# USABILITY REPORT

**DATE:** 4/25/2019

**TO:** Chris Hundhausen, CptS 443/543 Professor

**FROM:** Kliks 2.0

**RE:** Kliks 2.0 Usability Test

**HIGHLIGHTS VIDEO URL:**

Task 1: https://www.youtube.com/watch?v=z8GVbA76984

Task 2: https://www.youtube.com/watch?v=IkdqAe8ugtc

Task 3: https://www.youtube.com/watch?v=W37DbPBno_Q

Task 4: https://www.youtube.com/watch?v=jZlopQs4Fp4

Task 5a:https://www.youtube.com/watch?v=OeM7vIEly40

Task 6a:https://www.youtube.com/watch?v=_pQLUE9g6LQ

Task 5b/6b: https://youtu.be/-WUswTgipnc

## SUMMARY


*Purpose and Scope*

On April 21th through 22nd, we conducted a usability study of Kliks 2.0, a new updated student interaction environment that offers teachers and students improved interaction and attendance capabilities. In the study, participants used a high-fidelity prototype, and completed a set of tasks defined by our study. The purpose is to understand and refine the software's functionality. Questionnaires and interviews were designed, and used throughout the study sessions to elicit data that gave us insight into the extent to which Kliks 2.0 supported what the participants wanted to accomplish.

*Methods*

We performed the study in the WSU Visualization and End-User Programming Lab located in EME 228, where users interacted with the Kliks 2.0 prototype running on a 1.79 gigahertz DELL computer with 1 gigabyte of RAM, a 64 megabyte ATI graphics card, and a 17 inch LCD monitor. User video and audio was recorded with a Minolta DiMAGE X20 2.0 megapixel digital camera, and high resolution screenshots were captured with proprietary software.

3 participants were asked to volunteer for this usability study. Participant 1 is a non-student, Participant 2 is a student, and Participant 3 is a teacher.

One hour was allotted for each session. At the beginning of the test, participants filled out a background questionnaire (See Appendix A for a copy of the questions and their responses). Next, they completed a warm-up exercise, in which they were given a brief description of the Kliks 2.0 prototype software, and then asked to speak through their thoughts and actions while they explored the software interface. Each participant did this for about 10 minutes on average. Appendix B presents an overview of the software.

Once the warm-up exercises were finished, participants were asked to complete a series of six task sets with the Kliks 2.0 software. As the participants worked through each task, they were encouraged to think aloud, and provide a context for their activity. The findings for this portion of the usability study are given below. See Appendix C for a copy of the original task sheet that participants received for the test; Appendix D details the rationale for each task.

Upon completing the tasks, participants filled out an exit questionnaire to collect their impressions of the Kliks 2.0 software. Appendix E includes the exit questionnaire and participants' responses.

## FINDINGS

*Overview*

The success of our usability study for kliks 2.0 is interpreted in terms of the empirical lab results we gathered using our high fidelity prototype. Our study measured 6 tasks independently from 3 participants, where 18 total tasks are measured. Each participant used our improved kliks 2.0 interface, designed to illustrate the possibility of improved core tasks for the current kliks used by WSU students. Overall, the new design proved to be successful, according to the data and user feedback gathered through our study.

After analyzing the task time of each participant, where each task is defined by requirements for our study, some basic inferences were made from measurements taken with video data recorded in the lab intended for our analysis. The measure for task time is defined as the time each participant begins to move their mouse on the main task page, prompted by scenarios given in our study. The end time is gathered according to the individual's ending of each task. The results are given below:

| Time: | Participant 1 | Participant 2 | Participant 3 |
|---|---|---|---|
| Task 1 | :18 | 1:48 | :35 |
| Task 2 | 1:00 | :31 | :47 |
| Task 3 | 1:36 | 1:41 | :45 |
| Task 4 | 1:02 | :33 | :33 |
| Task 5 | 1:47 | :45 | :42 |
| Task 6 | 3:10 | 1:00 | :57 |

Each volunteer performed 6 tasks, which created a total sample size (n = 18) for kliks 2.0 task time completion. The average time across all participants (μ) is 1:05 minutes, and the standard deviation across all users is 0:42 seconds. The high standard deviation suggests a large variability between participants. This is indicated by the standard deviation measures taken for each user independently (n = 6), which is smaller. This difference is also suggested by the range (= 0:45 seconds) of average task completion times.

