Usability Test Plan of Video Game Communication Features for Deaf Gamers

DOROTHY GAMES INC.

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August 2, 2020

Executive Summary

This usability test plan outlines our study that will evaluate the efficiency of communication features for Deaf gamers in the online multiplayer games *Fortnite, Overwatch,* and *League of Legends*. We will generate recommendations for improving the inclusivity of their existing communication features based on our findings. This plan presents the benefits of the study, such as using the data to develop communication features for Dorothy Games' upcoming title, and the risks of remote testing due to COVID-19. The methodologies include a mixed methods approach to gathering and analyzing quantitative and qualitative data from 10 Deaf and 10 hearing participants between the ages of 18-34 who have played the video games in the past year. Findings from this study will be summarized in a Usability Test Report that will provide quantitative and qualitative results, limitations of the study, implications of our findings, and recommendations to improve the communication features based on current UX/UI research. A project timeline, testing schedule, tentative survey questionnaire, and usability test screener are attached.

This test plan includes the following sections:

1. **Project Overview**

According to Bierre, Chetwynd, Ellis, Hinn, Ludi, and Westin (2005), Deaf gamers often miss all auditory cues in video games. Therefore, the purpose of this study is to evaluate the efficiency of communication features for Deaf gamers in online multiplayer games and develop recommendations for improving the inclusivity of those existing communication features for Dorothy Games' upcoming game. This study investigates the communication features in *Fortnite, Overwatch,* and *League of Legends* and focuses on their usability for Deaf gamers. The goals of this study are to better understand how communication features in video games impact Deaf gamers and how improving these features can promote inclusivity.

To begin this study, we have determined five research objectives:

- To test the efficiency of existing communication features.
- To assess the inclusivity of existing communication.
- To evaluate user satisfaction of specific communication features.
- To identify difficulties in the user experience for Deaf gamers.
- To recommend potential improvements for communication features for our game.

Our research questions address these objectives:

- Are the communication features in the video games practical options of communication?
- Do the communication features in the video games consider the needs of more than one audience?
- Are the users satisfied with the current communication features available?
- Do the communication features pose obstacles for Deaf users?
- How can the existing communication features be improved?

2. **Benefits and Risks**

Administering this test and gathering its data will reveal the efficiency of communication features in the video games, improve the effectivity of these communication features, and bring more awareness to the inclusivity of video game communication features. This study will also have broader implications, as other gaming companies can use this data to update and create their own communication features. If the gaming company improves these features, then the game will encounter more user traffic. The more user traffic a game has, the more money it makes. This increase in traffic will raise the gross domestic product (GDP) of the game. Ultimately, this study will beget more studies about the effectivity and inclusivity of communication features in video games.

The risks of this study include not testing enough video game communication features and the effect of remote testing on our findings. The number of games that will be tested is limited, and the tasks or data might not apply to other games. Because of COVID-19, our tests will be administered remotely for the safety of the participants and researchers. The details of these remote usability tests are found in the Methodology section of this plan.

3. **Methodology**

This study employs a mixed methods approach to gather and analyze quantitative and qualitative data. To collect this data, we will conduct remote moderated usability tests on 10 Deaf and 10 hearing participants who play the popular video games *Fortnite*, *Overwatch*, and *League of Legends*. The test should take no more than 60 minutes to complete.

During the usability tests, we will ask the participants to complete six task scenarios:

1. *Communicate that you need healing.*
2. *Communicate that enemies are near.*
3. *Communicate that you need help in combat.*
4. *Communicate that you need supplies.*
5. *Communicate team strategy.*
6. *Communicate that you have a certain item or ability ready.*

These task scenarios will be recorded and analyzed to measure time on task, completion rate, and effort, which are considered viable performance metrics (Tullis & Albert, 2013, Ch. 4). Then, the participants will be asked to complete a survey questionnaire (Appendix A), which asks them about their experiences and attitudes toward specific communication features in the video games. This 10-question survey will consist of both open-ended and multiple-choice questions. The open-ended responses will be analyzed using inductive content analysis, and the multiple-choice questions will be given a numeric value between 1-5.

A potential open-ended question is shown below:

Overall, what was your preferred communication feature (communication wheel, ping, text chat, or voice chat) and why?

A potential multiple-choice question is shown below:

On a scale of 1 to 5 (1=lowest; 5=highest), how effective was the communication wheel in Fortnite?

