Mobile Test Proposal: SciStarter

Mobile Test Proposal: SciStarter Hub

NC State University Citizen Science Campus
SciStarter Website

Prepared for: Dr. Douglas Walls
Completed by: William Lewis
Date: Dec. 04, 2021

Table of Contents

List of Tables and Figures:

Purpose

NC State's SciStarter website is an online citizen science portal database that allows users to locate, participate, and contribute to science through multiple formal research projects, events and resources. By observing participants using the mobile application I will be able to collect feedback about their experience, and measure their time on task, errors, and successes.

This proposal is designed to address issues, concerns, and limitations that may prevent the participant's ability to navigate the app effectively in order to complete tasks easily and efficiently. This document describes a plan for the purpose of testing mobile usability of the SciStarter website. The objective of this proposal is to examine how users find, locate and save projects while obtaining data to facilitate better usage of the site in order to create a better user experience and contribute to citizen science projects.

Problem Statement

Locating projects, discovering resources, and contributing to science based activities are essential to the site's functionality. Previous usability tests for desktop applications have discovered difficulties primarily with saving projects to the users dashboard and locating specific projects of interest. This test will examine the same the functions of "save a project to dashboard" and also to "locate specific local projects" on mobile devices (android os and iphone os)

Test Objectives

This test is designed to determine the feasibility of the mobile version of SciStarter. The test also seeks to discover the utility of the mobile version when users attempt to engage with the application's navigation capabilities. The test will also determine if users are able to more easily locate specific projects, and save them to their dashboard.

The goals of this usability test include identifying potential concerns with NC State's SciStarter website through the scope of by utilizing the following specific attributes:

Learnability:

- Can new and existing users locate information about citizen science projects with ease?

Efficiency:

- Can users promptly find information?
- Are users able to modify and/or adjust screen size when interacting with content?
- How much scrolling is involved for simple tasks?

Memorability

- Are previous users of SciStarter able to locate information more quickly than first time users?

Errors:

- What kind of errors, if any, occur as users try to complete tasks?
- How frequently do errors occur? How long does the correction take?
- Are users able to recover from errors? If so, what resources helped get them on track?

Satisfaction:

- What are user opinions after interacting with the SciStarter mobile version?

Simplicity:

- How much content do users need to analyze before locating the correct information needed?

Comprehensibility:

- Are participants able to analyze/interpret/understand the information provided by the website?

Methodology

User Profiles

This test will involve five participants. Since SciStarter is ideal for many types of users I have compiled a list of participants that fit the descriptions of the potential SciStarter users. The participants will also be familiar with the use of smartphones for both android and iphone operating systems. The following personas will be considered:

Science Student
Actively attends an academic institution. May or may not have previous experience with SciStarter or similar citizen science websites. Actively uses mobile devices (phone, Laptop, etc.) to find science information through social media platforms.

Science Novice

Has not previously used SciStarter or similar citizen science websites. Is looking for a way to engage in public science despite not having a science background. Sometimes uses mobile devices and laptops to search for scientific information.

Science Activist

Has previously used SciStarter or a similar website to participate in citizen science projects Is always looking for ways to expand their engagement in public science. Promptly uses mobile devices, laptop, and PC to locate scientific information.

Test Procedure

Test environment and equipment

The tests will be conducted in person with testing sessions lasting approximately 30 minutes. In order to facilitate this test, I will need access to the following materials and equipment:
- Participants will need a desk and a chair
- Access to their personal mobile device with good wifi connectivity (preferably connected to a service provided in case wifi is unavailable. Access to a personal device will also eliminate issues with unfamiliar operating systems.
- A mounted video camera will be needed to record facial expressions and reactions
- A mounted video camera will be utilized to user actions on mobile devices.
- A test computer with a live feed to mounted cameras to observe user actions

During the test I will record observations, track the participants task time, and take overall notes throughout each test session. At the time of the test, I will provide participants with a brief overview of the test using a pre-written script (Appendix C) which will be used to guide each participant through the test.

