User Observation Report

Improving Long-Distance Communication Experience

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1. Ethnographic Research Executive Summary

The goal of this ethnographic research was to gather, define, and prioritize the requirements for a new experience design for long-distance communication for international students and their families who stayed in the home country while the student left the country for education purposes. For this goal, user observation requirement gathering and interview methods were applied in their natural context to get some insights about the current needs of this target group.

As it is hard to catch students while doing long-distance communication with their families and watching a lot of them at the same time, a direct observation method with task analysis approach was used. By this way, we could observe one subject group (student and his/her family) at a time by adjusting our visiting and observing schedule to their regular comminication time. Moreover, using task analysis approach helped us to follow the dynamics in the ways of comminication with logical steps.

After the direct observation, the same student subjects were interviewed to gather some further underlying information about their experiences and needs for a better long-distance communication experience. We think it is better to interview about these with the same subjects after their regular chatting experience because their thoughts and memories might be more powerful and fresh to uncover the expectations from future designs.

Based on the findings, both the parties of long-distance communication expressed their needs and prioritazions in favor of better communication quality and device design. Moreover, it seems time difference is one of the challenge for them as it requires some pre-settings and arrangements for both parties due to temporal limitations. The local people rather more flexible communication time. Although we tried to envision some specific needs for a better experience with body representation in video chat, we could not identify any kind of expectation regarding this need.

2. Introduction

Our design challenge is how we can better utilize AR technology to improve long distance communication experience between international students and their families. To gather requirements to achieve this challenge, user observations (maximum 20 minute) and interviews (~10 minute) are conducted. Although the number of subjects are very limited (n=4) in the requirement gathering, we are able to identify some common needs. Based on the findings and our insights during the data collection process, we propose a set important lenses that a designer should focus on to provide a solution for better long-distance communication.

3. Methods

Sample Selection

The sample consists of our roommates, colleagues and friends. The reason why we chose them is, they are all international students and they all usually do video chatting with their distant families. Also, we chose them because we want to observe them in a natural context and in this case, are the most possible participants we can reach. In this way, our sampling method is both convenient and purposive.

Description of the Location

For local people, the locations are different, including lounge, office and home. For distant people, the locations are all home. All of the locations are kind of casual, comfortable and silent.

Summary of Observations

	Group	Pseudonym	Gender	Age	Relationship	Years of Being Apart
1	Local person	Joking Jack	Male	27	Mother & Son	5
	Distant person	Easygoing Melly	Female	50		
2	Local person	Newsy Nancy	Female	28	Sisters	6
	Distant person	Newsy Ellen	Female	25		
3	Local person	Casual Carl	Male	22	Mother & Son	1
	Distant person	Casual Cindy	Female	52		
4	Local person	Playful Icy	Female	22	Mother & Daughter	3
	Distant person	Serious Lily	Female	50		

Verbal Description of Sample

Our sample are 4 groups. Each of them include a local person and a distant person. Local people are all international students who left their home country to pursue study in Michigan

State University. Distant persons are local person's families who live in their home country. Local people are usually younger than the distant ones. Local people who video chat with their distant families are female or male, while distant persons are more likely to be female. All the subjects are apart from each other for at least one year.

4. Findings

Introduction

In this part, we will share some interesting findings based on analysis of both observation and interview data. To protect the privacy of our subject, we can not leak or analyze the detailed content of our subjects. However, the analysis on observation and interviews revealed some common patterns on subjects. Based on these, we divide the results into the following parts:

A. Time zone difference
B. Distraction and activities while video chatting
   a. Unintentional actions
   b. Intentional activities
C. Viewing the Whole Body on Camera
D. Physical Interaction with the Device

In the following section, each part will be explained in detail providing some examples from the collected data.

A. Time zone difference

Section Introduction

According to our observation and interview results, setting a video chatting time with long-distance family members are kind of challenging for them. As the time difference is getting longer, the arrangements for scheduling a time and space can be a problem for long-distance communication parties. However, after some period of adaptation, people are following a regular settings and patterns to video chat with their long-distant loved ones. In this section, we will present the observation results about how the communication parties set their time to meet and how the time difference affect their conversation duration.

Table

Group	Local Person Time	Distant Person Time	Time Difference	How to Schedule for a Video Chat	Duration of Conversation
1	3:30 pm	10:30 pm	7 hours	Instant Messaging App	~ 20 min
2	4:30 pm	11:30 pm	7 hours	Instant Messaging App	~ 25 min
3	10 pm	10 am	12 hours	Instant Messaging App	~ 30 min
4	7:10 pm	7:10 am	12 hours	Instant Messaging App	~ 1.5 hours

Note : Grey color getting darker represents the increase in the lenght of the conversation.