A higher standard deviation of task times suggests a high distribution across participants, and a wide sampling. The descriptive measures pertaining to each task are investigated through the conceptual framework we've learned in class. The data we've collected is reinforced by use of Dumash and Redish severity/scope ratings, as well as other descriptive tools, which are applied to the task problems we observed during the study. The results below illustrate how these results are successfully classified by the severity/scope rating system.

*Table 1. Summary of key results vis-à-vis the usability and user experience goals we established for our software.*

| Usability or U.E. Goal | Relevant Empirical Result | Commentary |
|---|---|---|
| Users must receive feedback that their selection has been sent. | Participants rate question feedback with an 8 out of 10. | |
| Users must have an indicator to how long they have to answer a question | 0 of 3 participants had trouble completing this task. | Participants were asked to add time twice and answer the question before the timeout, none had issues with this task. |
| Users must have a way to indicate they want more time to answer a question | 0 of 3 participants had trouble completing this task. | Users were quickly able to add time to questions and answer the question before the timeout. |
| Adding questions needs to be quick to do and user friendly | Participants rated this feature with a 7 out of 10. | Some participants wanted to be able to add more than one question at a time. The question addition sequence could be simplified. |
| The UI must be visually appealing. | The UI is not visually appealing | Multiple participants mention the UI was not visually appealing. Color scheme was not appealing, lack of diversity in icons. |
| Results must be displayed on the users devices. | Participants rated this with an 8 out of 10. | The real time question feedback and charts were a bit hit with participants. One participant record this feature as their most liked feature. |

| | | |
|---|---|---|
| A notification is displayed if klicks users are not connected to the WSU network. | Users rated this as a 7 out of 10. | Users took ~0:50 seconds to complete this task. |
| Users must rate entry of new questions feature as an 8 or higher on a 1 - 10 scale in terms of ease of use. | Participants only rated this as a 7 out of 10. | The prototype only focused on adding a single new question. It was designed around a TA needing to add a question on the fly. More investigation into adding questions in general needs to be done. We should also consider separating adding new questions from presenting questions to students in the US. Question management and questioning students may benefit from separation. |
| Users must rate feedback from questions responses as a 9 or higher on a 1 - 10 scale | We averaged an 8 out of 10. | Only one participant rated this below 9. Increasing the study size could help with this, or pairing participants. |

We begin each subsection below with a brief description of the user subtask to which the problems listed in the subsection pertain. Next, in order of decreasing severity, we describe the associated usability problems, and provide “Severity” and “Scope” ratings[1] based on the empirical evidence. Following the problems, we cite evidence of each problem based on our analysis of the usability study. Each subsection concludes with specific design recommendations that we believe will remedy the problems.

[1] Severity indicates the level of difficulty that the problem caused users (1 = most severe). Scope indicates the range of users that the problem is likely to impact (1 = broadest). See Appendix E for precise definitions of these terms.

**1. Inadequate Visual Signifiers**

In this task, the user needs to click on the link labeled “History” on the top of the Klicks website page. The user does not need a active question because this task does not require one. After clicking on the link labeled “History” the user the must then find and click on the drop down menu labeled “CPTS 543 - January 10th” from the list of dates. Next the user needs to read and review the question and say out loud: “The correct answer from January 10th is purple”.

*Problems:*

1. The users were confused by the fact there was no active question. The user assumed that there was some sort of error and that to complete the task they needed to answer a question. The user had trouble noticing the "History" button near the top of the page. After being confused by there being no active question the users did not notice any of the options on the top of the page. (Severity = 2, Scope = 1).

*Evidence:*

3 of 3 participants had an issue with there being no active question. User 1 was able to find the “History” link after some delay. User 2 became frustrated after seeing there was no active question, believing that something had gone wrong with the program. The user eventually notices the history link and finishes the task correctly. User 3 was confused by no active question, however they were able to find the “History” link and complete the task.