The usability test will allow us to determine:

- Average times for communication tasks.
- Completion rates for communication tasks.
- Effort required to communicate using existing features.
- User satisfaction for specific communication features.
- Problems with existing communication features.
- Potential solutions for communication feature improvement.

Additionally, we will compare the quantitative and qualitative results between the Deaf and hearing participants to identify differences in communication efficiency and satisfaction.

3.1 Participants

This study will include 10 Deaf and 10 hearing participants between the ages of 18-34 who have played *Fortnite, Overwatch, and League of Legends* in the past year. We selected 10 Deaf participants because Lazar, Feng, and Hochheiser (2017, p. 504) suggest that a sample pool between 5-10 is appropriate if the participant criteria includes a specific disability. These Deaf participants will identify as culturally Deaf and use American Sign Language as their predominant language. We also chose to only include gamers between the ages of 18-34 because this is the primary audience of *Fortnite, Overwatch, and League of Legends* (Gough, 2019; Ballard, 2018; Statista Research Department, 2015). Another participant criterion is that the participants must have played these games in the past year so that they are familiar with any updated communication features. They also must have the minimum technical specifications of each video game (shown in Appendix B) and need to be able to run Zoom or Discord screen sharing simultaneously.

To recruit these participants, we created a usability test screener (Appendix B) that we plan to distribute to our target demographic through a third-party market research firm (Nunnally & Farkas, 2017). Once we have found the appropriate participants based on our user profiles and test screener, we will contact the participants individually and schedule a time to conduct the usability test.

3.2 Procedure

The moderated usability tests will take place remotely, from the users' homes. Before the test is conducted, the researchers will ensure that the participants are familiar with either Zoom screen sharing or private Discord streaming. Either of these tools will be used to moderate and communicate with the participants (text chat and voice chat). If the participants feel comfortable proceeding and have signed the informed consent forms (3.1), they will be asked to complete the six task scenarios while being recorded, as described in section 3. One of the researchers will moderate the usability test by asking the participants the task scenarios, and the other researcher will be the observer and will take notes on the usability test. After the participants have completed the task scenarios, they can stop sharing their screen/stream and will be asked to answer the 10-question survey via a Qualtrics link sent to their email. They can ask for further clarification either through the Zoom session or on Discord. Once they have submitted the survey, they have completed the usability test. The researcher will then complete the data analysis using the metrics described in section 3.4.

3.3 Statistical Analysis

The quantitative and qualitative data collected during the usability tests will be analyzed using the following metrics:

1. Time on Task- The researcher starts the timer after they have communicated the task to the participant, the participant has asked all their clarification questions, and the participant indicates they are ready. The researcher will communicate to the participant to start the task. When the task is completed successfully or when the

participant indicates they are done with the task, the researcher will stop the timer. The total amount of time spent on tasks will be divided by the number of total tasks.

2. Completion Rate- Tasks will be marked "successful" or "unsuccessful." A task is marked as "successful" if the participant can complete the task objective. The task is marked "unsuccessful" if the participant cannot complete the task and communicates unwillingness to continue the task or if the participant communicates that they are done with a task and the task objective was not completed successfully. The total number of tasks passed will be divided by the total number of tasks, then multiplied by 100.

3. Effort- During the usability test, the researchers will count the number of actions taken by the users while performing the task scenarios. Next, we will compare the effort averages between the Deaf users and hearing users.

4. User Satisfaction- The users will answer Likert scale questions from very dissatisfied to very satisfied. Then, the researchers will analyze their responses by assigning a numeric value for each answer between 1-5. These scores will be averaged and compared between the Deaf and hearing groups.

5. Inductive Content Analysis- The survey questionnaire responses will be grouped (open coding) and categorized under emergent themes (axial coding) using an affinity diagram to document results via Miro, an online collaborative whiteboard platform. Each of the researchers will individually code the responses and compare their findings to increase the reliability of the study (Lazar, Feng, & Hochheiser, 2017, p. 317).

3.4 Ethics

The participants must sign the informed consent form before proceeding with the usability test. This form will be sent virtually to their email, and it will outline the rights of the participants:

- They can withdraw from the study at any point without penalty.
- Their information will remind confidential.
- Any identifiable information will be changed in the report.

Each participant will also receive compensation of $100 for participating in the study.

