Amplification Filters

Incorporate interactive filters that amplify facial expressions and non-verbal cues during video calls. These filters could enhance emotional expression, making communication more nuanced and engaging.

These ideas are derived from the initial brainstorming session and aim to address the respective directions by aiding preparation, enhancing the video counselling experience, reducing distractions, and amplifying interactivity.

4.4. Creative sessions with people

To ensure a comprehensive range of ideas, a brainstorming session was organized involving 6 IDE students from the IPD and DFI programs. This session aimed to cover all the insights and opportunity points outlined in the table above, fostering a diverse and creative collection of ideas.

The concepts of the new round generated were summarized as follows:

4.4.1 Design a preparation toolkit for a better mindset shift (see Figure 4.8)

Before joining the counselling session, clients have the option to create a personalized profile by responding to various questions (such as queries about their current mood). This profile serves as a reference point for counsellors, enabling them to quickly comprehend the user's present emotional state as the session begins.

Additionally, users are provided with the opportunity to engage in a series of warm-up activities suggested by the platform, approximately 10 minutes before the scheduled counselling session. This feature aids in expediting the transition of the user's mindset, preparing them for more effective and focused interaction during the counselling session.

Preparation

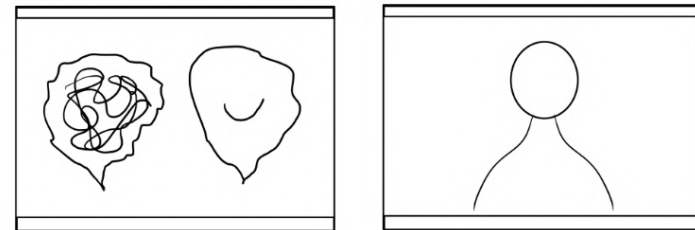
Using toolkit for better preparation

- generate a *persona* before the session by using the toolkit
- to set what is comfortable for the client, all the info will be visible during the counselling

Set an advance scene and play it for 5-10 minutes before the real video counselling

- warm-up video with music
- countdown?

Play this video for 5-10min → Real meeting



How Are You Feeling Today?

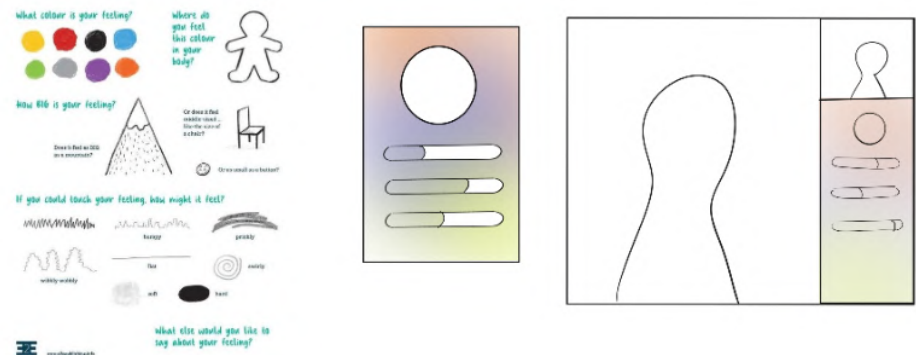


Figure 4.8. Preparation toolkit for a better mindset shift

4.4.2 Developing a playful counselling platform that incorporates gamification and storytelling elements into the session (Figure 4.9)

Within this platform, both the client and counsellor can create avatars and engage in various actions (such as delivering water, sending virtual hugs, passing paper towels, etc.). The clients have the choice to accept

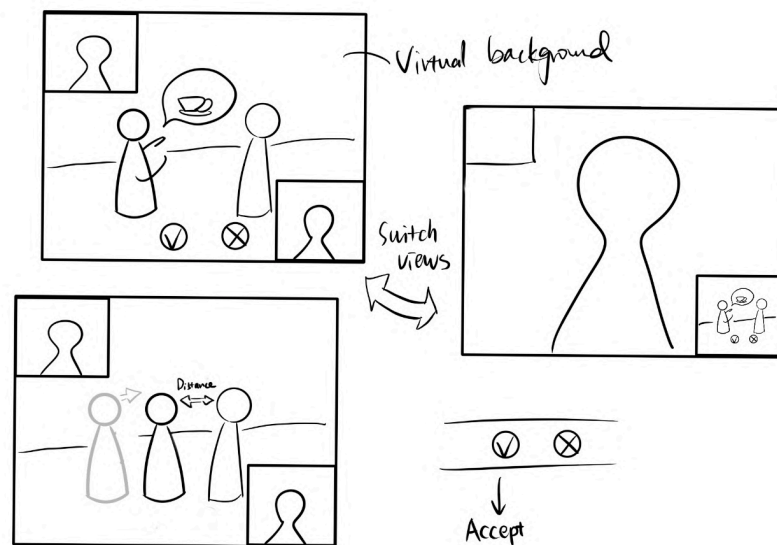
or decline each action, fostering heightened interactivity throughout the session. Additionally, counsellors can opt to guide their avatar closer to the client's, indicating proximity and strengthening the engagement between them.

This gamified interface can be switched with the traditional video interface, offering users the flexibility to choose their preferred interaction mode. This innovative approach aims to infuse an element of playfulness into the counselling experience, augmenting engagement and enriching the overall session dynamics.

Enhance
interactivity

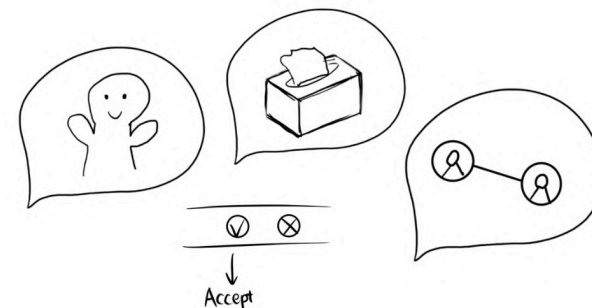
Using the digital platform to gamify/storyline the session

- Generate *avatars* to take activities
- Setting the *virtual background*
- Using the *sticker*
- Avatars can move around, e.g, be closer to the client
- Switching between real and virtual view



Interactive stickers

- Virtual hugs
- Typical reaction of the counsellor: facial expression, nodding, giving space, silence
- Typical actions: giving water, tissue box,...



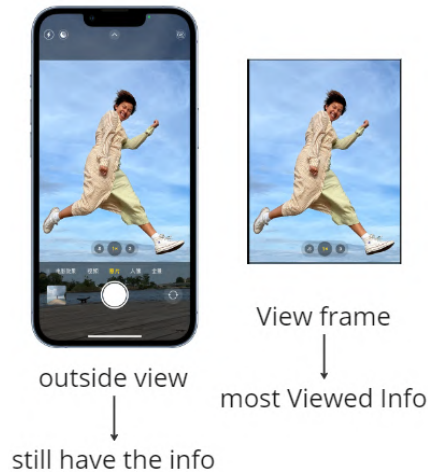
4.4.3 Augmented sensing for online counselling

Research has demonstrated that online forms of counselling often lack many sensory cues provided by non-verbal information, in contrast to face-to-face interactions. Common limitations include the inability to capture more body movements, the absence of clear facial expressions, and the challenge of maintaining meaningful eye contact. Consequently, the following ideations were designed with the goal of enhancing perceptual senses within the context of online counselling.

Inspiration: when you don't know if the person on the other end of the phone is listening, You can tell by whether he/she is holding the phone

Adjusting the range of vision to discover more about counsellors' activities

- Vision guidance by frame separation
- Set the *Visibility range*, how much you want to see, zoom-in zoom-out
- **Make the client trust** the counselor's involvement *taking notes*



Adjusting the vision range, allowing clients to see more of the counsellor's activities (Figure 4.10)

Inspired by the Apple Phone Camera, a concept has been developed to enhance the visual sense within online counselling sessions. This concept involves introducing a visual arrangement similar to the phone camera's setup, where a primary camera area is surrounded by a grey zone. The grey area offers an extended field of vision that enhances visibility without causing excessive distraction.

Incorporating this concept into the online counselling context, the proposed program involves adjusting the video's field of view. This adjustment allows clients to observe more of the counsellor's actions, such as typing or subtle body language cues. Moreover, users gain the ability to actively capture the counsellor's interactions with them during the session. This empowers clients to actively engage with the counsellor's responses, enhancing their involvement and facilitating a more immersive and enriching counselling experience.

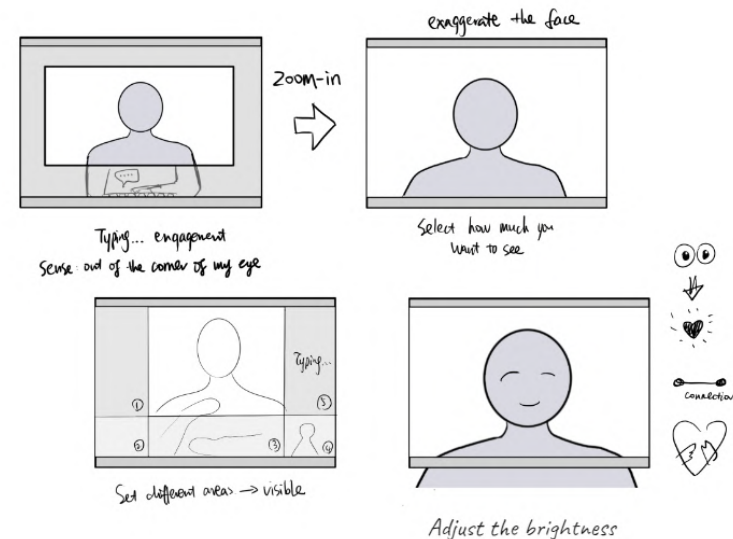


Figure 4.10. Vision range adjustment

Giving more visible eye contact, enhancing the sense of attention (from the counsellor) (Figure 4.11, left)

Eye contact plays a crucial role in conveying information, and the direction of one's gaze provides insight into their focus and attention (Jarick & Bencic, 2019). Therefore, this ideation aims to enrich the sensing of eye contact to enhance the user experience during online counselling.

Since that numerous cameras are typically mounted at the top or bottom of display screens, the user's eyes as seen from the screen often do not establish direct eye contact. To address this limitation, the proposed design entails conveying the impression of eye contact through a directional or transformative approach.

Using UI visuals to emphasize non-verbal feedback, enhancing the sense of connection (Figure 4.11, right)

This design introduces supplementary UI visual patterns intended to amplify the user's connection and interaction with the counsellor.

For instance, when the counsellor is typing notes, animated UI symbols will be used to communicate to the clients that their counsellors are taking notes. This element seeks to enhance transparency and reassure the user that their session is being documented and the counsellor is engaged.

Similarly, when the counsellor engages a touch bar or equivalent control, a UI visual cue denoting connection will appear on the screen. This visual indicator is designed to prompt the user, signalling that the counsellor is actively listening and genuinely concerned about their well-being.

These UI visual patterns are strategically integrated to bring a more engaged and responsive user experience, establishing a sense of rapport and care throughout the counselling session.

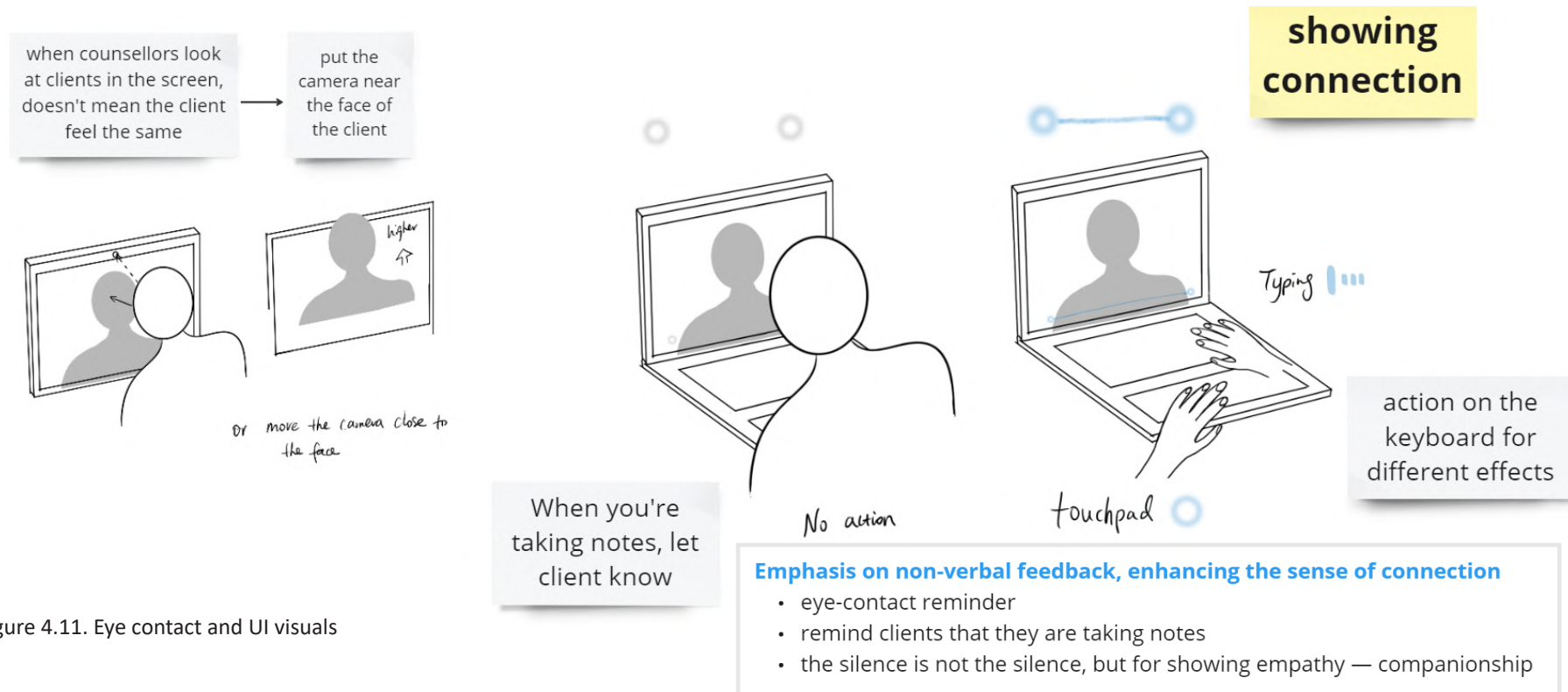


Figure 4.11. Eye contact and UI visuals

4.4.4 Using Mixed Reality and combined with the motion sensor (see Figure 4.12)

In order to provide a more immersive session experience, the concept of using virtual reality technology is still presented in this multi-person brainstorming session. It added the ability to use motion sensors to capture the movements of the client or counsellor, which enables users to

get more detailed insights into each other's body movements within the online environment. The combination of virtual reality and motion sensors contributes to a richer and more comprehensive understanding of non-verbal cues, creating a more effective and engaging online counselling experience.

Using mixed reality to enhance the presence

Putting the whole conversation into an AR/VR environment, no more online video

- Imitate they are talking F2F

Adding motion sensor to show the body movement

- The client know how the counsellor acts

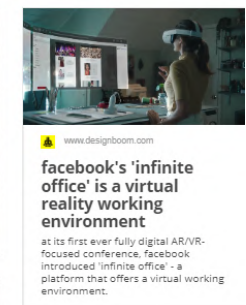
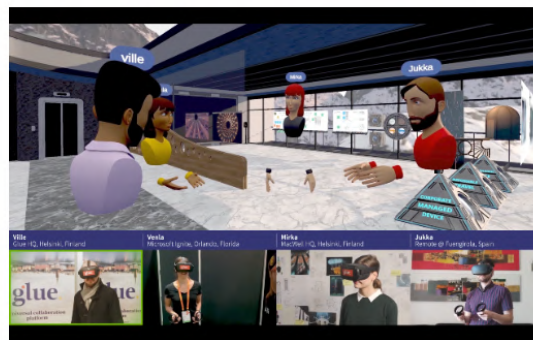


Figure 4.12. Mixed Reality combined with the motion sensor

4.4.5 Design a guideline for counsellors (see Figure 4.13)

In a paper about practice guidelines for surgeons in remote video treatment (Newcomb et al., 2021), they conducted a simulation test and came up with Best Practice Suggestions. Similarly, this design can serve as a foundation for creating guidelines that enhance the service experience for clients seeking counselling. These guidelines can offer counsellors practical recommendations to optimize their interactions. For instance,

counsellors can be advised to adjust lighting and display settings to ensure clarity for users. Furthermore, counsellors can ensure that their actions and pauses are clearly conveyed and justified to minimize any potential misunderstandings. By extrapolating from successful remote surgery guidelines, this counselling-focused set of guidelines can provide valuable insights to counsellors, enhancing their effectiveness and the overall counselling experience for clients.

A guide for counsellor

- Best Practices**
- Environmental**
- Arrange favorable lighting behind the computer, such as a ring light or natural lighting, reducing shadows on their face.
 - Dress professionally and position the computer camera to capture the full-face mid-screen.
 - Limit distracting clutter behind the speaker, visible to the viewer.
- Behavioral**
- Ensure that all movement is intentional, including looking up or down as the patient speaks.
 - "Narrate" behavior to minimize misinterpretation: request permission to take notes, punctuate quiet listening with verbal encouragements.
 - Add simple statements such as "Let me think just a moment" to give the patient confidence your continued focus.
 - A patient's distress may be more difficult to interpret on video; ask direct questions to understand the patient's emotional state.

Guide the counsellor to:

- Make sure the lighting looks nature and comfortable, reduce the shadow
- No distracting stuff in the vision area
- Visual guidance - to transfer the eye-contact
- reminder: to explain
- if the counsellor cannot hear clearly (the connection or...) use some thing to hint

Pre set

can hear - ✓
can't - X

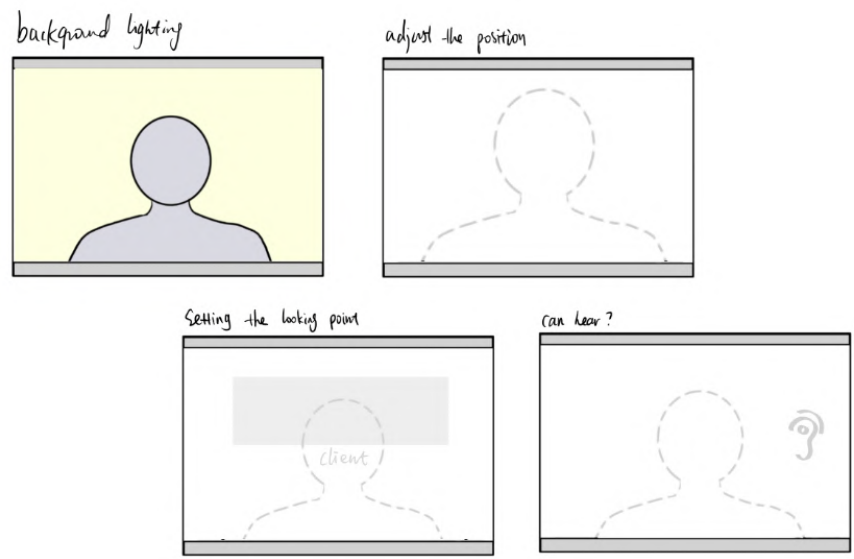


Figure 4.13. guideline for counsellors

4.4.6 AI monitoring assistance platform (see Figure 4.14)

Using the monitoring and recognition capabilities of artificial intelligence (AI), including features like expression and speech recognition, presents a powerful opportunity. Through advanced algorithms, these capabilities can be utilized to analyze the emotional nuances within counselling sessions. After that, AI can generate visuals that support and enhance the counselling process.