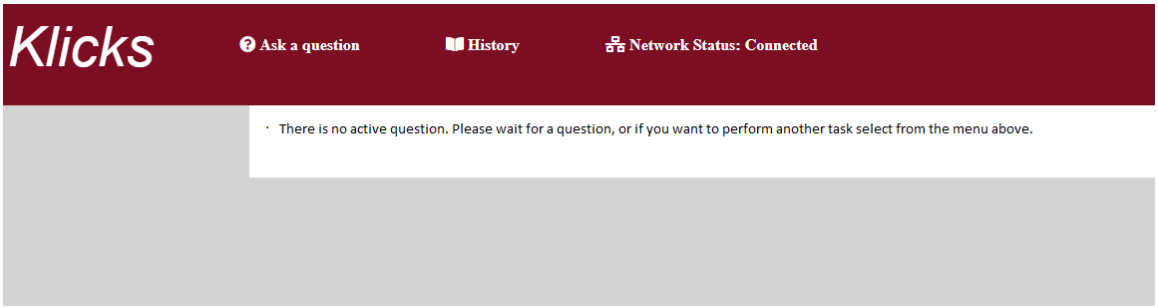
*Diagnosis:*

The diagnosis for this problem may related to Johnson’s discussion of visual priority in a user interface. The information needed to complete the task is already given on the task page, such that an active question is not required to complete the given task. However, the placement of this box conveys a central importance to the participant, and gains priority over the “History” tab above. This type of ‘visual priority’ queue is unconsciously assumed by the participant, who directs all their attention to the “No Active Question” box, despite its irrelevance, and fails to find to notice the “History” link.

*Recommendations:*

1. Change "There is no active question." to something that lets the user know that there are still other options on the page. In this example the text was changed to : “There is no active question. Please wait for a question, or if you want to perform another task select form the menu above”. The new text now tells the user that

there are other options on the menu above that they can interact with.




2. The History link can also be changed to stand out more. The  link could be made bigger and could be given a border around it to stand out from the background.

## 2. TA Options not easily recognized

In this task, the user needs to click on the drop down menu labeled “TA options”. From that menu, the user selects “Manage questions” and is sent to a new page. From that page the user must click on “Add a new question” which will give them two options. They need to select “Create a new written question”. After doing this they will be taken to a template that asks them to enter their question. The user must enter “How are you today?” into the provided text box. The user then needs to click on the button labeled “Finish creating question”. The user then selects “make active question” in the box labeled “How are you today?”.

*Problems:*

1. Again, the user was confused by there being no active question. User had trouble noticing that they were logged in as a TA for this task and had TA options to choose from. (Severity = 2, Scope = 3)

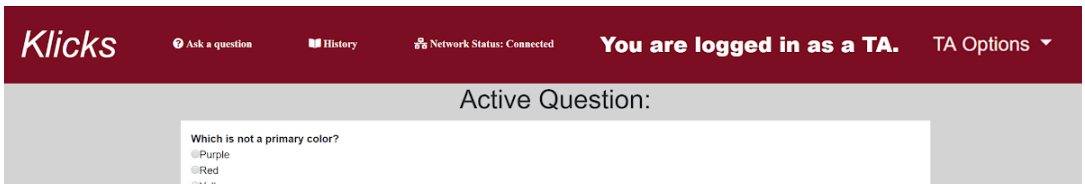
*Evidence:*

1 out of 3 participants had an issue with finding the TA options. User 1 was confused by there being no active question again and tried to solve the problem by backtracking. They eventually noticed that they had TA options.

*Diagnosis:*
The addition of the TA menu was not apparent to the users. It did not have a strong visual contrast from the other menu items. Once they had access to the TA options they did not notice the change.

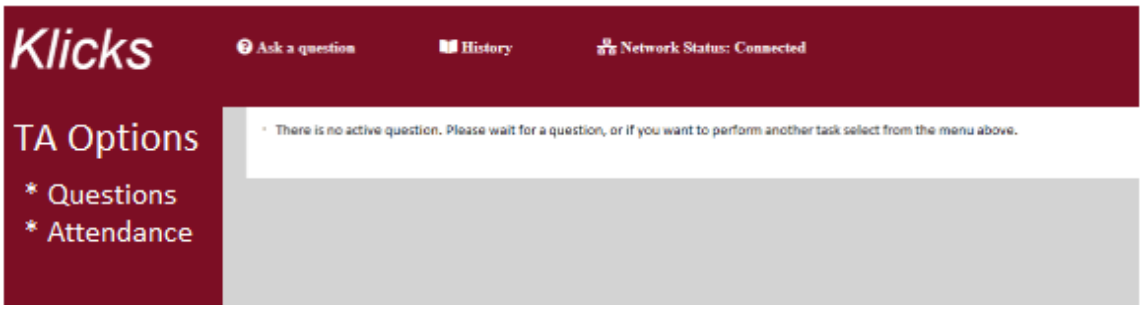
*Recommendations:*

1. Again, change “There is no active question” to “There is no active question. Please wait for a question, or if you want to perform another task select form the menu above”.
2. Make the the fact that the user is logged in as a TA clearer to the user. This could be done by including a large message near the TA options.