4. **Project Deliverables**

Our findings will be summarized in a Usability Test Report that will provide additional information: quantitative and qualitative results, limitations of the study, implications of our findings, and recommendations to improve these communication features based on current literature in the field of UX/UI. We will also develop a design proposal that includes a few communication feature prototypes and addresses these recommendations for Dorothy Games' upcoming video game. This proposal will consist of a project plan, project budget, and project charter that will be distributed to the project managers and stakeholders of the company.

Throughout this study, we will debrief the stakeholders weekly by email to update them on the progress of our study, and we will hold monthly meetings with the stakeholders to ensure that we are meeting their expectations for the project. Within the research team, we will update one another on our findings daily via email and record them on a quadrant map using the SWOT analysis chart shown below (Nunnally & Farkas, 2017, Ch. 13):

5. **Project Timeline**

Work Items	**Completion Windows**
Initial Meetings • Review project purpose, goals, objectives, and research questions • Review communication features of the online video games • Review targeted audience • Create Testing Schedule	03 August 2020 – 17 August 2020
Screen participants	18 August 2020 – 21 August 2020
Review and recruit participants	24 August 2020 – 7 September 2020
Create testing script	08 September 2020 – 14 September 2020
Practice testing script	15 September 2020
Administer usability tests	16 September 2020 – 21 September 2020
Begin analysis, generate report	22 September 2020 - 13 October 2020
Present project findings	14 October 2020

References

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Appendices

Appendix A: Tentative Survey Questionnaire

1. What communication feature (e.g., communication wheel, ping, text chat, voice chat) do you prefer and why?

2. Do you feel that the communication features you used affected your gameplay? Why or why not?

3. How effective do you feel the communication features are at achieving their intended purpose?

4. Was the communication feature you used convenient to use? Why or why not?

5. What difficulties, if any, did you encounter when trying to use a communication feature? Describe them.

6. Do you feel that certain communication features are more functional than others? Why or why not?

7. Do you think that you will use a different communication feature in your personal gaming sessions? Why or why not?

8. What suggestions do you have concerning the communication features?

Respond to the following statements based on your satisfaction:

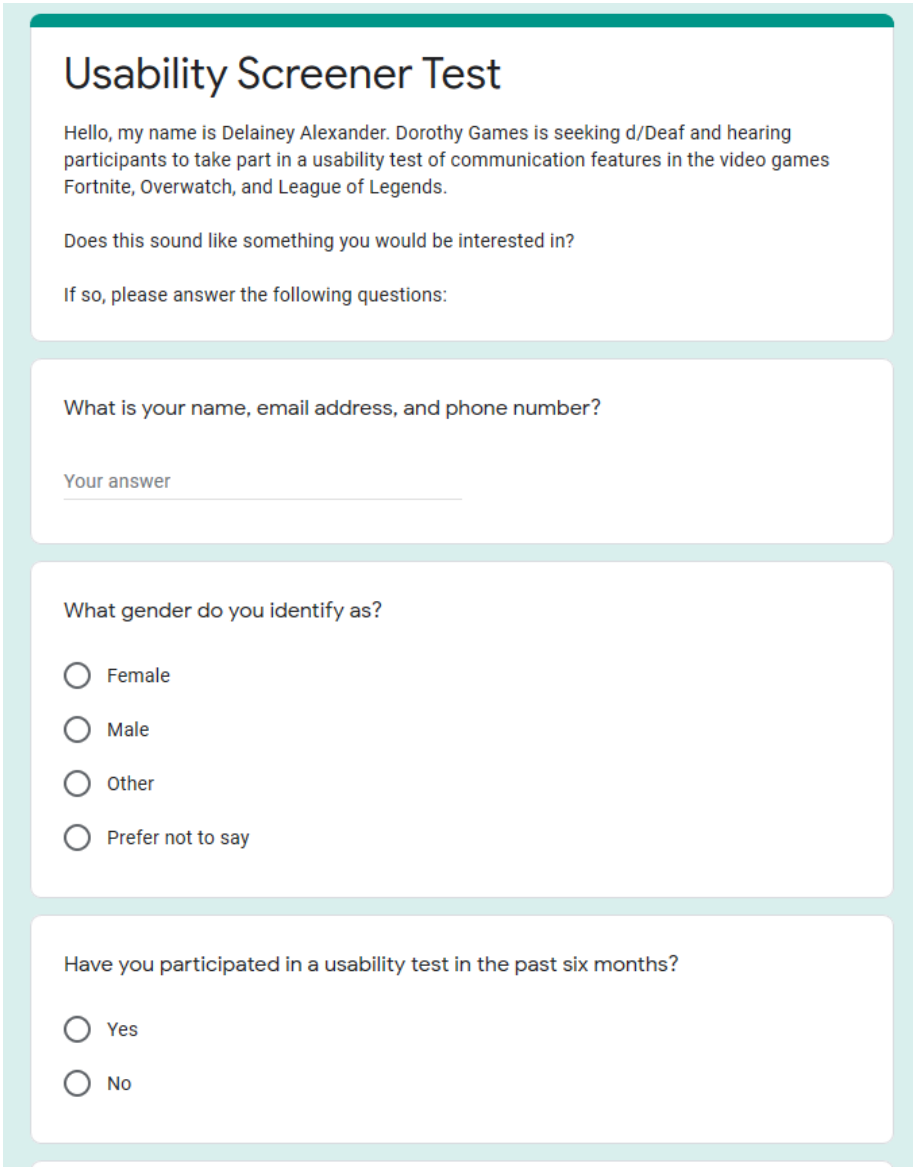
9. The communication features available:

