CS5760 - Human Computer Interaction & Usability Testing

- Jyoti Suhag

Usability Test Results of Socratic Programming Tutor API

APP : Socratic Programming Tutor UI

Team:

Developers

- Troy Muehlhausen
- Christopher Rochon
- Chloe Scheetz
- Fatima Morera Lohr
- Joe Halcombe
- Scout Lex
- Robin Vanden Heuvel

UX Consultant

- Jyoti Suhag

Computer User Interface Usability Testing

You are being invited to participate in a research study to determine the usefulness and usability of computer user interfaces. This study is being conducted by Dr. Robert Pastel of Michigan Technological University Computer Science Department and Dr. Pastel's Human-Computer Interaction (HCI) courses. The students are performing the usability tests as part of their project and to fulfill the HCI course requirements.

There are no known risks if you decide to participate in this research study. There are no costs to you for participating in the study. The information you and the tasks that you will perform will determine the usefulness and usability of user interfaces. The questionnaires and the tasks should take less than an hour to complete. The information collected may not benefit you directly, but the information learned in this study should provide more general benefits.

The questionnaires and tests are anonymous. No one will be able to identify you and your answers, and no one will know whether or not you participated in the study except for the instructor of the class who is giving you credit for participating. Should the data be published, no individual information will be disclosed.

Your participation in this study is voluntary. By completing the questionnaires and performing the tasks, you are voluntarily agreeing to participate. You are free to decline to answer any particular question you do not wish to answer or not to perform a task for any reason.

The testing may make use of video conferencing software which will record your tasks on the computer screen and from your webcam. The webcam recordings will not be shared,and you
may mute the webcam at any time. Before sharing your screen, you should clear your desktop of any open apps except your browser. Also you should clear your desktop of any icons or widget that you wish not to be observed.

If you have any questions about the study, please contact Dr. Robert Pastel, Associate Professor, Computer Science Department, Michigan Technology University, Houghton, MI 49931.

1. Test Objectives

The goal of this usability test is to evaluate how effectively users interact with the Socratic Programming Tutor API. The evaluation will focus on:

- Ease of use: How intuitive is the chatbot for first-time users?
- Efficiency: Are responses timely?
- Error handling: How well does the chatbot respond to ambiguous or incorrect inputs?
-Responsiveness : How well does a website respond on different platforms chrome, firefox or mobile .

2. Target Users

Primary Users:

- Beginner programmers
- Students in introductory coding courses
- Self-learners using the chatbot for coding practice

Secondary Users:

- Instructors and mentors assessing student learning
- Advanced programmers testing chatbot reasoning

3. Test Environment & Equipment

- Devices: Laptop/Desktop(pr)
- Browser Compatibility: Chrome, Firefox, Edge, Safari

The scenarios mentioned below will be tested in a total of 7 sessions, each of which will be an hour long. The sessions will be administered by the UX consultant (Jyoti Suhag) and the developers who have participated. All the sessions will be conducted via zoom.

please rate your experience on a scale of 1 to 5, where 1 represents the lowest rating and 5 represents the highest rating.

4. Test Scenarios

Scenario 1: Navigating the Interface

Objective:

- Assess ease of navigation to different options present within the chatbot.
- Identify the difficulties users faced while navigating through different parts.

Quantitative Measurement List:

- Success rate of completing navigation tasks without assistance.

Post-Scenario Questionnaire Results :

Question 1: Ease of Navigation (Scale 1–5)
- 3 users rated: 5 (Very Easy)
- 3 users rated: 4 (Easy)

Overall, users found the navigation intuitive and straightforward.

Question 2: Difficulty Accessing Features (Yes/No)
- All users responded: No

Users reported no issues locating or accessing features within the app.

Participant's Name	Q1: How easy was it to navigate the different options in the app? (1-5)	Q2: Were any features difficult to find or access? (Yes/No)	Q3: What improvements would you suggest for easier navigation?
Tyler Ormstad	4	No	Maybe colours can be used to highlight the errors in different parts of the code as done in VS Code.
Johnathan Sepulveda	5	No	-
Olivia Klevorn	5	No	Feedback section is long and can be improved.
Coleton Wilczynski	5	No	-
Larry Dubay	4	No	-
Benji Sutton	4	No	Maybe UI can be improved
Yaman Aljnadi	-	-	-

Scenario 2: Response Time & Performance

Objective:

- Ensure chatbot responses are quick and do not cause frustration.

Quantitative Measurement List:

- Measure the time taken for the chatbot to generate a response after a query is submitted.

Post-Scenario Questionnaire Results :

Question 1: Chatbot Response Speed (Scale 1–5)
● All users rated: 5 (Excellent)

Users were highly satisfied with the chatbot's quick response time.

Question 2: Consistency of Response Time (Yes/No)
● All users responded: Yes

The chatbot maintained a consistent response time throughout the session.

Question 3: Handling of Multiple Queries (Scale 1–5)
● All users rated: 5 (Excellent)

The chatbot effectively managed multiple queries in succession without delay or confusion.

Participant's Name	Q1:How would you rate the speed of the chatbot's response? (1-5)	Q2:Did the chatbot maintain a consistent response time throughout your session?(Yes/No)	Q3 : How well did the chatbot handle multiple queries in succession? (1-5)	Q4: What improvements would you suggest for fast response?
Tyler Ormstad	5	Yes	5	-
Johnathan Sepulveda	5	Yes	5	-
Olivia Klevorn	5	Yes	5	-
Coleton Wilczynski	5	Yes	5	Flags can be added between the feedbacks.
Larry Dubay	5	Yes	5	Feedback reading is difficult and can be improved by making sections in feedback.
Benji Sutton	5	Yes	5	-
Yaman Aljnadi	-	-	-	-

Scenario 3: Responsiveness on different platforms (Laptops, Mobiles and tablets)

Objective:

- Ensure the seamless and consistent user experience across different platforms, including laptops, mobile devices, and tablets.
- This evaluation will assess layout adaptability, response accuracy, and ease of use on various screen sizes and input methods.

