Usability Testing for Mobile App Sky Guide

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Abstract

The sound quality of the Sky Guide app has been questioned as user engagement hits an all-time low. Recognizing the urgency to address this issue, usability testing was conducted with four individuals representative of Sky Guide's consumer population. Through this process, valuable insights into the app's usability were gained and areas that need improvement were identified. As well as features that were well-received and require no adjustments.

Upon concluding the usability testing, a mixed set of results emerged. Overall, participants expressed enjoyment of the app. Highlighting favorable features and satisfaction with its intended purpose. However, concerns related to design choices and app organization surfaced both during the tests and through direct feedback.

While Sky Guide boasts a well-developed app providing an enjoyable experience, it is crucial to give further consideration to the design of specific features. Addressing ambiguities that may lead to confusion during app use is paramount for enhancing overall user satisfaction.

Summary

The usability testing conducted on Sky Guide yielded mixed feedback. Participants offered positive comments, expressing appreciation for the app's aesthetics, design, and formatting. Nonetheless, concerns were raised regarding ambiguity, particularly related to the lack of labeling on certain app features. Leading to confusion and partial disorientation among some participants.

Despite these concerns, the overall testing outcomes were predominantly positive, aligning with a Net Promoter Score averaging 9.25 (as seen in Appendix I). This score is conducive to a generally favorable experience reported by all participants.

Introduction

Usability testing is a method employed to assess and enhance the functionality of the subject under examination. According to Norman and Kirakowski, as defined in their book *The Wiley Handbook of Human-Computer Interactio*n on page 257, usability testing is described as "a user testing method in which one or more representative users at a time perform tasks or describe their intentions under observation."

Testing was conducted by Sky Guide communication expert, Rachael Jeffries, and performed over Zoom. With the meeting recording the participants face and voice. The communication expert recorded comments, actions, and spoken thoughts of the participants.

In alignment with the principles of usability testing, participants in this study were tasked with completing a set of assignments aimed at scrutinizing Sky Guide. This decision stemmed from concerns regarding a perceived lack of engagement with the mobile app. Through the execution of usability testing within the app, we aimed to unveil not only minor issues that might have gone unnoticed but also to identify features that users found enjoyable or beneficial.

This report aims to present the selection of participants, procedures followed during usability testing, the outcomes of these tests, and an in-depth analysis of said outcomes.

Procedures

Participants were selected based on their alignment with Sky Guide's perceived demographic. Four college STEM students were chosen, as their commitment to math and science degrees made them likely to be intrigued by the features offered by Sky Guide.

The usability testing was conducted through recorded Zoom meetings, with recording taking place only upon the participant's consent. Before starting the testing process, a brief overview was presented, allowing participants to ask any questions for clarification. The usability test commenced with background questions, found in Appendix A, addressing participant demographics.

After completing the background questions, the testing transitioned to specific tasks. Five tasks, detailed in Appendix J, were presented to participants, prompting them to interact with key features of Sky Guide in ways reflective of typical app use. Participants were encouraged to vocalize their thoughts throughout the tasks, with records kept of any comments made. Following each task, participants were asked questions related to that task, and their responses were recorded.

Quick Overview of Tasks:

1. Locate and turn on the compass.
2. Locate the search function and find the North Star (Polaris).
3. Turn on the AR Mode.
4. Please find when the next Solar Eclipse will happen.
5. Find the “February 2024 Sky Sights Of The Month” article.

Once all tasks and questions were completed, participants were asked to fill out a post-test questionnaire, provided in Appendix K. This questionnaire aimed to gather conclusive insights into participants overall experience with Sky Guide.

Results

Time Spent on Each Task

Sky Guide usability testing presented a new outlook on the app's feasibility. A further explanation of each task and task questions can be found in Appendix J.