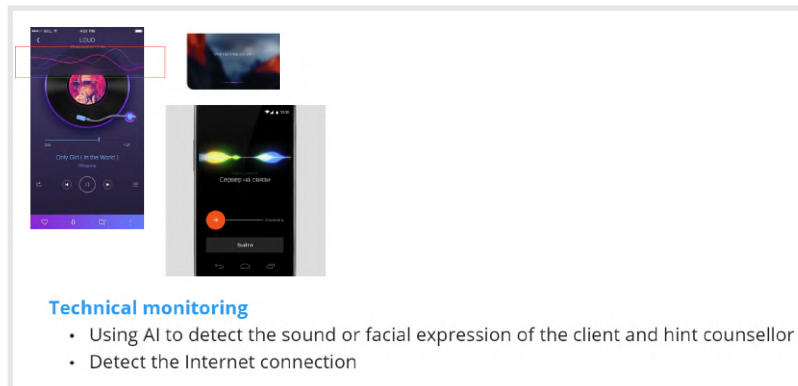


Figure 4.14. Ai monitoring assistance platform

4.4.7 Customized assistance after-session (see Figure 4.15)

Different clients have different needs after the end of the counselling, and the counsellor also arranges different tasks depending on the situation. By analysing the entirety of the counselling conversation, AI can generate comprehensive outcomes for users to reflect upon. Simultaneously, it can facilitate preparation for subsequent sessions.

By utilizing AI to assist personalized reflection and preparatory materials, this concept ensures that the client's needs are met beyond the immediate counselling session, contributing to a more impactful and sustained counselling experience.

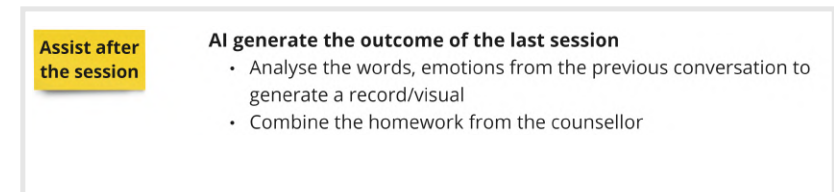


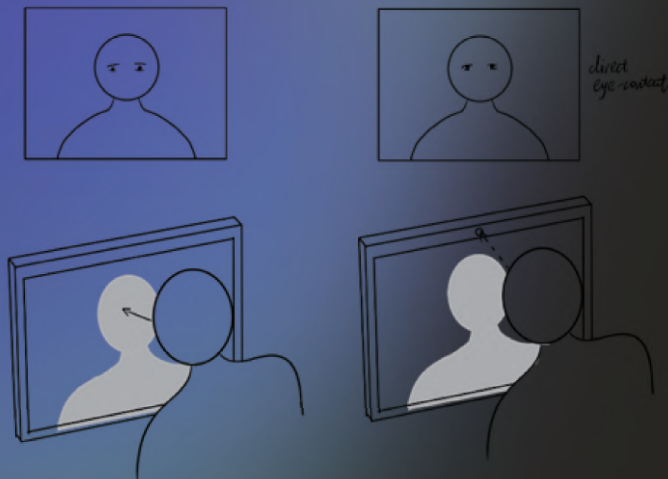
Figure 4.15. Customized assistance after-session

Conclusion

This chapter outlines the design process following the conclusion of insights from the research stage. Initially, 5 different directions for the three phases were summarized from the complex insights. Simultaneously, inspirations were collected to enhance the online meeting experience, and relevant cases and technologies were identified to elevate the sense of immersion and enhance sensing. Following this, two rounds of concept generation were carried out, refining concepts for these various directions. The aim of this iterative process was to enhance the depth and effectiveness of each concept within its respective focus area.

Test

Design vision



Final concept generation

V Concept development



In this Chapter, the design vision was defined from the previous steps. Three different ideas were chosen based on the design vision. The corresponding prototypes were made and used in the initial test. After the test, some useful inspirations and insights were concluded to generate the final concept.

5.1 Design vision

With the previous research, inspiration drawn from other products and services and the generated ideas, the vision has been shaped.

In contrast to the pre-session and after-session phases, the during-session stage demands active participation from both the client and the counsellor. Additionally, it is within this phase that the most significant challenges arise due to the limitations imposed by the online format, particularly in isolating non-verbal information. During this phase conveying emotions and feedback encounters the greatest difficulty. Therefore, addressing communication challenges at this stage contributes to the overall experience.

On this basis, the vision of this design is defined as:

Enhance the interactivity and connection in the online during-session phase.

This includes helping the client to express themselves better as well as helping the client feel better about the reaction and feedback from the counsellor, bringing the experience closer to face-to-face counselling. (see Table 5.1)

5.2 Concept development

Based on the design vision and the brainstorming, the ideas in Chapter 4 were compared with these criteria. From the exploration of these ideas, 3 different ideas were selected to move to the next testing phase. The primary challenge associated with these selected concepts is:

How can the client feel that the counsellor is more engaged and that there is a stronger sense of connection between them?

The 3 ideas:

1. Adjusting the vision range, allowing clients to see more of the counsellor's activities
2. Giving more visible eye contact, enhancing the sense of attention (from the counsellor)
3. Using UI visuals to emphasize non-verbal feedback, enhancing the sense of connection

These chosen specific ideas can undergo further testing to check their effectiveness in enhancing interactivity and creating a deeper sense of connection.

<i>Enhance the connection and interactivity during online session for clients</i>	<i>Better expression of the clients (emotions, status)</i>	
	Helps to present the client's mood or non-verbal info	
	<i>Help the client feel the comprehensive interaction from the counsellor, close experience to F2F counselling</i>	
	Perception	Help clients easily determine if what they said is being understood 'Do you know what I mean?'
	Presence/ Engagement/ attention	Let clients know that the counsellor is actively involved in the conversation and paying attention to them The client get instant response from the counsellor
Emotional conveyance	Enhance the feeling of support/empathy (usually transferred by the non-verbal information) from the counsellor	

Table 5.1

5.3 Test and prototype

The purpose of conducting tests with prototypes is to evaluate whether the three different ideas can effectively make the user feel engaged by the counsellor and foster a heightened sense of connection within the context of video counselling.

Material

For the testing process, two actors will participate in a simulated counselling session recorded by video. The session's conversation content will be based on sample counselling scripts sourced from the internet (Counseling Script, n.d.). One actor will play the role of the counsellor and will showcase the different concepts during the demonstration. Meanwhile, the participant participating in the test will sit in front of a computer, simulating the role of the client, and will observe the counsellor's reactions throughout the simulated counselling session.

Participants

A total of 8 participants have been invited to join in the test, followed by interviews. This comprehensive approach aims to gather valuable insights into the impact and effectiveness of these ideas in terms of enhancing engagement and connection within video counselling sessions.

Methods

To facilitate a comparison of the effects of different ideas on users, this design employs a control variable approach. Initially, a video depicting a counselling scenario in its original form will be recorded, named **No.1 Original test material** (see Figure 22). Then, participants will be requested to respond to a set of questions assessing their perceived engagement and sense of connection. These responses will be gathered using a scale-based questionnaire (Score from 0-5) (see Table 6). This method allows for a systematic assessment of the impact of various ideas on the user experience.

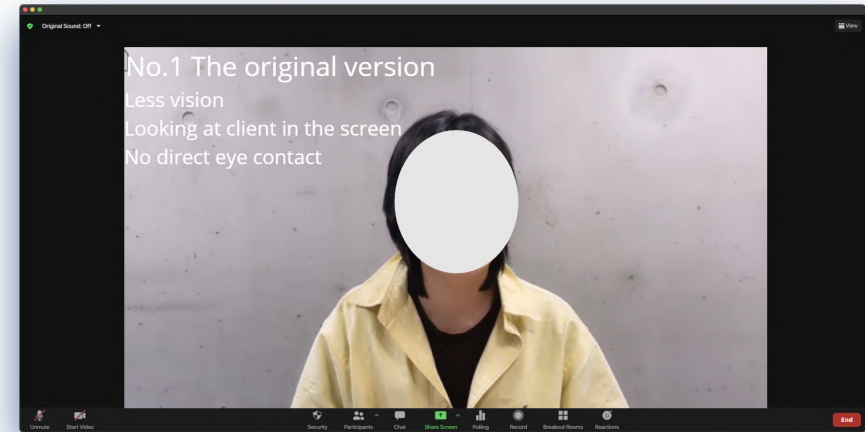


Figure 5.1. No.1 Original test material

Engagement	To what extent does your 'counsellor' really listen to you?	0-5
	How satisfied are you with the 'counsellor's' level of involvement?	0-5
Connection	How much would you say that this 'counsellor' cares about you?	0-5
	To what extent does your 'counsellor' show you compassion?	0-5
	To what extent do you feel the connection with the other person?	0-5
	To what extent do you trust your 'counsellor'?	0-5

Table 5.2. Received engagement and sense of connection scale

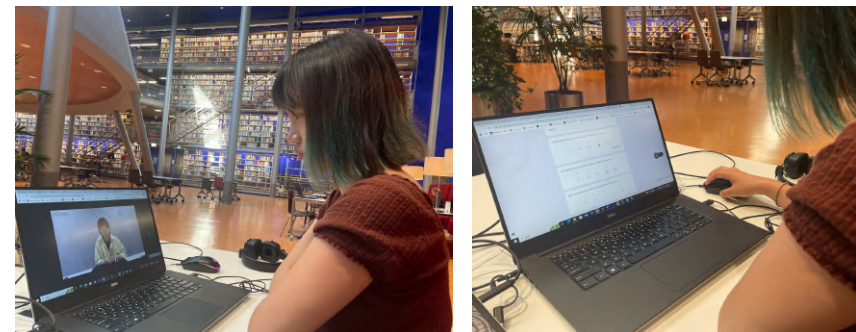


Figure 5.2. Test procedure

Procedure

1. Brief introduction

Welcome the participants and briefly introduce the evaluation. Described using context to the participant.

2. Demonstrated the test

Showcase and explain the test material videos to the participants.

3. Evaluate the experience

After going through each test, the participant was asked to fill in the online evaluation forms with the question in Table 5.2.

4. Ask for feedback

After the tests, the participant was interviewed for their overall experience towards the 3 directions, and gave suggestions.

Idea 1: Adjusting the vision range, allowing clients to see more of the counsellor's activities

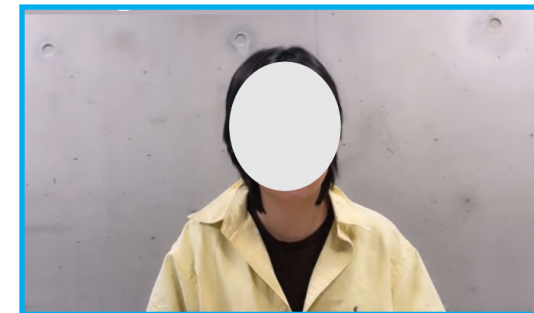
In this scenario (see Figure 23), clients are provided with an expanded field of view compared to the typical video counselling setup (typically focused above the shoulder). The test material is named ***No.2 Larger range of vision***, involves participants viewing the video material. This modified perspective gives participants the ability to observe the counsellor's instantaneous actions, such as typing and other counselling-related activities.

The goal is to see whether the client can feel that the counsellor is more engaged and that there is a stronger sense of connection between them **by adjusting the vision frame to show more actions of the counsellor during the video**. Following their engagement with the session, participants will be asked to complete the same questionnaire (shown in Table 6) and share their insights and opinions regarding the experience.



Figure 5.3. *No.2 Larger range of vision*

Original: above the shoulder



Idea 2: Giving more visible eye contact, enhancing the sense of attention (from the counsellor)

As analysed in the prior chapter, the camera placement on computers can lead to a situation where the counsellor's gaze, directed at the client on the screen, is perceived as looking either upward or downward on the client's screen. This often results in the inability to establish direct eye contact (see Figure 5.4). Based on that, a testing scenario named **No.3 Eye Contact Material** has been formulated. In this scenario, the counsellor consciously directs their gaze towards the camera, thereby allowing the client to experience a more distinct sense of direct eye contact (see Figure 5.5).

The video material created for this scenario involves the "counsellor" maintaining eye contact with the camera during the counselling session. This setup is intended to enable participants to sense direct eye contact from the other person on the screen. The goal is to assess whether clients can feel that the counsellor is more engaged and that there is a stronger sense of connection between them **When clients feel more direct eye contact from the counsellor on the screen.**

Once participants have engaged with this session, they will be prompted to complete the same questionnaire presented in Table 6 and share their impressions and insights regarding the experience.

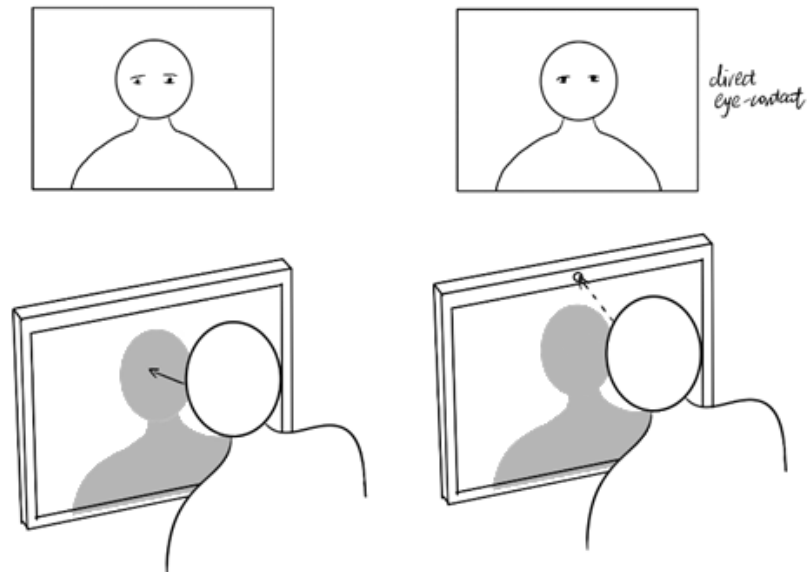


Figure 5.4. The normal situation without eye contact

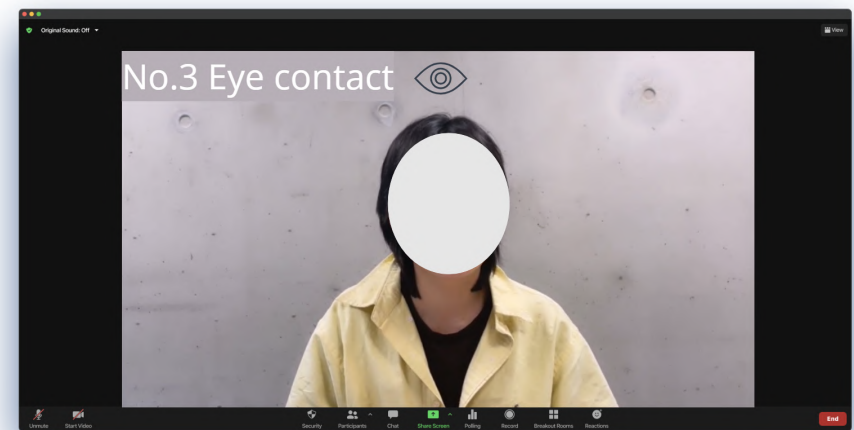


Figure 5.5. No.3 Eye contact material

Idea 3: Using UI visuals to emphasize non-verbal feedback, enhancing the sense of connection

This idea wants to prompt the client with some additional UI visuals of the counsellor's engagement and connection with them. The details of the design are as below:

1. Using UI to remind clients that the counsellor is taking notes (using UI typing indicator)
2. When the counsellor is holding down the touch bar, there will be a UI animation to show that they are connected
3. Let the client understand that the counsellor is using some extra interaction to show that they are actively listening

During the testing phase, the video material will incorporate certain functional UI visual elements, named **No.4 UI interaction visuals** (see Figure 5.6). These elements are designed to enhance the interactive aspects of the online counselling session and provide cues for the client's perception of the counsellor's engagement. Specifically, two types of UI elements will be integrated into the video to assess their impact on the client's experience.

Typing Indicator: When the "counsellor" is typing, a visual indicator in the form of a jumping element will appear on the side of the screen (indicated by the first red circle in the figure). This element aims to convey to the client that the counsellor is actively typing and engaged in the conversation.

Active Listening Indicator: The "counsellor" will have the ability to interact with the mouse or touch bar. When the counsellor is actively listening, they can press the touch bar, resulting in a flowing blue line connecting two circles on either side of the screen (as shown in the second red circle). This UI element symbolizes the connection and serves as a visual cue to indicate that the counsellor is actively listening to the client.

The goal of incorporating these UI visuals is to assess whether clients perceive a higher level of counsellor engagement and experience

a stronger sense of connection when they can observe these cues representing the counsellor's interactions (such as typing and active listening). After participants engage in this session, they will be prompted to complete the same questionnaire presented in Table 6 and share their insights on how these UI visuals influenced their perception of the counselling experience.

