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User Interfaces

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Usability Report

I. Introduction

A. Systems being evaluated: There are two systems that will be evaluated. I will be having the user evaluate a computer prototype and using paper to learn and apply SQ3R. Both of the prototypes explain what SQ3R is and how to apply each step to readings.

B. Overview of Study: The goal of the user observation study is to find out whether the computer prototype is more useful for learning and applying SQ3R than using paper to learn and apply SQ3R.

1. Hypothesis: The computer prototype will be more useful for learning and applying SQ3R because of the ability to interact more with the system itself and the hand-held or walk through process that the system has.
2. Usability Goals: I want to make sure the system itself is not too complicated for the user to use when it comes to buttons, text fields, and anything else they are able to interact with.

II. Methodology

A. Participants: I recruited one of the people who is in CS 122, named Ireland. She is not a Computer Science major, however is in the introductory computer science class. Ireland is not a computer science major. She is a double major in

biochemistry and neuroscience but has not learned biology. Ireland asked one of her friends, Marley, if she would be willing to participate in the study as well. Marley goes to Lane Community College. Ireland and Marley were my first two participants. I asked two of my other friends and they agreed to participate. The third person I asked was: Arista, my roommate from last year and I knew I would be spending Thanksgiving at her house. Arista is a double major in theater arts and journalism. The fourth person I asked was Jackie and she was willing to participate after had boba and went to Target. Jackie is a business major with a concentration in sports marketing.

B. Setting: For my first two participants, Ireland and Marley, I did it in the Erb Memorial Union on campus. For my third participant, Arista, I did it at Arista's house, specifically in Arista's room. For my fourth participant, Jackie, I did it in my apartment, specifically in the living room. I chose the EMU, Arista's house, and my apartment because there are three locations where in real life, someone would be studying and using the computer prototype if it did exist online.

C. Materials: The testing materials include my phone to record my participants. In order to hold my phone up, I used my water bottle and Arista's laptop. I used my computer to pull up the computer prototype for my participants to use. I had a printed out handout of an overview of SQ3R and a printed out article, specifically Chapter 1: The Study of Life from the Biology Textbook. I had a blank sheet of binder paper for the participants to take handwritten notes for the paper portion and I had 2 different types of quizzes for each participant. One quiz was for the computer prototype and one quiz was for learning and applying SQ3R on paper.

I had two different scripts for starting the computer prototype and for starting to learn and apply SQ3R via paper.

Computer Prototype Script:

Here is the computer prototype, you have these buttons over here to use. They should be self explanatory. On the side, there's also this menu, however don't use it until you've clicked one of the buttons on the page. You have to click one of the buttons in order for your typed text to save. You are good to start now. Please do not close out of the system because I do need to screenshot what you typed.

Using Paper to Learn and Apply SQ3R:

Here is this paper, along with the reading. If you get to section 1.1, then that is perfect because section 1.2 is a little more complicated in terms of reading level. You can choose whether or not you want to go through the full chapter, or read up until section 1.1. For the first part, if you could read out loud what you see for the first part of SQ3R, which is the survey part, that would be great. Please read this handout and apply it to the reading. You are good to start now. Here is a piece of paper to take handwritten notes.

Introductory Script

> Hello, my name is Isabella Cortez. I appreciate you taking the time to participate in this study. I will be conducting this user observation to study to observe your interactions with paper to learn and apply SQ3R and a computer prototype to learn and apply SQ3R.
>
> You will be using [insert system here] first, then [insert system here] next.
>
> You can opt out at any time, however if you decide to do the full study, I'd appreciate thorough notes and please try to really learn and

understand the task. There will be a quiz at the end of it so please pay attention and try to understand the task.

First two participants: with paper, computer prototype
Second two participants: computer prototype, with paper

D. Experimental Design: Since I only need 4 people for the study, I used a within-subjects design to test my hypothesis. I used a within-study design that way all 4 of the participants are exposed to both of the conditions. Exposing each participant to both conditions makes it easier to get results. If I have a between-subjects design, I would not have enough information for the results because I would only have two people testing each system, however that is not enough people to make a conclusion. For the first two participants, I started both of them off with using paper, then transferring to the computer (start with paper trial, then computer trial). For the last two participants, I started both of them off with the computer prototype and then transferred them to using paper (start with computer trial, then paper trial). The paper article was Chapter 1: The Study of Life from the Biology Textbook and I informed my participant to get through section 1.1. The computer prototype had Huckin and Olsen, Chapter 2: Writing Paragraphs.

E. Procedure: To administer the study, here are the steps I will be taking

1. Ask my friends if they would be willing to participate in a study for a class and see if they know anyone else who can participate.
2. Figure out who my 4 participants will be.
3. Figure out what days and times my participants are free.
4. Set a location, date, and time for my participants.

5. When meeting up with my participants for the study at the correct location and time, this is what I will say:

    Hello, my name is Isabella Cortez. I appreciate you taking the time to participate in this study. I will be conducting this user observation to study to observe your interactions with paper to learn and apply SQ3R and a computer prototype to learn and apply SQ3R.

    You will be using [insert system here] first, then [insert system here] next.

    You can opt out at any time, however if you decide to do the full study, I'd appreciate thorough notes and please try to really learn and understand the task. There will be a quiz at the end of it so please pay attention and try to understand the task.