Task 1

- Participant 1: 00:07
- Participant 2: 00:14
- Participant 3: 00:08
- Participant 4: 00:10
- Average: 00:10

Task 2

- Participant 1: 00:28
- Participant 2: 00:12
- Participant 3: 00:10
- Participant 4: 00:12
- Average: 00:16

Task 3

- Participant 1: 00 :23
- Participant 2: 00:40
- Participant 3: 00:10
- Participant 4: 00:08
- Average: 00:20

Task 4

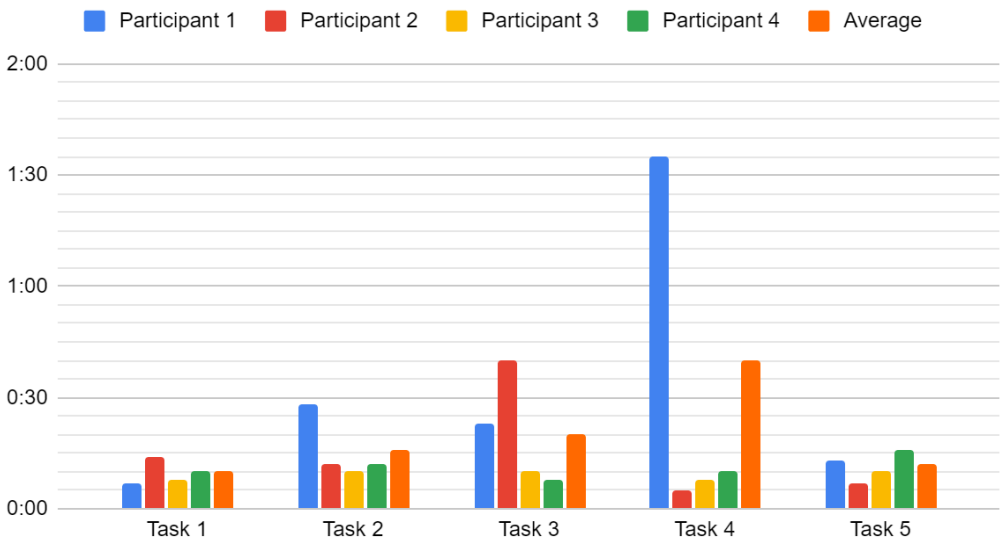
- Participant 1: 01:35
- Participant 2: 00:05
- Participant 3: 00:08
- Participant 4: 00:10
- Average: 00:40

Task 5

- Participant 1: 00:13
- Participant 2: 00:07
- Participant 3: 00:10
- Participant 4: 00:16
- Average: 00:12

Data for Time Spent on Each Task is visually plotted in Figure 1.

Figure 1: Time Spent on Each Task



Number of Errors on Each Task

Task 1

- Participant 1: 0
- Participant 2: 0
- Participant 3: 0
- Participant 4: 0
- Average: 0

Task 2

- Participant 1: 0
- Participant 2: 0
- Participant 3: 0
- Participant 4: 0
- Average: 0

Task 3

- Participant 1: 0
- Participant 2: 3
- Participant 3: 0
- Participant 4: 1
- Average: 1.5