Quantitative Measurement List:

- Measure how well the chatbot adjusts to different screen sizes (laptops, mobiles, tablets).
- Check if chatbot retains session history and settings across devices.

Post-Scenario Questionnaire Results:

Question 1: Adaptability to Different Screen Sizes (Scale 1–5)
● 5 users rated: 5 (Excellent)
● 1 user rated: 4 (Good)

Overall, the chatbot displayed excellent adaptability across laptops, mobiles, and tablets.

Question 2: Typing Experience and UI Responsiveness (Yes/No)
● All users responded: No

No participants experienced difficulties typing queries due to UI responsiveness.

Question 3: Retention of Session History Across Devices (Yes/No)
● All users responded: Yes

The chatbot successfully retained session history and settings when switching between devices.

Participant's Name	Q1:How well did the chatbot adjust to different screen sizes (laptops, mobiles, tablets)?(1-5)	Q2:Did you experience any difficulty typing queries due to UI responsiveness? (Yes/No)	Q3 :Did the chatbot retain session history and settings when switching between devices?(Yes/ No)	Q4: What improvements would you suggest for fast response across different platforms?
Tyler Ormstad	5	No	Yes	Design can be changed according to screen sizes.
Johnathan Sepulveda	5	No	Yes	-
Olivia Klevorn	4	No	Yes	-
Coleton Wilczynski	5	No	Yes	Formatting issues in small screens maybe try changing designs.
Larry Dubay	5	No	Yes	If the submit button is at the top it will be helpful.
Benji Sutton	5	No	Yes	-
Yaman Aljnadi	-	-	-	

Scenario 4: Handling Incorrect Inputs

Objective:

- Evaluate how well detects, responds to, and guides users when they provide incorrect or malformed inputs.

Quantitative Measurement List:

- Time taken by the chatbot to process and respond to an incorrect input.

Post-Scenario Questionnaire Results:

Question 1: Handling of Incorrect or Malformed Inputs (Scale 1–5)

● 5 users rated: 5 (Excellent)

● 1 user rated: 4 (Good)

The chatbot was highly effective in recognizing and responding to incorrect or malformed inputs.

Question 2: Response Time for Incorrect Inputs (Scale 1–5)

● All users rated: 5 (Excellent)

Participants reported excellent response speed even when dealing with incorrect inputs.

Participant's Name	Q1:How well did the chatbot handle incorrect or malformed inputs?(1-5)	Q2:How would you rate the response time of the chatbot when handling incorrect inputs? (1-5)	Q3: What improvements would you suggest for incorrect responses ?
Tyler Ormstad	5	5	If links appear as hyperlinks it will be nice.
Johnathan Sepulveda	5	5	-
Olivia Klevorn	5	5	-
Coleton Wilczynski	5	5	-
Larry Dubay	4	5	-
Benji Sutton	5	5	Have some more colors, maybe add drag and drop for entering code.
Yaman Aljnadi	-	-	-

Test Setup Details:

- Conducted in a controlled online environment.
- Written scenario text and instructions provided to participants.
- Observers will document interactions and note any usability issues.

Testing Process :

- Consent from Participant
- Explained app description to participant
- Explained the test scenarios
- Asked to perform testing
- Recorded observations
- Post-testing questions

Appendix A:

Below is the attendance of the developers for the test sessions.

Test Session 1 : April 7th, 2025 at 4:30 pm - 5:30 pm

Developers	Attendance
Chloe Scheetz	Yes
Fatima Morera Lohr	Yes
Scout Lex	Yes
Christopher Rochon	Yes
Troy Muehlhausen	Yes
Joe Halcombe	Yes

Test Session 2 : April 8th, 2025 at 2:00 pm - 3:00 pm

Developers	Attendance
Chloe Scheetz	Yes
Fatima Morera Lohr	Yes
Scout Lex	Yes
Christopher Rochon	Yes

Troy Muehlhausen	Yes
Joe Halcombe	Yes
Robin Vanden Heuvel	Yes

Test Session 3 : April 9th, 2025 at 4:30 pm - 5:30 pm

Developers	**Attendance**
Chloe Scheetz	Yes
Fatima Morera Lohr	Yes
Scout Lex	Yes
Joe Halcombe	Yes

Test Session 4 : April 10th, 2025 at 2:00 pm - 3:00 pm

Developers	**Attendance**
Chloe Scheetz	Yes
Fatima Morera Lohr	Yes
Scout Lex	Yes
Christopher Rochon	Yes
Troy Muehlhausen	Yes
Robin Vanden Heuvel	Yes
Joe Halcombe	Yes

Test Session 5 : April 10th, 2025 at 3:00 pm - 4:00 pm

Developers	Attendance
Chloe Scheetz	Yes
Scout Lex	Yes
Christopher Rochon	Yes
Troy Muehlhausen	Yes
Robin Vanden Heuvel	Yes
Joe Halcombe	Yes

Test Session 6 : April 10th, 2025 at 6:30pm - 7:30pm

Developers	Attendance
Chloe Scheetz	Yes
Fatima Morera Lohr	Yes
Christopher Rochon	Yes
Troy Muehlhausen	Yes
Robin Vanden Heuvel	Yes

Test Session 7 : April 11, 2025 at 6:00pm - 7:00pm

- Participant Not present.

Testing Challenges:

Test Challenge Number	Name	Description
1	CORS	We were unable to run the API without turning off the security.

Bug Report Form:

Bug Name	Bug Description	Steps to Reproduce