Overview

Based on our observations, all the people decide on their time to make a video chat by using a messaging app. Since the time difference is a prominent factor to set a time, all the local people tend to choose a time after the daily work hours (e.g. all of them are after 3:30 pm). Moreover, the duration of the conversation increases as the time to chat is more later for the local person.

Details

In Group 1, as the Joking Jack did not have much time to chat and due to his mother will be busy by leaving the town for a trip next day in the morning, they wanted to have a video chat. They used WhatsApp as the instant messanger app to set a time to video chat. As the time in the local person's location was corresponding to a relatively busy hours, he tried to keep the conversation short. In Group 2, the time for the local Newsy Nancy is kind of relaxed, she was not in rush to end the video chat. However, in their case, since the distant person needed to sleep, they ended the conversation. In Group 3 and 4, although the local people were more okay with the time, they stated that one of the parties need to wake up early although they do not like it very much.

Insights

The time difference is a big problem as the subjects stated during the interview. There are three main reasons for it. Firstly, the local people prefer to talk after the school time, however, that time becomes to late for the distant families. The local people stated that this is one of the reasons that they can not talk too much during the week days. Secondly, even if they set a time during the busy hours, they need to keep it short and the conversation does not

happen in a comfortable environment due to physical limitations in the school environment. Lastly, as they use a messaging app to agree on the time, sometimes one of the party does not see the message so, when (s)he realizes, it may not be a good time for the local person to have a video chat. Therefore, instant realization and feedback in the messaging app is the essence to schedule a meeting very quickly.

B. Distraction and activities while video chatting

a. Unintentional actions

This actions include some distraction indicators during the video chat such as rubbing head / eyes, looking towards another direction for a short period of time, playing with the artifacts like paper/pen etc. Although the main focus is on the video chat during the communication, the attention of the party is unintentionally switches to other actions like these.

Section Introduction

In this section, some observation findings is explained regarding the unintentional activities during the communication. It is observed that some parties during the video chatting are intentionally doing some actions which we think may affect the quality of communication experience.

Table

Group	Distraction (Unintentional)	Local Person	Distant Person	Occurence of Distraction
1	Playing with hair		▓	3 times
2	Looking out of the window, drawing on paper	▓		3 times with ~ 1 min.
3	Rubbing Head/Eyes		▓	3-4 times
4	Rubbing Eye		▓	Once

Note : ▓ Green color represents the (unintentionally) distracted party.

Overview

It is clear that during the conversation the attention of the parties are switching between unintentional activities as well. There may be many reasons for it such as not enjoying the conversation subject or just beacuse the person is thinking other things. If the amount of unintentional distraction is high, it may affect the communication experience of both parties like not following the conversation.

As it is seen on the table above, the distant person, Easygoing Melly in Group 1 is playing with her hair with her one hand although she was halding the communication device, phone, all the time with the other hand. In the second group, Newsy Nancy kept looking out of the window of her office 3 times with relatively long time while speaking to her sister at the same time. And in Group 3 and 4, the distant people kept rubbing their head or eyes a couple of times.

Among these, especially looking out of the window was a kind of the most distracted unintentional activity during the conversation such that the person may not just follow the conversation if the activity takes long time. In our observations, rubbing eye or playing with hair are not that much distractive since the person can still keep looking at the other person on the video chat. However, if there are other attention taking objects/scenes in the environment, it may defect the experience not only for one party but also for both parties of the communication.

b. Intentional actions

This actions consist of intentional concurrent activities that a party of a communication is doing at the same time during the conversation such as cooking, cleaning, studying etc. It is interesting that sometimes the concurrent action requires spatial movement which may arise some other problems related to the communication experience such as not hearing clearly, not seeing the other party on the camera all the time.

In this section, we will analyze the distraction factors in video chatting that our subjects revealed to us. And we will try to have some insights if these factors effect the another subject's emotion.

Group	Distraction (Intentional)	Local Person	Distant Person	Duration of Distraction
1	Checking Pastry in the Oven		🟩	Short
2	Grading	🟩		Long
3	Doing cleaning / Eating		🟩	Long
4	Cooking / Eating	🟩		Long

Note : 🟩 Green color represents the (intentionally) distracted party.

We find that all of our subjects, when video chatting with each other, are not always looking at the each other, their attention can easily have caught by other intentional/planned occupation.