Task 4

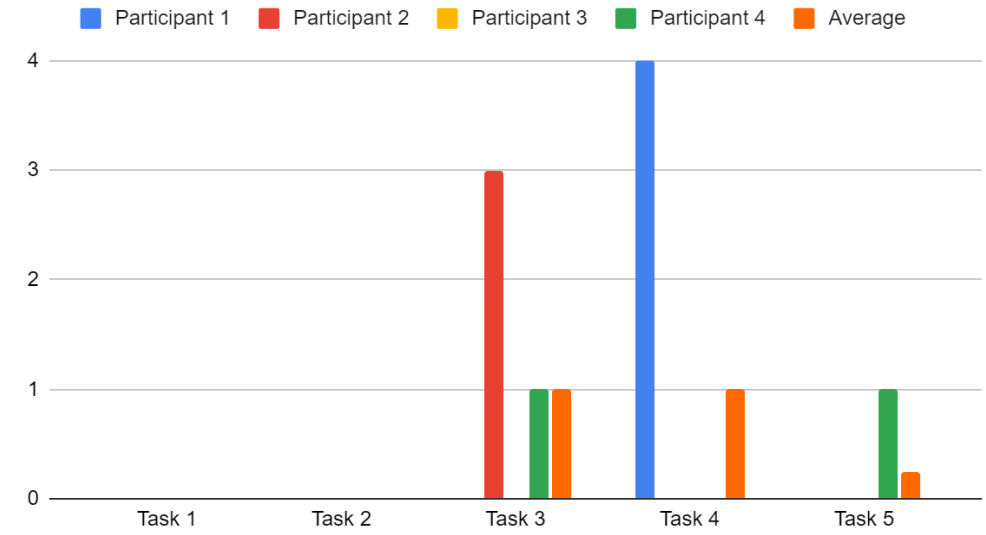
- Participant 1: 4
- Participant 2: 0
- Participant 3: 0
- Participant 4: 0
- Average: 1

Task 5

- Participant 1: 0
- Participant 2: 0
- Participant 3: 0
- Participant 4: 1
- Average: .25

Data is visually plotted in Figure 2: Number of Errors on Each Task.

Figure 2: Number of Errors on Each Task



Time Spent on Error Recovery

Task 1

- Participant 1: 00:00
- Participant 2: 00:00
- Participant 3: 00:00
- Participant 4: 00:00
- Average: 00:00

Task 2

- Participant 1: 00:00
- Participant 2: 00:00
- Participant 3: 00:00
- Participant 4: 00:00
- Average: 00:00

Task 3

- Participant 1: 00:00
- Participant 2: 00:30
- Participant 3: 00:00
- Participant 4: 00:05
- Average: 00:09

Task 4

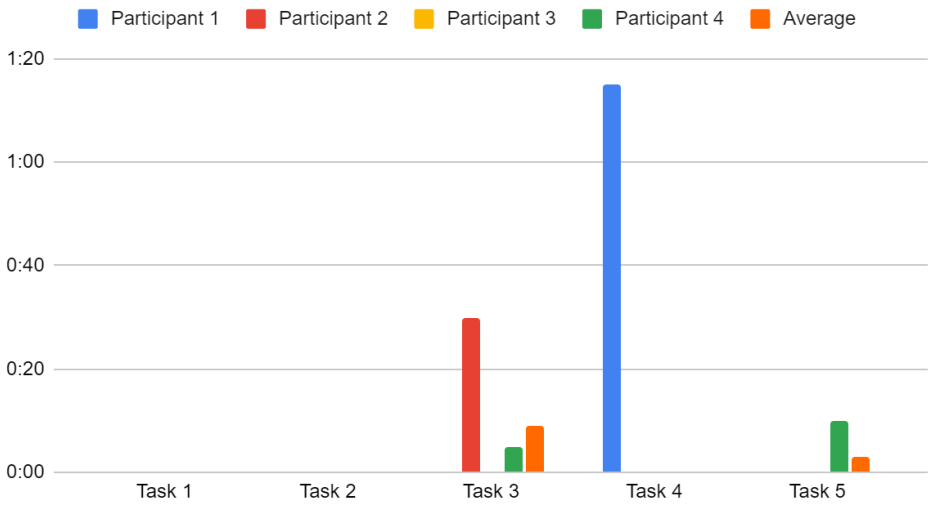
- Participant 1: 01:15
- Participant 1: 0
- Participant 1: 0
- Participant 1: 0
- Average: 00:19

Task 5

- Participant 1: 00:00
- Participant 2: 00:00
- Participant 3: 00:00
- Participant 4: 00:10
- Average: 00:03

Data is visually plotted in Figure 3: Time Spent on Error Recovery

Figure 3: Time Spent on Error Recovery



Most Enjoyed Moments Throughout Testing

- Participant 1: Enjoyed aesthetics, app design, and found the experience engaging.
- Participant 2: Enjoyed aesthetics, app design, and found the experience engaging.
- Participant 3: Enjoyed aesthetics, all features, app design, and found the experience engaging.
- Participant 4: Enjoyed aesthetics, app design, and found the experience engaging.