During the test session, participants will be asked to think aloud while completing tasks. In addition to written notes, sessions will be recorded via the Zoom platform and saved for review. As part of the pretest procedure I will also ask participants to consent to being recorded verbally by reading the consent form (Appendix D) at the start of each session. Time on task will be tracked with a mobile stopwatch and recorded, along with observation notes and errors, on the observation form (Appendix E). Notes on errors made, if any, will include what kind of error was made, how the participant recovers, and how long it takes to do so.

After each task, participants will provide an answer to the post-task questionnaire as seen in (Appendix F) before moving on to the next task.

At the end of the test, participants will be asked a series of questions outlined on the post-test questionnaire (Appendix G).

Tasks and Scenarios

Task	User Subgroup	Task Description	Success Criteria	Failure Criteria
1	science novice, science activist	*Create an account*	Taps on "Sign Up"	Fails to create an account using more than 2 finger taps
2	science student, novice, adult activist	*Find a local public project to participate in that focuses on conservation*	Taps "add location" Enters "conservation" into search field by "keyword" in "Find a Project" window. If the add location function is not available the user can select "Near me."	Fails to allow "add location within" one finger touch. Fails to enter "conservation" into the search field within 5 finger taps.
3	science student, novice, adult activist	*Select a project & identify the goal of your selected project*	Selects a project within 3 finger touches.Verbally identifies the goal of the project.	Fails to select a conservation project within 3 finger taps. Fails to identify the goal of the project within 1 minute.
4	science student, novice, adult activist	*Save the project to your dashboard*	Selects "Save to Review Later" button	Taps "Save to review later" within 5 finger taps or selects on any other icon that is able to the save project
5	science student, novice, adult activist	*Navigate to your SciStarter dashboard*	Clicks menu icon in upper right hand corner, selects carrot or Dashboard button and selects main dashboard in the drop down menu.	Fails to reach the main dashboard within 3 finger taps. Fails to complete task within one minute.

Table 1: *Tasks, NCSU SciStarter Home website usability study.*

Task 1: Because of potentially varying download speeds (some participants may have fluctuating networks) on mobile devices in this task revision I have chosen not to include time

limits. I have also decided to allow for a certain number of "taps" based on accurate navigation techniques from the previous test as a metric from a previous desktop usability test of the same website. Comparing both users who have never used the site with that of a user who is comfortable with the site will reveal an accurate depiction of how the site should be utilized.

Task 2: In this task revision I have chosen to include 5 finger taps in order to more accurately identify the average of touches when evaluating the website. Because of the simplicity of the action pressing the "allow location" button in combination with download varying download speeds I have allowed the participant 1 minute to make a decision.

Task 3: Because of the simplicity of the action, I have allowed for 3 finger taps to "select a project." Also, I have allowed for the participant to respond by verbalizing the project goal within a 1 minute time frame. This time frame is based on varying download speeds.

Task 4: For this revision, I have allowed for 5 finger taps to select the "save a project" button. This is due to many false icons that enable a user to save a project to a user's dashboard.
> ***note** - During the desktop trials, identifying the "save a project" icon received the highest number of failures.

Task 5: For this revision, because of the familiarity of menu icons, I will set a one minute failure criteria. I will also set a 3 finger tap limit for the participant to locate their "main dashboard."

Evaluation Methods

During the test as a part of qualitative data analysis, participants will be asked to vocalize their thoughts as they work through each task. Notes on what they say, how they said it, and what they are doing when they say these things will be recorded in my observations. After each task participants will be able to explain or elaborate on their rankings for the ease of the assigned tasks. At the end of the test, participants will be asked about their overall experience using NC State's SciStarter website.

Also during the test, quantitative analysis will be determined by examining the total time for each task recorded as well as the number of and type of errors and whether or not a task is completed successfully. The time on task metric will include the total time a user spends on a task recorded in min:sec.

