Evaluating an HCI-Inspired Quiz System

Gaining insight into user satisfaction and quiz performance

Alec Braynen
College of Engineering
The University of South Florida
Tampa, FL, 33647
alecbraynen@usf.edu

Sefat E Rahman
College of Engineering
The University of South Florida
Tampa, FL, 33647
sefaterahman@usf.edu

Kyle Walker
College of Engineering
The University of South Florida
Tampa, FL, 33647
kylewalker@usf.edu

Althaaf Shaik
College of Engineering
The University of South Florida
Tampa, FL, 33647
althaaf@usf.edu

Leela Sumanth Manduva
College of Engineering
The University of South Florida
Tampa, FL, 33647
leelasumanth@usf.edu

1 Introduction

HCI design is the science/art of designing "usable" and "useful" interfaces for users. While these terms are intuitive, they are difficult to directly quantify and qualify. In this paper, we evaluate our HHCI-inspired quiz system, comparing its usefulness and usability (across some specific dimensions) with that of a baseline system (representative of the norm in online quiz systems.)

Specifically, we evaluate 1) whether our system provides the user with a better subjective experience than the baseline and 2) whether our system provides better feedback than the baseline.

Our user population was University of South Florida students familiar with the Canvas quiz system. Our experiments were performed in a non-formal setting, with the users taking both quizzes and answering survey questions about their experience.

Ultimately, our quiz system was found to improve usability and usefulness across the dimensions of feedback and user satisfaction. Our results are presented and explained throughout the paper.

2 Establishing User Requirements

2.1 Method

We gathered both qualitative and quantitative data regarding user satisfaction and their measure of feedback. We conducted a survey, composed of qualitative and quantitative questions. Specifically, we employed a Qualtrics survey utilizing these questions.

2.2 User Demographics

We surveyed 15 users in total. Nine of them were between the ages of 18-24, 5 of them between 25 – 34 and one of them between 35 – 44. Eleven of them reported themselves as male and 4 of them as female.

2.3 User Requirements

From the data, our users were required to be college students, who are between the ages of 18 – 44, and familiar with the Canvas quiz system due to their enrollment at the college.

3 Initial Design

Our initial design seeks to give students helpful feedback during tests and enable them to finish a test even if there is a connectivity problem or service interruption. User interviews, user-centered design principles, and inspiration from existing online learning systems are all factors that influenced our design decisions. Giving students a hassle- and stress-free atmosphere to participate in online exams is the main goal of our design.

Our quiz user interface has two specific new features: an offline quiz mode and connection status notifications. If the internet is interrupted, the offline quiz mode will assist students in finishing their exams. By doing this, students can write exams without worrying about any network disconnections that might hinder their mental state at the time. Students will be kept up to date on the connectivity status due to the notification status function. In the event of a disconnect, students can still complete their exam, and once it is finished, they are informed to wait for the connection to come back before submitting.

Most of our design's user-facing elements, including the color palette, affordances, button placement, design, and so forth, remained relatively the same throughout the design and implementation phases. Using this initial design as our inspiration, we conducted a few surveys asking students what features they are looking for in online quiz systems. It was discovered students wanted the option to hide the running timer because doing so made them anxious and hurt their performance on the exam.

After considering all the survey comments, we adjusted our design to incorporate a hide/show timer option. Taking this concept further, we created a high-fidelity prototype that accurately represents the final product we planned to develop and presented to the class. Most students thought it was great that the issue they were facing was addressed, and they gave mostly favorable feedback. We decided to continue with our current design because we received no feedback that would have inspired us to add or remove any element of our design.

We finalized our design to include an offline quiz mode, connection status notifications, and a hide/show timer option. This coincides with one of our design goals, which is to protect the user's mental state during the exam. We want our examination system to capture our user's capabilities more accurately, and this requires that we keep them calm, in control, and stress-free during their exam.

The offline quiz mode is designed to continue the test while the timer is running even if there is an internet connection problem. The user is informed of the connection status using a pop-up and the connection icon on the exam page. The user will be informed if the connection resumes. If the connection is lost and the user finishes the exam, they can click the submit button and keep the page open until the connection is restored, at which point the quiz will be submitted automatically.

The hide/show timer option works with the click of a button at the top right corner of the page where the user hides it or pops it back up if he needs to. The user interface we created for all our features is clean and user-friendly, setting out each component so that the user can easily access it.

4 Implementation Details

4.1 Front-end:

The front-end interface is built using the Angular framework and the Angular Material Component UI Library for a consistent page design with a minimalistic look. The web application's pages are all uniformly styled in a two-tone color scheme.

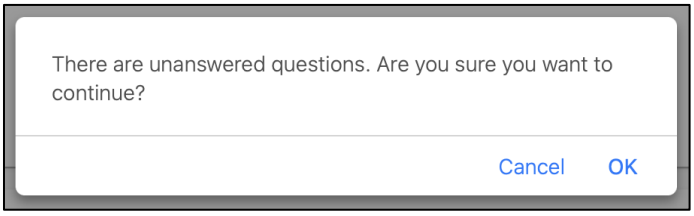


Figure 1: Confirmation message shown to the user if try to submit the quiz without answering all the questions.

Notifications are an important aspect of this system regarding the HCI questions we are trying to answer. While the user is interacting with the quiz web application various situations warrant a notification so that the user can clearly understand what is happening while conducting their tasks. When the application is offline, and the user tries to start a quiz a notification will inform the user and ask them to try again later. Once the user is online and clicks the start quiz button they will be prompted to acknowledge if they want to start the quiz and will have to confirm before the quiz can start.

When the quiz is in progress the user can encounter two additional notifications. The first is a notification informing that the user is offline and assuring them to continue until finished. This feature is the main difference between what the current system does. The current system will pause the quiz until all issues are resolved, resulting in the user losing time on the quiz. The user is also notified the moment the internet connection has been restored.

4.2 Backend:

The backend is implemented as a Java Spring Boot microservice, which is used to serve requests from the UI. Postgres, a relational database was used for storing the backend data for the project.

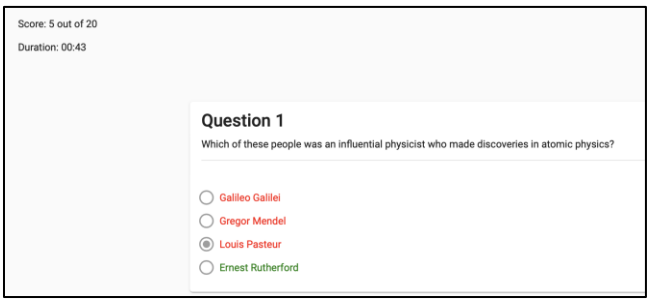


Figure 2: Quiz submission report page

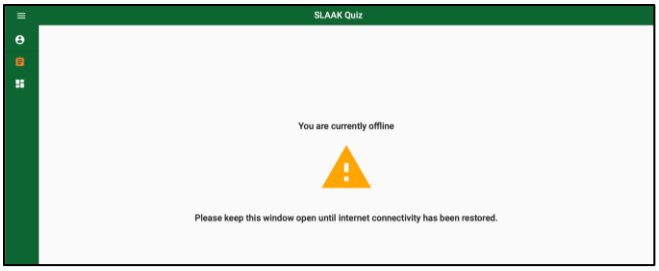


Figure 3: Quiz application waiting for the network connection to submit the quiz.

To develop different functionality, a wide variety of APIs shown in Fig 4 were employed in this project.

- UpdateConnectionStatus: This is a put API that is used to update a user's connection status on the server. Primarily to simulate a network disconnection.
- PutAnswers: This is a put API that is used to send the options selected by the user to the server for report creation. Questions are updated with the user-selected options. The results are then able to be displayed when calling the QuizResult API.
- PostQuestions: This API is used to initiate a new quiz. When called quiz questions are retrieved from a third-party API that supplies trivial questions. Those questions are saved to the Quiz, Questions, and Options tables. The questions are then returned in the response that will be displayed to the user. This interaction happens when the Start Quiz button is clicked on the UI.
- QuizResult: This is a get API. It retrieves the quiz results containing how long the user took, the number of correct answers, and all the questions from the latest quiz taken for the user.
- GetConnectionStatus: This is a get API that fetches the connection status from the server.

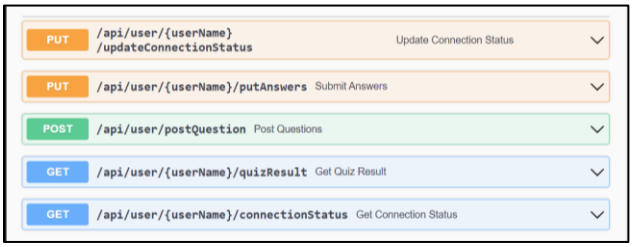


Figure 4: All five back-end APIs

4.3 Database Schema

The below lists the five tables in Fig 5 that are implemented in the database schema for the interactive quiz examination.

4.3.1 Users

This allows the server to recognize each user separately, enabling it to choose a unique set of questions for each user.

4.3.2 Quiz

This schema contains information about the quiz, such as the total number of questions, the total number of questions that were answered correctly, and the overall time to complete the quiz.

4.3.3 Questions

This schema contains all the quiz questions. Each question has a question number attribute, and each question is linked to a quiz id.

4.3.4 Options

This serves as the repository for all options-related data. This schema stores all possible options for the question, the option chosen by the user, and the correct option for a specific question.

4.3.4 Connection Status

This schema contains the connection information. It is useful for determining the user's network status.

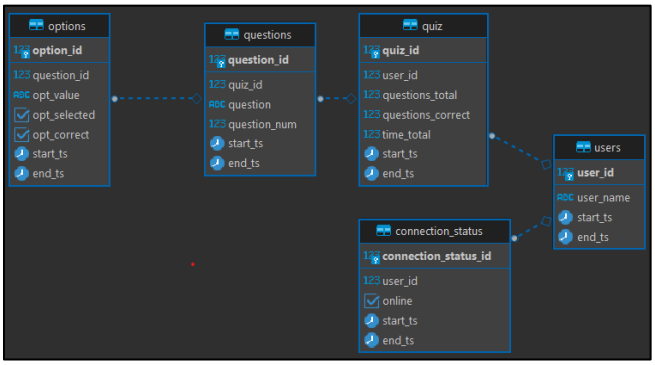


Figure 5: PostgreSQL database schemas

4.4 Tools and Libraries for the project extension or replication

4.4.1 Front-end

1. Install NodeJs
2. Install IDE (we used Visual Studio Code)

3. Install Angular CLI packages via the command line
4. Deployment solution for Front-end:
    a. Build the project and deploy compiled files to AWS using S3 and configure it as a statically hosted site.
    b. **http://slaak-hci-quiz-app.s3-website-us-east-1.amazonaws.com**

4.4.2 Back-end

1. Install OpenJDK 18
2. Install Java IDE (we used IntelliJ IDEA)
3. Create a Spring Boot base project (https://start.spring.io/)
4. Install Docker
5. Create a Postgres docker container
6. Deployment solution for Back-end:
    a. Build the project and deploy the JAR file to AWS using Elastic Beanstalk as a Web Service
    b. **http://slaakhciquizapi-env.eba-n2tmhbnq.us-east-1.elasticbeanstalk.com/swagger-ui.html**

5 Evaluation

5.1 Method

5.1.1 Participant Procedure

For our evaluation method, participants were provided with two URLs with which they were given access to the current canvas version of the quiz system and our proposed solution for the quiz system. Participants took quizzes in both versions. To balance the data, we provided half of the participants with the current solution first, followed by our proposed solution, and another half of the participants were given the proposed solution first, followed by the current solution. While taking the quiz, we simulated the offline mode that the participants will face. In the current solution, the participants waited until the connection got restored whereas participants continued taking the quiz without any issue in our proposed system when they were disconnected. After they took each quiz, they were handed out a questionnaire that took feedback from them about their experiences.