Visualization of the data can be found in Figure 4: Most Enjoyed Moment Throughout Testing.

Figure 4: Most Enjoyed Moment Throughout Testing

	Participant 1	**Participant 2**	**Participant 3**	**Participant 4**	**Average**
Enjoyment of Aesthetics	✓	✓	✓	✓	100%
Enjoyment of the All Features			✓		25%
Overall Engaging	✓	✓	✓	✓	100%
Appreciation for App Design	✓	✓	✓	✓	100%

Frustrations Faced Throughout Testing

- Participant 1: Faced challenges but did not get frustrated.
- Participant 2: Faced errors throughout testing that caused confusion.
- Participant 3: Faced no challenges while completing tasks.
- Participant 4: Faced errors while completing tasks.

Visualization of the data can be found in Figure 5: Frustrations Faced Throughout Testing.

Figure 5: Frustrations Faced Throughout Testing

	Participant 1	**Participant 2**	**Participant 3**	**Participant 4**	**Average**
No Frustrations	✓		✓		50%
Difficulty/ Confusion Finding Task Solutions	✓	✓		✓	50%

Discussion

An analysis of the results clearly indicates an overall positive experience. However, certain issues became evident that impacted participants' understanding and enjoyment of the app. Task 3, which required participants to "Turn on AR mode," revealed a total of four errors, with Participant 2 committing three errors and Participant 4 committing one. Both participants spent an average of :09 correcting their errors. The criticism of the design element centered around the fact that the AR mode icon was not visible unless the compass mode was turned on. To address this, it is recommended that the AR mode icon be made visible even when the compass mode is not activated. Additionally, a transparent outline of the current AR mode icon and a prompt such as "Please turn on Compass to access AR mode" could enhance user understanding.

Task 4, which required participants to "Find when the next solar eclipse will happen," experienced a total of 4 errors, with Participant 1 committing all four errors. Participant 1 dedicated 1:15 to correct these errors. In response, Participant 1 pointed out that the information was not searchable through the search function. Based on this feedback, it is suggested to implement directions to the calendar icon when searching for information related to upcoming solar eclipses. This improvement aims to reduce confusion and enhance the ease of information retrieval.

Task 5, which required participants to "Locate a specific article," yielded a total of 1 error, with Participant 4 committing the one error. Participant 4 spent :10 correcting their error. In response, Participant 4 commented on the lack of clarity upon clicking the featured icon, which houses all articles/space information, and what that icon contained. Based on this feedback, it is suggested to implement a subheading, such as "Everything you need to know about Space" or "Space Information," under the featured icon. This subheading will provide concise clarity about the purpose of the icon, reducing confusion for users.

More detailed descriptions of negative responses can be found in Appendix F and Appendix G.

Delving into the positives of Sky Guide, there were a number of responses that appreciated app features/design. To summarize, shared responses included:

- Tastefully minimalistic and well-organized.
- Aesthetically pleasing and beautiful.
- Efficient placement of features.
- Appreciation for images for the icons rather than a use of words.
- Very engaging.
- Enjoyment of the thoughtful scientific information and educational value.

A more detailed explanation of positive responses can be found in Appendix F and Appendix H.

In conclusion, Sky Guide proves to be an exceptional educational app that effectively captures and maintains user attention, fostering engagement in a unique way. Overcoming initial learning challenges, users are rewarded with an unparalleled experience not found in other apps of its kind. The app excels in app aesthetics/design, informational/educational value, and engaging content; contributing to its success.

To further enhance engagement and expand the user base, attention to specific areas such as headings, icon design, and information organization is recommended. For instance, improving clarity in headings, refining icon designs for intuitive navigation, and optimizing information organization can elevate the user experience. By addressing these aspects, Sky Guide has the potential to not only maintain its current success but also attract a broader audience.