Errors, non-critical and critical will potentially be made by a user made while attempting a task. In order to determine whether a task is a failure or success the participant will complete a task as defined by the predetermined task descriptions. Non-critical errors will be identified if the user completes the goal of a task in a way that is not outlined in the task descriptions. A critical error will be identified if the participant is unable to complete the task, gives up on completing the task, asks to move on, or has spent more than 2 minutes on the task.

After each task, participants will provide feedback for each given task using a Likert scale indicating the relative ease of completing each task as measured from 1 to 5 (1 indicating the task was easy; 5 indicating the task was difficult). At the end of the test, participants will provide feedback on the overall usability of the website using a Likert scale indicating the degree to which they disagreed or agreed with predetermined statements regarding the usability of the website as measured from 1 to 7 (1 indicating Strongly Disagree; 7 indicating Strongly Agree).

Skeletal Personas

Appendix A: Skeletal Personas

Personas	Persona 1: As an advanced science student, I want to expand and apply my scientific knowledge by participating in active research opportunities. Actively uses mobile devices (phone, Laptop, etc.) to find science information through social media platforms.	Persona 2: As a novice with little scientific background, I want to learn more about the scientific world around me and better understand science as a part of my daily life. Sometimes uses mobile devices and laptops to search for scientific information.	Persona 3: As an adult activist interested in conservation, I want to engage in active conservation efforts near and far to help preserve the world for future generations. Promptly uses mobile device, laptop, and PC to locate scientific information.
Quote	"Knowing about science is only helpful when we apply our knowledge through action."	"I try to be involved in science but without a background it's hard to find appropriate resources and engaging activities for which I qualify."	"If we do nothing in conservation today, we will be greatly impacted tomorrow."
Type of devices they use	Laptop, smartphone	PC, TV, smartphone	Tablet, smartphone
Where do they learn about current research efforts?	Textbooks, research papers from courses, science journals, course lectures & labs	Science journals & news articles reporting on new research, library books on scientific topics	Social media posts & online communities focused on conservation

How do they share information about public science?	Sharing links through social media and other science based applications with colleagues	Facebook, text messaging	Various social media including Twitter, Facebook, and Reddit
What type of science are they most interested in?	Physics, biomechanics	Biological behavior, evolutionary science	Animal husbandry, ecology, environmental sciences
What happens when they encounter science concepts they're unfamiliar with?	They research independently before asking peers and instructors	They search for similar topics in related journals and news articles trying to piece the concept together from a variety of sources	They google the concept and read related headlines
How will they curate their contribution to public science and citizen science?	A record of learning is kept by the individual and submitted to the instructor for evaluation	Saves articles and journals to browser and online cloud storage to review as needed	Posts to social media on mobile device and activity accounts for their contribution to the science community

Appendices

Appendix B: Screener

Hello,

My name is Bill and I'm a graduate student studying Technical Communications at NC State University. I'm looking for participants to help me conduct a usability test on a website using a mobile device for citizen science research.

If you are interested in participating, please complete the following questionnaire. The study will take place online with a session that is approximately 30 minutes in length. Once selected, we will work together to schedule a time that works for both of us.

Thank you.

First name:

Last name:

Gender:

Select your age:
- ☐ 18-24
- ☐ 25-34
- ☐ 34-44
- ☐ 45-54
- ☐ 55-64
- ☐ 65-74
- ☐ 75+

Are you interested in citizen science?
- ☐ Yes
- ☐ No

Are you currently a student at an academic institution?
- ☐ Yes
- ☐ No

Are you affiliated with North Carolina State University?
- ☐ Yes
- ☐ No

Do you currently have a smartphone device with wifi or network provider service capabilities?
- ☐ Yes
- ☐ No

Are you able to meet in person?
- ☐ Yes
- ☐ No

How often do you use your mobile device?
- ☐ Multiple timer per day
- ☐ Not very often
- ☐ Never