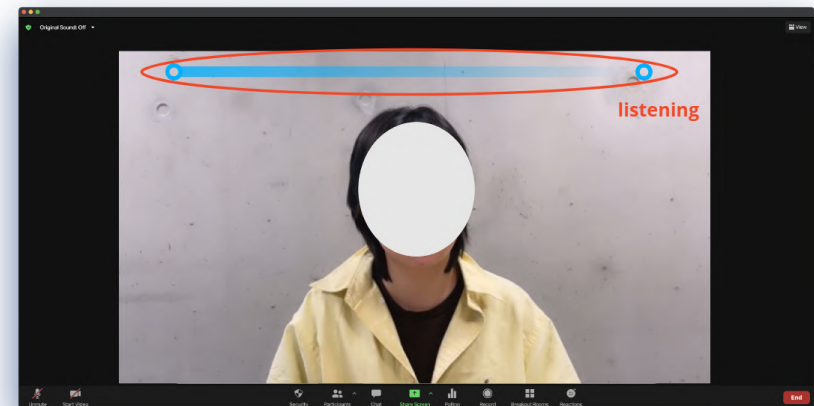
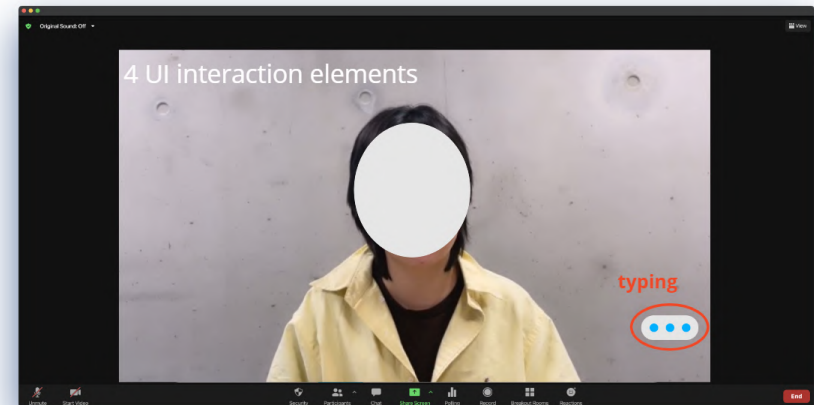


Figure 5.6. No.4 UI interaction visuals

Test result

After testing the participants with 4 video materials, the scores for the three different ideas are shown below. (see Figure 5.7)

Perpection	Question	No.1 Original	No.2 Larger vision	No.3 Eye contact	No.4 UI indicator
Engagement	To what extent does your 'counsellor' really listen to you?	3.25	3.75	4.5	3
	How satisfied are you with the 'counsellor's' level of involvement?	3	3.75	4.75	3.67
Connection	How much would you say that this 'counsellor' cares about you?	3.5	3.5	4.5	3.33
	To what extent does your 'counsellor' show you compassion?	2.25	3	4.25	3.33
	To what extent do you feel the connection with the other person?	2.5	2.5	4	3.33
	To what extent do you trust your 'counsellor'?	3.5	3.25	4	3.67

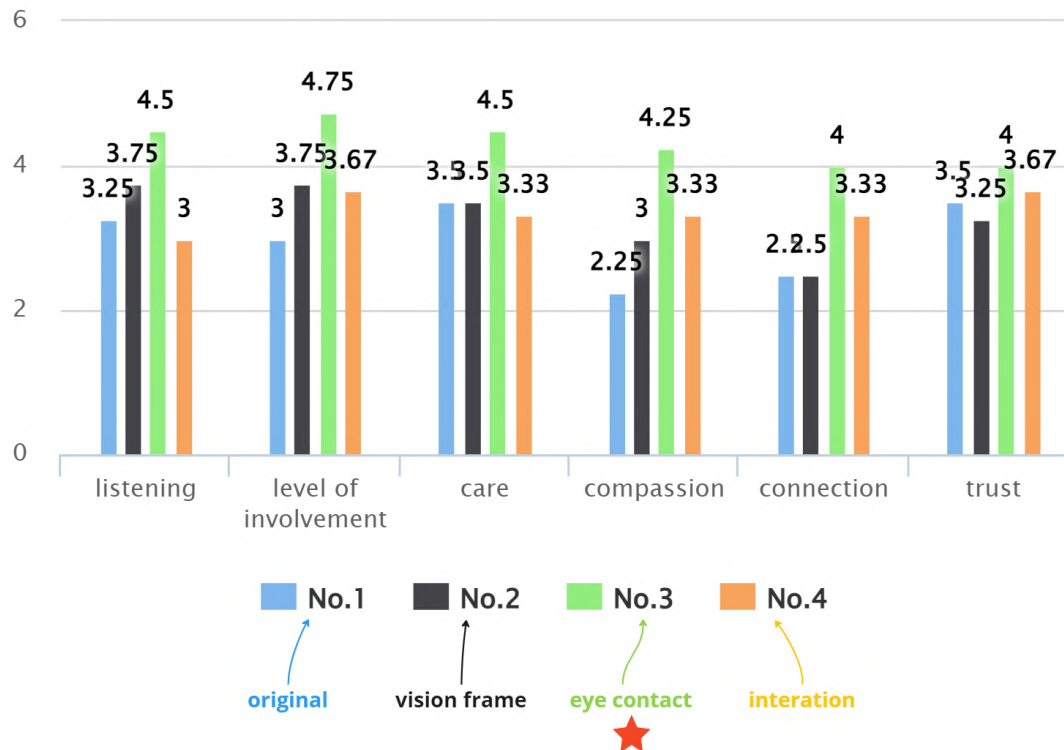


Figure 5.7. Test result

After conducting the testing phase, it was evident that the No.2 eye contact solution involving enhanced eye contact achieved significant positive outcomes, while the other two did not. The concept of eye contact clearly creates a feeling of being cared for and listened to.

The concept of No.1 enlarging the vision frame, exhibited limitations. This approach could potentially divert the client's attention away from details such as the counsellor's facial expressions due to a heightened focus on broader visual aspects, including typing movements. As a result, this direction was deemed counterproductive, as it contradicted the aim of emphasizing non-verbal feedback through the counsellor's facial expressions.

User testing of the No.3 interaction visuals revealed an evident desire for a clear semantic understanding of the used icons. An intuitive and easily comprehensible iconography was anticipated, ensuring a low threshold of comprehension and natural interaction. Additionally, the concept of allowing the counsellor to operate these visuals through the keyboard was perceived as inconvenient in practical use.

Drawing insights from the study of icons in video software, it is evident that many established icons are deliberately designed for intuitive and user-friendly recognition. The microphone visual icon (see Figure 5.8) serves as a prime example, where changes in the filled green portion correspond to the user's speech volume. This illustrates the principle that interaction designs should align with the user's inherent understanding and expectations, promoting seamless engagement.

Simultaneously, the original intention behind the No.3 interaction element was to augment the client's experience of the counsellor's feedback through the counsellor's operation. However, an alternative perspective emerged, where the system itself could actively monitor and provide feedback based on the user's voice. Building upon this, technologies such as Automated Emotion Recognition (AER) and Speech Emotion Recognition (SER) could be harnessed to analyze the user's voice, offering a promising avenue for providing user feedback directly through the system. This concept of integrating automated feedback into the user experience gained traction through this exploration.

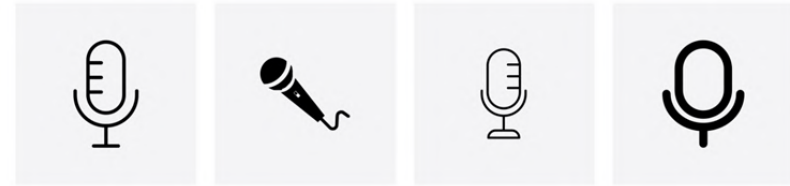


Figure 5.8. Microphone UI visuals

Insights

Through the exploration of the test, some useful insights were generated for the final design:

1. Establishing eye contact proved to be a useful means of conveying care and engagement to the client, creating a sense of being heard and understood.
 2. The vision frame should not be too big to distract the user from capturing the facial expression details of the counsellor.
 3. The design of UI visual elements must value user comprehension by embodying intuitiveness and ease of understanding.
 4. Some designed counsellor actions, such as pressing the touch bar or keyboard, risked disrupting their workflow during video counselling sessions.
 5. Introducing client feedback through the system itself, as opposed to manual interventions by the counsellor, has the potential to streamline and enhance the feedback process.
- These insights have been integral in shaping the final design, ensuring it meets the goals of enhancing user engagement, communication, and connection during online counselling sessions.

5.4 Final concept generation

Combining the test results and insights, counselling is a two-way process for the client: the client's own emotional expression, and the response and support the client receives from the counsellor (see Figure 5.9):

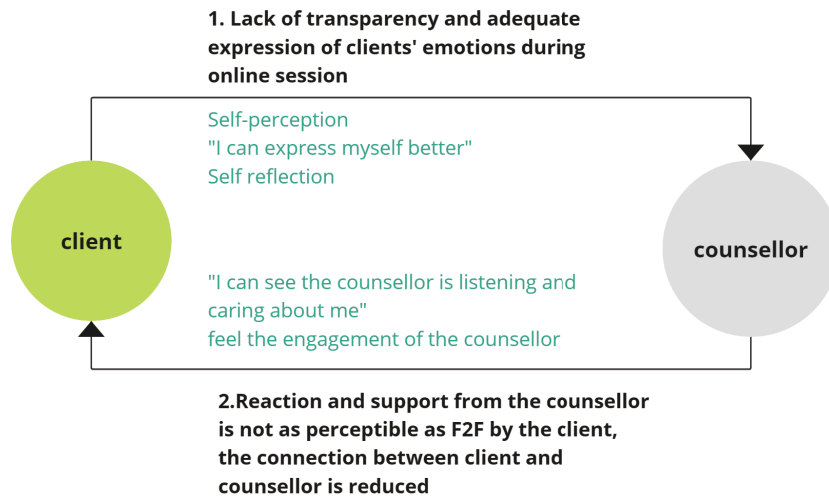


Figure 5.9. Clients' emotional expression and reception of responses

5.4.1. The client's emotional expression in the counselling

Existing problems:

Lack of transparency and adequate expression of clients' emotions during the online session, due to the video format.

How to help:

Help the client to have a perception of their own feelings (detected by the system):

"I can see my emotion is conveyed to the other side",

"I can express myself better",

"I know my feelings are being conveyed as best as I can";

When the clients express themselves better, they can reflect on that after the session (e.g. They can tell when they are most emotionally intense and think about the reasons behind it)

Design:

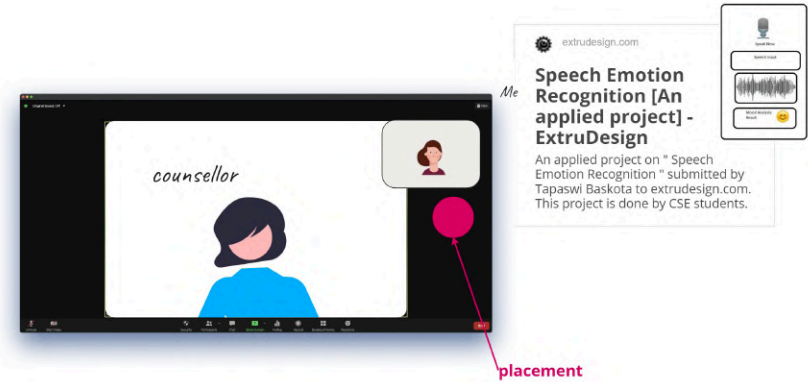
Using Speech Emotion Recognition (SER), the client's tone variations and emotions are identified and visualized in real time. In this process, the user's emotions are communicated to the counsellor in an additional way, helping the client to better express his/her emotions. At the same time, clients can "see" their feelings and understand themselves better. At the end of the counselling session, they are left with the visual material for self-reflection. (see Figure 5.10)

self-expression

concept

A **ui animation** to demonstrate client's speech emotion recognition

Consider its performance, placement
(demo to show that the effect changes when a person is in an emotional state)



inspiration

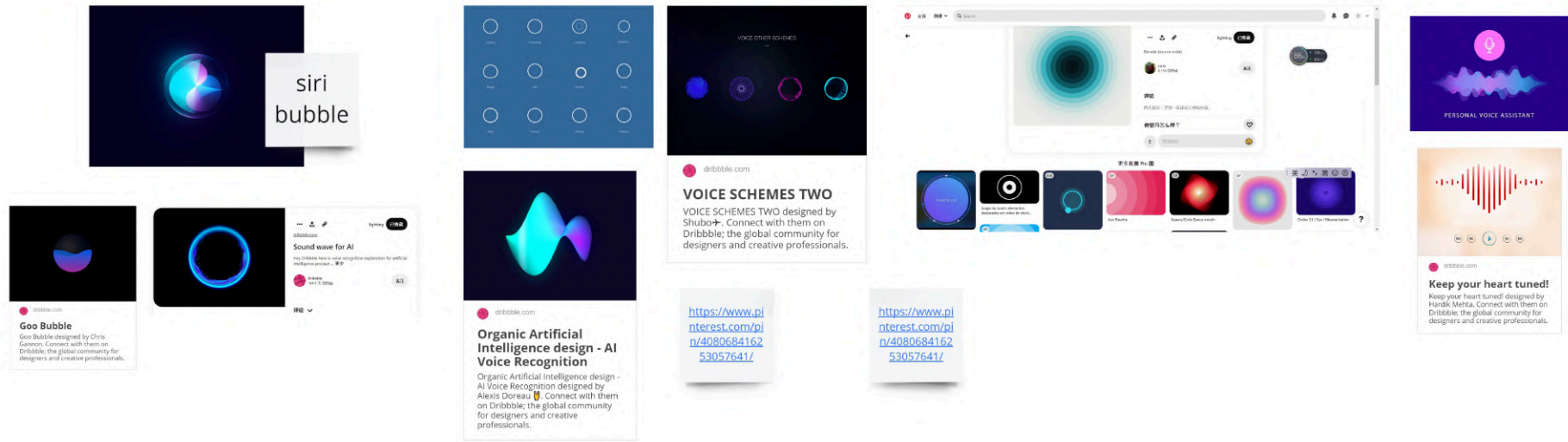


Figure 5.10. Self-expression of the client

5.4.2 The response and engagement that the client receives from the counsellor

is not as perceptible as face-to-face, and the connection between client and counsellor is reduced.

Existing problems:

In online counselling, clients are not able to determine whether the counsellor is listening to them, or showing concern and support for them because the online format segregates a lot of non-verbal information.

How to help:

The following four further design scenarios (see Figure 5.11) arose in response to the question of how to help users get better access to feedback from counsellors:

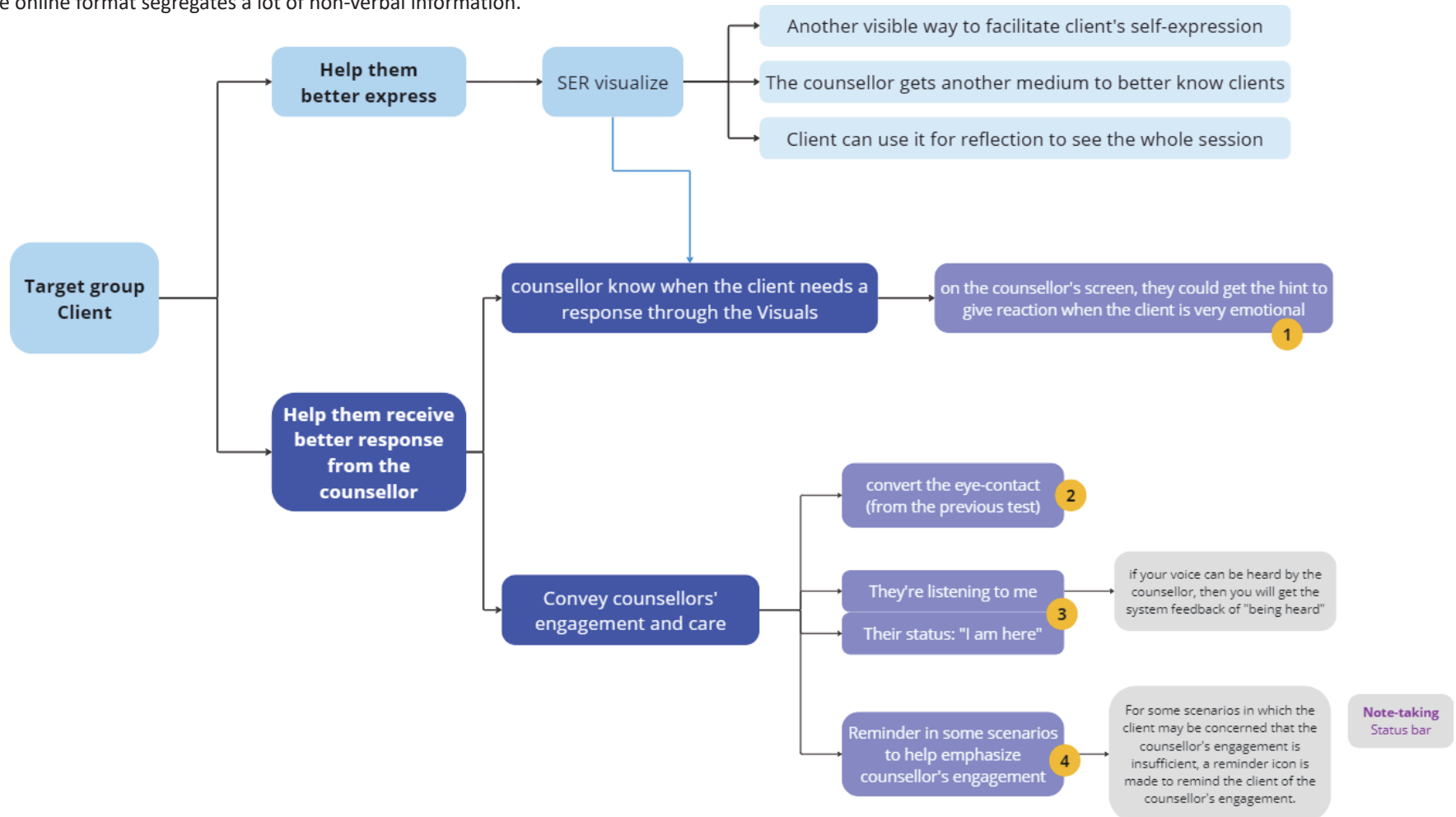


Figure 5.11 Design scenarios

i. Reminder for the counsellor:

When they should give feedback to better support the client based on the speech emotion recognition

In the previous description of the use of SER technology, real-time monitoring of the client's own emotions and transfer it to the counsellor. The counsellor can get a reminder in the moment from the icon pattern when the client is very emotional (special effects such as the icon's border lighting up), then the counsellor could react to the client.(see Figure 5.12)

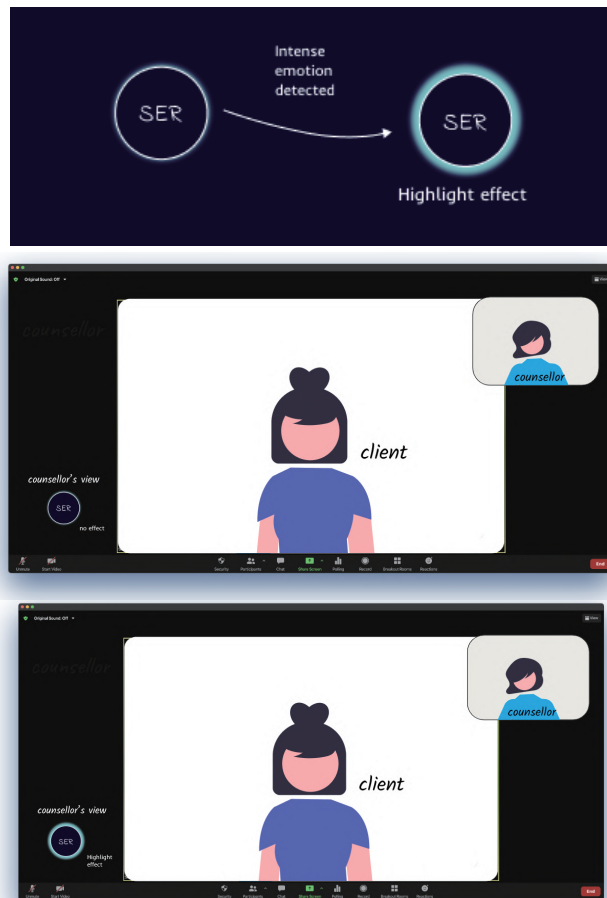


Figure 5.12. Reminder for the counsellor

ii. Converting eye contact to help the client get better feedback and support from the counsellor

In previous tests, users' perceptions of others' engagement and listening levels were tested in three different directions. It was found that eye contact is a way that can be very indicative of the counsellor's engagement and concern, but using AI to correct for eye contact or having the counsellor look at the camera as much as possible can be unnatural and detract from the counselling. This eye contact might be made into an interactive feature that, when displayed on the screen, suggests that the counsellor is looking at the user, giving them a sense of being heard and cared about.