Details

While observing the subjects "when/ how to decide to start a video chat?", we find that our subject don't usually do it early. The most common situation is that they text their families and ask "Do you have time to video chat now? " or in Playful Icy's case, she just sent the video chatting request without asking if her parents were available. This lead to that when starting video chatting, people might already in the middle of something. Even if that was not a important thing (checking pastry, cleaning, cooking), they were still occupied. Later in the interview, Playful Icy shared with me that why she was cooking while video chatting with her family. "I don't need to pay much attention to cooking, so I think I can use this extra time to see my families, and they can see me cooking." Point being, people are willing to do other things while video chatting. And in Playful Icy and Casual Carl's case, they were doing something for a long duration (cooking and cleaning).

Insights

These are indeed distractions, but we don't think these as harmful factors. On the other hand, we think we can use this situation and build on that. Focus on building hands-free features and hardwares. Allowing users to do other things more easier when video chatting. Further more, we can set a system that allow users two share two cameras' image at the same time. In this way, users can share what they are doing with their families and friends. This is a way of improving the quality of video chatting.

C. Viewing the Whole Body on Camera

Section Introduction

In this section we will analyze the data from observation and interview. And find out if expanding the scale in screen for body parts in necessary. This is our group's pre-thought idea, but we put it as secondary observation target, in case we find something more intriguing and valuable.

Table

Group	Local Person Body scale in Camera View	Distant Person Body scale in Camera View	Body Gesture
1	Waist up	Face and small part of chest	None
2	Head	Head and chest	Hand gestures

3	Head	Head	Hand gestures
4	Waist up	Head	Cooking

Overview

Among our 4 subjects, none of them show their whole body during video chatting. 2 of the showed face and upper body. But only in Playful Icy's case, showing body parts is meaningful because she was cooking. And by showing upper body, her families can see her cooking. Another two were just showing their heads. And they were satisfied with it.

Details

We find most of times, subjects tend to lean forward to the device. If the subject is doing another action which requires to be away from the camera like cooking etc., then they lean to the communication medium to hear better based on the observation. Showing whole body parts might lead to even worse voice quality. In other cases where the local person is not doing another action while video chatting, we assume that the leaning may be due to the need to be closer to the distant person. Most of our subjects made no body gesture or just hand gestures (which does not require a lot of screen space.). So we think showing body parts, in this case, might be a immature idea. This thought was supported in our interviews. When asked about would you like to see your families' whole body, 2 of them said "No that would be weird. ", they seem to be satisfied with just showing head and chest. But when we change our question to "would you like to see your families whole body while video chatting in a VR or AR device?" They changed answer to yes. I think this might be the tend to try out new technology instead of the real needs of seeing more body parts during video chatting.

Insights

If we were to improve video chatting to whole body parts level, it should be revolutionary. Otherwise users might feel dull and awkward. We should see this as a side mission, need further understanding and more data from video chatting users' experience.

D. Physical Interaction with the Device

Section Introduction

In this section, we will analyze how people interact with their video chatting device. And finding out whether there is any preference or tendency for people when they are doing video chatting.

Table

Group	Local Person	Distant Person	Physical Interaction with the Device
1	🟩		putting on the table, using the stand, hands free
		🟩	holding in hand all the time
2	🟩		putting on the table, using the stand, hands free
		🟩	sometimes holding in hand, sometimes leaning it up
3	🟩		sometimes holding in hand, sometimes placing aside
		🟩	sometimes putting on somewhere, holding most of the time
4	🟩		putting on somewhere, hands free
		🟩	putting on somewhere, hands free

Note : 🟩 Green color represents the party who interacts with device.

Overview

Among 4 groups, which include 8 participants, there are 4 people put their device aside sometimes during the video chatting process. Also, 2 people are hands free during the whole video chatting process.

Details

People tend to put their communication device aside sometimes or even be hands free. Based on observation, participants put their device somewhere instead of holding the device because they need hands to do some other things, which include unintentional distraction and intentional activity. We also assume people put their device aside may be due to their arms or hands were sore if they were not going to other things. We also found people tend to shake while holding the device by hands which may cause the other party feel uncomfortable based on our interview results. Therefore, this might be another reason that more people do not or do not always hold their devices by hand.

Insights

If we want to improve the long distance communication experience between international students and their distant families, it would be a great focus on ways to improve device interaction. To be specific, our device design should offer hands free option. Also, the camera needs to be anti-shake.

5. Overall Recommendations

Here is a list of overall recommendation for the designers while creating a new long-distance communication solution for people. There are some design challenges that we identify with even our tiny sample size such as time difference, concurrent actions, physical interactions with the device, body volume in the field of view of the camera and connection quality.