Have you ever used NC State's SciStarter website?
- ☐ Yes
- ☐ No

Which role would be most comfortable for you to slip into for this study?
- ☐ A student looking for public science information to help their career
- ☐ An adult seeking information about citizen science for personal education or teaching purposes
- ☐ An activist seeking information on citizen science projects to contribute to

Appendix C: Moderator Script + Checklist

Prior to participant arriving

- ☐ Print out script+checklist, observation form, post-task questionnaire, and post-test questionnaire
- ☐ Set up and test microphone, camera, and recording recording equipment
- ☐ Send out an email to remind participants to bring their own mobile device
- ☐ Prepare link to NC State's SciStarter website

Prior to test

- ☐ Introduction and covering of test methods
- ☐ Explain purpose of the test

Hello, my name is Bill Lewis. Thank you very much for your time. Today, you will be helping me assess the existing SciStarter website on your mobile device in order to help understand the overall functionality of the site. Throughout the test, I will ask you to complete a few tasks on the mobile version of the SciStarter website each of which will be followed by a question asking you to rate the relative ease of completing said task. After the completion of all tasks, I will ask you a few more questions about your overall experience before ending the session. The entire testing session should be approximately 30 minutes in duration. Your feedback about the mobile site's navigation capabilities is extremely important to me. During the sessions, I would like for you to comment verbally as much as possible. For example, if you are having difficulties with a task, you could say "I'm having trouble finding the link" or if you find a task to be particularly effortless you could say "That was easy." Please be as honest about your experience as possible.

Though I am an NCSU Graduate student, I am not associated with the website in any way and giving your honest opinions will not offend me. Keep in mind this is a test of the website and not your skills. The goal is to improve the usability of the website, so the more detail you can provide about your experience, the better. Lastly, this test session will be recorded. At this time, I would like to give you the opportunity to read and sign our informed consent form. You are not, at any point obligated, to participate in this and are free to leave at any time without penalty. I know this was a lot of information. Before we begin, do you have any questions for me about the consent form, study, or sessions?

- ☐ Provide time for participant question/response
- ☐ Screen share consent form
- ☐ Begin recording on Zoom
- ☐ Record participant's consent statement

During test

- ☐ Introduce the first scenario
- ☐ Begin timer

"The first task is …"

☐ Record observations, errors, and time on task
"Now we will complete the post-task questionnaire for task 1…"

☐ Record post-task questionnaire response
"The second task is …"

☐ Record observations, errors, and time on task
"Now we will complete the post-task questionnaire for task 2…"

☐ Record post-task questionnaire response
"The third task is …"

☐ Record observations, errors, and time on task
"Now we will complete the post-task questionnaire for task 3…"

☐ Record post-task questionnaire response
"The fourth task is …"

☐ Record observations, errors, and time on task
"Now we will complete the post-task questionnaire for task 4…"

☐ Record post-task questionnaire response
"The fifth task is …"

☐ Record observations, errors, and time on task
"Now we will complete the post-task questionnaire for task 5…"

☐ Record post-task questionnaire response

☐ Remind participants to think out loud where necessary

After test

☐ Present post-test questionnaire
"Thanks for your participation. Before we end our session, I will ask for your responses to the post-test questionnaire. At the end of the questionnaire, you will be thanked again for your time and the call will end."

Appendix D: Consent form

I hereby grant permission to have myself, my screen, and my audio recorded for the usability test being conducted on ___(today's date)_____ remotely via Zoom.

My first name may be used for reporting following this usability test on NC State'sSciStarter website.

I give up any rights to the recording and understand that they may be used for the purposes outlined in this test and explained to me during the test.

As the test is conducted remotely and virtually, this verbal recording serves as my official consent.