This eye contact might be made into an interactive visual that, when displayed on the screen, suggests that the counsellor is looking at the user, giving them a sense of being heard and cared about. (see Figure 5.13)



placement

Figure 5.13. Converting eye contact

iii. Communicate to the client, "I'm listening" and "I'm online" status

When the client's voice can be heard by the counsellor, there is an icon to show that his/her voice is being conveyed and heard. In this case, it's okay to convey the feeling of being heard, even if it's a fake belief. (see Figure 5.14)



Figure 5.14 The icon to show " I am listening"

iv. Status reminder in some scenarios to help emphasize the counsellor's engagement

For some scenarios in which the client may be concerned that the counsellor's engagement is insufficient, a reminder icon is made to remind the client of the counsellor's engagement. For example, when the counsellor is taking notes, the status bar can be used to tell clients that their counsellor is still engaged in this session. (see Figure 5.15)

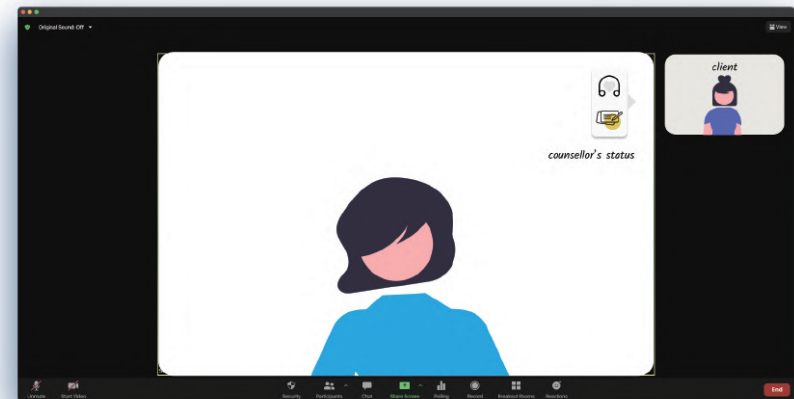


Figure 5.15 The icon to show the engagement of counsellor

Analysis

The analysis and discussion of the four design directions aimed at improving user responses and engagement from counsellors are as follows:

The **i reminder for the counsellor** could be integrated into the Speech Emotion Recognition function. When the clients can see their own emotion and convey it to the counsellors, the system will simultaneously provide the counsellor with a prompt (highlight) when strong emotions are detected. This enables the counsellor to offer a more effective response to the client with the assistance of the system.

The **ii convert eye contact** intends to convey the counsellor's eye contact to the client using a visualization pattern. However, there is a potential issue where the client might constantly notice changes in the icon pattern throughout the whole session. This constant change might amplify the user's perception of moments when there is "no eye contact," potentially distracting their attention and creating a negative experience.

The **iii Listening status** is similar to the second one in terms of visualizing the counsellor's engagement status throughout the conversation. However, like the eye contact direction, displaying the listening status continuously might lead the user to focus on the moments when the counsellor appears to be "not listening," which could have a negative impact on the user's experience.

Therefore, the design should aim to avoid moments when the client might notice that the counsellor is disengaged. Instead, it should emphasize the moments when the client doubts that the counsellor is not engaged. This approach can enhance the client's experience and strengthen their connection with the counsellor.

Conclusion

In this chapter, design vision is defined as ***Enhancing the interactivity and connection in the online during-session phase***. Grounded in this vision, three ideas from Chapter 4 were chosen for the testing phase, aiming to augment the engagement and rapport that users experience with their counsellors. The impact of eye contact, as indicated by the test, was put into the next design stage. Meanwhile, the insights obtained from the after-test interviews showed that monitoring and feedback through the system itself was a more intuitive and easy-to-understand way of interacting with the counsellor.

Combining these insights with the aim of enhancing the user's expression, the final design was generated: Using interaction visual patterns to help the client's self-expression and use it for reflection, to help the client get better feedback and support from the counsellor, and thus to enhance the connection between them.

In the next Chapter, the design of the specific visualization scheme, including its appearance and interaction, will be presented.

Perception

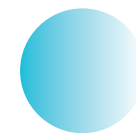
After-session

Visualize



Emotion

VI Final Design



In this Chapter, the requirements concluded from the previous chapter and the design of the specific final visualization tool, including its appearance and interaction will be presented.

6.1 Requirements

The design requirements are based on the literature (chapter 2), the framing of the design vision, feedback from the user test and the final concept generation phase (chapter 5).

Functionally,

Promote the expression of the client

It is the basic requirement, in order to compensate for the problem of lack of non-verbal information transmission due to the segregation of sense in online counselling, clients require a useful tool to express their emotions effectively.

Self-reflection of the client

Built on the basis of aiding clients in expressing themselves, users can also see their own emotions in the process of establishing self-expression, which is conducive to self-reflection after counselling. The improvement in the counselling experience goes beyond just the during-session phase.

Enhance the feedback

It is also a basic requirement to solve the problem of lack of information transmission. Clients often question whether their counsellor is truly listening and understanding them. There should be a way to effectively convey the counsellor's care and responses to the clients.

Avoiding negative aspects

The analysis in section 5.4.2 leads to the conclusion that visualizing the counsellor's entire reaction to the client could potentially draw the user's attention to moments when the counsellor is not fully engaged, resulting in negative effects. Hence, this aspect must be carefully considered and avoided in the design.

Triggered by system monitoring

Based on the findings from the previous test section 5.3, it is evident that allowing the counsellor to manually operate actions to demonstrate engagement to the client can be disruptive. Therefore, a more spontaneous trigger, one that is monitored by the system, should be adopted instead.

Interaction design aspect,

Less distraction

The design will be integrated into the existing video call platform interface, it should take into account factors such as implementation, appearance, and feature placement to ensure minimal distraction for the user.

Conforms to the atmosphere of the counselling

The overall design style should align with the tone of the counselling session, avoiding interactive features that introduce humour or noise commonly found in video software.

Semantic consistency, no misunderstanding

In test section 5.3 participants mentioned the problem that the semantics of the designed UI pattern was different from the intended meaning, which led to a requirement about semantic design.

Theoretically, people's comprehension of an icon is based on their existing knowledge. When an icon is selected, it activates the user's mental model, enabling them to understand its meaning or purpose. Through repeated encounters with the icon, users come to recognize the meaning it represents. It's important to note that the signals conveyed by the designer through the icon may not always align with the user's understanding. Ideally, effective icon design should prompt the user to form the correct mental model, allowing them to accurately comprehend the icon's meaning and take appropriate action (Isherwood, 2009).

In design, it is desired that the user's understanding of UI is intuitive, as in the earlier-mentioned microphone imagery. Therefore, the design of specific patterns is aimed at making the user spontaneously associate the meaning of their appearance.

A Should-have, Nice-to-have, Won't-have figure is shown as Figure 6.1.



Figure 6.1. Should-have, Nice-to-have, Won't-have figure

6.2 Self-expression tool

6.2.1 Concept

Using Speech Emotion Recognition (SER) to help the client's self-expression and use it for reflection

Self-expression of clients:

Clients have the ability to observe their own real-time emotions during the session, understanding that their feelings will also be conveyed to their counsellors.

Reminder for counsellors:

Counsellors gain an additional understanding of their clients, as the system provides prompts (highlights) when strong emotions are detected. This helps them respond more effectively to the client with the system's assistance.

Reflection for clients:

The entire session's speech is recognized and transformed into visuals. Beyond real-time presentation during the counselling, the system also generates comprehensive reflective visual material, along with the corresponding recording, after the counselling session.

What is SER?

An existing emotion recognition technique is Speech Emotion Recognition (SER). It is used to recognize human emotions and affective states from the analysis of speech patterns (Shivamburnwal, 2020).

In speech, there are 3 types of features (Trends, 2021):

Lexical features: the words the speaker said

Visual features: the expression of the speaker

Acoustic features: sound properties like pitch and tone

Feature extraction involves the analysis of specific attributes derived from audio signals. and the emotion of the current audio is identified based on the existing database. This technique finds application in various scenarios, including the analysis of customer satisfaction through call feedback assessments.

How SER works?

Several existing Speech Emotion Recognition (SER) techniques employ diverse methods, including machine learning (Raval, 2023) and deep learning (Shivamburnwal, 2020). These approaches enable the recognition of a broad range of emotions. For instance, Vivoka's voice development kit stands out by successfully identifying eight distinct emotions with high accuracy: neutral, calm, happy, sad, angry, fearful, disgust, and surprise. Other studies have shown that six and seven emotions can also be recognized in the context of the different language databases (De Lope & Graña, 2023).

Here in this project, specific speech feature extraction and analysis methods are beyond the scope of this design, which builds on the feasibility of the SER technique and uses its results as a foundation for the following visualization work (see Figure 6.1).

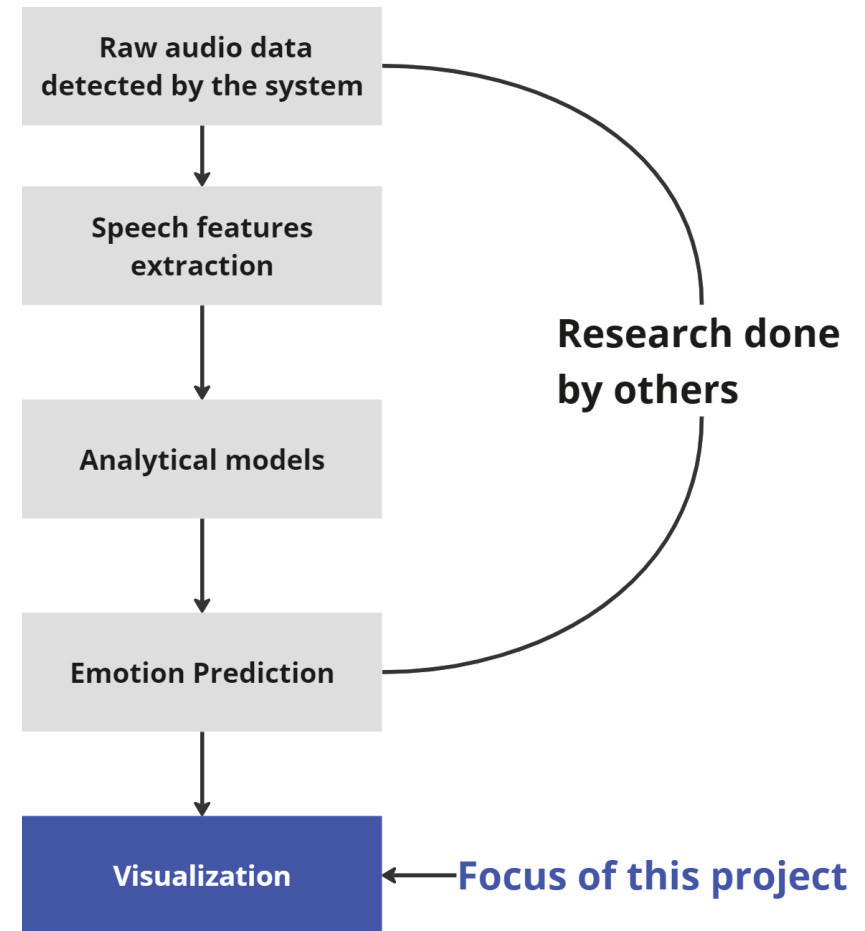


Figure 6.2. The focus of the project

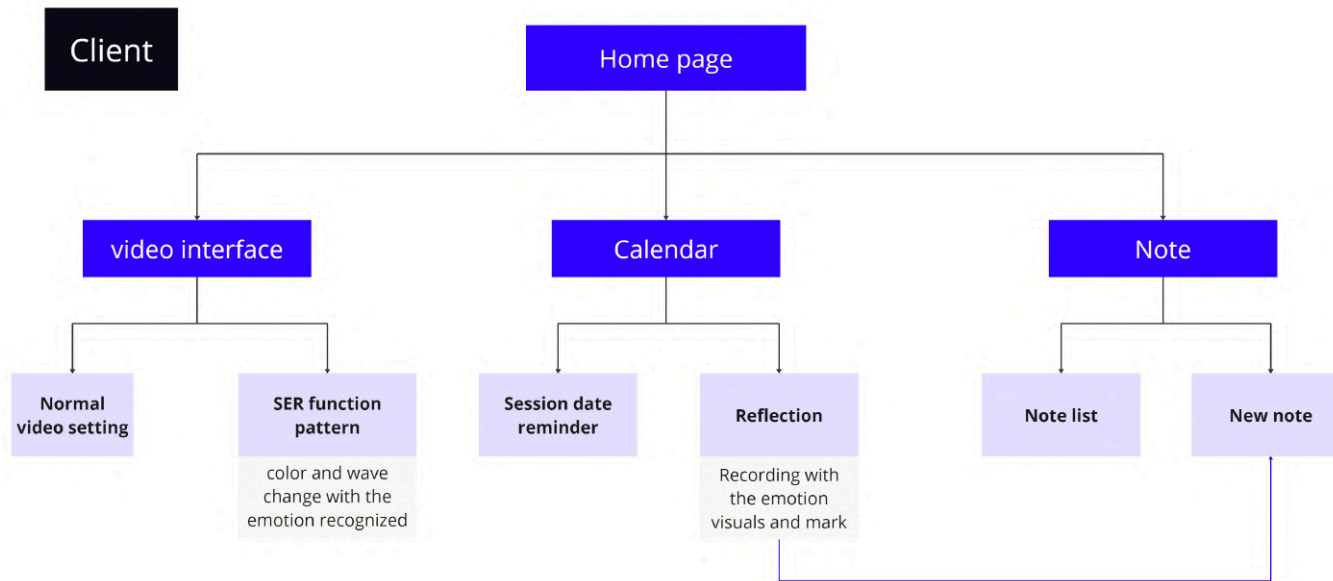


Figure 6.3. Client user flow

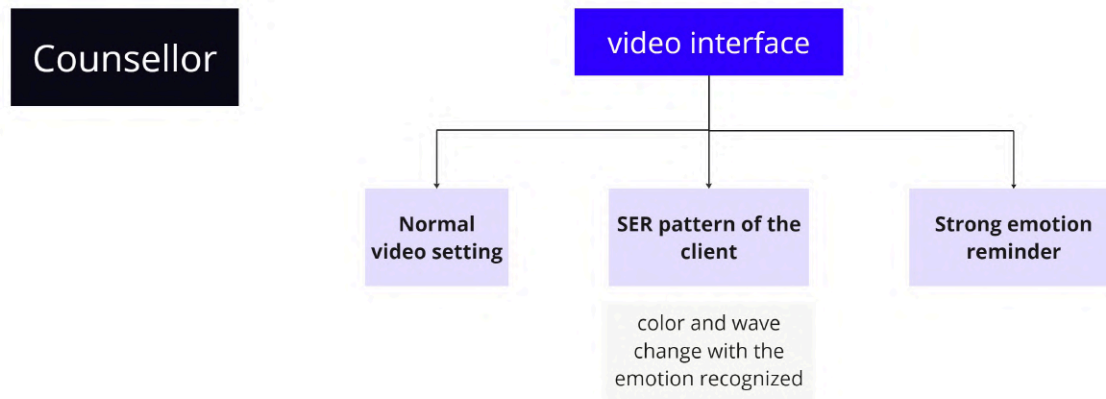


Figure 6.4. Counsellor user flow

User flow

Client User flow

For clients, the function user flow is shown in Figure 6.3. It encompasses two main functions: speech-emotion recognition and reflection. Meanwhile, to make its service more complete, features such as taking notes on the reflection will also be integrated. On the one hand, the SER function compensates for the lack of non-verbal information in online counselling by adding the sense of helping both parties to enhance their perceptions. On the other hand, the functions of helping reflection with recording and using the system to detect and analyse the emotion are not accessible in face-to-face counselling. Here, when users finish counselling, they don't just leave, instead, they are provided with an additional means to have their sessions reviewed, observe how their own emotions were and how the counsellor responded to them.

Counsellor User flow

The counsellor user flow (see Figure 6.4) is way simpler compared to that of the clients. Counsellors have the capability to see changes in the client's emotions with the SER pattern, receiving prompts from the system when the client experiences strong emotions. This prompts the counsellor to respond with assistance from the provided reminders.

6.2.2 Visual Appearance

Colour represents emotion

From some colour theory, different colours represent different emotions (see Figure 6.2). The connection between these colours and emotions is not hard and fast, however, in this design, they are associated according to some existing examples. Since the five emotions chosen for this design are:

neutral, anger, fear, happiness, and sadness

several corresponding colours were chosen to represent each of them. See Figure 6.3 for selected colours and emotions.

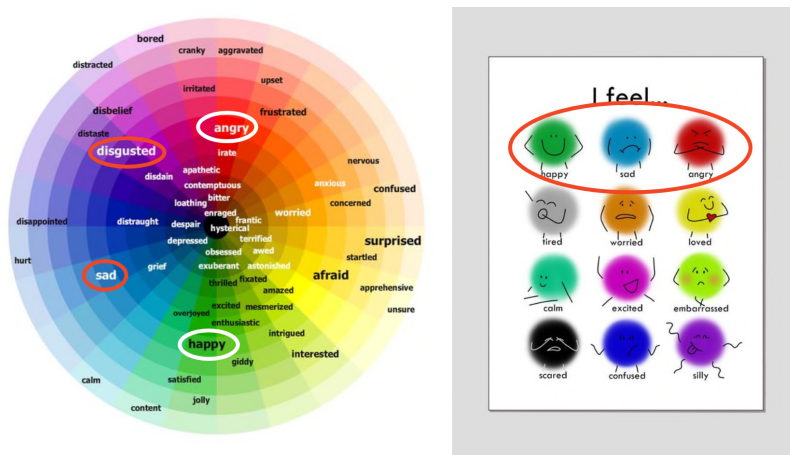


Figure 6.2. Theory Colours represent emotions






<i>neutral</i>	grey	
<i>anger</i>	Red	
<i>fear</i>	purple	
<i>happiness</i>	green	
<i>sadness</i>	blue	

Figure 6.3. Selected colours for 5 emotions

Interaction patterns and demos

Based on the previous analysis phase, the design of the pattern needs to be comprehensible and can draw inspiration from existing visual patterns associated with audio cues (see Figure 6.4).

