

Space and Process Design via Usability Testing

Usability Study

Background

The following usability test focuses on the “Texture!” touchscreen device at the CODED_COUTURE exhibit of the Tufts University Art Gallery. “Texture!” is designed to aid creativity of fashion design by encouraging the user to find inspiration through different words of various colors and shapes. Different motions on the touchscreen device, such as tapping and swiping, change the word sequences, colors, and fonts. The usability of these features will be assessed in the usability test.

Objectives

The purpose of this study is to evaluate the usability of the “Texture!” touchscreen device at the CODED_COUTURE exhibit.

Methods

Materials

I will use a checklist and my computer to collect data during each task and during the follow-up interview.

Study Logistics

I will conduct usability tests on five participants, individually, using interviews and observation. First, I will give each participant a one-minute introduction to the study, explaining its purpose, the procedures of the tasks, and the expected duration. I will also assure them of their confidentiality and ask three background questions. Second, I will ask the participant to conduct the following four tasks: (1) activate a word, (2) create a graphic mix of words and letters, (3) randomize the color palette and font type, and (4) reset the process. Each task should take no more than a few seconds. Third, I will conduct a post-test interview, which will last five to ten minutes. Finally, I will wrap-up the study by thanking the participant for their time.

Participants

The user population is everyone who might attend and interact with this exhibit. Since the exhibit is currently located at Tufts University, I will recruit five Tufts students of varying school years for the usability tests.

Environment

The touchscreen device is part of the CODED_COUTURE exhibit, so this will be the location for the study. The application will not be used on a smartphone outside the exhibit, because the focus of the study is the usability of this element within the exhibit.

Data Collection and Analysis

I will use a checklist to collect objective data on the usability of each feature of the device. Then, I will collect subjective data by transcribing responses to interview questions on my computer.

Researchers

I will conduct the study on my own and be responsible for all data collection.

Discussion Guide

Introduction

The purpose of this study is to evaluate the usability of the "Texturel" touchscreen device. You will be asked to use the touchscreen to elicit four different responses from the application. There are no expected risks associated with your participation in this study; however, your participation is voluntary and can be withdrawn at any point during the study. Furthermore, your data and responses will not be tied to your name to ensure confidentiality. This study is not expected to last more than 15 minutes.

Background Questions

What is your year of graduation?

Have you ever been to the Tufts University Art Gallery?: Y / N

Are you familiar with the CODED_COUTURE exhibit? Y / N

Tasks

1. Please activate a word.
 - Expected action: Tap the screen
 - Did the participant consult the instructions for guidance?: Y / N
 - Did the participant perform the expected action?: Y / N
 - Did the participant successfully activate a word?: Y / N
2. Please create a graphic mix of words and letters.
 - Expected actions: Swipe up, swipe down, or a combination
 - Did the participant consult the instructions for guidance?: Y / N
 - Did the participant perform the expected action?: Y / N
 - Did the participant successfully create a graphic mix of words and letters?:
Y / N
3. Please randomize the color palette and font type.
 - Expected actions: Swipe left, swipe right, or a combination
 - Did the participant consult the instructions for guidance?: Y / N
 - Did the participant perform the expected action?: Y / N
 - Did the participant successfully randomize the color palette and font type?:
Y / N
4. Please reset the process.
 - Expected actions: Swipe up, swipe down, or a combination
 - Did the participant consult the instructions for guidance?: Y / N
 - Did the participant perform the expected action?: Y / N
 - Did the participant successfully reset the process?: Y / N

Post-Test Interview

What was your overall impression of this device?

What do you think are this device's strengths?

What do you think are this device's shortcomings?

Would you be interested in using this device again? Why or why not?

Report

Findings

Strengths

1. The device is interactive, in contrast to most other aspects of the exhibit
2. The concept is promising in terms of its usefulness
3. The concept is unique in terms of its combining words and colors
4. There is visual feedback when you are successful
5. The visual feedback is appealing

Shortcomings

1. The purpose of the device is not clear
2. There are no instructions on the device
3. Instructions on the wall are far away from the device, written in a small font, and not intuitive
4. The device is either extremely delayed or dysfunctional
5. The device does not provide feedback when it is not working

Suggestions for Improvement

1. Upon activation, the device should introduce itself with an explanation of its purpose and the sequence of steps that the users are expected to complete
2. The interface of the device should include instructions; since steps are progressive, the interface should use progressive disclosure (i.e., present each step and expected motion only when the previous step has been completed) to guide the user and reduce the user's cognitive workload
3. If instructions are provided by the device, they should be removed from the wall to prevent redundancy and clutter
4. Based on the presence of the spinning pinwheel wait cursor, the delays are likely caused from insufficient RAM (Random Access Memory); therefore, more RAM should be purchased to prevent those delays. If problems persist, the program's code should be reevaluated for bugs (problems in the software)

5. When the device is not working, the screen should indicate whether the cause is an unregistered motion from the user, a delay in the software, etc, so the problem can be solved more efficiently and effectively

Participants (see Appendix A)

Five students from Tufts University participated in this usability test. Of those students, one was a freshman, two were sophomores, one was a junior, and one was a senior. With regard to gender, two participants were male and three were female. As for relevant experience, three participants reported having been to the Tufts University Art Gallery before, but of those participants, only one reported being familiar with the CODED_COUTURE exhibit.