- As time difference affects the setting of the time for video chat such, physical preparation and the duration of the communication, while designing a new device or system, the designer should consider all these lenses. Since people use some messaging apps to decide on time first, the new solution might have that feature already included in itself. Notifications or feedback are very important to be in coordinated during this setting process. An optimal time to meet recommendations may be proposed based on the schedule of the local student and the distant family member(s).
- As people tend to do some other untintentional or intentional activities at the same time during video chatting, to decrease the attention split and improve the communication quality, visual or auditorial feedback may be used in the new design if it detects any kind of these. Moreover, since people also move around spatially during the conversation, a body attached and hands free design should be favored.
- Due to physical interaction with the communication medium, some annoying camera shaking may happen and this may decrease the communication engagement and quality of the video communication due to some processing reasons over network. Therefore, hands free and stable/stationary solutions should be considered while desining a new product.
- During the video chat, the most prominent body part in the camera is head. However, sometimes people need to see the other parts of the body or whole body to engage in the conversation more. There are some other reasons why people tend to keep the camera very close to themselves like familiarity with the technology/medium or some difficulties in hearing or sight. Therefore, the new solution should consider using a camera with more field of view and better audio quality not to let people to lean towards the medium to hear better.
- Most of the subjects expressed the problems about connection during their conversations. This subject may be independent from the new design solution, however, the network quality and processing power of the new product should also be considered. As video communication consumes more resources, at least, audio communication should be provided very smoothly and without connection problems.
- The last but not least, during the requirement gathering process:
  - We should have our ideas about what to observe specifically before observation and interview. But we should no count on our users to fit in everything we design. They might don't know what we want, we might not

have an insight what they want. Because, they might don't even know how to give the answer we want. What we should do is that we put our ideas on the side for a moment, and consider if we can build on their opinions.
- We shouldn't ask too many "Yes/No" questions in the interviews. Users might simply answer just like that. Asking more open questions such as "How would you describe your video chatting experience?" would be more effective to identify some further insights.

6. Appendix

Appendix-A : Coding Form

CODES	Local Person	Distant Person
Gender		
Age		
Place		
Time of Chat (e.g Time in Michigan & Time in Parent Country)		
Communication Device (e.g. phone, laptop, tablet)		
Attire (Dress code)		
Companions (e.g. addition 1 person:sister)		
1- Who talks first (e.g just mark one of them like "X")		
1- Talk how long?		
1- Talk about what?		
Emotion & # of Occurence (e.g. Laugh:3, Cry:1)		
# of Long Answers		
# of Questions Asked		
Artifacts (showing of props (physical objects)) (e.g Yes/No)		
Screen Sharing (e.g Yes/No)		
Intentional Activity (e.g. eating/drinking)		
Unintentional Activity/distraction & # of occurence (e.g.Rubbing head/eyes/neck:3)		
# of Spatial movement		
Body Gestures & # of occurence (e.g.Hugging:3)		
Pose & # of occurence (e.g.Lying down:3, Leaning in close to screen:4)		
# of asking to view whole body of the other person		
Average camera distance (e.g. 0-10 inches, 10-20 inches, more than 20 inches)		
# of external distraction (e.g. another friend jumps into the room)		
Physical Interaction with Device & # of occurence (e.g. holding:2, putting somehwere:1)		
Turn Taking (each time talking turn switches to the person, mark as something like "X")		
Duration of conversation		
Facing to the camera		
Body parts seen on the camera		

Appendix-B : Consent Form

You are being asked to take part in a research study. Your participation in this research is voluntary. If you agree to participate, you will be observed while you are communicating with your families over a video chat.

GENERAL INFORMATION ABOUT RESEARCH STUDIES

You are being asked to take part in a research study. Joining to the study is voluntary. You may refuse to join, or you may withdraw your consent to be in the study at any time, for any reason, without penalty or loss of any benefits to which you are entitled.

PURPOSE OF RESEARCH

From this study, the researchers aim to observe how international students communicate with their families via long distance communication tools. The content of conversation will not be focused or recorded in any ways.

LENGTH OF STUDY

Participants will be observed and interviwed only once and it will take about 40 minutes in total.

PROCEDURE OF STUDY

The study is part of an academic research study to gather, define, and prioritize the requirements for a new experience design for long-distance communication for international students and their families who stayed in the home country while the student left the country for education purposes. If the student agree to participate in the study by signing the consent form, then he or she will be asked to read it to their family member(s) on the video chat by translating the consent form into their own native language. If the family member(s) also agree to be observed during the conversation, the investigator will observe the participants while they are communicating. If the conversation lasts more than 20 minutes, the investigator will leave the environment and set a meeting with the student later to apply the interview as the second part of the requirement gathering process. The student will be asked about 16 questions to identify their needs, experiences and preferences about long-distance communication. Interview session will take approximately 20 minutes to complete.