5.1.2 Equipment

The participants needed only a computer with an internet connection to access the URLs. For our evaluation, we stored data such as the average time taken by participants to take each type of quiz in the background. For the questionnaires, a computer or even a mobile phone with an internet connection was enough for our evaluation.

5.1.3 Location

Most of our participants were approached by us on campus where we provided them with the required URLs needed to complete the quizzes as well as the questionnaire. Some of our participants took the quiz and survey virtually through MS teams.

5.1.4 Time

Each participant took two quizzes which were of 5 minutes each. So, with the break in the middle, it took at best 12 minutes to take two quizzes. After that, the questionnaire took 2-3 minutes for each version. So, it will take a total of 15-20 minutes including the break for each participant to complete the study.

5.2 Participants

USF Students were targets for our study, this is due to their familiarity with the current system Canvas, and its quiz-taking system. USF uses the canvas platform for conducting online exams. So, Students are familiar with the functionalities and problems associated with the present canvas examination system. As our application is built upon the current canvas system by solving some of its problems USF students were able to provide valuable feedback and evaluation.

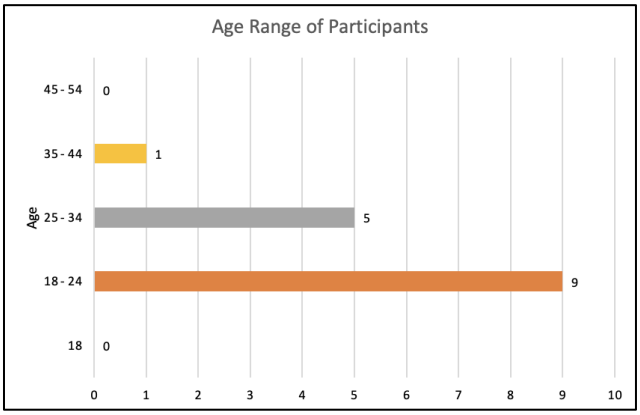


Figure 6: Age Range of Participants.

Every student was a potential end-user of our application. As a result, we selected participants using the Convenience Sampling technique. We recruited a total of 15 students visiting campus buildings such as the library and classmates as well as virtually of which 11 students were male and 4 were female students in **Fig 7**. Most of the participants ranged in age from 18 to 24 as shown in **Fig 6**.

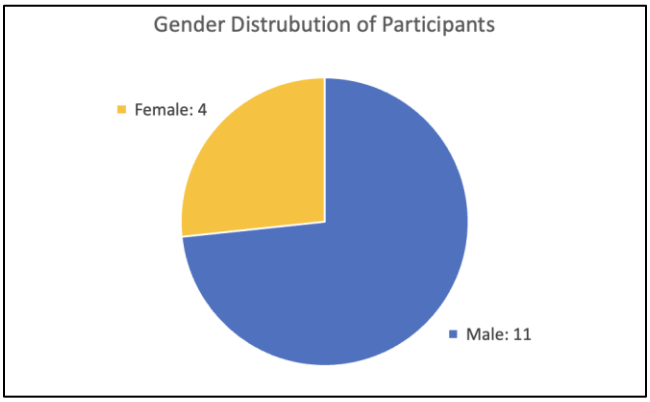


Figure 7: Gender Distribution of Participants

5.3 Results

Following the surveys, our statistics demonstrate the following conclusions:

1. Our proposed solution gave uninterrupted exam experience to participants in the scenario of network disconnection.
2. The participants in the exam were kept informed of key network connectivity status thanks to our proposed solution.
3. Our proposed solution helped participants finish their exam in time where they lost a considerable amount of time in the current solution because of network disconnection.
4. Our proposed solution eliminated the anxiety of losing time in the scenario of network disconnection whereas giving an exam in the current solution participants lost time when the network was disconnected.
5. The overall satisfaction rate of our proposed solution was relatively higher than the current existing canvas solution.

5.4 Statistics

We have gathered several statistics from the results of the questionnaire that was completed after each version of the exam to highlight some key aspects. Firstly, the participants were able to complete the quiz in both current and proposed versions of the quiz, but it is noticed that few participants mentioned that they felt that in an actual exam scenario, our proposed solution will help them from losing time thus allowing them to complete the exam. **Fig 8** and **Fig 9** show the opinion of participants on whether they have enough time to complete the exam in case of network disconnection.

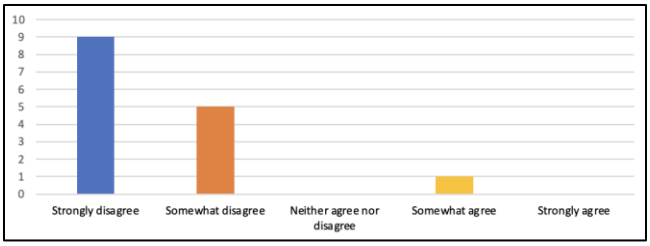


Figure 8: Participants' opinions on whether the current solution gives them enough time to finish the quiz.

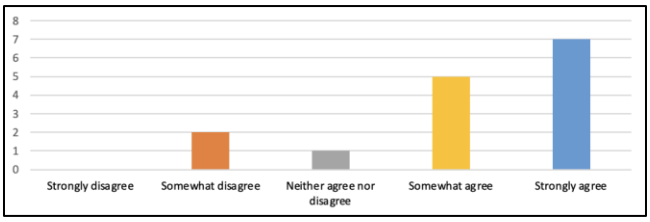


Figure 9: Participants' opinions on whether the proposed solution gives them enough time to finish the quiz.

One of the key components of our proposed solution is that we keep our users informed on the network connection status throughout the duration of the quiz. Fig 4 shows the feedback we got from our users on the notification system which shows most of them felt that it was very useful for them. The data from the questionnaire also showed that most participants felt they might not be able to complete the quiz in the current solution due to losing time when the network was disconnected.

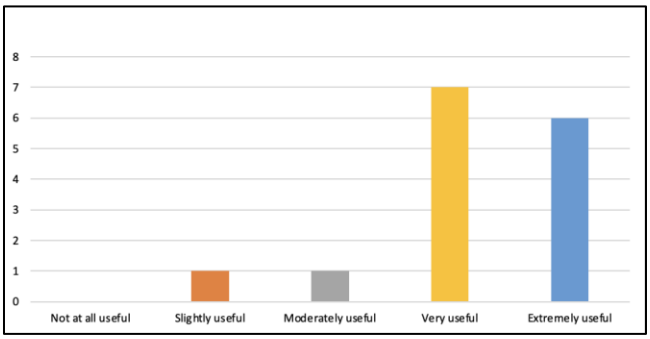


Figure 10: Feedback from participants on our notification system

The features we developed for our proposed solution include notifications for the network connection status, the hide/show timer options, and the offline quiz mode were all designed to provide users with an uninterrupted experience, primarily by attempting to eliminate or lessen any anxiety or frustration brought on by network interruption. **Fig 11** shows that 10 participants out of 15 felt that the current solution caused anxiety in them while taking exams when the network got disconnected.

Fig 12 shows us that 6 participants strongly disagreed that our proposed solution caused any sort of anxiety or frustration to them. While the rest of them remained neutral about this. This concludes our proposed solution can bring down levels of anxiety or frustration in users.

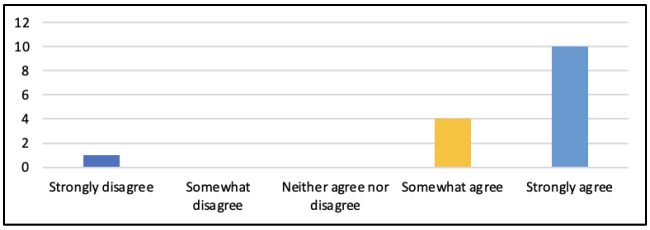


Figure 11: Degree of Anxiety or Frustration caused by network disconnection in the current solution.

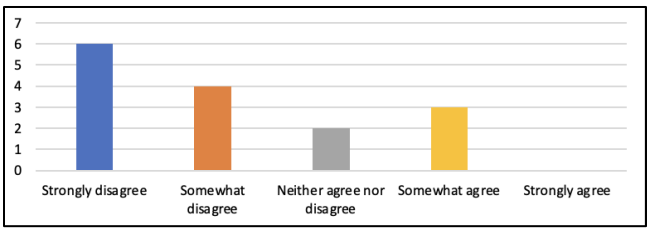


Figure 12: Degree of Anxiety or Frustration caused by network disconnection in the proposed solution.

Figures **Fig 13** shows that while using the current canvas solution 6 users were somewhat dissatisfied whereas 4 were extremely dissatisfied. Whereas our proposed solution shows in **Fig 14,** that 11 of our participants were extremely satisfied with it. The major takeaway being none of the participants felt extremely satisfied with the current canvas solution in the scenario of network disconnection whereas most participants felt extremely satisfied with our proposed solution.

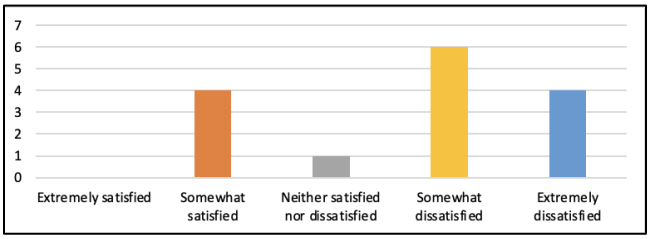


Figure 13 - Degree of satisfaction in users using the current solution

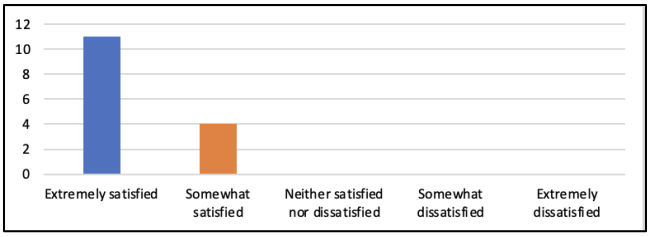


Figure 14: Degree of satisfaction in users using the proposed solution.