    First two participants: with paper, computer prototype
    Second two participants: computer prototype, with paper

6. Start first part, quiz, start next part
    a) After finishing each part (with paper or with computer), give them the specific quiz that is for the system they finished
    b) Script for starting with paper:
        (1) Here is this paper, along with the reading. If you get to section 1.1, then that is perfect because section 1.2 is a little more complicated in terms of reading level. You can choose whether or not you want to go through the full chapter, or read up until section 1.1. For the first part, if you could read out loud what you see for the first part of SQ3R, which is the survey part, that would be great. Please read this handout and apply it to the reading. You are good

to start now. Here is a piece of paper to take handwritten notes.

c) Script for starting on computer:

(1) Here is the computer prototype, you have these buttons over here to use. They should be self explanatory. On the side, there's also this menu, however don't use it until you've clicked one of the buttons on the page. You have to click one of the buttons in order for your typed text to save. You are good to start now. Please do not close out of the system because I do need to screenshot what you typed.

7. Debrief with my participants.

a) Ask them what they thought (general thoughts)

b) For the people who had the computer then the paper, ask them if it helped to type notes on the computer with SQ3R or hand-write notes with SQ3R

c) Write down what they say (general thoughts/self report thoughts)

F. Threats to External Validity: Three threats to external validity include the minimum number of people required, whether or not the participant knows SQ3R, and how much the participant knows about biology. In order to account for the external validity, I am doing a within-subjects design but I am switching what order two of the participants use each prototype. I am also doing a within-subjects design because there wouldn't be enough evidence to support the computer prototype being better if only 2 of 4 students use it. In order to find out how much

the participant knows about SQ3R and Biology, I will ask how much they know about biology and if they have heard of SQ3R. If they know little-to-no information about both SQ3R and Biology, I will use them in the study. If they know a lot of information about one or both SQ3R and Biology, I will not include them within the study. Another way to account for external validity, is by making sure my participants are not computer science majors and I will account for that by asking what they are majoring in.

III. Results

A. Observed Data: The results of the user observation study were mixed.

1. Starting with paper, then computer: My first two participants took an hour to do each section, therefore it took 2 hours total for Ireland and Marley. Even though it took them 2 hours for both of them, they tried hard on both parts of it and made sure to fully understand the task.
2. Starting with computer, then paper: For my last two participants, Arista and Jackie, it took them about 20 minutes for each task, therefore it took about 40 minutes total. I noticed for my last two participants, they did not take the time to fully understand SQ3R and its importance whereas my first two participants did. My last two participants did understand the steps of SQ3R and were able to apply it to the articles.

B. Usability: For the usability of the computer prototype itself, it was easy for the participants to figure out what the buttons meant and to figure out the text areas.

1. Errors: There was one error that one of my participants asked about. When going between the pages, the user has to click on the buttons instead of

using the drop down menu on the side. One of my participants used the drop down menu on the side before clicking either back, home, questions, or next and therefore lost her notes. Other than that, the system was self explanatory for the participants in the study.

a) For the paper part of the study, I had my participants say out loud some of the heading names for the survey part. Three out of Four of the participants said the heading names out loud. One of them said them quietly therefore I am not 100% sure that it is audible, but I did observe them listing the heading names. For the listing out the headings part, I told my participants they did not have to say every single heading, but as long as they could list some or most of them, then that works. My participants were able to do that.

2. Backtracking: In both the paper and computer portion of the study, the participants did have to backtrack. For the paper portion of the study, participants had to read through the article multiple times, once for the headings, a second time to come up with questions, a third time to find the answers to questions, and a fourth time to double check the questions are correct. For the computer portion of the study, the participants had to flip between the question and read page to look at the questions they wrote or copy and paste the questions they wrote.

IV. Analysis/Discussion

A. Overall Assessment: Overall, learning and applying SQ3R on paper and on the computer were both helpful to the participants. The systems did meet the usability goals as all four of the participants identified that SQ3R is a way to make reading easier. Both systems did have their flaws as two of my participants thought SQ3R was related specifically to the computer system and three of my participants did not remember what SQ3R meant after using paper to apply the method.

B. The strength of using the computer prototype to learn SQ3R was that it was a hand-held way of learning the steps it takes to use the method. The weakness of using the computer prototype, is that due to the fact that it was a computer, it is easier to rush through or take less time on it. The strength of using paper to learn and apply SQ3R is that hand-writing notes makes it easier to retain information in general. The weakness of using paper to learn and apply SQ3R is that for the first two participants especially, they had to study the SQ3R handout more and refer to it a lot while trying to both learn and apply it.

C. Three interface modifications I could incorporate are:

    1. Have the importance of SQ3R on its own page instead of having it on just the title page that way people understand that SQ3R is a technique to help make reading easier, instead of ignoring what the title page says about SQ3R
    2. Make it so that the user can add more than 5 questions and answers because if an article is long, 5 questions to generate out of over 30 headings may not be the best way to learn the importance of the article.

3. Allow the user to see the survey headings in the question page and the questions someone creates in the read page that way people do not have to go back and forth between pages.

V. Conclusion

Overall my findings were that the results between my first two users and my last two users were similar. Even though some results were similar, there were varying results between the information learned and their self-report responses. The information each participant learned at the end of each section varied between each participant.

The information I gathered was that the computer system was more useful to start with for someone who does not know what SQ3R is. The paper system was useful after users understood what SQ3R is and was more helpful for retaining information.

In this project, I learned how important it is to have users test your system before publishing it. Even though it could look amazing to me, it is good to have users to test it to see if anything needs to change, if users will notice things in the system, and if a system is easy to learn and use. I thought the system I built was fun and interactive for people, and my participants found it easier to use.

In this class, I found out how important it is to understand a task before going to design work. After understanding the task, then breaking it down and coming up with rough sketches is important for design work. After creating rough sketches, then I can use a program to create those sketches in the program itself. Then I have to have my user test to make sure an interface is easy and self-explanatory for people. I learned the importance of being able to break down each task in the smallest possible form is the best

way to get a project done. As a result of this project and this class, I would like to build more interfaces using Axure or other UI design programs that are out there in the world.