As a result, the following two related interaction patterns are available: the sound wave type (see Figure 6.5) and the circle pattern in the case of the Siri icon (see Figure 6.6).

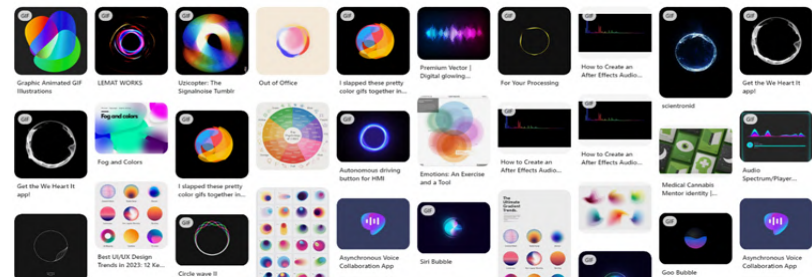


Figure 6.4. Inspiration of audio-related pattern



Figure 6.5. sound wave example

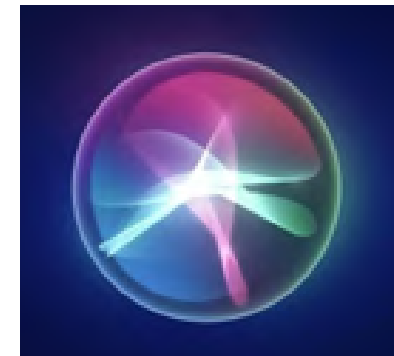


Figure 6.6. Siri pattern

This visual pattern will be placed on the video call interface between the client and the counsellor, and the following two designs have been made for its appearance:

1. This design chooses to use a circular pattern for the purpose of overall coherence and occupancy, and in order to make this interaction pattern able to display the user's changing emotions, an interaction icon design that can be changed in gradient colour and its intensity is designed (See Figure 6.7) It has a round shape on the outer rim and a highly changing waveform inside that represents the change in intensity. When the user's emotion becomes stronger or the sound increases significantly, the waveform in it will be seen to rise significantly.

2. The design uses a waveform visual pattern to represent its connection to speech emotion recognition (See Figure 6.8). As shown in the figure, the height and colour of this wave pattern change following the recognition of emotions. When the client's emotion becomes stronger or the sound increases significantly, the waveform in it will be seen to rise significantly.

For both pattern design, the visual pattern's colour will transition when different emotions are detected by the system. For instance, in the absence of strong emotions, the icon will adopt a neutral grey hue. However, when anger is detected, the icon will promptly shift to a visible red shade, while sadness will progressively transition to a serene blue tone.

In the design of the reflection page that follows, it was observed that the wave pattern is better suited to visually correspond to emotional high points and the timeline, particularly in relation to the system-recognized time markers compared to the circle pattern. As a result, the wave pattern is being considered for use in representing the SER function.

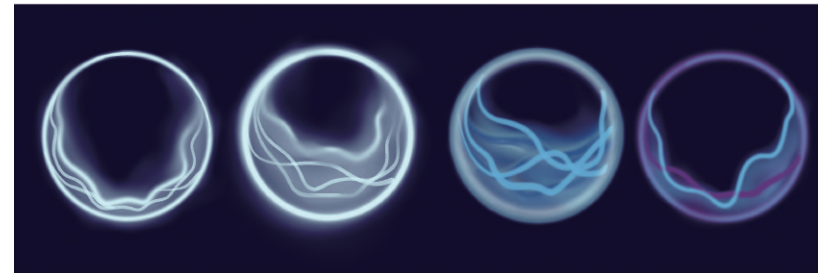


Figure 6.7. The round interaction pattern visuals

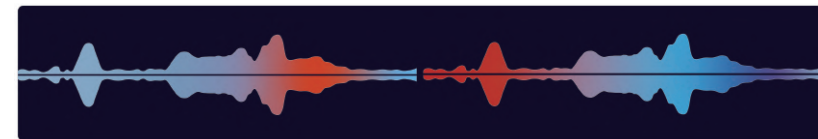


Figure 6.8.1 The wave interaction pattern visuals

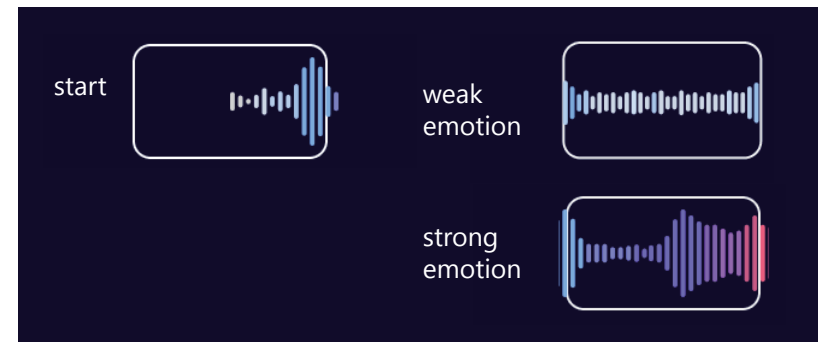


Figure 6.8.2 Wave visuals display

6.2.3 Interface

Video interface during counselling

When the client chooses to use this function, the visual pattern becomes visible in the lower right corner of the video interface for both the client and the counsellor (see Figure 6.9 and 6.11).

As the client expresses themselves, they can observe the changes in this visual pattern corresponding to the displayed emotion (see Figure 6.10). Through this process, the client becomes aware that their emotions are being conveyed through a more visually expressive medium.

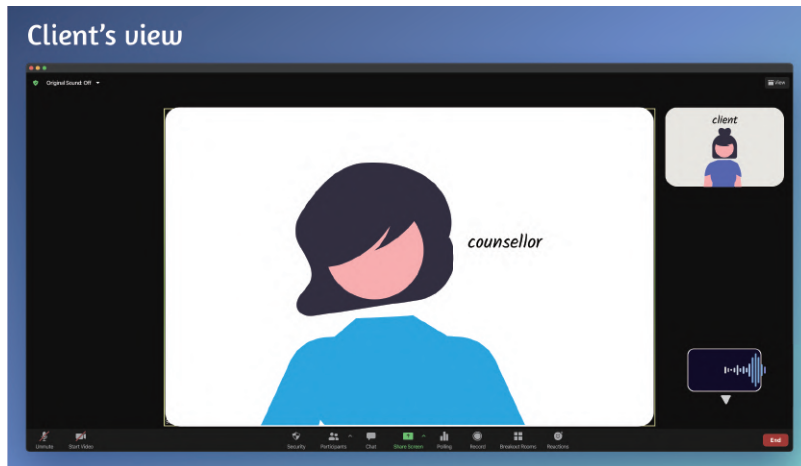


Figure 6.9. The wave pattern on the client-side video screen

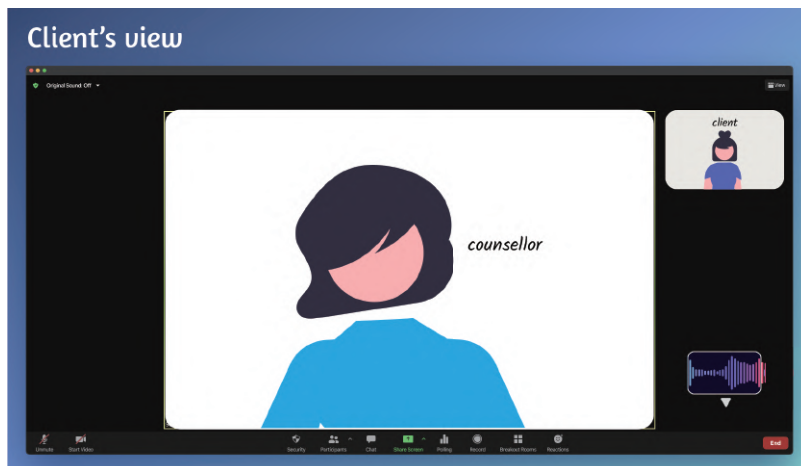


Figure 6.10. The pattern changes with the emotion

Counsellor's view

Meanwhile, the counsellor gains an additional sense of perceiving the client's emotions, this visual pattern is highlighted (see Figure 6.12) when the user's strong emotions are monitored compared to the weak emotion status (see Figure 6.11). This prompt enables them to formulate responses that are attuned to the client's emotional state.

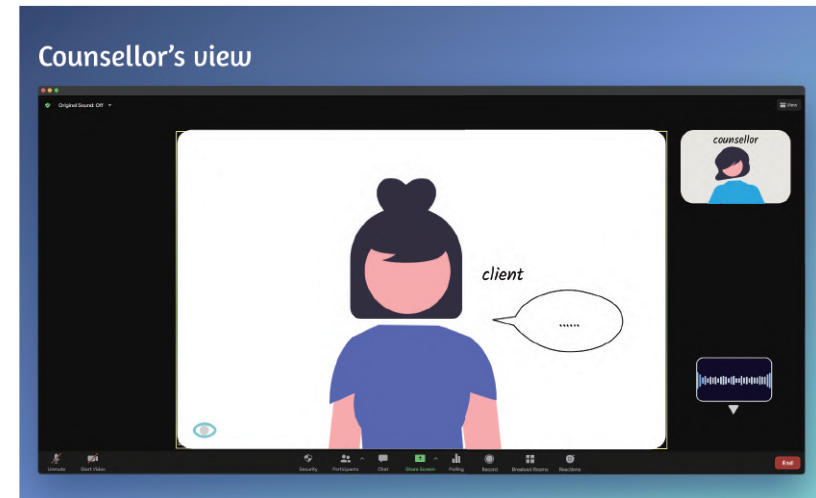


Figure 6.11. The wave pattern on the counsellor video screen

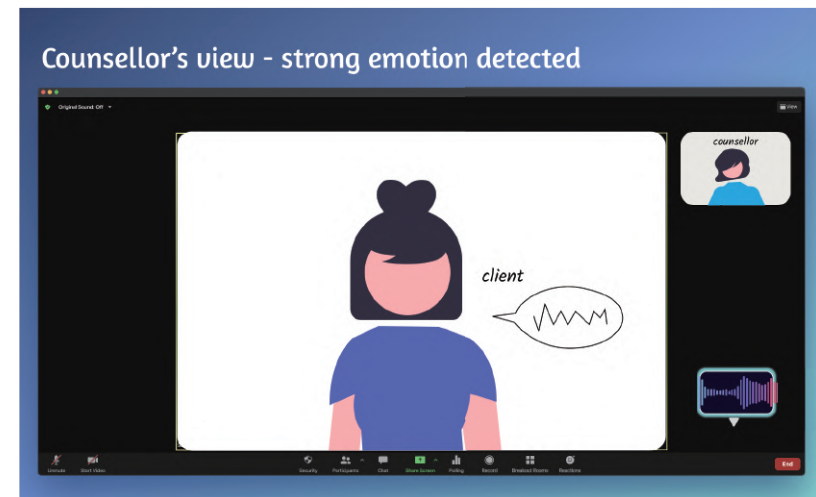


Figure 6.12. A highlighted prompt for the counsellor

Reflection interface after counselling

The purpose of this interface is to help the client perform the after-session reflection activity.

As shown in Figure 6.13, the entire session's speech is recognized and transformed into visuals. The client could reflect on a specific session by clicking on the date on the calendar. After ending the counselling, the SER visual corresponding to the whole conversation will be analysed and summarized into several points and marked on the timeline. In Figure 6.14 and 6.15 there are two different interface designs for the reflection phase, which will be evaluated for their efficiency in the next chapter.

Corresponding to each time node, which will be marked with a colour related to the emotion, the client will have the option to click on these nodes, triggering the playback of the conversation recording from that specific point. This playback will include both the client's statement and the counsellor's subsequent response. The process of engaging with this playback conversation encourages introspection and reflection on the conversation.



Figure 6.13. Reflection material interface

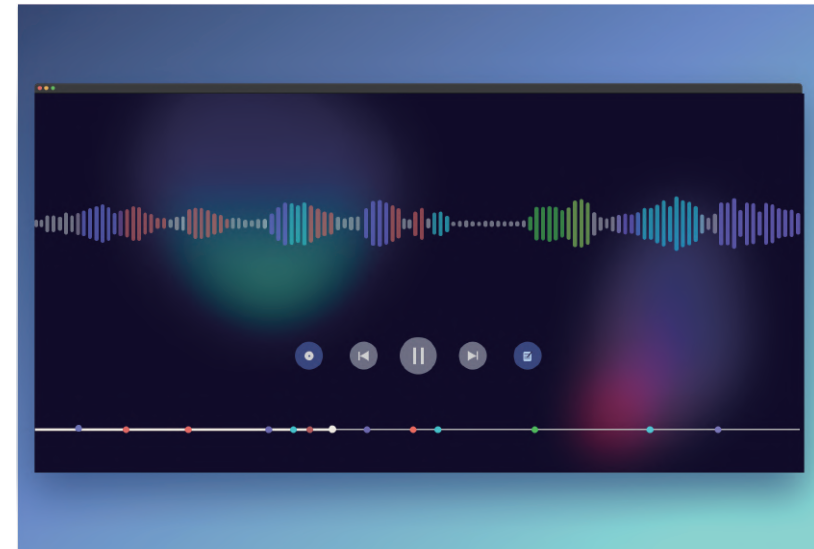


Figure 6.14. Reflection interface with the emotion spectrum visual

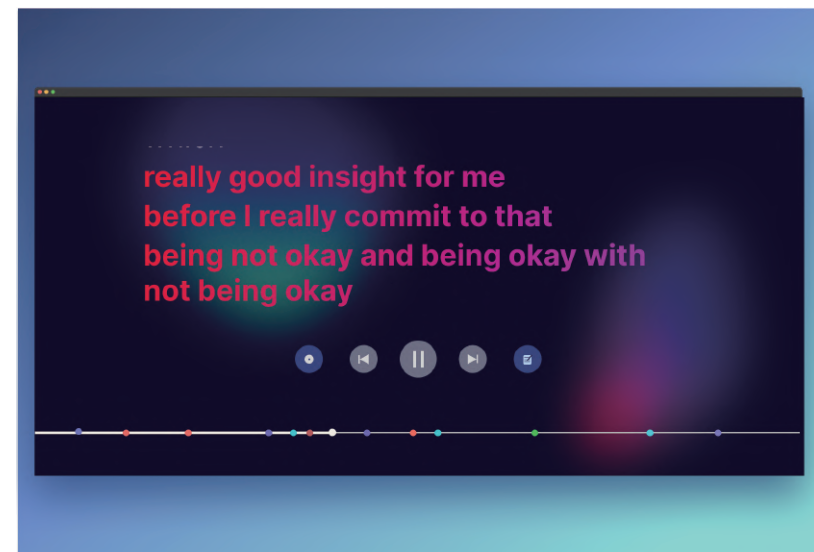
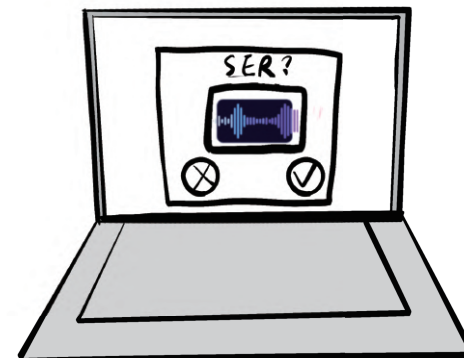


Figure 6.15. Reflection interface with the transcription

6.2.4 Storyboard (see Figure 6.15)



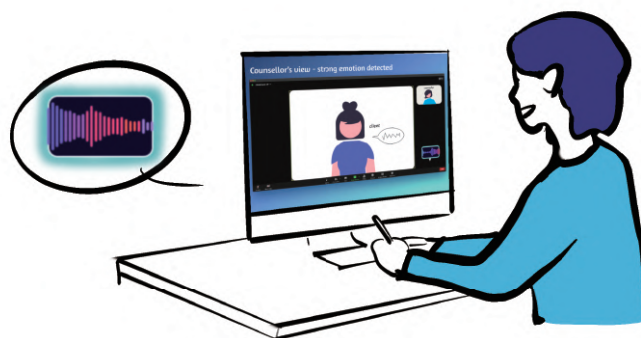
1. The client starts the video interface and is ready to start the counselling.



2. The client turns on the SER function (Includes the option to allow SER and recording)



3. The client can see the pattern and improve self-expression during the session.



4. The counsellor can also see the client's status through this pattern. And the system provide the highlight reminder.



5. After the counselling, the system automatically identifies several points for clients to reflect on the sessions

Figure 6.16. Storyboard

Conclusion

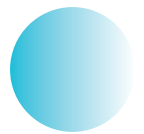
In this chapter, the final design for the enhancement of interactivity and connection is finalized. A system using Speech Emotion Recognition (SER) to enhance counsellor's understanding of client's emotion and client's self reflection is established with the conclusion from previous research and ideation.

The design are considered in terms of design requirements like semantic associations, intuitiveness, ease of comprehension, and automatic monitoring of recognition by the system, which are discussed in the previous content. Based on the definition of the concept, their associated functional interfaces are refined.

In the next chapters, the design will be finally evaluated and iterated.



VII Prototype



In this chapter, the preparation of prototype videos for this design will be described. These videos will be used as material for the subsequent final evaluation, aiming to provide participants with an experience closely resembling the real setting. This approach is intended to ensure that more insightful feedback can be obtained.

7.1 Goal

The goal of the prototype is to provide users with a more real experience through feasible methods to simulate the usage scenario of this design. Subsequently, evaluations and conclusions will be conducted based on this simulated experience.

7.2 Speech emotion recognition on the clients' side

Different directions:

1. Finding Pre-Analyzed Audio: Searching if there is an existing audio recording of the counselling that has already been analysed for emotions

Trying to find audio recordings of counselling sessions that have already been analysed for emotions can be tough. Not many pre-analysed recordings are readily available. Some existing text-to-speech AI software may also be stiff in its effects.

2. Checking SER Implementation Software: Looking for software that can analyse speech and recognize emotions (SER) by simply uploading the audio.