A paired two-sample t-test **Fig 15** & **Fig 16** was performed to determine (first hypothesis) if allowing the user to continue working on a quiz uninterrupted when losing an internet connection will reduce the emotional impacts of this time-sensitive task, resulting in higher user satisfaction.

Question: You felt a degree of anxiety or frustration when the internet connection was lost.

Participants	Current	Proposed
1	5	2
2	5	2
3	4	4
4	4	3
5	4	1
6	1	4
7	5	4
8	5	2
9	3	4
10	5	1
11	5	1
12	4	3
13	5	1
14	5	1
15	5	1

t-Test: Paired Two Sample for Means

	Variable 1	*Variable 2*
Mean	4.333333333	2.266666667
Variance	1.238095238	1.638095238
Observations	15	15
Pearson Correlation	-0.618594185	
Hypothesized Mean Difference	0	
df	14	
t Stat	3.716603514	
P(T<=t) one-tail	0.001150228	
t Critical one-tail	1.761310136	
P(T<=t) two-tail	0.002300457	
t Critical two-tail	2.144786688	

Figure 15: T-Test performed to check if emotional impacts were reduced or not.

Based on your most recent interaction with our quiz application, how satisfied are you with the quiz system?

Participants	Current	Proposed
1	5	4
2	2	5
3	4	4
4	2	5
5	4	4
6	1	5
7	2	4
8	4	5
9	5	2
10	2	5
11	1	5
12	1	5
13	1	5
14	2	5
15	2	5

t-Test: Paired Two Sample for Means

	Variable 1	*Variable 2*
Mean	2.533333333	4.533333333
Variance	2.123809524	0.695238095
Observations	15	15
Pearson Correlation	-0.721064253	
Hypothesized Mean Difference	0	
df	14	
t Stat	-3.622844187	
P(T<=t) one-tail	0.001385031	
t Critical one-tail	1.761310136	
P(T<=t) two-tail	0.002770063	
t Critical two-tail	2.144786688	

Figure 16: T-Test performed to find our system resulted in better user satisfaction.

Since p=0.0011 & p=0.0013 (<0.05), We reject the null hypothesis and accept our hypothesis. We conclude that working on a quiz uninterrupted minimized the emotional impacts and increased satisfaction.

A second paired two-sample t-test **Fig 17** was conducted to check (second hypothesis) whether users perceive our online quiz system's feedback and notification system as more informative than the baseline system.

The quiz system provided useful notifications when the internet connection was lost.

Participants	Current	Proposed
1	4	5
2	2	4
3	3	4
4	2	4
5	2	2
6	5	5
7	4	4
8	5	4
9	4	5
10	1	4
11	1	5
12	1	5
13	1	3
14	4	4
15	4	5

t-Test: Paired Two Sample for Means

	Variable 1	*Variable 2*
Mean	2.866666667	4.2
Variance	2.266666667	0.742857143
Observations	15	15
Pearson Correlation	0.297248207	
Hypothesized Mean Difference	0	
df	14	
t Stat	-3.451795709	
P(T<=t) one-tail	0.001945364	
t Critical one-tail	1.761310136	
P(T<=t) two-tail	0.003890728	
t Critical two-tail	2.144786688	

Figure 17: T-Test performed to check the notifications provided to users are informative.

As p=0.0019(<0.05), We have rejected the null hypothesis and accepted our hypothesis. We conclude that the notifications and feedback provided by our quiz system are more informative than those provided by the canvas system.

6 Discussion

Our results show that our proposed system reduces negative mental states in users during quiz participation. Our experiments showed that users feel much less anxious with our proposed system instead with the baseline system. Figures 5a, 6a, and 7a show that users felt more anxious and "not very satisfied" with the quiz experience of the baseline system. On the other hand, our proposed system obtained results (figures 5b, 6b, and 7b) that indicate that users felt more satisfied with the interface experience than the baseline system. These results are in line with our hypothesis that allowing the user to continue working on a quiz uninterrupted despite network issues will reduce negative emotional impacts and lead to higher user satisfaction with the quiz system.

Additionally, the results shown in figures 4 and 8 confirm our additional hypothesis, which is that users will find the feedback and notification system of our solution more informative than the baseline system. Both figure 4 and figure 8 show that users found our feedback and notification system useful and informative.

In relevant works [1], Tao et al. propose an HCI and Pedagogy model to follow when designing online classroom systems. The authors discussed relevant theoretical solutions for design in their work. Notably, they discussed evaluation models that aim to capture perceived usefulness and ease of use from participants. Our work is a further example of the evaluation model, as we utilized a similar paradigm to guide our research. The authors in [1] lament that evaluation models are too general to help with specific classroom designs, however, the generality of the model helped us to design a model that better fits our task of building specifically building a better quiz system.

Additionally, our results present in a sense, a step towards an evaluative context for the systems demonstrated in [2] and [3]. In [2] and [3], Yong-Sheng et al. and Zhenming et al., present a system that is generally similar to ours; they utilize a frontend, a middleware and backend system that utilizes web development and database technologies to implement an examination system. In contrast to these works, however, we present the consequential results (quantitative, qualitative, and statistical) that show that our system led to improvements in user satisfaction, whereas in [2] and [3] they left this kind of data out of the paper.

Finally, we confirm an inductive conclusion presented in [4] by Younis et al. Younis et al concluded in [4] that resumption capabilities in quiz systems would lead to an increase in user satisfaction and a reduction in examination time. Our results have confirmed these conclusions.

6.1 Expected Outcomes

From the very beginning of the project, we had a very clear idea of what we were going to do and how we were going to do it. We formulated the problem, proposed a solution, made an initial plan of how we were going to implement the solution, got user responses from surveys to verify that there needs to be an improvement to the existing solutions, developed the prototype of the initial design, got feedback from others (the class as well as the course instructor) about whether any modifications are needed, chose the platform on which we would develop the proposed solution, implemented the coding, made the product ready for the end user, selected the participants who would test our system and got their provided from our designed survey. Everything went well according to our plan.

6.2 Unexpected Outcomes

Although everything worked well from the very beginning to the end, some issues also needed to be addressed. Instead of looking at the bigger picture, if we narrow down our focus, we experienced something that we didn't anticipate. We gave the participants two different links for two different versions of quizzes, but we recorded their feedback on both quizzes by giving the same link both times. While the participants wanted to give feedback on the second quiz through survey, they got a notification that stated that their survey was already submitted. The issue was raised because each participant completed the survey with a participant ID. After submitting the first survey, when they went to the same survey link, the system saw that one response was already recorded with the same ID.

To solve this, we asked the participants to go to the incognito or private mode while submitting the second survey. Thus, we took care of that issue. Also, one of the participants while taking the quiz, experienced a blank page after selecting the start quiz button which was also not expected. We told the participant the same as before to use incognito/private mode to take the quiz. When they tried with the incognito/private mode from the browser or even tried it with a different device, the problem vanished. This could probably be due to the holding the cache issue. These are the issues that were encountered that were not anticipated when we started our work.

7 Conclusion and Future Work

In this paper, we present the results of our HCI inspired quiz system. We surveyed users about their experience with our quiz system compared to a baseline system and analyzed the results. Our results confirmed conclusions presented in [4], that an examination system with an offline capability mode to allow for the examination to continue despite network issues, would lead to increased user satisfaction. Additionally, our results showed that our implemented feedback and notification system were found, by users, to be more informative than the baseline system.

For future work, there needs to be further requirements gathered from users regarding the user interface features. Additionally, there needs to be work done on preventing the avenues for cheating and dishonesty that were opened up by the system allowing for offline examinations.

REFERENCES

[1] L. Tao and M. Zhang, "Understanding an Online Classroom System: Design and Implementation Based on a Model Blending Pedagogy and HCI," in IEEE Transactions on Human-Machine Systems, vol. 43, no. 5, pp. 465-478, Sept. 2013, doi: 10.1109/THMS.2013.2281436. [2] Sten Andler. 1979. Predicate path expressions. In *Proceedings of the 6th. ACM SIGACT-SIGPLAN Symposium on Principles of Programming Languages (POPL '79)*. ACM Press, New York, NY, 226-236. DOI:https://doi.org/10.1145/567752.567774

[2] Z. Yong-Sheng, F. Xiu-Mei and B. Ai-Qin, "The Research and Design of Online Examination System," *2015 7th International Conference on Information Technology in Medicine and Education (ITME)*, 2015, pp. 687-691, doi: 10.1109/ITME.2015.96

[3] Zhenming, Y., Liang, Z., & Guohua, Z. (2003, November). A novel web-based online examination system for computer science education. In *33rd ASEE/IEEE Frontiers in Education Conference* (pp. 5-8).

[4] Younis, M. I., & Hussein, M. S. (2015). Construction of an online examination system with resumption and randomization capabilities. *International Journal of Computing*, *4*(2), 62-82.