Task Performance Summary

Of the twenty tasks (each of the five participants conducted four tasks), only three were completed successfully, signifying a success rate of 15%. Similarly, participants only looked at the instructions on the wall 15% of the time. As expected, 100% of participants who looked at the instructions performed the correct motion; however, the correct motion lead to the expected response only 43% of the time.

Participants did not perform the expected actions 65% of the time; the most common mistake was tapping instead of swiping, but other mistakes included swiping horizontally instead of vertically and unregistered motions such as pressing and holding, swiping inwards and outwards, and tapping with multiple fingers at a time (see Appendix C).

The most significant source of confusion was the lack of feedback from the device. Instead of assuming they were doing the wrong gestures, most participants assumed the touchscreen was broken or lagging. As a result, instead of consulting the instructions for guidance, most participants gave up hope of completing the task and gestured randomly for the duration of the test.

Summary of Objective Test Data (see Appendix B)

On the first task (Activate a word), one participant consulted the instructions for guidance, all participants performed the expected action (Tap the screen), and

two participants successfully completed the task. On the second task (Create a graphic mix of words and letters), one participant consulted the instructions for guidance and performed the expected action (Swipe up, swipe down, or a combination), but no participants successfully completed the task. On the third task (Randomize the color palette and font type), only one participant consulted the instructions for guidance, performed the expected action (Swipe left, swipe right, or a combination), and successfully completed the task. On the fourth task (Reset the process), no participants consulted the instructions for guidance, performed the expected action (Swipe up, swipe down, or a combination), or successfully completed the task.

Summary of Subjective Test Data (see Appendix D)

With regard to overall impressions, all responses included a negative remark and only two responses included a positive remark about the device. For strengths, two participants used the word “pretty” and two participants used the word “cool” to describe the device. For shortcomings, three participants said the device “didn’t work” or was “broken,” two participants mentioned the instructions on the wall were too small and far away, and three participants complained about a lack of feedback or guidance from the device. As for having future interest in using the device, all participants said that they would *not* want to use the device again due to its shortcomings.

Lessons Learned

Many participants became frustrated with the lack of immediate response from the device and started to gesture wildly on the screen. This may have overwhelmed the device, causing it to fail. As a result, if I were to conduct these test sessions again, I would state the task and then ask, “What gesture do you think you should do?” Once the participant chooses a motion, they can test that gesture only. If the gesture fails to produce the correct response, I will ask, “Why do you think that didn’t work?” This process will slow down the participant, allowing the device to keep up with their motions and allowing me to gather more information on the participant’s thought process and expectations.

Appendix A
Background Questions

	P1	P2	P3	P4	P5
What is your year of graduation?	2017	2019	2018	2020	2019
Have you ever been to the Tufts University Art Gallery?	Y	N	Y	Y	N
Are you familiar with the CODED_CULTURE exhibit?	N	N	Y	N	N

Appendix B
 Objective Test Data

	P1	P2	P3	P4	P5
Task 1: Instructions? Action? Success?	N, Y, N	N, Y, N	Y, Y, Y	N, Y, Y	N, Y, N
Task 2: Instructions? Action? Success?	N, N, N	N, N, N	Y, Y, N	N, N, N	N, N, N
Task 3: Instructions? Action? Success?	N, N, N	N, N, N	N, N, N	N, N, N	Y, Y, Y
Task 4: Instructions? Action? Success?	N, N, N	N, N, N	N, N, N	N, N, N	N, N, N

Appendix C
Researcher Observations of Mistakes

- Tapping the screen when expected action is a swipe
- Swiping horizontally when expected action is a vertical swipe
- Holding down finger
- Swiping outwards and inwards as if to zoom
- Tapping in different locations of the screen
- Tapping with one versus multiple fingers at a time

Appendix D
 Subjective Test Data

	P1	P2	P3	P4	P5
Impressions	Computer was bad	It sucks. It doesn't work. It's not functional	It looked cool but didn't work.	Seemed simple but was hard to use in terms of no indicators on the screen of the gestures. I had to improvise everything and play by ear to figure out how to use it. And once you think you've figured it out it wouldn't work anymore.	It's useless
Strengths	It's pretty. They do provide some visual feedback when you touch a word.	It looks pretty.	Nice design concept. Cool way to have something interactive in this museum.	When you do succeed in using the gesture, it is clear when something happens	Words and colors are nice. When it worked for a few moments I thought it was cool.
Shortcomings	Not sure what the goal is. No onscreen directions. Instructions that were available (on wall) were far away, difficult to follow, and small. Horribly buggy interface. No feedback when you swipe.	It doesn't work. It doesn't show you what you're supposed to do.	It didn't work. It didn't do what it was supposed to do after I found a word.	When something isn't happening, there isn't a ton of indication. What is the next step? What are the possible steps? Also, I didn't know the stuff on the wall was about how to use the touchscreen. I thought it was about the history of the device or something. Instructions should be clearly labeled as instructions; I shouldn't have to seek them out.	It's broken. Touchscreen is horrible. Not intuitive. Instructions are very small and should be on the device itself not on the wall.
Future interest?	No. It sucks.	No. It didn't work.	No. Spinning wheel made me annoyed! Very frustrating.	No. With fine tuning, it would work, but it's not super usable.	No. It doesn't work. Spinning ball was jarring and took out of the experience because that's the universal sign that something isn't working. Reminded me it was a computer and not an experience.