Big tech companies like IBM Watson, Google Cloud, and Microsoft Azure are researching and developing APIs for this purpose related to speech, text, and emotion. However, the accuracy and effectiveness of these tools are still being refined. Current solutions can detect basic emotions like neutral, happy, angry, sad, fear, and surprise, but they might not distinguish more detailed emotions.



3. Analysing Specific Audio Clips by the author: Choosing short, around 6-minute audio segments from existing counselling videos to analyse emotions precisely.

For specific mood-colour correspondences refer to colours in hume.ai (Speech Prosody, n.d.) in Figure 7.1.

Figure 7.1. mood-color associations from hume.ai

Analysing and visualising emotions in example videos

As speech emotion recognition demands a lot of coding study and skills, achieving a complete implementation of SER in the prototype is not feasible. However, analysing emotions from selected example session video recordings and correlating them with corresponding emotions for visualization of the final effect is achievable. This will be performed through the authors' own analyses, serving as a basis for subsequent final evaluations.

Example video selected:

The video case study Person Centred Therapy Demonstration: A Contemporary Approach from Mick Cooper, 2022 was selected (See Figure 7.2) The original length of the video was 50 minutes, and a 6-minute segment with various mood changes such as sadness, anger, fear, etc. was selected for emotion analysis and visualisation. The video has images of both the counsellor and the client, making it easy to cut and produce later. In the SER pattern prototype video, on the right bottom side are the emotion variation visuals (see Figure 7.3). The participants could see visual patterns showing changes in emotion during this 6-minute video period.



Figure 7.2. Selected video case



Figure 7.3. The pattern changes during the session

7.3 Reflection page prototype

In the test of the reflection interface, there are two different types of interfaces:

- Emotion visual with the corresponding timeline and mark (Figure 7.4)***;
- Emotion visual and the recording transcription corresponding to the timeline (Figure 7.5)***

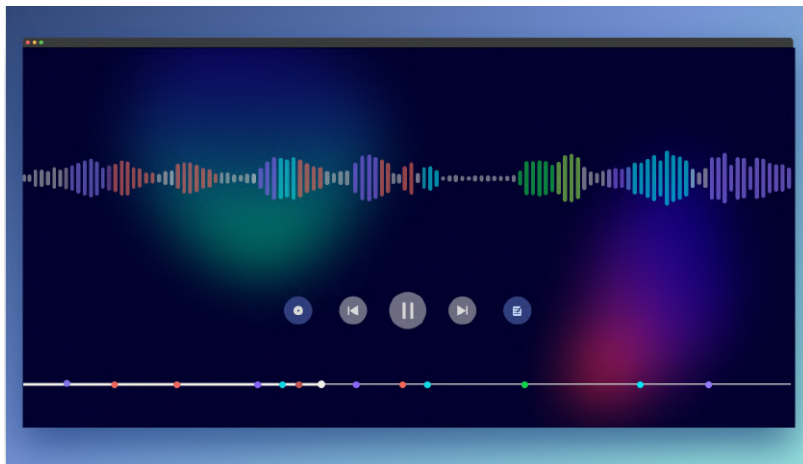


Figure 7.4 Emotion visual with the corresponding timeline and mark

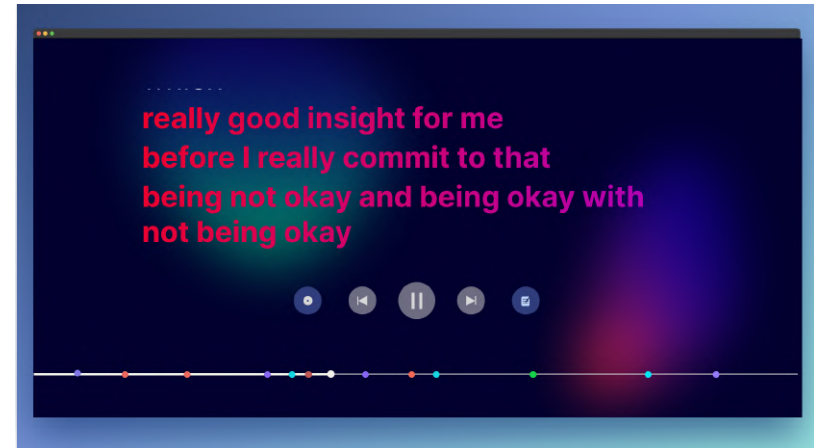


Figure 7.5 Recording transcription corresponding to the timeline

Both interface videos use the same 6-minute session recording. Users can select what to play by dragging the timeline bar.

In the first interface, clients can listen to their own voice and the counsellor's response while dragging the timeline bar according to the prompts of the system-generated emotional points or their own choice. In the second interface, as the user drags the progress point on the timeline, a transcription of the recording appears on the interface.

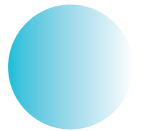
In the next chapter, the user will experience and evaluate the design, based on which the final iteration and conclusion of the product will be presented.

Iteration

Refletion

Evaluation Studies

Emotion recognition



VIII Evaluation of the final concept

In this section, the design solution identified in Chapter 6 undergoes a final evaluation. Following this evaluation, any necessary iterations are made to refine the details of the design. This process aims to test whether the final solution aligns with the overall design vision and meets the specified requirements.

8.1 Introduction

Goals

The goal of evaluation is to provide a final assessment of the overall design concept, including validating whether the final design effectively fulfils the established design vision and requirements, evaluating its compatibility with the existing context, gauging its usability in real-world scenarios, and acquiring valuable insights to guide potential improvement.

Participants

People with online counselling services experience were recruited to participate in the final evaluation.

Methods


The two parts of the design were presented and explained separately to the participants. To reduce the effect of viewing order on the test effect, 8 participants will be divided into two groups. The order in which they watch the evaluation video will be switched. After experiencing the concept, the participants were asked to finish the evaluation form provided by the designer. A follow-up interview was conducted to collect their feedback.

8.2 Evaluation questions

the design vision is to enhance the interactivity and connection by

- Improve the emotion self-perception of the client**
- Make counsellors more understanding of clients' emotions**
- Help the client to reflect on the session effectively**
(which only can be achieved with online system)

8.2.1 Speech recognition function pattern



New table

What I want to ask?	Original video no extra function	Video setting with the SER pattern
Does this SER function <u>enhance the self emotion perception of the client during counselling?</u>	Q1 To what extent do you have a sense of your own emotions during an online session?	Q1 To what extent do you have a sense of your own emotions during an online session?
Does this design <u>let the clients feel that their counsellor know them better with the SER function?</u>	Q2 To what extent do you think your emotions are perceived fully by the counsellor?	Q2 To what extent do you think your emotions are perceived fully by the counsellor?
Does this design <u>enhance the interactivity between them during counselling?</u>	Q3 To what extent would you rate the interactivity between you two?	Q3 To what extent would you rate the interactivity between you two?
Does this design <u>enhance the connection between them during counselling?</u>	Q4 To what extent would you rate the connection between you two?	Q4 To what extent would you rate the connection between you two?
if the pattern design provide <u>semantic consistency</u>		Q5 To what extent do you have a clear semantic understanding of this visual pattern and can you relate it to speech emotion recognition function?
Overall, to what extent does this design enhance your experience of communication during online counselling?		Q6 Overall, to what extent does this design enhance your experience of communication during online counselling?

Table 8.1. Questions for Speech recognition function pattern

8.2.2 Reflection function



New table

What I want to ask?	Emotion visual with the corresponding timeline and mark	Recording transcription corresponding to timeline and mark
Which interface could motivate client to reflect on the session more?	Q1 After the counselling, to what extent do you think the design will motivate you to reflect on the session?	Q1 After the counselling, to what extent do you think the design will motivate you to reflect on the session?
Which interface is better at guiding the user to reflect based on system-generated points?	Q2 When using the reflection interface, to what extent do you think the design could guide you to reflect on the point marked by the system?	Q2 When using the reflection interface, to what extent do you think the design could guide you to reflect on the point marked by the system?
Which interface is better when the client want to find a specific point to reflect in session?	Q3 When using the reflection interface, to what extent is it easy to find a point that you want to specifically reflect on?	Q3 When using the reflection interface, to what extent is it easy to find a point that you want to specifically reflect on?
Overall, which design could provides more effective reflection activities?	Q4 Overall, to what extent does this design provide you effective reflection?	Q4 Overall, to what extent does this design provide you effective reflection?

Table 8.2. Questions for reflection function

Here are the test questions for the two functions. The same questions will be utilized for both variables in each test to prevent questions from influencing the participants. Once a participant completes experiencing a test video, they will proceed to fill out the scale by answering these questions.

8.3 Procedure

1. Brief introduction
Welcome and briefly introduce the evaluation. Described using context to the participant.
2. Demonstrated the test
Two scenarios were shown and explained. Explanations were provided when necessary.
3. Evaluate the experience
After going through the tests, the participant first filled in the online evaluation forms.
4. Ask for feedback
In the end, the participant was interviewed, shared their overall experience, asked further questions, and gave suggestions.

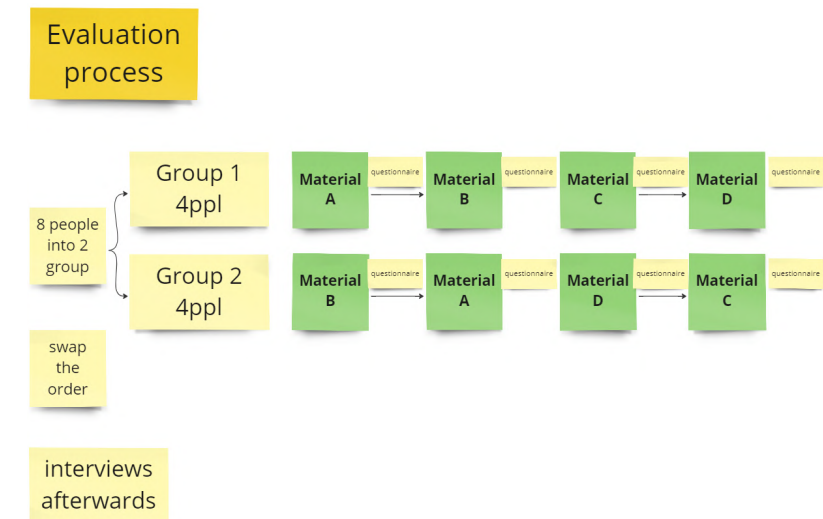


Figure 8.1. Evaluation procedure

8.4 Results

8.4.1 Data analysis

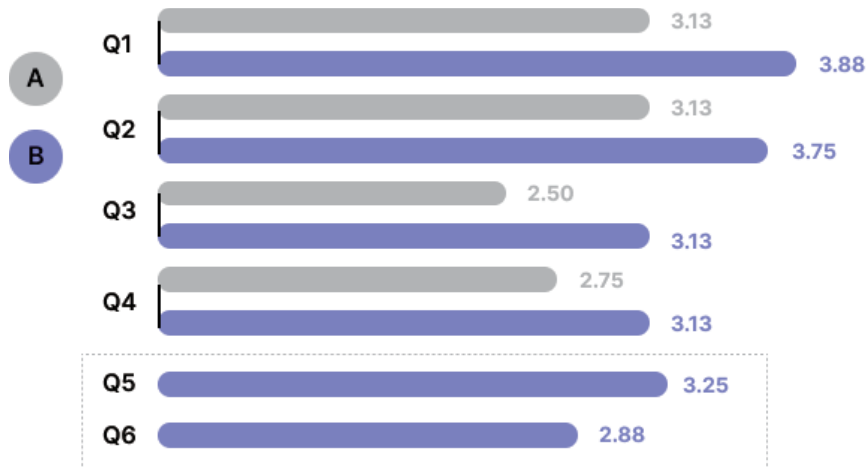


Figure 8.2. Result of test material A/B

By testing the first material A/B part, it can be noted through the data (Figure 8.2) that this SER pattern is supportive in enhancing the user's perception of emotions. There is also a beneficial effect on the interactivity and connection between the counsellor and the client.

For the understanding of its semantic consistency, this pattern is designed to be easily associated with sound volume, so it can be optimised to avoid ambiguity.

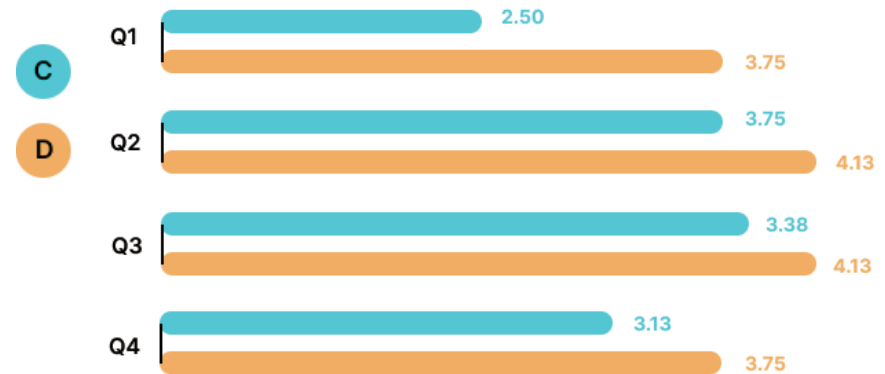


Figure 8.3. Result of test material C/D

For the second material test (Material C/D). The data shows the visualization with transcription has better results in motivating and guiding people to reflect and it is more clear to find a specific point by going through the text without too much effort.

8.4.2 Feedback Analysis

SER function

To optimize the real-time Speech Emotion Recognition (SER) function within the online counselling interface, several important considerations have been identified:

1. User Perspective

Recognizing that clients are deeply immersed in their own emotions during counselling, the SER function primarily serves the counsellor. The UI for real-time recognition should be visible on the counsellor's side, providing valuable insights and aiding in understanding the client's emotional state.

2. Real-time Recognition UI Design

The current design resembling a volume symbol could be refined to an abstract and visually engaging representation, such as a more abstract wave or an AI assistant like Siri. This design could consist of abstract bubbles that dynamically change in colour and size, making it visually appealing and easier to interpret.

3. Minimizing Distraction

Acknowledging that vision direction shifts between people on screen and the UI can be distracting, customization options should be incorporated. Users should have the ability to personalize the placement and size of the UI, possibly through a drag-and-drop feature. This customization allows the user to position the UI in a way that minimizes distraction during the counselling session.

4. Colour, Legends, and Instructions

Implementing a colour-based system, accompanied by legends or instructions is needed. Different colours within the UI should represent various emotions. Initially, the system should guide the user by displaying the emotion names associated with each colour. However, this feature should be customizable, allowing users to choose whether to display emotion names once they are familiar with the color-emotion associations.

By considering the user's perspective, optimizing the UI design for real-time recognition, minimizing distraction, and providing customization options for colour representation, the SER function can effectively enhance communication and understanding between the counsellor and the client during online counselling sessions.

Reflection function

Based on the insights gained from the test with the reflection page, the real-time dialogue-to-text function proves to be highly valuable as a note-taking tool for the counsellor. This feature is particularly essential since counsellors need to take notes during counselling sessions, a task that may distract them from fully engaging with the client. With the transcription tool, counsellors can transcribe the dialogue without the need to type, allowing them to devote more attention to the client. This reduces their workload and significantly enhances counsellors' engagement, aligning with the design vision of augmenting connection and interactivity in the online counselling process. The notes generated by this tool are automatically categorized and marked by AI based on the detected emotions. This automated categorization streamlines the process of reviewing a client's situation, enabling counsellors to efficiently revisit and prepare for subsequent sessions based on the system's emotional markers.

For the client, insights from the interview research emphasize that after a counselling session, they engage in activities like reviewing and reflecting or attempting to transition from the mindset present during the session. The after-session reflection tool precisely addresses these after-counselling needs. The reflection tool takes the form of an AI-generated summary map, condensing key points from the consultation. These points are categorized by different emotions, allowing the client to review both their and the counsellor's statements that have been summarized. Furthermore, the client has the option to access the original recording of the counselling session at specific moments by simply clicking on the summarized points. This comprehensive functionality serves to support the client's after-counselling activities and fosters a more effective and insightful transition from the counselling session.

In summary, the final function structure encompasses a real-time dialogue-to-text feature that significantly aids counsellors in note-taking, reducing distraction and enhancing engagement. Additionally, an after-session reflection tool equipped with an AI-generated summary map caters to the client's post-counselling needs, facilitating review, reflection, and a smoother transition from the counselling experience.

Suggestion for enhance the function

1. Empowering Clients in Reflection

During the reflection process, clients should have the ability to refine the system's analyses of their emotions. Allowing clients to modify the AI's interpretations helps in training the system, ultimately leading to more accurate analyses in subsequent sessions.

2. Colour and Legend Instructions

Incorporate clear instructions and legends within the reflection interface to educate users about the colours and their corresponding emotions. Providing this guidance ensures users comprehend and effectively utilize the color-coded emotional representation.

3. Comparison of Material C and Material D

When comparing Material C (Timeline with visuals) with Material D (Timeline with transcription), transcription proves to be the superior choice. Users can effortlessly read the dialogue, gaining control and efficiency over the session's content. This visual approach allows users to avoid the inconvenience of listening and provides more precise information. Additionally, users have the option to choose whether to play the sound, enhancing their overall experience.

4. Distinguishing Between Speakers

To enhance readability and clarity, a dialogue box layout can be implemented, with one speaker's text displayed on the left and the other on the right. Incorporate distinctive features like position, font, and colour to differentiate between the counsellor and the client. This differentiation aids users in easily identifying and attributing the dialogue to the respective speaker.