As users continue to seek educational and engaging experiences, Sky Guide stands poised to meet and exceed these expectations with strategic improvements in design and functionality.

Conclusion

In conclusion, Sky Guide received invaluable feedback from all participants during usability testing, laying the foundation for continuous improvement. Adhering to the thoughtful suggestions and comments provided by participants will undoubtedly contribute to the ongoing enhancement of Sky Guide as an app. Throughout the testing process, both positive and negative comments were invaluable, highlighting areas of success and potential refinement.

I would like to extend my sincere gratitude to Professor Daniel Agbo for his invaluable assistance and guidance throughout the testing process. His expertise greatly enriched the testing experience and contributed to the app's development. Additionally, I want to express my heartfelt thanks to all the participants who generously shared their time and insights. Your contributions have been instrumental in shaping Sky Guide into a better app. Without your help, the future of further app creation for Sky Guide would not be possible.

As we move forward, the positive collaboration between testers, Professor Agbo, and all those involved sets the stage for continued success and improvement. Sky Guide's journey would not be the same without your collective support and feedback.

Appendix A

Demographic/Background Questions

General questions concerning participants reveal the demographic of testees. And gives a basic understanding and context to results.

	Participant 1	**Participant 2**	**Participant 3**	**Participant 4**	**Average**
Age	21	19	19	19	19.5
Year & Major	Junior Chemical Engineering	Freshman Biomedical Engineering	Sophomore Petroleum Engineering	Sophomore Mechanical Engineering	Sophomore Engineering
App Familiarity	No familiarity.	No familiarity.	No familiarity.	No familiarity.	No familiarity.
Confidence with New Apps, On a Scale of 1-10	7	7.5	9	8	7.9

Appendix B

Time Spent on Each Task

This tests for the principle efficiency by calculating the amount of time spent completely each task.

	Participant 1	**Participant 2**	**Participant 3**	**Participant 4**	**Average**
Task 1	00:07	00:14	00:08	00:10	00:10
Task 2	00:28	00:12	00:10	00:12	00:16
Task 3	00:23	00:40	00:10	00:08	00:20
Task 4	01:35	00:05	00:08	00:10	00:40
Task 5	00:13	00:07	00:10	00:16	00:12

Appendix C

Number of Errors on Each Task

This tests for the principle error by tallying the amount of times participants make a mistake, give up, or need help while completing a task.

	Participant 1	**Participant 2**	**Participant 3**	**Participant 4**	**Average**
Task 1	0	0	0	0	0
Task 2	0	0	0	0	0
Task 3	0	3	0	1	1
Task 4	4	0	0	0	1
Task 5	0	0	0	1	.25

Appendix D

Time Spent Error Recovery on Each Task

This tests for the principle error, furthermore the severity of errors, by calculating the amount of time spent on recovery following an error on each task by each participant (when a mistake is made).

	Participant 1	**Participant 2**	**Participant 3**	**Participant 4**	**Average**
Task 1	—	—	—	—	—
Task 2	—	—	—	—	—
Task 3	—	00:30	—	00:05	00:09
Task 4	1:15	—	—	—	1:15
Task 5	—	—	—	00:10	00:10

Appendix E

Number of Fatal Errors on Each Task

This tests for the principle error by tallying the amount of times participants give up or make a mistake beyond recoverable while completing a task.

	Participant 1	**Participant 2**	**Participant 3**	**Participant 4**	**Average**
Task 1	0	0	0	0	0
Task 2	0	0	0	0	0
Task 3	0	0	0	0	0
Task 4	0	0	0	0	0
Task 5	0	0	0	0	0

Appendix F

Responses about App Design

This tests for the principle satisfaction as well as learnability because it considers both aesthetic responsiveness and how design hindered or encouraged learnability.