APPENDIX

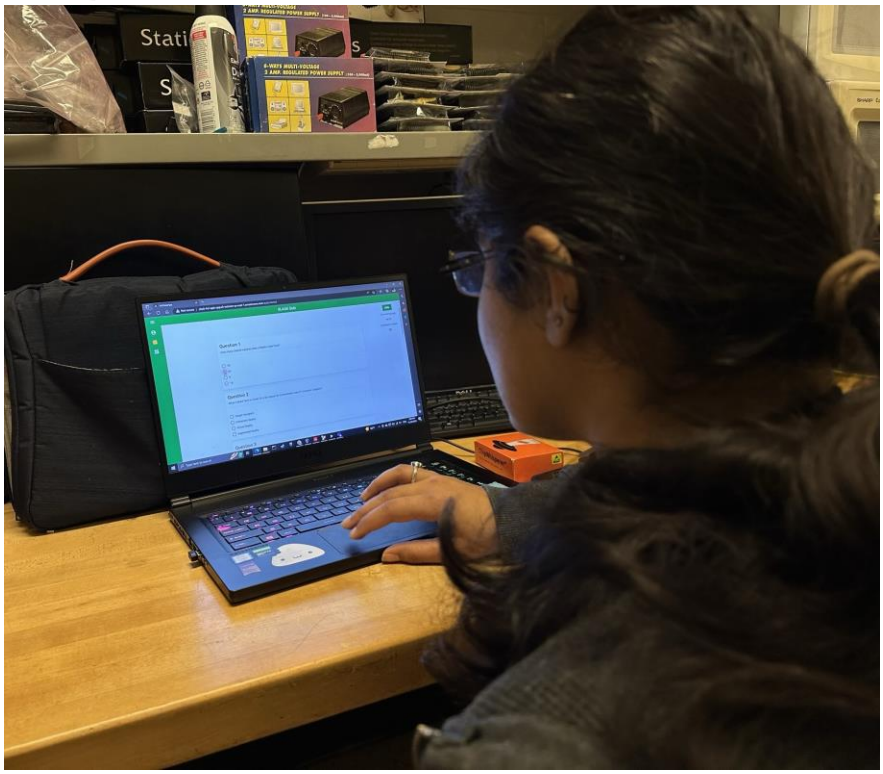


Figure A1 - Participant evaluation of the quiz system

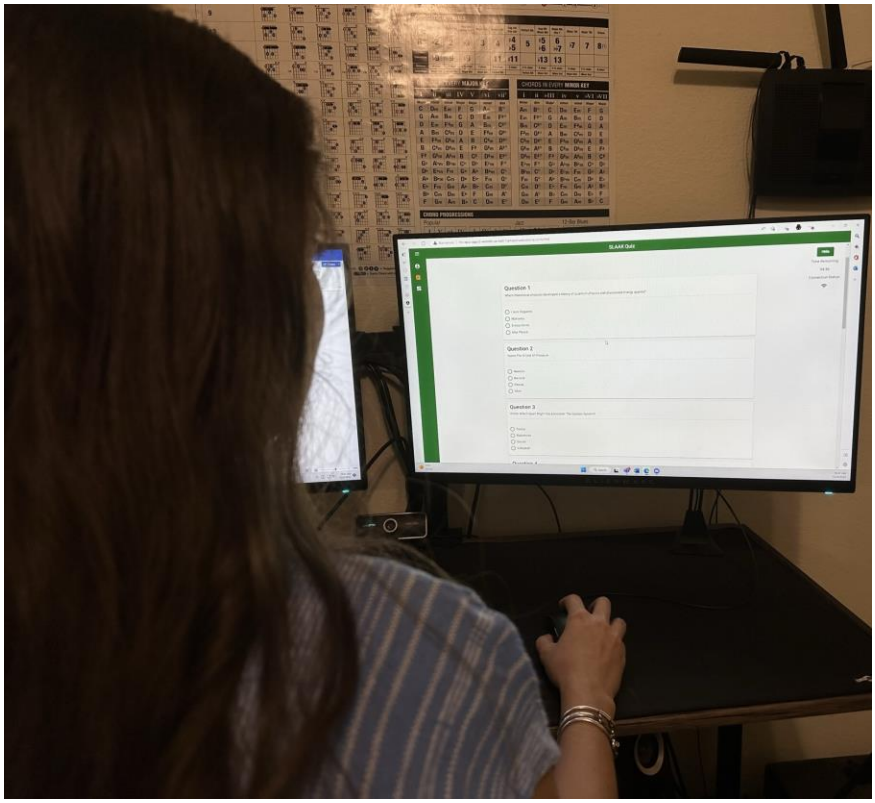


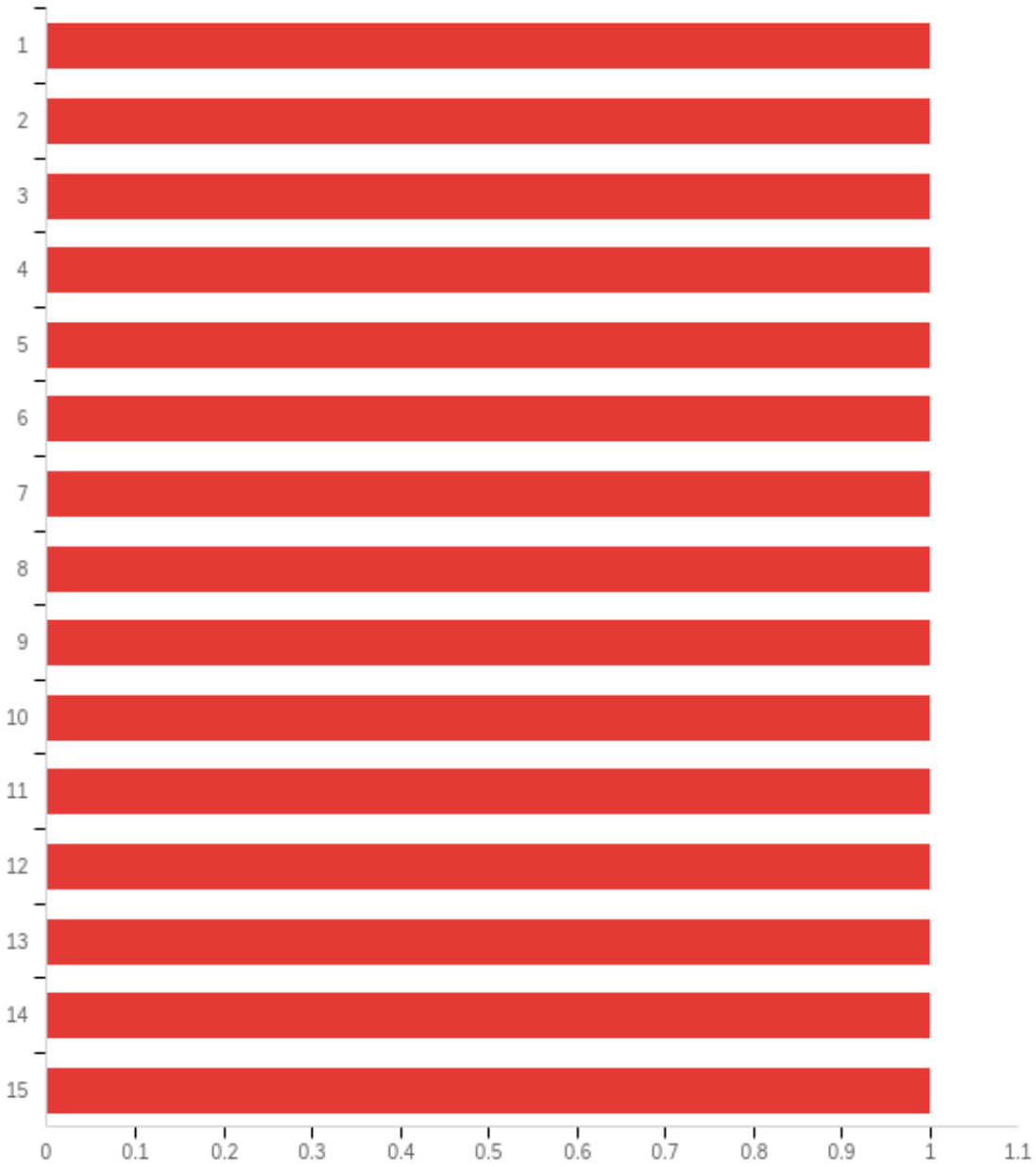
Figure A2 - Participant evaluation of the quiz system

Current Solution Evaluation Report

Quiz Evaluation Questionnaire - Current Solution

December 4th 2022, 9:13 am EST

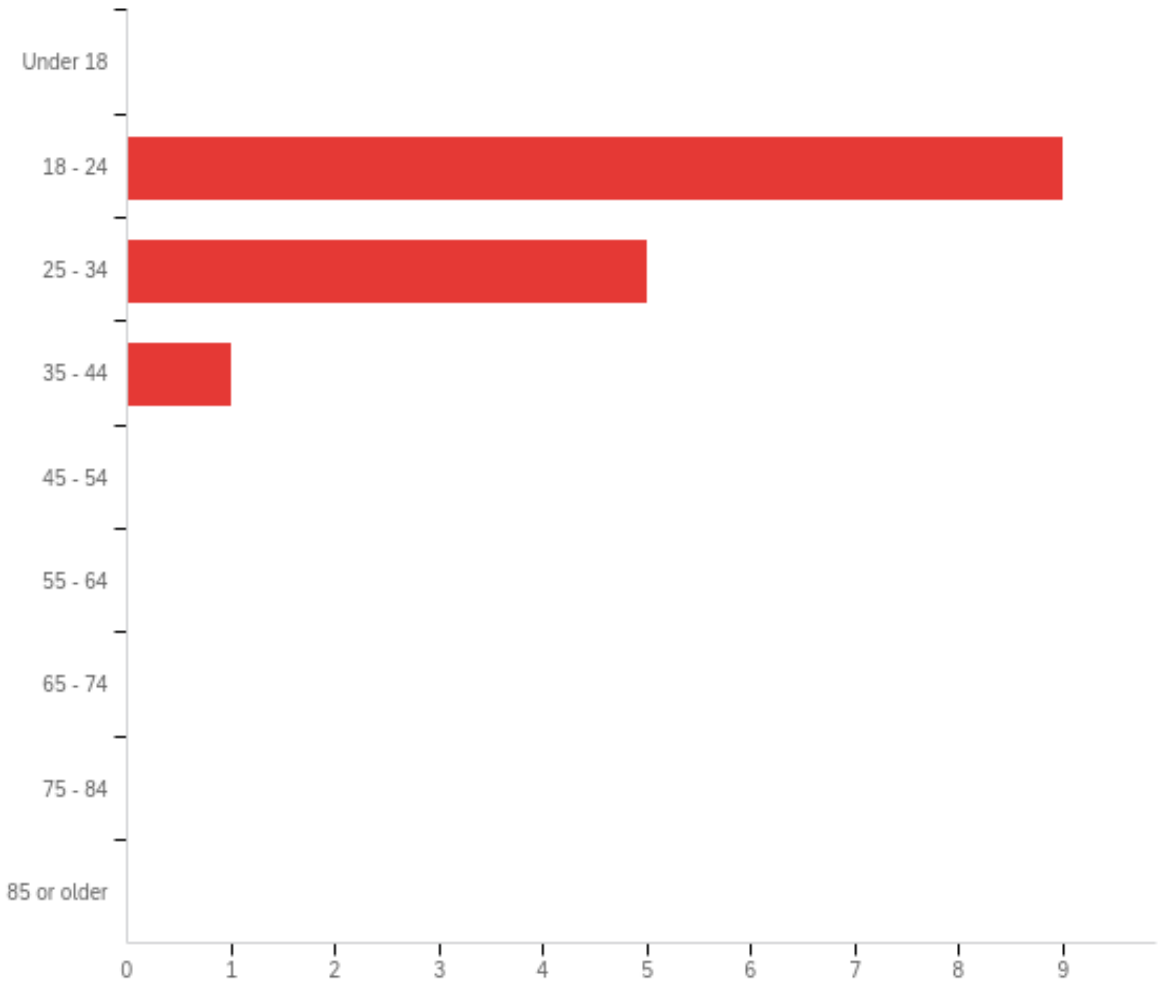
Q1 - Please select the participant number you were given.