The website could also change color if you are logged in as a TA.

3. Another option is to make the TA options a sidebar, this would create a separation between the student features and the TA features. This would only appear for TA's. They would also be advanced users and would be expecting this menu. The gestalt law of proximity would help distinguish these two features (student/TA).




### 3. Loading issue in software

In this task, the user clicked the "Attendance" option in the "TA options" dropdown menu.

*Problems:*

1. When the user clicks on the "Attendance" option, they are taken to a page showing the attendance of multiple days. The time this page takes to load is longer than what we would like, ranging from 7-15 seconds. (Severity=3, Scope=1)
2.

*Evidence:* 3 out of 3 participants had this issue.

*Diagnosis:*

*Ensure all pages have a fast loading time.*

*Recommendations:*

1. Change the way that the program was coded to reduce the loading time of the attendance page.

### 4. Lack of Functionality Affordances

In this task, the user needs to see that the user is not connected to a WSU network. The user then clicks on the "Network Status" link at the top of the page. This link will open a pop-up explaining that there are not connected to a WSU network as well

as how they can fix it. After closing the pop-up, the user will see that they are now connected.

*Problems:*

1. Two users saw that the network was not connected but did not click on the "Network Status" link. This ultimately completed the desired task, but not in the way we wanted/expected. (Severity=2, Scope=2)

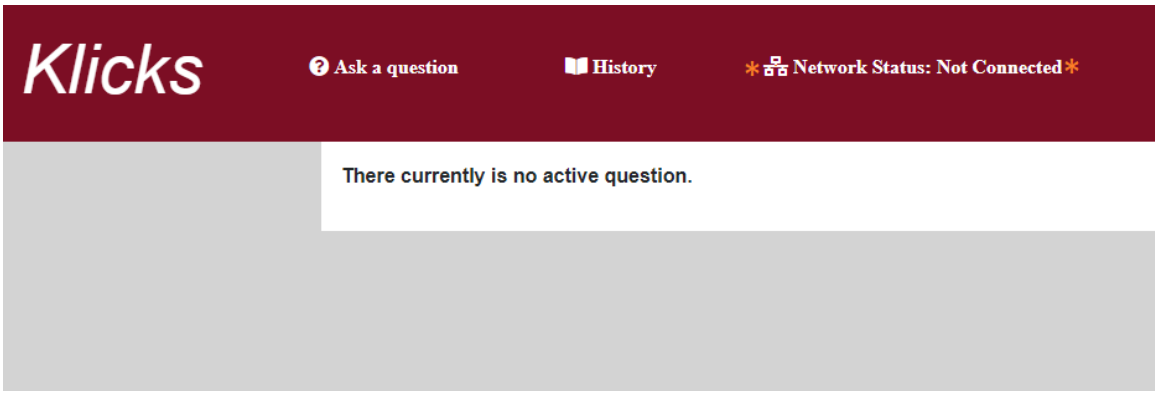
*Evidence:* 2 out of 3 participants had this issue. User 1 saw that they were not connected and believed they were done with the task, moving on to the next task. User 3 also saw that they were not connected and moved on to the next task.

*Diagnosis:*

The icons do not have any contrast from the signifiers. There is some dual encoding between the signifiers and the icons, but it is limited. The menu items also have no clicking affordances, they are simply white text on a solid background.

*Recommendations:*

1. Give a better warning that draws attention to the network status when the user is not connected to a WSU network. I this example orange *s were added to better capture the eye of the user.




2. Change the "Network status" link into a button or have another indication that it can be clicked upon.
3. Modify the submit button to turn yellow when not connected and modify the text from "Submit" to "Submit when not connected to WSU network". This would put the error condition into the foveal view of the users.

**5. General problems**

In observing the usability study and listening to participants' suggestions, we identified several general problems with the interface. These problems, which span multiple user tasks, are collected in this subsection. Note that, unlike the previous subsections, this subsection does not always cite evidence. In most cases, it draws on established usability guidelines, and on the suggestions of participants in the study.

*Problems:*

1. Color Scheme (Severity 1, Scope 2) Some users may find the color scheme to be unpleasant. One of three participants indicated the red and blue color schemes were not pleasant.

2. Not aesthetic (Severity 1, Scope 2). Some users may find the user interface is not aesthetically pleasing. One of three participants indicated the user interface is not aesthetically pleasing.