	Participant 1	**Participant 2**	**Participant 3**	**Participant 4**	**Average**
Reaction to App Design	Very minimalist and well-organized . Easy to navigate.	Solid design, very aesthetically pretty.	The application was very well organized and fit the aesthetic of the app's purpose.	Very well designed and aesthetic.	Well-organize d, well designed, and aesthetic.
Reaction to Features Placeme nt/Desig	The app was designed such that the icons were off to the side so as not	More labeling for some of the icons. Overall, easy to navigate.	Everything was placed appropriately and fit the structure of the	Everything placed in common, easy to find locations.	Placement was efficient, but labeling could use improvement.

n	to obstruct the viewing window. The app also used images instead of words for the different tabs, which made it more user friendly.		application.		
Description of Overall Experience	App design is conducive to looking at stars, and aesthetically pleasing.	Liked the app and thought it was interesting/good to use.	Had a good experience, it was very accessible and interesting.	Enjoyable and easy to navigate.	Very enjoyable experience.

Appendix G

Frustrations Faced throughout App Experience

This tests for the principle satisfaction by gathering responses from participants about specific challenges they faced, and their reaction.

Participant 1	**Participant 2**	**Participant 3**	**Participant 4**	**Average**
No frustrations faced.	Some of the aspects were kind of difficult to find because there weren't any labels, just symbols, and the compass part was disorienting at first.	No frustrations, the application was very easy to navigate.	The features tab was a bit confusing, as it was an odd mix of news and other unrelated articles.	Some of the tabs were confusing because of lack of labeling/lack of intended purpose.

Appendix H

Most Enjoyed Moment throughout App Experience

This tests for the principle satisfaction by gathering responses from participants about specific moments they enjoyed, and their reaction.

Participant 1	Participant 2	Participant 3	Participant 4	Average
Enjoyed the feature where you could search and be directed towards a specific star.	Liked the AR projections of the stars and the way it directed you to the North Star. Also liked the variety of science articles available to read.	I enjoyed the format of the dashboard and how it was all set up. It was concise and well thought out.	The aesthetics were beautiful and well-designed.	A lot of enjoyment from the engagement aspects and aesthetics of the app.

Appendix I

Overall User Satisfaction (Numerical Scale)

This tests for the principle of satisfaction by directly asking the participants to place a numerical value reflecting their overall satisfaction.

	Participant 1	Participant 2	Participant 3	Participant 4	Average
1					9.25
2					
3					
4					
5					
6					
7					
8					

9	★	★	★		
10				★	

Appendix J

Task List and Post-Task Questions Script

1. Locate and turn on the compass.
    a. Was it hard to locate the compass? If yes, why?

    b. From first impressions, how do you feel about what the compass changed?

    ★ Please navigate back to the app home screen.

2. Locate the search function and find the North Star (Polaris).
    a. Was it hard to locate the search function? If yes, why?

    b. Was it hard to locate the North Star (Polaris) upon searching? If yes, why?

    ★ Please navigate back to the app home screen.

3. Turn on the AR Mode.
    a. Was it hard to locate the AR Mode function? If yes, why?

    b. How does it compare to the app before you turned AR Mode on?

    ★ Please navigate back to the app home screen.

4. Please find when the next Solar Eclipse will happen.
    a. Please indicate which icon you chose to find this information.

    b. Was it hard to find this information? If yes, why?

★ Please navigate back to the app home screen.

5. Find the “February 2024 Sky Sights Of The Month” article.
    a. Was it hard to find this article? If yes, why?

    b. Did you find anything misleading when trying to find the article? If yes, why?

Appendix K

Post-Test Questionnaire

1. What is your reaction to the design of the app?
    a. Did you appreciate where everything was placed? If not, why?

    b. Did you appreciate the look of the app? If not, why?

    c. How would you describe your overall experience?

2. Was there anything that frustrated you about either the tasks or the app? If yes, why?

3. What did you enjoy most while using the app?

4. On a scale of 1-10, how likely would you be to promote this app to a friend?

Works Cited

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