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Please select the participant number you were given.	1.00	15.00	8.00	4.32	18.67	15

#	Answer	%	Count
1	1	6.67%	1
2	2	6.67%	1
3	3	6.67%	1
4	4	6.67%	1
5	5	6.67%	1
6	6	6.67%	1
7	7	6.67%	1
8	8	6.67%	1
9	9	6.67%	1
10	10	6.67%	1
11	11	6.67%	1
12	12	6.67%	1
13	13	6.67%	1
14	14	6.67%	1
15	15	6.67%	1
	Total	100%	15

Q10 - Age

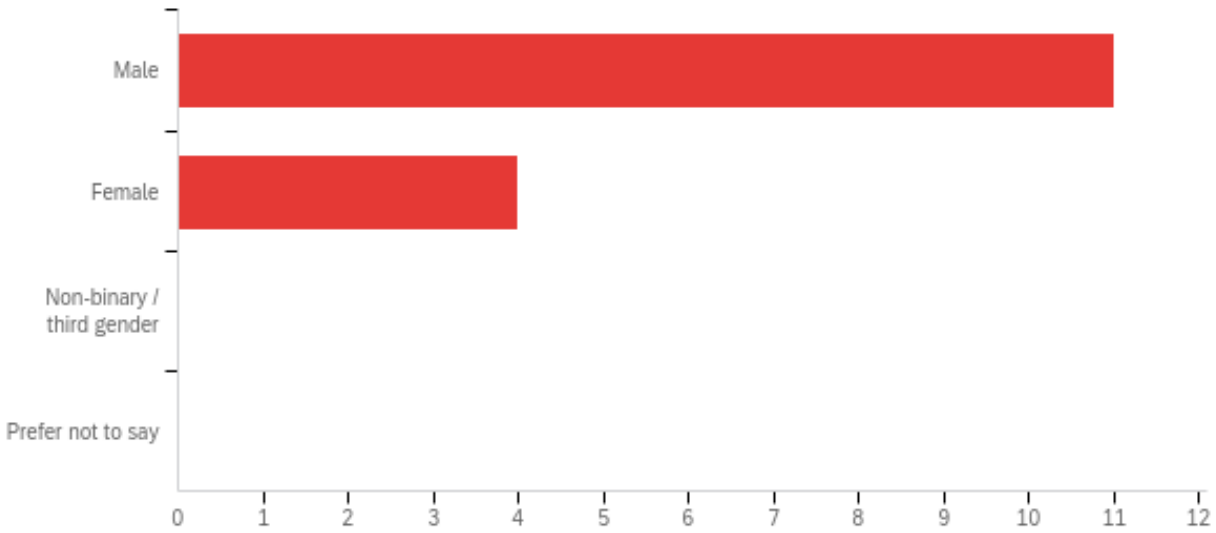


#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Age	2.00	4.00	2.47	0.62	0.38	15

#	Answer	%	Count
1	Under 18	0.00%	0
2	18 - 24	60.00%	9
3	25 - 34	33.33%	5
4	35 - 44	6.67%	1

5	45 - 54	0.00%	0
6	55 - 64	0.00%	0
7	65 - 74	0.00%	0
8	75 - 84	0.00%	0
9	85 or older	0.00%	0
	Total	100%	15

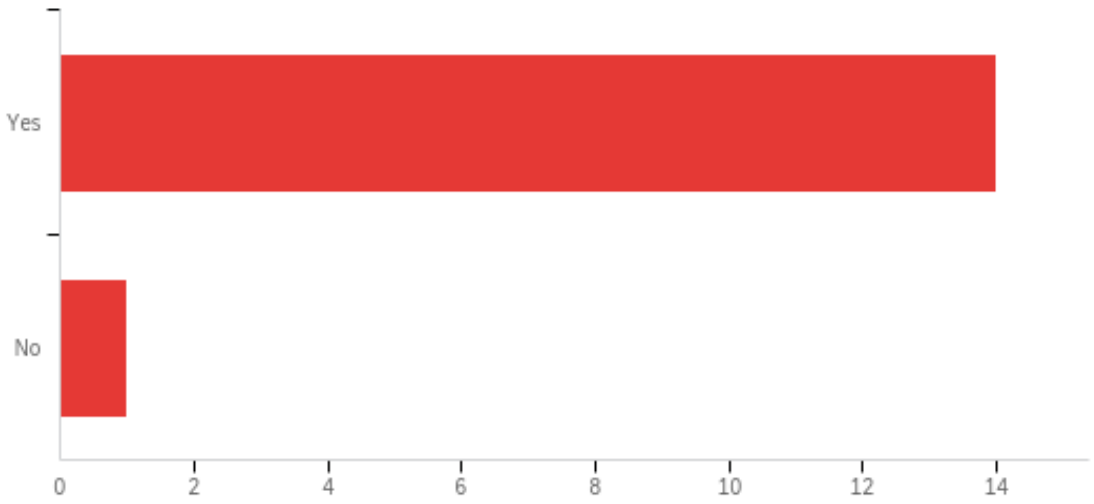
Q11 - Gender



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Gender	1.00	2.00	1.27	0.44	0.20	15

#	Answer	%	Count
1	Male	73.33%	11
2	Female	26.67%	4
3	Non-binary / third gender	0.00%	0
4	Prefer not to say	0.00%	0
	Total	100%	15

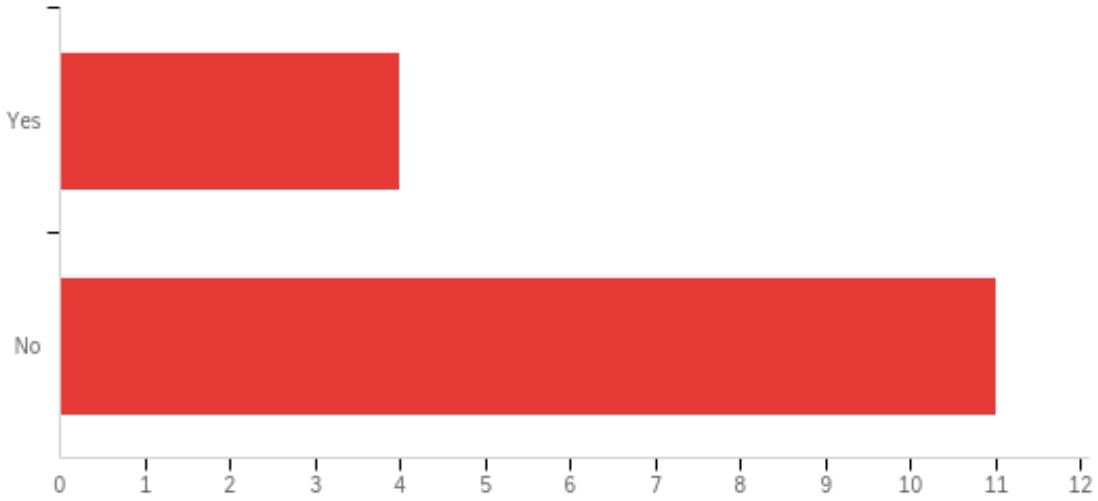
Q2 - Did you complete the quiz within the time limit?



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Did you complete the quiz within the time limit?	1.00	2.00	1.07	0.25	0.06	15

#	Answer	%	Count
1	Yes	93.33%	14
2	No	6.67%	1
	Total	100%	15

Q8 - Were you able to continue taking the quiz when an internet disconnection occurred?



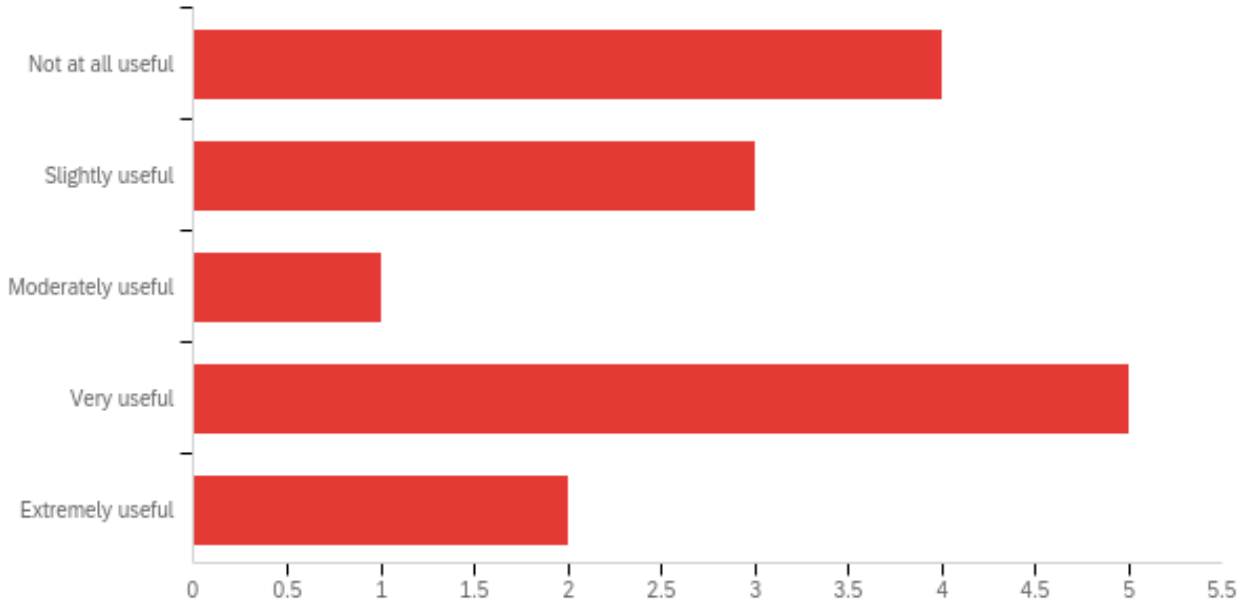
#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Were you able to continue taking the quiz when an internet disconnection occurred?	1.00	2.00	1.73	0.44	0.20	15

#	Answer	%	Count
1	Yes	26.67%	4
2	No	73.33%	11
	Total	100%	15

Q14 - Did you lose any time on the quiz from the disconnection? If yes, do you feel that impacted your score and why?