*Recommendations:*

1. *Find a good color scheme 1* , The red and blue color scheme were indicated to be unpleasant. The color scheme needs to be investigated to find a good visually appealing combination.
2. *Add colorful icons 2* , It would be beneficial to investigate icons that could be used for the menu items, these should still have the text signifiers, but having large icons would be more visually appealing. Care should be taken to ensure these icons have a natural mapping to the task being done to reduce the need for users to read all the signifiers. The menu would then also benefit from dual-encoding.

# APPENDIX A: BACKGROUND QUESTIONNAIRE RESPONSES

## Background Questionnaire

1. How many years of experience do you have with taking in class digital quizzes/surveys/attendance in a lecture setting? 0
2. Briefly describe your educational background. High school grad, 1.5 years at WSU.
3. What are the different software solutions you have used for digital quizzes/surveys? Quizlet, Blackboard.
4. Have you used another digital tool for taking attendance? If so what are they? iClicker
5. Have you ever taught a class? If so what tools have you used for quizzes/surveys/attendance? N/A.

## Background Questionnaire

1. How many years of experience do you have with taking in class digital quizzes/surveys/attendance in a lecture setting? 6
2. Briefly describe your educational background. Marketing AA, current DTC major
3. What are the different software solutions you have used for digital quizzes/surveys? Blackboard, survey monkey
4. Have you used another digital tool for taking attendance? If so what are they? Tophat
5. Have you ever taught a class? If so what tools have you used for quizzes/surveys/attendance? Not yet.

## Background Questionnaire

1. How many years of experience do you have with taking in class digital quizzes/surveys/attendance in a lecture setting? 15+
2. Briefly describe your educational background. Bachelors in History Education Masters Educational Technology (online) currently persuing Masters in Management & Leadership
3. What are the different software solutions you have used for digital quizzes/surveys? Blackboard, e-mail, survey monkey, google forms
4. Have you used another digital tool for taking attendance? If so what are they? Skyward
5. Have you ever taught a class? If so what tools have you used for quizzes/surveys/attendance? Yes
   Skyward (attendance)
   email/phone, survey monkey, Google forms

| | | P1 | P2 | P3 | Avg | Deviation |
|---|---|---|---|---|---|---|
| 1 | Question Creation | 8 | 8 | 5 | 7 | 1.333333 |
| 2 | Attendance | 9 | 8 | 4 | 7 | 2 |
| 3 | Network Feedback | 9 | 8 | 4 | 7 | 2 |
| 4 | Question Feedback | 9 | 10 | 5 | 8 | 2 |

| | | |
|---|---|---|
| 5 | Most Appealing | Review past questions and answers |
| | | Real-time feedback from students |
| | | Home button in upper left easy to use |
| 6 | Confusing | Study Instructions |
| | | No |
| | | More context to tasks is needed |
| 7 | Most Likes | History |
| | | Realtime student feedback |
| | | Klicks icon made it easier to navigate |
| 8 | Not Liked | Color Scheme |
| | | N/A |
| | | Ta Options menu harder to use |

| | | |
|---|---|---|
| 9 | What to change | Ability to add multiple questions at once |
| | | mobile app |
| | | More informative |
| 10 | Would you use | Yes, history great, would add more study features |
| | | absolutely |
| | | Yes |
| 11 | most frustrating | large format question additions |
| | | long wait (prototype issue) |
| | | Does not inform on what to do |
| 12 | Describe Klicks | Succinct |
| | | Easy to use |
| | | simple |
| 13 | Feature to remove | None |
| | | None |
| | | All features |
| 14 | Recommend | Yes, if it was more aesthetically pleasing |
| | | yes |
| | | No |

## APPENDIX B: USABILITY TEST TASKS

https://docs.google.com/document/d/1iAmjzXzqy4QdA6jUg8OcY6PMJgkTCtxn8AL-QdA5eIg/edit?usp=sharing

# APPENDIX C: EXIT QUESTIONNAIRE RESPONSES

## Exit Questionnaire

1. On a scale of 1 – 10, how would you rate the question creation system with respect to ease of use? ~~8~~ 9
2. On a scale of 1 – 10, how would you rate the attendance system with respect to ease of use? 9
3. On a scale of 1 – 10, how would you rate the feedback given when when not connected to the correct network? 9
4. On a scale of 1 – 10, how would you rate the feedback given when answer a question? 9
5. What core feature do you find to be the most appealing?