8.5 Iteration Functional Structure

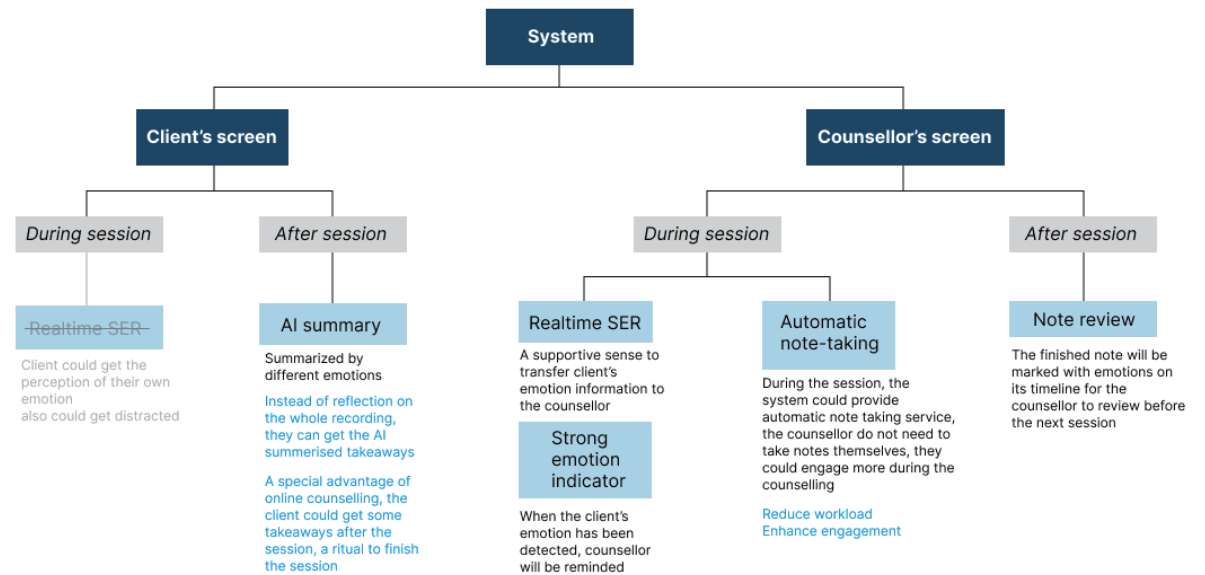


Figure 8.4. Iterated function structure

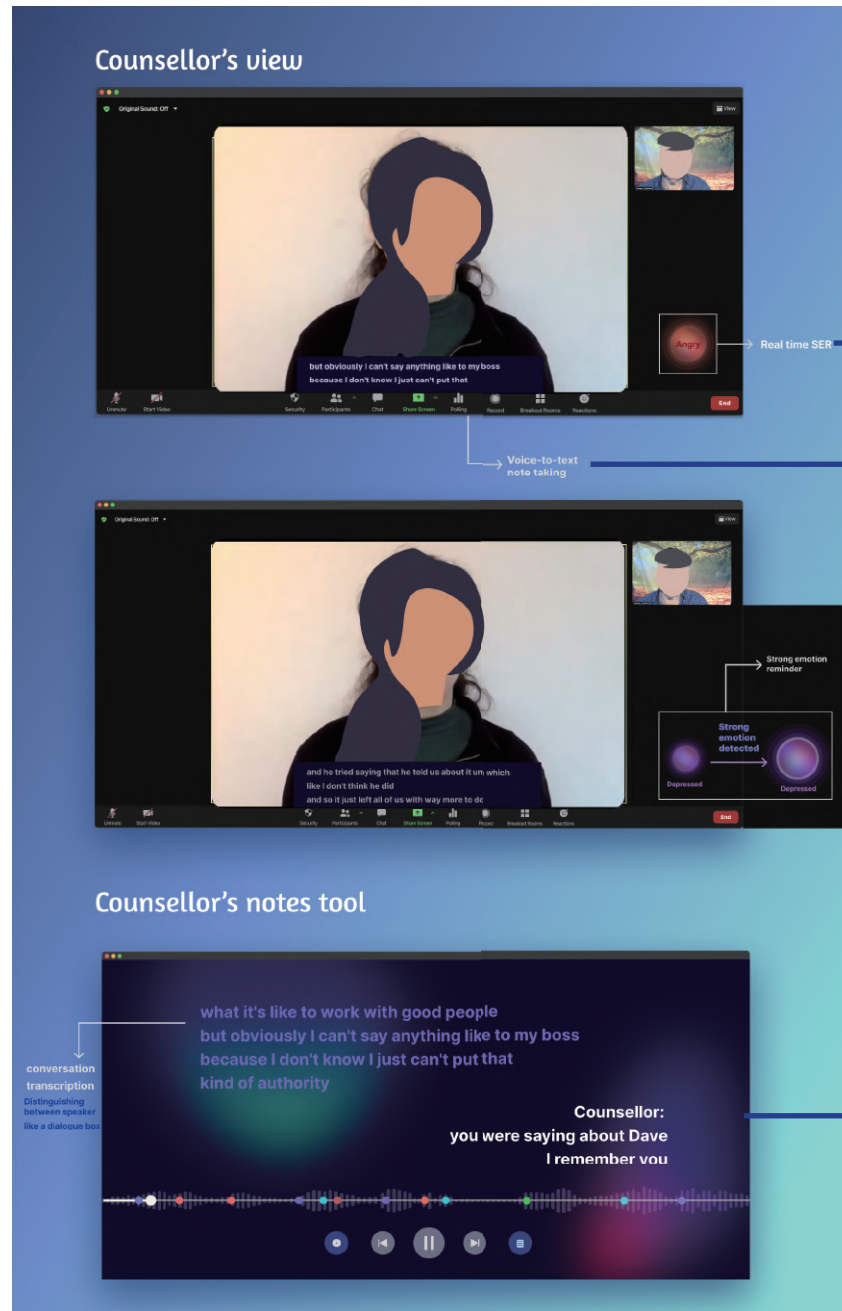
In Figure 8.4, the functional structure of the system during counseling is made.

During the counselling process, the counsellors' side will have a real-time SER UI showing the client's emotions, helping them to better understand the client's emotional changes, when the AI detects a strong emotion, the counsellors can receive reminders through the change of the UI. During the communication process, the system will help the counsellors to record notes throughout the process, reducing their workload

and boosting engagement, and these notes will be available for the counsellors to review after the end of the session, aiding in preparation for future sessions.

At the end of the counselling, the user will get an AI summary about the session, the takeaways throughout the session will be marked with different emotions and presented in a similar way to the effect of the user's journey, Enables client's reflection for a better conclusion to the counselling session.

Counsellor's side (Figure 8.5)



SER visulizer

A tool to compensate for the lack of non-verbal info in online communication

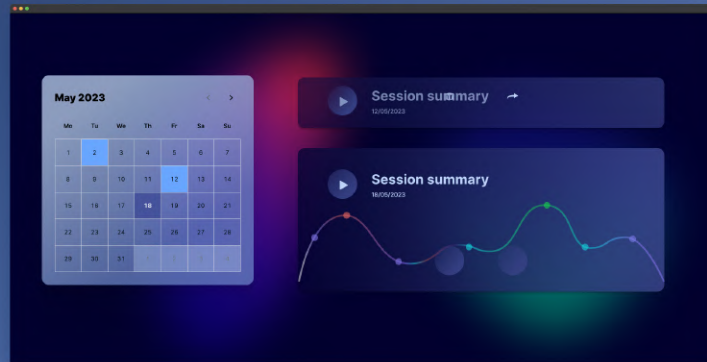
Auto speech-to-text note taking tool

A tool to reduce the counsellor's workload and enhance their engagement during counselling

Figure 8.5. Counsellor's side interfaces

Client's side

Reflection main page with calendar



Reflection detailed page



Marked points based on the detected emotion

When the mouse hovers over the corresponding point, the summary for that emotion point will display



Figure 8.6. Client's side interfaces

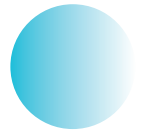
Reflection tool: A summary map generated by the system's AI, which enables clients to swiftly adjust their mindset after-session, having in a smoother transition from the counselling session (see figure 8.6).

To provide a better service, all content will be *end-to-end encrypted*, while users will be able to *correct and train the AI* so that it can make more accurate summaries.

Design process

Design concept

IX Conclusion



This chapter is the summary of the whole design project, it contains the answer to the original question, what is the difference between online and face-to-face counselling, and what could be improved here.

9.1 Design process

To answer the design question and achieve the design goal, this project uses the double-diamond method to separate the research and design phases. In the first diamond, a thorough literature review was carried out to compile existing research on both online and face-to-face counselling. On this basis, interviews were conducted with both the counsellor and the client, these interviews highlighted experiential differences between the two counselling modalities and generated valuable insights, resulting in some potential touch points.

After the research phase, the design directions were concluded for the design phase. Inspiration was gathered using online communication as the keyword, followed by a creative session that produced the results of the first phase of brainstorming and design vision. After a testing round of the initial ideas, the final version of this design was created and explored in terms of how it could enhance communication activities in online counselling. This concept is based on emotion recognition and provides tools for counsellors and clients respectively.

9.2 Design Concept

The final design corresponds to the needs and problems that arose during the counselling that were identified in the research:

In the literature review ([chapter 2](#)), it was emphasized that counsellors require comprehensive information about the client to provide accurate responses and build rapport, leading to effective counselling outcomes. To address this, the design introduces a speech emotion recognition (SER) function. This function serves to offer a supportive sense to the counsellor, helping in a deeper understanding of the client's emotions and providing additional valuable information.

Meanwhile, the interview ([chapter 3.2](#)) reveals a concern related to clients questioning the counsellor's engagement during sessions. Clients often have worries about whether the counsellor is fully attentive, especially when they observe the counsellor taking notes or multitasking. This issue was also addressed during preliminary tests ([Chapter 5.3](#)). In response, the design incorporates a note-taking tool for counsellors. This tool allows real-time transcribing of the conversation, relieving counsellors from the need to type during the session. By reducing the counsellor's workload, this feature enhances engagement and interaction. Additionally, the notes are categorized based on the identified emotions at the time, facilitating efficient review and preparation for subsequent counselling sessions.

In response to the challenge of after-counselling mindset transition for clients, insights from the interviews ([Chapter 3.2](#)) highlighted the client's desire for effective after-session self-care strategies and a quick shift in mood and atmosphere. To meet this need, the design uses a reflection interface that guides clients through a post-session reflection using a summary map generated by the system's AI. Clients can review their expressions and the counsellor's responses marked by emotions throughout the session. This process enables clients to swiftly adjust their mindset after-session, having in a smoother transition from the counselling session. This reflective feature is uniquely achievable in an online setting.

AI

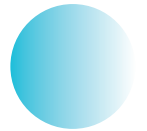
communication

Technology

HUMAN

Ethical

X Discussion



This chapter is the discussion part of this design. After the design solution is delivered, the feasibility and limitations will be analysed and future recommendations will be brought to the readers. A personal reflection is written down here.

10.1 Feasibility

Privacy and Ethical Concern

The function of Real-time Data Processing requires secure and ethical handling of user data during listening and recording.

It also needs to comply with the data privacy laws and ethical guidelines to respect users' privacy and maintain trust. Consent and transparency in data usage are fundamental aspects.

Implement techniques to anonymize and protect personally identifiable information to mitigate any potential privacy risks.

Technical Feasibility

Speech Emotion recognition technology relies on advancements in artificial intelligence (AI) development. The modelling algorithm's (machine learning, deep learning,...) effectiveness will influence the accuracy of representing and recognising emotions in speech. The ability to realize real-time processing is also essential, especially in dynamic conversational environment.

Operational Feasibility

The technology could be integrated with current online video platforms like Zoom or online counselling services like Open-up, enhancing the overall user experience.

It can also be integrated with mental health monitoring systems or virtual assistant applications to expand the scope and utility of the technology, and making it more versatile and beneficial across multiple domains.

These key feasibility aspects provide a foundational understanding of the practical, ethical, and technical considerations necessary for the successful development and implementation of this concept.

10.2 Limitation

It is important to acknowledge the limitations due to different aspects that may influence the design outcome.

Sample Size and Diversity

When recruiting interviewees, I mainly used channels such as group chats at the university to find clients and counsellors with online and in-person counselling experience, and similar channels were used in subsequent tests, so users of all ages were not recruited. Also, the majority of those invited to participate in the interviews were female, which may be because more females than males are involved in counselling or they are more willing to participate in the interviews to share their experiences.

Time Constraint

Due to the time constraint of the graduation project, there will be the possibility that it cannot be explored fully as desired and then influence the outcome of the design.

Accuracy

Many techniques and algorithms related to emotion recognition are still in the process of research and not fully realised, thus affecting the accuracy of emotion recognition. And since the definition of different emotions is not very clear, subtle variations in intonation, loudness, pitch, and other speech elements can lead to varied interpretations. (Cen et al., 2016)

AI-generated results may not always align with human perception due to differences in the algorithms' interpretation and human Interpretation.

Human emotions are continuous and multifaceted, presenting a challenge in real-time visualization. The representation of emotions as discrete entities may not accurately capture the fluidity and complexity of human emotional experiences.

Privacy and Ethics issues

The ethical dimension of this design is inevitable, given the sensitive and controversial nature of both intervening in the recognition of emotion by Artificial Intelligence and its application to psychotherapy.

MIT's Ethics Sheet for Automatic Emotion Recognition and Sentiment Analysis (Mohammad, 2022) emphasizes that the analysis of emotions is a complex process, and AI, being a tool, has its limitations and potential to cause harm, directly or indirectly, during the analysis. Hence, researchers must exercise vigilance and adhere to higher ethical standards when delving into this domain.

Ethical discussions of other projects involving Artificial intelligence in psychotherapy have identified the need for regulation of device and website data security when delivering personal health information, as well as clear standards for confidentiality, information privacy, and secure management of data collected (Fiske et al., 2019). There also needs to be transparent channels for participants to obtain their full consent.

Respecting individual privacy and ensuring informed consent regarding the use of AI in emotion recognition is critical. Clients engaging in online counselling deserve transparency regarding the utilization of such technologies and their potential impact on the therapeutic process.

10.3 Future recommendations

Design of the whole process

The context research of this design discovered that online counselling is actually quite different from in-person counselling throughout the entire process. However, due to the time and focus constraints of this design, it was not possible to perfect the entire Before-during-after process. The system could be improved by combining more functions like the 15-minute preparation activities and after-session self-care activities for a more complete service system.

Long-term Psychological Impact

Analysing data with AI in online counselling gives us insights into a user's history and changes over time. It helps counsellors adjust their approach for more effective support based on this understanding.

Expanding the Scope of Use Context

While the primary focus of this design is online counselling, it is interesting to say that the insights and concepts generated can go beyond this specific context. The implications of this design can be used in various online activities and contexts where the digital format significantly influences the overall user experience.

In practice, diverse domains such as e-medicine, online education, long-distance relationships, and more cases can also derive useful points from it. The features of the online environment, particularly limitations in capturing non-verbal cues and the advantages of interacting with artificial intelligence systems, show the opportunity for innovative solutions in online communication.

The core concepts of enhancing interactivity, understanding emotions, and aiding reflection through AI summary can be used to address the unique challenges and objectives of these areas.

10.4 Reflection

I wouldn't say that my graduation design has been a very smooth ride, but at the same time, I have had more opportunities to make trial and error and learn new things. Design is indeed a cyclical journey involving exploration, trial and error, learning, and adaptation. It's common to face moments where a step back is necessary to make a significant change, and I started to think about the sunk cost and a "possibly" better choice.

Since I was working on the topic of interaction design, I had to learn a lot of knowledge and skills from scratch, and I often felt overwhelmed, some problems that other people could point out at a glance often puzzled me for a longer time, which led me to have self-doubt. However, I think it is worthwhile to learn a lot of things through the half-year graduation project. Learn by doing, and understand that many times I can't get the feedback I want, but there must be a result of my effort, and I can see my potential to explode quickly, which I have written down as my personal ambition in my project brief.

I would like to put a quote that's on my phone's lock screen and one that I think every person in the design profession will feel resonance with:

*“Every once in a while, go back and look at your old work, cringe for a bit, then keep going.
You’re still getting better, confirmed.”*

- Marques Brownlee

Acknowledgement

First and foremost, I would like to thank my supervisors: Catelijne and Martin for their guidance and time during this project period. I spent a lot of time with you on this journey of exploration and you provided a lot of useful feedback for me to get better improvement. I am glad to finish my thesis together with you.

I would also express my gratitude to my friends and fellow peers for their help and participation in the co-creation and test session, without you I could not have so many useful insights and suggestions. You also gave me encouragement during the challenging time of this project.

I want to say thanks to my family, my parents, for your understanding and patience with me, allowing me to moderate my mindset well and have the chance to take a break.

I would like to thank all my participants who shared their experiences with the counselling, even though we don't talk about the details, I understand that the memories are still sensitive and painful. I hope all the pain will be filled and you'll be happy with your lives.

The journey here is over and I'm about to move on to the next step of my unknown future.

Reference

- Adoga, R. O. (2020). Psychological tests in counselling. ResearchGate. https://www.researchgate.net/publication/344395552_Psychological_Tests_in_Counselling
- American Psychological Association. "Counseling Psychology." American Psychological Association, 2008, www.apa.org/ed/graduate/specialize/counseling.
- Andrews, G., Davies, M. L., & Titov, N. (2011). Effectiveness Randomized controlled trial of face to face versus internet Cognitive behaviour therapy for social phobia. *Australian and New Zealand Journal of Psychiatry*, 45(4), 337–340. <https://doi.org/10.3109/00048674.2010.538840>
- Anthony, K., & Goss, S. (2009). Ethical thinking in therapeutic practice. In D. Hill (Ed.), *Forms of ethical thinking in therapeutic practice* (pp. 50– 66). The Open University Press.
- Apple Inc. (2023, June 9). WWDC23 highlights - Discover - Apple Developer. <https://developer.apple.com/news/?id=cj1fjit2>
- Ardito, Rita B., and Daniela Rabellino. "Therapeutic Alliance and Outcome of Psychotherapy: Historical Excursus, Measurements, and Prospects for Research." *Frontiers in Psychology*, vol. 2, no. 270, 18 Oct. 2011, www.ncbi.nlm.nih.gov/pmc/articles/PMC3198542/, <https://doi.org/10.3389/fpsyg.2011.00270>.
- Bavor, C. (2021, May 18). Project Starline: Feel like you're there, together. Google. <https://blog.google/technology/research/project-starline/>
- Counseling script. (n.d.). Scribd. <https://www.scribd.com/document/511424638/Counseling-Script#>
- Cen, L., Wu, F., Yu, Z. L., & Hu, F. (2016). A Real-Time Speech Emotion Recognition System and its Application in Online Learning. In Elsevier eBooks (pp. 27–46). <https://doi.org/10.1016/b978-0-12-801856-9.00002-5>
- De Lope, J., & Graña, M. (2023). An ongoing review of speech emotion recognition. *Neurocomputing*, 528, 1–11. <https://doi.org/10.1016/j.neucom.2023.01.002>
- Elmansy, R., Elmansy, R., & Elmansy, R. (2023). The Double Diamond Design Thinking Process and How to Use it. Designorate - Design Thinking, Innovation, User Experience and Healthcare Design. <https://www.designorate.com/the-double-diamond-design-thinking-process-and-how-to-use-it/>
- Fiske, A., Henningsen, P., & Buyx, A. (2019). Your robot therapist will see you now: Ethical Implications of Embodied Artificial intelligence in Psychiatry, Psychology, and Psychotherapy. *Journal of Medical Internet Research*, 21(5), e13216. <https://doi.org/10.2196/13216>
- Hazlegreaves, S. (2020). The future of therapy: Online counselling searches increase by 124%. Open Access Government. <https://www.openaccessgovernment.org/the-future-of-therapy-online-counselling-searches-increase-by-124/95498/>
- Isherwood, S. (2009). Graphics and Semantics: The Relationship between What Is Seen and What Is Meant in Icon Design. In Springer eBooks (pp. 197–205). https://doi.org/10.1007/978-3-642-02728-4_21
- Jarick, M., & Bencic, R. (2019). Eye contact is a Two-Way street: arousal is elicited by the sending and receiving of eye gaze information. *Frontiers in Psychology*, 10. <https://doi.org/10.3389/fpsyg.2019.01262>
- Kholin, S. (2023, July 26). Virtual Reality meetings: benefits and use cases. Onix. <https://onix-systems.com/blog/virtual-reality-meetings>
- Lmsw, H. O., & Shea, A. (2023). Tried, tested, and expert-approved: the 13 best online therapy services of 2023. Verywell Mind. <https://www.verywellmind.com/best-online-therapy-4691206>
- Lonczak, H. S., PhD. (2023). 12 popular counseling approaches to consider. PositivePsychology.com. <https://positivepsychology.com/popular-counseling-approaches/>

Mick Cooper. (2022, November 11). Person Centred Therapy Demonstration: A Contemporary Approach (No commentary) [Video]. YouTube. <https://www.youtube.com/watch?v=CMmzqH5gC5A>

Mohammad, S. M. (2022). Ethics Sheet for Automatic Emotion Recognition and Sentiment Analysis. *Computational Linguistics*, 48(2), 239–278. https://doi.org/10.1162/coli_a_00433

National Academies Press (US). (2012, November 20). The evolution of telehealth: Where have we been and where are we going? The Role of Telehealth in an Evolving Health Care Environment - NCBI Bookshelf. <https://www.ncbi.nlm.nih.gov/books/NBK207141/>

Newcomb, A. B., Duval, M., Bachman, S. L., Mohess, D., Dort, J., & Kapadia, M. R. (2021). Building rapport and earning the surgical patient's trust in the era of social distancing: Teaching Patient-Centered Communication during video conference encounters to medical students. *Journal of Surgical Education*, 78(1), 336–341. <https://doi.org/10.1016/j.jsurg.2020.06.018>

NHS. "Counselling." NHS, 5 Feb. 2021, www.nhs.uk/mental-health/talking-therapies-medicine-treatments/talking-therapies-and-counselling/counselling/.