Did you lose any time on the quiz from the disconnection? If yes, do you feel that impacted your score and why?
I feel that I would have more time to confirm my answers.
No
Yes , the quiz was off for a short while. In an actual exam scenario i might lose some considerable amount of time.
Yes. Quiz has been stopped in the middle due to internet disconnection for about a minute.
Yes
Yes, I got distracted when the quiz returned. I also feel it caused me to recheck my previous answers which helped.
Yes. I think more time would have helped me get better score
Yes, it interrupted my flow, but it was fine because the quiz was brief. However, if this had been a real exam, I would not have been able to finish it on time.
Yes, I did lose a little bit of time when the internet was cut off. And because I didn't know how long the net would be down, there was a certain amount of tension, when I was in the middle of the test.
I really didn't know. didn't check the time before it went offline.
no picked where it left off, previous answers were saved
Yes. It did not allow me to complete the necessary questions and it did feel like I had to rush in order to complete the quiz.
I can't quite remember
Yes, I lose sometime due to the disconnection. Due to this disconnection suddenly I feel tensed and become panicked for a few moment. This surely have some bad impact in my quiz.
Yes

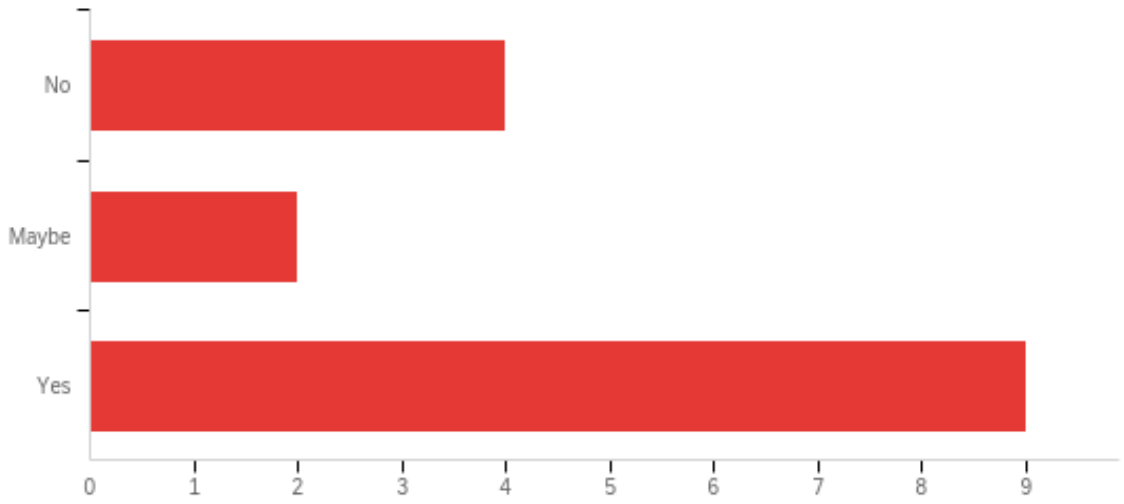
Q13 - The quiz system provided useful notifications when the internet connection was lost.



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	The quiz system provided useful notifications when the internet connection was lost.	1.00	5.00	2.87	1.45	2.12	15

#	Answer	%	Count
1	Not at all useful	26.67%	4
2	Slightly useful	20.00%	3
3	Moderately useful	6.67%	1
4	Very useful	33.33%	5
5	Extremely useful	13.33%	2
	Total	100%	15

Q7 - Were you immediately notified when an internet disconnection occurred?



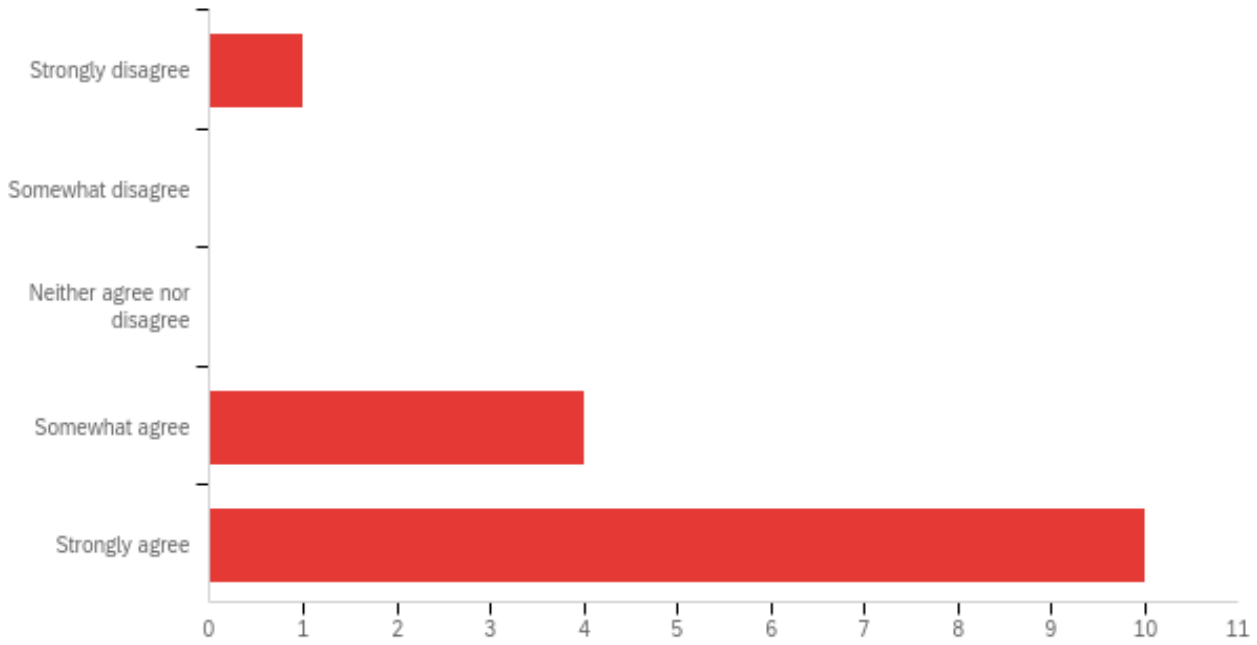
#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Were you immediately notified when an internet disconnection occurred?	1.00	3.00	2.33	0.87	0.76	15

#	Answer	%	Count
1	No	26.67%	4
2	Maybe	13.33%	2
3	Yes	60.00%	9
	Total	100%	15

Q3 - Did any circumstances impact your ability to complete the quiz to the best of your ability?

Did any circumstances impact your ability to complete the quiz to the best of your ability?
The anxiety of feeling rushed
No
Yes, if i had more time , i could have answered better
I felt a bit anxious when the quiz was stopped in the middle and a bit frustrarted.
Yes, I lost time and panicked a little when the internet was disrupted
The disconnection
yes, network got disconnected
just the network disconnectivity issues.
I couldn't take the quiz when the internet connection was interrupted, so yeah.
Yes, I didn't know if the time was lost when the quiz went offline. Also i don't know why, but it knocked my window down for some reason and i had to pull it up again on the browser.
no
Yes, I felt like the disconnection from the internet made me feel nervous and I felt like I had to rush to complete the rest of the quiz. I did not feel like my answers were the best of my ability.
No
When the connection is lost for the first time I was like what is happening? And I become tensed.
Time was continuing when the internet was disconnected

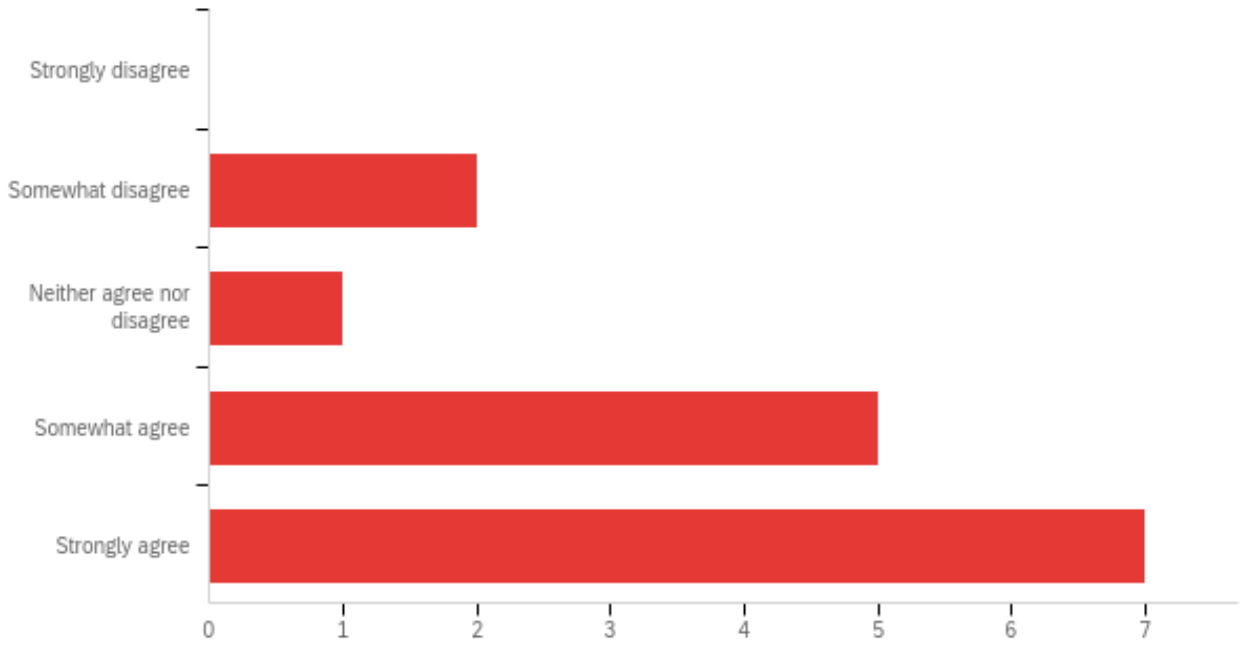
Q9 - You felt a degree of anxiety or frustration the internet connection was lost.