BENEFITS□

There is no compensation for your participation in this study. However, your responses may help us learn more about the current needs on long distance communication between you and your families. And could lead to some major improve to your experience of communicating with your families.

POTENTIAL RISKS

This study will involve minimal risk and discomfort. The probability of harm and discomfort will not be greater than your daily life encounters. Risks may include emotional discomfort from answering questionnaire or interview questions. If you withdraw from the study before its completion, we will not use any of the data you provide us.

PRIVACY AND CONFIDENTIALITY

Although the findings of this study may be published, no information that can identify you will be included. The notes taken by the investigator will be secure and only accessible by the

investigator. The only people with access to the data will be Irem Gokce Yildirim, Yiqing Ling and Bingzhe Li. Your confidentiality will be protected to the maximum extent allowable by law.

QUESTIONS ABOUT THIS STUDY

If you have concerns or questions about this study, such as scientific issues, how to do any part of it, or to report an injury, please contact the researcher (Bingzhe Li, libingzhe72@gmail.com;Irem Gokce Yildirim, Room 516 - Communication Arts and Sciences Building, yildiri4@msu.edu, 517-348-3866; Yiqing Ling, lingyiq1@msu.edu).

At the time that you sign this consent form, you will receive a copy of it for your records, signed and dated by the investigator.

_____

Signature (Participant)   Signature (Investigator)   Date

Appendix-C : Interview script & Questions

Script

Welcome and thank you for your participation today. My name is [Investigator Name] and I am a graduate student at Michigan State University conducting this research in partial fulfillment of the requirements for the degree of Master of Arts. Thank you for letting us observe you while video chatting with your family, and this follow-up interview will take about 20 minutes and will include 16 questions regarding your long-distance communication experiences and what might affect your communication satisfaction as an international student whose family is very living far away. I would like your permission to take notes from this interview, so I may accurately document the information you convey. If at any time during the interview you wish me to discontinue noting or the interview itself, please feel free to let me know. All of your responses are confidential. Your responses will remain confidential and will be used to develop a better understanding of how you and your peers view your communication experiences and what might influence or improve it. The purpose of this study is to increase our understanding of current needs about long-distance communication and improve the communication experience.

Remember, your participation in this interview is completely voluntary. If at any time you need to stop, take a break, or return a page, please let me know. You may also withdraw your participation at any time without consequence. Do you have any questions or concerns before we begin? Then with your permission we will begin the interview.

QUESTIONS (semi-structured)

1. When was the last time you talked to your family? *(This question should be asked right after the observation if possible. Because, the behaviours may be linked to this period.)*
2. Do you feel time difference is a big problem in terms of long-distance communicating with your families?
    a. Have you or your family member(s) ever felt annoyed due to time limitation (caused by time difference) to have a video chat?
3. Could you share some long distance communication experience/ stories related to time difference?
4. How do you decide on the time to video chat with your family member(s)?
5. Is there any specific setting required before starting the video call?
6. Have you or your families ever complained about shaking devices while video chatting?
    a. Would you prefer hands-free, stabilized device as a solution?
7. Have you or your families ever felt impatient while waiting you on video call due to being distracted by something else?
8. Have you or your families ever felt it was difficult to adjust the camera angle while video chatting? *(e.g tilting up the camera angle that's coming from beneath person's chin)*
9. Have you ever felt uncomfortable due to camera's field of view not covering all the family members on the other side of the video chat?
    a. Would you prefer a communication medium which automatically detect the multiple instances of people on the camera's field of view and rotate accordingly to fit in the view?
10. Have you ever felt disturbed when the video chat screen gets smaller while sending media files to the counterparty during your conversation?
11. Do you feel disturbed not being allowed to take pictures while video chatting if your family member ask you to send to him/her?
12. Would you prefer to have more time to video chat with your family each week?
13. Do you think video chat is the best way to relieve the homesickness? If so, why? If not, what else?
14. Would you prefer to see your family member's body gestures as if they are nearby?
15. Would you like to hug or reach around your family member while video chatting?
    a. Would you prefer your family member being able to send body emoticons instead of smileys so that you can see a moving body represented in a 3D environment?
16. In which way do you think video chatting can be improved?

We are grateful for your participation. We are listening and are committed to taking any action based on the feedback you give us. Thank you for your participation.

*** *If participant wishes to discontinue study, ask if they would be willing to share why:*