Very Dissatisfied ○ ○ ○ ○ ○ Very Satisfied

10. The communication features' effectiveness:

Very Dissatisfied ○ ○ ○ ○ ○ Very Satisfied

Appendix B: Usability Screener Test (https://forms.gle/bcazQCy11aKSJr9L7)



Usability Screener Test

Hello, my name is Delainey Alexander. Dorothy Games is seeking d/Deaf and hearing participants to take part in a usability test of communication features in the video games Fortnite, Overwatch, and League of Legends.

Does this sound like something you would be interested in?

If so, please answer the following questions:

What is your name, email address, and phone number?

Your answer

What gender do you identify as?

- ◯ Female
- ◯ Male
- ◯ Other
- ◯ Prefer not to say

Have you participated in a usability test in the past six months?

- ◯ Yes
- ◯ No

What age group do you identify as?

- ◯ 18-24
- ◯ 25-34
- ◯ 35-50
- ◯ 50-65
- ◯ 65+

Do you identify as d/Deaf?

- ◯ Yes
- ◯ No
- ◯ Prefer not to say

Do you identify as hearing?

- ◯ Yes
- ◯ No
- ◯ Prefer not to say

Do you identify as hard-of-hearing?

- ◯ Yes
- ◯ No
- ◯ Prefer not to say

Do you play video games?

- ◯ Yes
- ◯ No
- ◯ Maybe

Have you played any of these games in the past year? Fortnite, Overwatch League of Legends

- ◯ Yes
- ◯ No

If you answered yes to the question above, which games have you played?

Your answer

Do you play on Windows, Mac, or Linux?

- ◯ Windows
- ◯ Mac
- ◯ Linux
- ◯ Other: _____

Does your current computer's operating system (OS) meet these minimum specifications? Windows® 7 / Windows® 8 / Windows® 10 64-bit (latest Service Pack)

- ◯ Yes
- ◯ No
- ◯ I'm not sure

Does your current computer's processor meet these minimum specifications? Intel® Core™ i3 or AMD Phenom™ X3 8650

- ◯ Yes
- ◯ No
- ◯ I'm not sure

Does your current computer's video (graphics card or GPU) meet these minimum specifications? NVIDIA® GeForce® GTX 460, ATI Radeon™ HD 4850, or Intel® HD Graphics 4400

- ◯ Yes
- ◯ No
- ◯ I'm not sure

Does your current computer's memory meet these minimum specifications? 4 GB RAM

- ◯ Yes
- ◯ No
- ◯ I'm not sure

Do you have access to broadband internet connection?

- ◯ Yes
- ◯ No
- ◯ I'm not sure

Can your computer run 1024 x 768 minimum display resolution?

- ◯ Yes
- ◯ No
- ◯ I'm not sure

Do you feel comfortable communicating in online-multiplayer video games?