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	You felt a degree of anxiety or frustration the internet connection was lost.	1.00	5.00	4.47	1.02	1.05	15

#	Answer	%	Count
1	Strongly disagree	6.67%	1
2	Somewhat disagree	0.00%	0
3	Neither agree nor disagree	0.00%	0
4	Somewhat agree	26.67%	4
5	Strongly agree	66.67%	10
	Total	100%	15

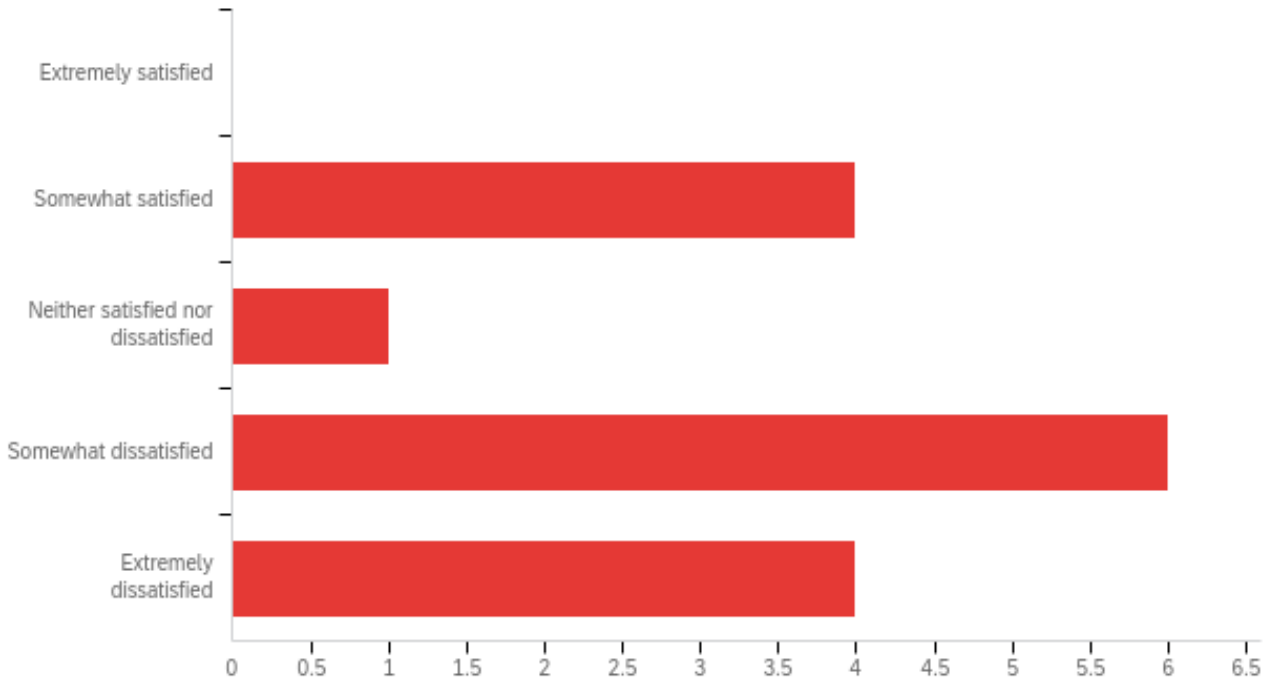
Q12 - You felt that there might not be enough time to complete the quiz due to the simulated technical issue?



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	You felt that there might not be enough time to complete the quiz due to the simulated technical issue?	2.00	5.00	4.13	1.02	1.05	15

#	Answer	%	Count
1	Strongly disagree	0.00%	0
2	Somewhat disagree	13.33%	2
3	Neither agree nor disagree	6.67%	1
4	Somewhat agree	33.33%	5
5	Strongly agree	46.67%	7
	Total	100%	15

Q4 - Based on your most recent interaction with our quiz application, how satisfied are you with the quiz system?



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Based on your most recent interaction with our quiz application, how satisfied are you with the quiz system?	2.00	5.00	3.67	1.14	1.29	15

#	Answer	%	Count
1	Extremely satisfied	0.00%	0
2	Somewhat satisfied	26.67%	4
3	Neither satisfied nor dissatisfied	6.67%	1
4	Somewhat dissatisfied	40.00%	6
5	Extremely dissatisfied	26.67%	4
	Total	100%	15

Q5 - If you would like to share any additional comments about your most recent interaction with our quiz application.

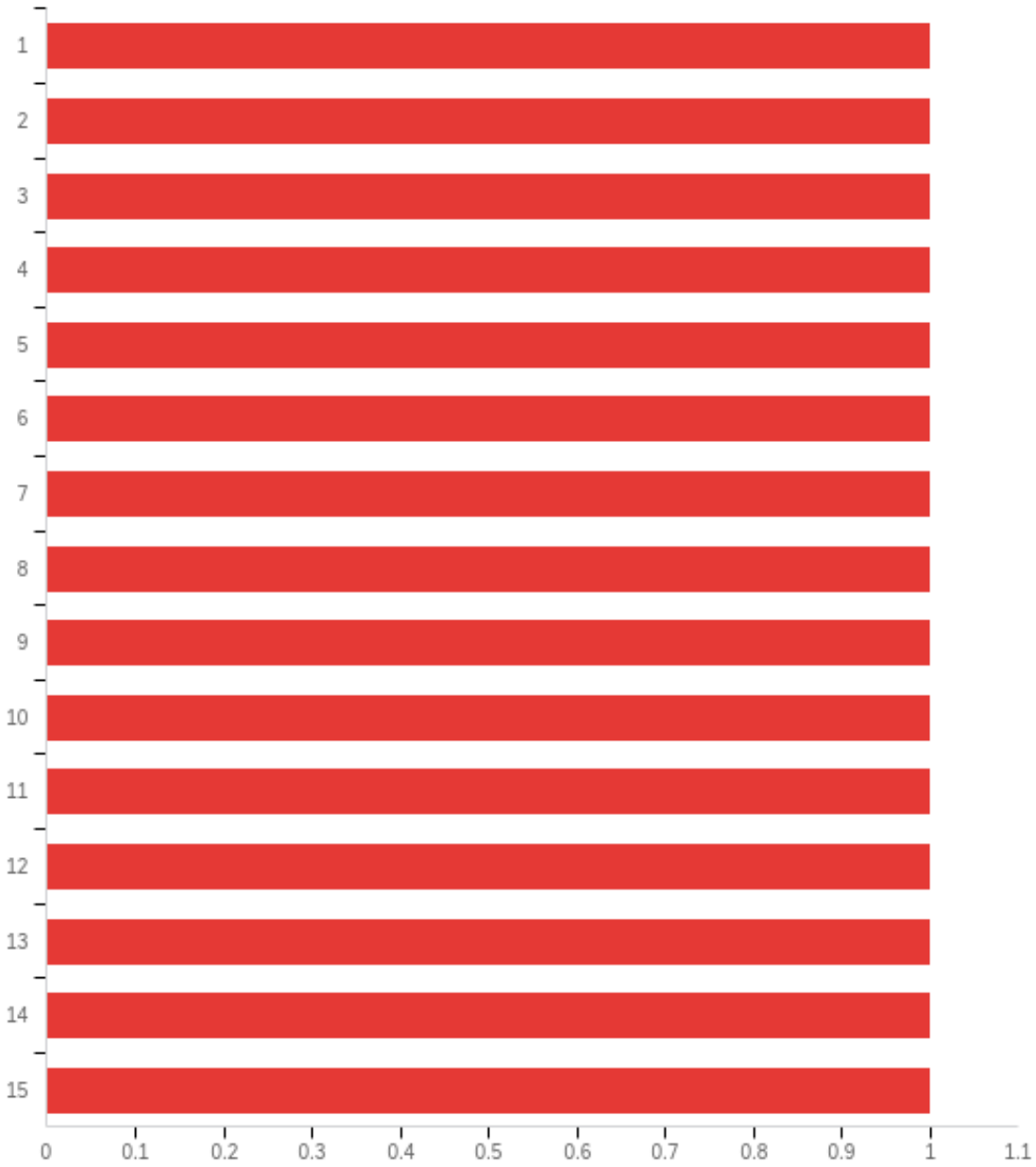
If you would like to share any additional comments about your most recent interaction with our quiz application.
TO be able to continue the quiz when the internet connection is lost
The quiz was nicely curated, and I liked the style. However, I did not know the answers to some of the questions since I did not study the topics before.
No
No additional comments
NA
N/A
Adding a feature to notify that the network is disconnected might be better
This system, in comparison to the proposed system, lacks the functionality to notify users when they have been disconnected and also reduces the time required to complete the exam.
When the internet stopped working, all I could see was a blank white screen. At one point, I wondered whether I had clicked the wrong button or something similar. I had no idea what went wrong. It stopped abruptly, whereas you're quiz was showing a dialogue box saying that the internet has disconnected
Yes, I would like to know if time was lost during offline periods.
no
no comments
Looks good
I think it is not user friendly.
N/A

Proposed Solution Evaluation Report

Quiz Evaluation Questionnaire - Proposed Solution

December 4th 2022, 9:17 am EST

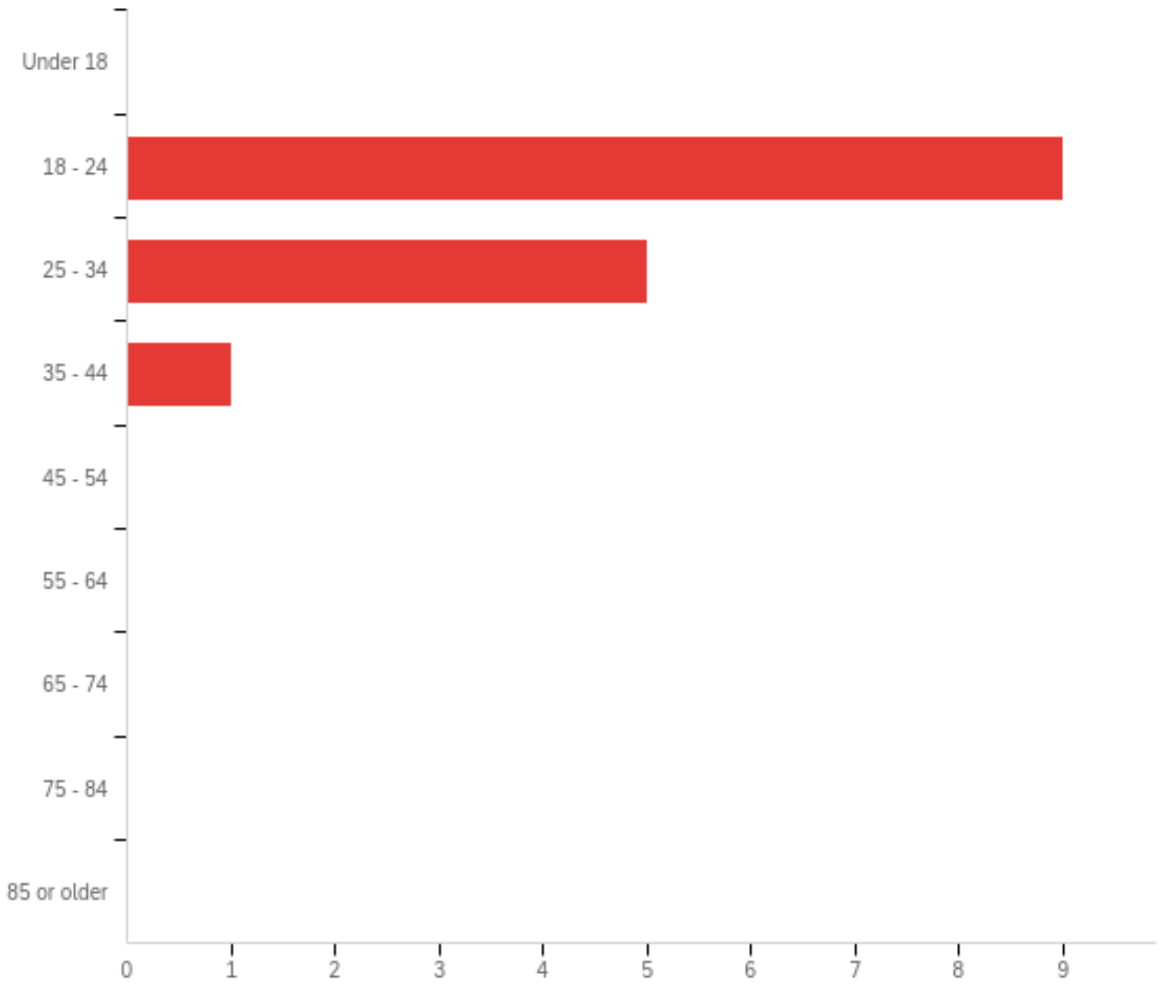
Q1 - Please select the participant number you were given.