   Ability to review past questions & answers
6. Did you find any of the tasks to be confusing? Which ones? How would you change the tasks to make them easier to understand?

   Not w/in the program, but the experiment directions were a bit confusing
7. What did you like about kliks? Were there any features that you found particularly useful? Why?

   Ability to review past questions
8. What did you not like about kliks? Were there any features that gave you particular grief? Why?

   colors → the red/blue together isn't exciting
9. If you were designing this software, how would you change it so that it worked better for you?

   Ability to add multiple questions at a single time
10. Is the software you used in this test something that you could see yourself using in your day-to-day life? Why or why not? Yes, I think it would be great for review, as a student I'd love to have other study type options
11. What do you find most frustrating about Klicks V2?

    Large format question additions
12. How would you describe Klicks V2 in one or more words?

    Succint
13. Which features could you live without?

    N/A
14. Would you recommend Klicks V2 to a friend?

    Sure, though I'd like to see it more aesthetically pleasing first.

## Exit Questionnaire

1. On a scale of 1 – 10, how would you rate the question creation system with respect to ease of use?
   8
2. On a scale of 1 – 10, how would you rate the attendance system with respect to ease of use?
   8
3. On a scale of 1 – 10, how would you rate the feedback given when when not connected to the correct network? 8
4. On a scale of 1 – 10, how would you rate the feedback given when answer a question?
   10
5. What core feature do you find to be the most appealing?
   Real time feedback from students
6. Did you find any of the tasks to be confusing? Which ones? How would you change the tasks to make them easier to understand?
   no
7. What did you like about kliks? Were there any features that you found particularly useful? Why?
   I would love the opportunity to get real time feedback from students to better assess understanding while I'm teaching
8. What did you not like about kliks? Were there any features that gave you particular grief? Why?
   N/A
9. If you were designing this software, how would you change it so that it worked better for you?
   mobile
10. Is the software you used in this test something that you could see yourself using in your day-to-day life? Why or why not?
    working w/ students in a live setting, absolutely! It would save time & energy
11. What do you find most frustrating about Klicks V2?
    long wait on last prompt
12. How would you describe Klicks V2 in one or more words?
    Easy to use student feedback & attendance tool
13. Which features could you live without?
    None
14. Would you recommend Klicks V2 to a friend?
    If they were teaching a live class w/ an attendance requirement or wanted real time feedback yes

## Exit Questionnaire

1. On a scale of 1 – 10, how would you rate the question creation system with respect to ease of use?
   5
2. On a scale of 1 – 10, how would you rate the attendance system with respect to ease of use?
   4
3. On a scale of 1 – 10, how would you rate the feedback given when when not connected to the correct network? 4
4. On a scale of 1 – 10, how would you rate the feedback given when answer a question?
   5
5. What core feature do you find to be the most appealing?
   Clicking on the Klicks icon on the upper left to go back to home.
6. Did you find any of the tasks to be confusing? Which ones? How would you change the tasks to make them easier to understand?
   I think the last ones were the most confusing, provide more context on what the tasks want to be done.
7. What did you like about kliks? Were there any features that you found particularly useful? Why?
   The Klicks icon, made it easier to navigate home.
8. What did you not like about kliks? Were there any features that gave you particular grief? Why?
   The T.A. options page was more hard to use, none that gave me grief.
9. If you were designing this software, how would you change it so that it worked better for you?
   I would design it to look more informative.
10. Is the software you used in this test something that you could see yourself using in your day-to-day life? Why or why not?
    Yes, if I were to use this to be a teacher.
11. What do you find most frustrating about Klicks V2?
    It doesn't inform you of what to do.
12. How would you describe Klicks V2 in one or more words?
    Simple,
13. Which features could you live without?
    The features besides the Klicks icon.
14. Would you recommend Klicks V2 to a friend?
    No.

## APPENDIX D: CRITICAL INCIDENTS LOG

Critical Incidents Logs:
https://drive.google.com/open?id=1KK-rqZM9Yp7y8-n-7eQdOWe82bH3sPIn

Critical Incidents Videos:
https://drive.google.com/open?id=1xrqHhXxINZR6ssToTQb6pTqUJcJslYM8

## APPENDIX E: SUMMARY OF USABILITY PROBLEMS

https://docs.google.com/spreadsheets/d/1xM0AsOGoj2D0Cq3j6PCBBFoPThsWa0tNTP1iBMKPt9s/edit?usp=sharing