My name is ____(state your first and last name)___

Today's date is: ___(restate today's date)___

Appendix E: Observation form

Participant #___					
	Notes	**Succ ess? (Y/N)**	**Time on Task**	**# of Error s**	**Description of errors**
Task 1					
Task 2					
Task 3					
Task 4					
Task 5					

Appendix F: Post-task Questionnaire

Rate each task depending on how easy or difficult it was on a scale from 1 to 5. 1 indicates the task was very easy and 5 indicates the task was very difficult.

Sample Question: *"Find a local public project to participate in that focuses on conservation"*

	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5
Task 1					
Task 2					
Task 3					
Task 4					
Task 5					

Appendix G: Post-test Questionnaire

Based on the Perlman questionnaire.

Perlman, G. (2018). *Computer System Usability Questionnaire.* Available at
https://garyperlman.com/quest/quest.cgi.

There are 17 quantitative questions that ask you to rate how usable SciStarter was on a scale
from 1 to 7. 1 means strongly disagree, 7 means strongly agree. N/A is also an option. The final
question (question 18) will be an open-ended question about your overall experience with the
website.

	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5
1. Overall, I am satisfied with how easy it is to use this website					
2. It was simple to use this website					
3. I can effectively complete my work using this website					
4. I am able to complete my work quickly using this website					
5. I am able to efficiently complete my work					

using this website					
6. I feel comfortable using this website					
7. It was easy to learn to use this website					
8. I believe I became productive quickly using this website					
9. The system gives error messages that clearly tell me how to fix problems					
10. Whenever I make a mistake using the website, I recover easily and quickly					
11. The information (such as online help, on-screen messages, and other documentati					

on) provided with this website is clear					
12. It is easy to find the information I needed					
13. The information provided for the system is easy to understand					
14. The information is effective in helping me complete the tasks and scenarios					
15. The organization of information on the website screens is clear					
16. The interface of this system is pleasant					
17. I like using the interface of this system					

Please describe your overall experience navigating SciStarter.					

Are the elements of a formal test plan present?

(Barnum, 283)

Plan proposal:
- ❏ Cover or Title Page
- ❏ Table of Contents
- ❏ List of tables/illustrations
- ❏ Purpose
    - ❏ Problem Statement
- ❏ Introduction/Background
- ❏ Proposed Methodology
    - ❏ User Profiles/Personas
    - ❏ Participants and participant incentive
    - ❏ Tasks/Scenarios
    - ❏ Success condition descriptions
    - ❏ Fail conditions description
    - ❏ Test Environment and Equipment List

Materials
- ❏ Personas
- ❏ Moderator's script & checklist
- ❏ Screener questionnaire
- ❏ Pretest questionnaire per persona
- ❏ Description of scenarios
- ❏ Checklists broken down by pre, during, and post test tasks
- ❏ Observation form
- ❏ Post-task questionnaire
- ❏ Pre-test questionnaire
- ❏ Post-test questionnaire
- ❏ Schedule proposal

Are tasks, scenarios, personas focused on appropriate for mobile concerns such as:

Learnability:
> Poor (1 - 2 - 3 - 4 - 5) Good

Efficiency:
> Poor (1 - 2 - 3 - 4 - 5) Good

Memorability
> Poor (1 - 2 - 3 - 4 - 5) Good

Error Tolerance:
> Poor (1 - 2 - 3 - 4 - 5) Good

Satisfaction
> Poor (1 - 2 - 3 - 4 - 5) Good

How well have revisions for mobile been made in the following proposal sections? How well have the revisions for mobile been highlighted and explained?

Personas:
> Poor (1 - 2 - 3 - 4 - 5) Good

Tasks/Scenarios:
> Poor (1 - 2 - 3 - 4 - 5) Good

Success condition descriptions:
> Poor (1 - 2 - 3 - 4 - 5) Good

Test Environment and Equipment List:
> Poor (1 - 2 - 3 - 4 - 5) Good

Screener questionnaire:
> Poor (1 - 2 - 3 - 4 - 5) Good

Checklist:
> Poor (1 - 2 - 3 - 4 - 5) Good