Owen-Pugh, V. (2013). How to incorporate wellness coaching into your therapeutic practice: a handbook for therapists and counsellors. *British Journal of Guidance & Counselling*. <https://doi.org/10.1080/03069885.2013.795773>

Raval, P. (2023, July 15). Speech Emotion Recognition Project using Machine Learning. ProjectPro. https://www.projectpro.io/article/speech-emotion-recognition-project-using-machine-learning/573#mctoc_1fu6b81tbj

Shivamburnwal. (2020). Speech emotion recognition. Kaggle. <https://www.kaggle.com/code/shivamburnwal/speech-emotion-recognition/notebook>

Speech prosody. (n.d.). Hume AI. <https://hume.ai/products/speech-prosody-model/>

TanmayPatange@TWCN & TanmayPatange@TWCN. (2020b, August 7). Zoom adds AR video filters, noise suppression & fun features to meetings. TheWindowsClub News. <https://news.thewindowsclub.com/zoom-adds->

[ar-video-filters-noise-suppression-fun-features-to-meetings-102157/](https://news.thewindowsclub.com/zoom-adds-ar-video-filters-noise-suppression-fun-features-to-meetings-102157/)

The Online Therapeutic Relationship: Examining Tradeoffs between Convenience and Depth of Engagement : UEL Research Repository. (n.d.). <https://repository.uel.ac.uk/item/85vwq>

Trends, M. (2021). Speech Emotion Recognition (SER) through Machine Learning. Analytics Insight. <https://www.analyticsinsight.net/speech-emotion-recognition-ser-through-machine-learning/>

Wagner, B., Horn, A. B., & Maercker, A. (2014). Internet-based versus face-to-face cognitive-behavioral intervention for depression: A randomized controlled non-inferiority trial. *Journal of Affective Disorders*, 152–154, 113–121. <https://doi.org/10.1016/j.jad.2013.06.032>

Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., Ho, C. S., & Ho, R. C. (2020). Immediate Psychological Responses and Associated Factors during the Initial Stage of the 2019 Coronavirus Disease (COVID-19) Epidemic among the General Population in China. *International Journal of Environmental Research and Public Health*, 17(5), 1729. <https://doi.org/10.3390/ijerph17051729>

What is Psychological Counselling? – Institute of Mental Health (IMH). (n.d.). <https://www.imhkl.com/counselling/>

Writers, S. (2022, August 16). Virtual therapy vs. in-person therapy | Psychology.org. Psychology.org | Psychology's Comprehensive Online Resource. <https://www.psychology.org/resources/virtual-therapy-vs-in-person/>

Appendix

A Project Brief

B Interview guide

C Interview data

D Initial test questionnaire

IDE Master Graduation

Project team, Procedural checks and personal Project brief

This document contains the agreements made between student and supervisory team about the student's IDE Master Graduation Project. This document can also include the involvement of an external organisation, however, it does not cover any legal employment relationship that the student and the client (might) agree upon. Next to that, this document facilitates the required procedural checks. In this document:

- The student defines the team, what he/she is going to do/deliver and how that will come about.
- SSC E&SA (Shared Service Center, Education & Student Affairs) reports on the student's registration and study progress.
- IDE's Board of Examiners confirms if the student is allowed to start the Graduation Project.

! USE ADOBE ACROBAT READER TO OPEN, EDIT AND SAVE THIS DOCUMENT

Download again and reopen in case you tried other software, such as Preview (Mac) or a webbrowser.

STUDENT DATA & MASTER PROGRAMME

Save this form according the format "IDE Master Graduation Project Brief_familyname_firstname_studentnumber_dd-mm-yyyy". Complete all blue parts of the form and include the approved Project Brief in your Graduation Report as Appendix 1 !



family name _____
 initials _____ given name _____
 student number _____
 street & no. _____
 zipcode & city _____
 country _____
 phone _____
 email _____

Your master programme (only select the options that apply to you):

IDE master(s): IPD Dfl SPD

2nd non-IDE master: _____

individual programme: - - - (give date of approval)

honours programme:

specialisation / annotation:

SUPERVISORY TEAM **

Fill in the required data for the supervisory team members. Please check the instructions on the right !

** chair _____ dept. / section: _____
 ** mentor _____ dept. / section: _____
 2nd mentor _____
 organisation: _____
 city: _____ country: _____

comments
(optional)
 :
 :

! Chair should request the IDE Board of Examiners for approval of a non-IDE mentor, including a motivation letter and c.v..

! Second mentor only applies in case the assignment is hosted by an external organisation.

! Ensure a heterogeneous team. In case you wish to include two team members from the same section, please explain why.

APPROVAL PROJECT BRIEF

To be filled in by the chair of the supervisory team.

Catelijne van Middelkoop
 Digitally signed by Catelijne van Middelkoop
 Date: 2023.05.17 07:41:34 +02'00'

chair _____ date ____ - ____ - ____

signature _____

CHECK STUDY PROGRESS

To be filled in by the SSC E&SA (Shared Service Center, Education & Student Affairs), after approval of the project brief by the Chair. The study progress will be checked for a 2nd time just before the green light meeting.

Master electives no. of EC accumulated in total: _____ EC

YES all 1st year master courses passed

Of which, taking the conditional requirements into account, can be part of the exam programme _____ EC

NO missing 1st year master courses are:

List of electives obtained before the third semester without approval of the BoE

name _____ date ____ - ____ - ____

signature _____

FORMAL APPROVAL GRADUATION PROJECT

To be filled in by the Board of Examiners of IDE TU Delft. Please check the supervisory team and study the parts of the brief marked **. Next, please assess, (dis)approve and sign this Project Brief, by using the criteria below.

- Does the project fit within the (MSc)-programme of the student (taking into account, if described, the activities done next to the obligatory MSc specific courses)?
- Is the level of the project challenging enough for a MSc IDE graduating student?
- Is the project expected to be doable within 100 working days/20 weeks ?
- Does the composition of the supervisory team comply with the regulations and fit the assignment ?

Content: APPROVED NOT APPROVED

Procedure: APPROVED NOT APPROVED

comments

name _____ date ____ - ____ - ____

signature _____

_____ project title

Please state the title of your graduation project (above) and the start date and end date (below). Keep the title compact and simple. Do not use abbreviations. The remainder of this document allows you to define and clarify your graduation project.

start date _____ end date _____

INTRODUCTION **

Please describe, the context of your project, and address the main stakeholders (interests) within this context in a concise yet complete manner. Who are involved, what do they value and how do they currently operate within the given context? What are the main opportunities and limitations you are currently aware of (cultural- and social norms, resources (time, money,...), technology, ...).

space available for images / figures on next page

introduction (continued): space for images

image / figure 1: _____

image / figure 2: _____

PROBLEM DEFINITION **

Limit and define the scope and solution space of your project to one that is manageable within one Master Graduation Project of 30 EC (= 20 full time weeks or 100 working days) and clearly indicate what issue(s) should be addressed in this project.

(This area is reserved for the student's problem definition. A vertical dashed line is present on the left side.)

ASSIGNMENT **

State in 2 or 3 sentences what you are going to research, design, create and / or generate, that will solve (part of) the issue(s) pointed out in "problem definition". Then illustrate this assignment by indicating what kind of solution you expect and / or aim to deliver, for instance: a product, a product-service combination, a strategy illustrated through product or product-service combination ideas, In case of a Specialisation and/or Annotation, make sure the assignment reflects this/these.

(This area is reserved for the student's assignment. A vertical dashed line is present on the left side.)

PLANNING AND APPROACH **

Include a Gantt Chart (replace the example below - more examples can be found in Manual 2) that shows the different phases of your project, deliverables you have in mind, meetings, and how you plan to spend your time. Please note that all activities should fit within the given net time of 30 EC = 20 full time weeks or 100 working days, and your planning should include a kick-off meeting, mid-term meeting, green light meeting and graduation ceremony. Illustrate your Gantt Chart by, for instance, explaining your approach, and please indicate periods of part-time activities and/or periods of not spending time on your graduation project, if any, for instance because of holidays or parallel activities.

start date _____ - _____ - _____ end date

MOTIVATION AND PERSONAL AMBITIONS

Explain why you set up this project, what competences you want to prove and learn. For example: acquired competences from your MSc programme, the elective semester, extra-curricular activities (etc.) and point out the competences you have yet developed. Optionally, describe which personal learning ambitions you explicitly want to address in this project, on top of the learning objectives of the Graduation Project, such as: in depth knowledge a on specific subject, broadening your competences or experimenting with a specific tool and/or methodology, Stick to no more than five ambitions.

Vertical dashed line on the left side of the page.

FINAL COMMENTS

In case your project brief needs final comments, please add any information you think is relevant.

Vertical dashed line on the left side of the page.

Appendix B1

Client interview guide

- Counselling Format/ Reason for the format/ Start time/ Frequency
- Reason of the counselling (depression, anxiety, marital problems, stress management,..)
- What is the goal of the counselling?

- What's the communication process?
- Will you **look at each others** during the talking? would you get the non-verbal information? do you think it's important? is it different from online and face-to-face?
- For example, if you have strong emotions, such as the urge to cry, does the counsellor take any action to help clients calm down?
- What would be comforting to you about the other person's action? Words, expressions, gestures? Is it clear through the screen
- Do you feel empathy, emotional support, connection, ...?
- Be open/trust to the counsellor? concern
- Do you encounter other distractions or do other things in the process of conversation?

- The effectiveness of the counselling
- How do clients view online counselling?
- What are the perceived differences between online counselling and in-person counselling?
- Are there differences in the perceived outcome of on line counselling and in-person counselling?
- How do the clients experience the online therapeutic relationship with counsellors?

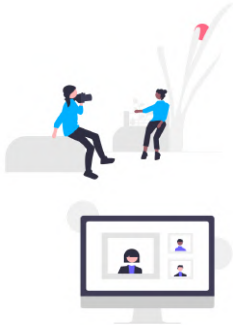
Appendix B2

counsellor interview guide

- **How many years of experience? the percentage of online or face-to-face? which kind of service do you provide for online counselling? text, call or most video.**
- psychologists for the TU (or also from an agency)
- How many clients are students? Are there any other ppl included
- **The reason for the format, how to decide whether online or not (university requirement? by the clients?)**
- **Reason for the counselling (depression, anxiety, marital problems, stress management,..)**
- **What is the therapy approach? Would it be influenced by the online format? some are suitable to use through the screen**
- Frequency for one client (once a week?)
- **What's the communication process?**
- Will you **look at each other** during the talking? Would you want to convey that you are looking at them and caring about them?
- How do you show empathy/support through the screen, would it be harder to give non-verbal information?
- For example, if the client has strong emotions, such as the urge to cry, does the counsellor take any action to help the client calm down?
- Do you encounter other distractions or do other things in the process of conversation?
- How do counsellors view online counselling?
- What are the perceived differences between online counselling and in-person counselling?
- Are there differences in the perceived outcome of online counselling and in-person counselling?
- Would it be more difficult to achieve an effect in the early stages of the counselling?
- How do you experience the online therapeutic relationship with counsellors?

Apendix C

Interview data



Interview

7 with client

3 with counsellor

Why you choose online counselling?

Already have a counsellor in another place, want to keep the same one because they know each other

2 clients

Cultural difference or language barrier, need to talk with the counsellor who shares the same culture background and language

5 clients

Long waiting times for F2F counselling appointments, but specific service websites (e.g. open-up) usually **react in 24 hours**

1 client uses these websites

2 counsellors from Open-up

Covid-19 causes more mental health issues & restrictions limited in-person counselling

Literature

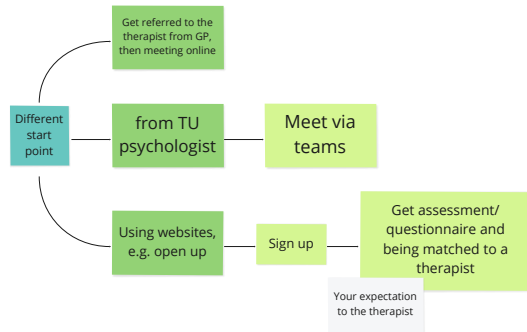
Personal reasons, such as distance, fees, and privacy

anywhere anytime

convenience

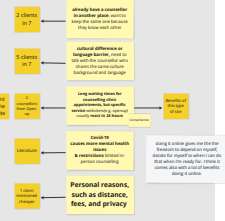
1 client mentioned cheaper

"doing it online gives me the the freedom to depend on myself, decide for myself to when I can do that when I'm ready for. I think it comes also with a lot of benefits doing it online."

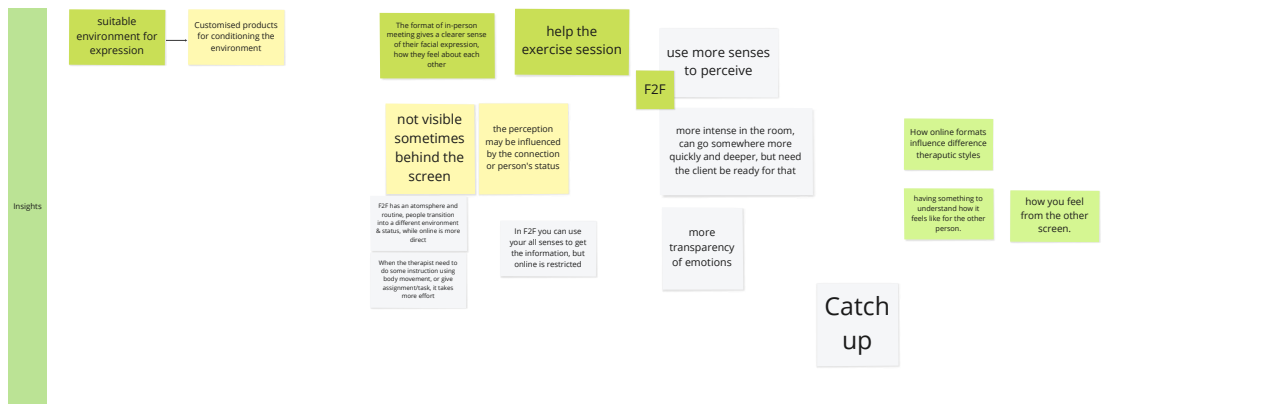
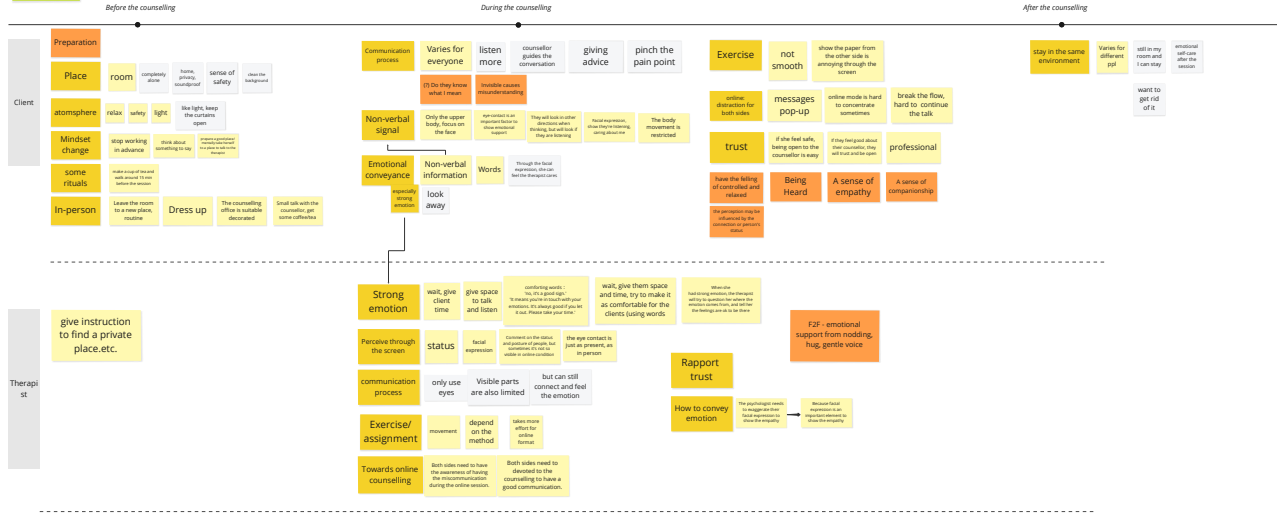


Interview 10 interviews: 7 with client, 3 with counsellor

Why you choose online counselling?



journey map



Catch up

Appendix D

Initial test questionnaire

1 Your participant ID

2 To what extent do you feel your 'counsellor' is really listening to you?

1 2 3 4 5

3 How satisfied are you with the 'counsellor's' level of involvement?

1 2 3 4 5

4 How much would you say that this 'counsellor' cares about you?

1 2 3 4 5

5 To what extent does your 'counsellor' show you compassion?

1 2 3 4 5

6 To what extent do you feel the connection with the other person?

1 2 3 4 5

7 To what extent do you trust your 'counsellor'?

1 2 3 4 5