- ◯ Yes
- ◯ No
- ◯ Maybe

Submit

Appendix C: Reflections

Delainey Alexander

1. After completing this assignment, I learned that there is a lot of information that needs to be accounted for when creating a usability test. Specifically, I learned more about the business side of UX research. When writing the Project Deliverables section, I reflected on the reading that discussed debriefing and presenting your findings (Nunnally & Farkas, Ch. 12). From the text, I was able to develop a list of deliverables like weekly emails to stakeholders, monthly meeting for stakeholders, quadrant mapping of findings, etc.
2. This assignment helped me better understand the importance of ethics (confidentiality, privacy, and compensation) early in the research process and staying accountable for your practices (Lazar, Feng, & Hochheiser, 2017, p. 468). Our test plan designates a section on the ethics of our study in the Methodology to emphasize that we respect our participants' rights and their decision to withdraw from the study. We also included a sentence on compensation that aligns with the recommendation of Lazar, Feng, and Hochheiser (2017, p. 462). Additionally, we wanted to gain authentic perspectives from the demographic we intended to study, Deaf participants, so we included qualitative data that allows the Deaf gamers to freely discuss their concerns about the video game communication features that we may have not thought of.
3. Finishing this assignment helped me better understand cross-cultural communication methods in research (Nunnally & Farkas, Ch. 9). For example, our plan considers communication methods with hearing and Deaf participants during the usability test and survey questionnaire by allowing them to either use voice chat or text chat to communicate their questions or their concerns about the study. We also acknowledge that 10 of our participants identify as culturally Deaf, so we approached that sample pool with respect. For instance, the user test screener uses appropriate language that is respectful of our prospective participants. Rather than use the derogatory term *hearing impaired*, we used d/*Deaf* to describe a hearing status option.
4. Chapter 6 of *Inclusive Design* (Gilbert, 2018) discusses effective research methods for studying people with disabilities and accessibility. Funny enough, this chapter offered an example research plan that described the plan purpose, context of the product, priority areas, methodologies, premortem, timeframe, research questions, goals, participants, script, and ethics (p. 100-101). So, some of this content helped me complete the Usability Test Plan because my study attempts to make more inclusive communication features in video games. This chapter touches on recruiting and research methods, and it presents a case study that shows the redesign of an interface after accessibility research. The chapter concludes by emphasizing the importance of accessibility and offering steps to user research for the reader.
5. From this assignment, I learned how to determine what methods would be most effective for my desired goals. For example, we chose a mixed-methods approach to collect

quantitative data and qualitative data to obtain efficiency metrics and user satisfaction feedback. I learned from Lazar, Feng, and Hochheiser (2017, p. 314) that qualitative data needs to be valid and reliable. Therefore, our procedures will be well documented throughout the study (via an affinity diagram), and we established a coding method in our Methodology section so the data is stable and reproducible (p. 317). I will reflect on this experience when I am deciding which methods I should implement in my study as a UX researcher, hopefully.

Cristian Hernandez

1. This assignment was super fun to put together, first and foremost. Putting myself in the shoes of a plan orchestrator was really cool and the readings prepared me to fit those shoes! Our assignment was about improving the inclusivity and functionality of existing communication features in video games. The research from Lazar, Feng, and Hochheiser comes to mind about disabilities since we plan to have Deaf participants in the study. Participants with disabilities must be included in studies as to have a holistic view of the usability of the product (Lazar, Feng, Hochheiser, 2017, para.16.2.2).
2. This assignment helped me understand the ethics of UX in usability research because the research, in part, focuses on improving the functionality and accessibility of communication features for Deaf gamers. The documents that will be distributed to participants were built with their needs in mind. Lazar, Feng, and Hochheiser state it's important that participants with disabilities are able to able to engage with all parts of the research process, including testing materials (2017, para.16.4.5).
3. This assignment helped me understand cultural and historical issues by teaching me about the Deaf community (thank you DJ!). Even before this project, we had an idea to improve the communication features of video games so that they are more accessible and just as effective as any other communication feature. With DJ's knowledge of the Deaf community, we were able to create a test that Deaf gamers can benefit from. The test methodologies were crafted in such a way as to be inclusive to Deaf individuals (Lazar, Feng, Hochheiser, 2017, 16.2.2).
4. I have currently completed and summed up all chapters in my book in previous weeks and projects. The book was a great look into the real-world instances of UX design. With the knowledge I've gained from this book, I will be able to apply it in my professional career! One sentiment I will include in this response is this: UX and design issues stem from misalignment of individual intent (Natoli, 2019, para.6).
5. I learned how to craft executive summaries. I'm constantly working on how to make content more usable, effective, and approachable by cutting down its size while maintaining its meaning and purpose. I also practiced applying quantitative data metrics. We use Time on Task and User Satisfaction in the usability test plan, common metrics according to Lazar, Feng, and Hochheiser (2017, para.10.5.6).