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Please select the participant number you were given.	1.00	15.00	8.00	4.32	18.67	15

#	Answer	%	Count
1	1	6.67%	1
2	2	6.67%	1
3	3	6.67%	1
4	4	6.67%	1
5	5	6.67%	1
6	6	6.67%	1
7	7	6.67%	1
8	8	6.67%	1
9	9	6.67%	1
10	10	6.67%	1
11	11	6.67%	1
12	12	6.67%	1
13	13	6.67%	1
14	14	6.67%	1
15	15	6.67%	1
	Total	100%	15

Q10 - Age

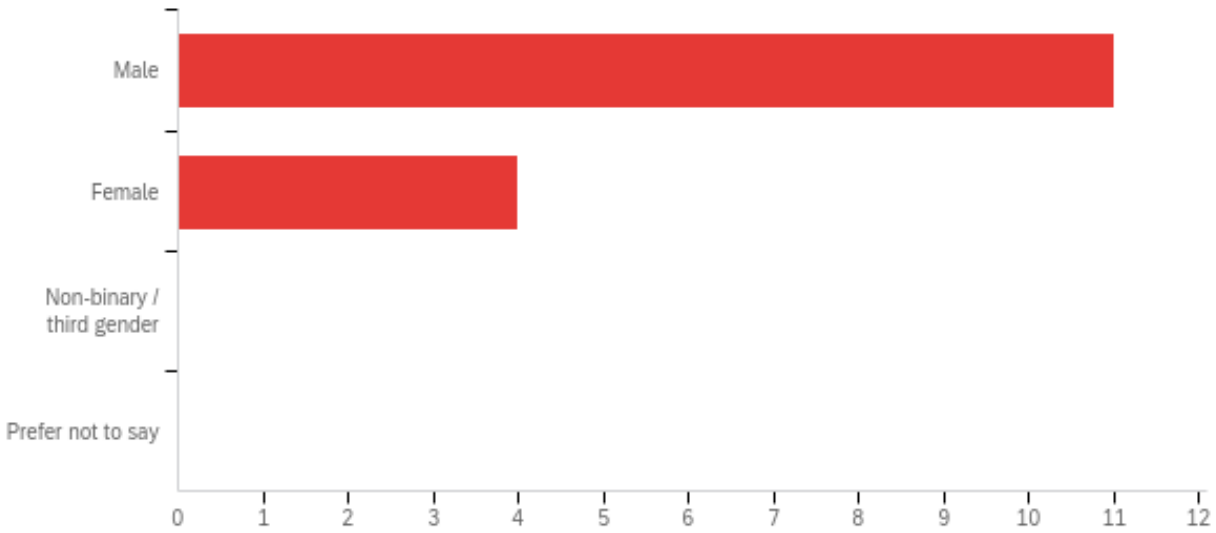


#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Age	2.00	4.00	2.47	0.62	0.38	15

#	Answer	%	Count
1	Under 18	0.00%	0
2	18 - 24	60.00%	9
3	25 - 34	33.33%	5
4	35 - 44	6.67%	1

5	45 - 54	0.00%	0
6	55 - 64	0.00%	0
7	65 - 74	0.00%	0
8	75 - 84	0.00%	0
9	85 or older	0.00%	0
	Total	100%	15

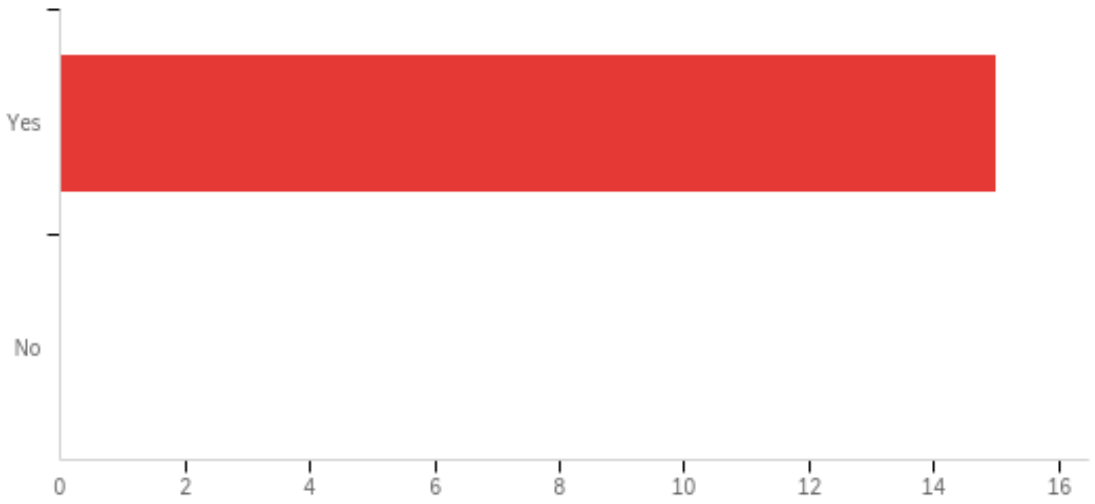
Q11 - Gender



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Gender	1.00	2.00	1.27	0.44	0.20	15

#	Answer	%	Count
1	Male	73.33%	11
2	Female	26.67%	4
3	Non-binary / third gender	0.00%	0
4	Prefer not to say	0.00%	0
	Total	100%	15

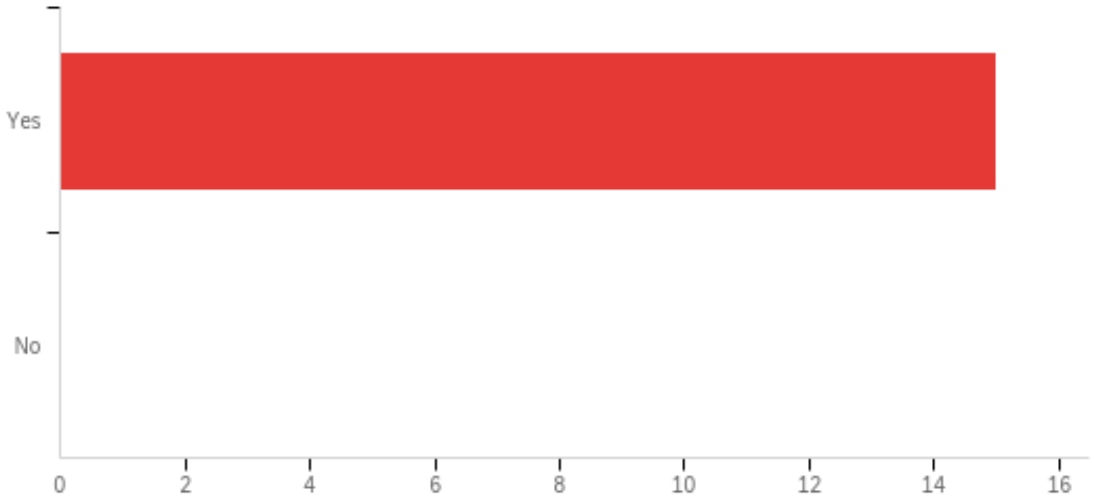
Q2 - Did you complete the quiz within the time limit?



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Did you complete the quiz within the time limit?	1.00	1.00	1.00	0.00	0.00	15

#	Answer	%	Count
1	Yes	100.00%	15
2	No	0.00%	0
	Total	100%	15

Q8 - Were you able to continue taking the quiz when an internet disconnection occurred?



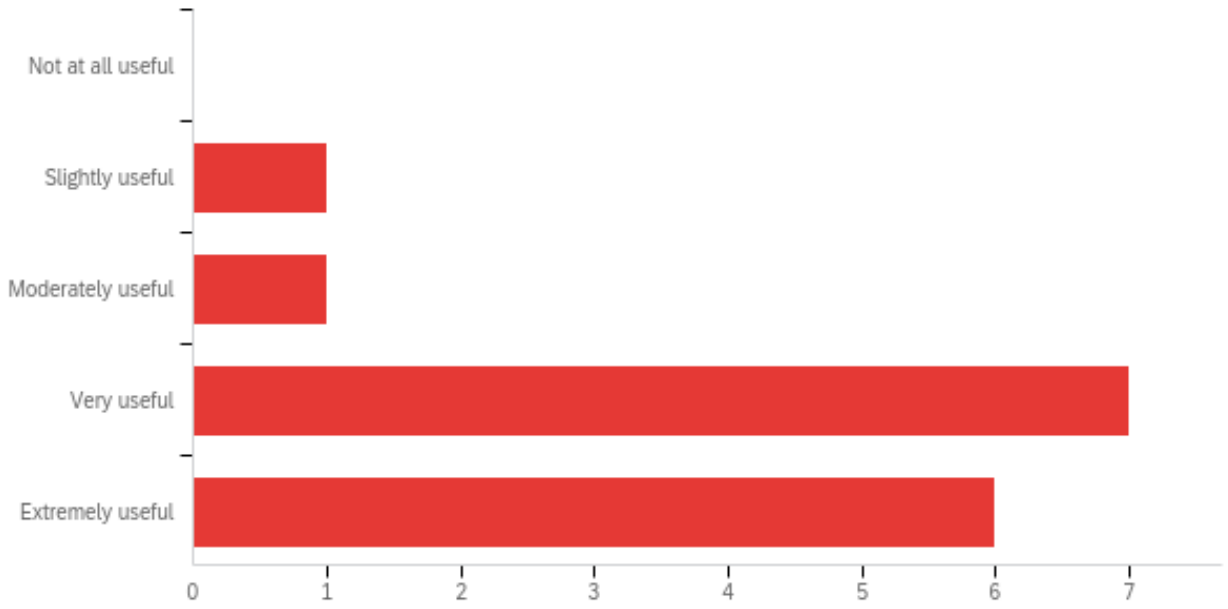
#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Were you able to continue taking the quiz when an internet disconnection occurred?	1.00	1.00	1.00	0.00	0.00	15

#	Answer	%	Count
1	Yes	100.00%	15
2	No	0.00%	0
	Total	100%	15

Q14 - Did you lose any time on the quiz from the disconnection? If yes, do you feel that impacted your score and why?

Did you lose any time on the quiz from the disconnection? If yes, do you feel that impacted your score and why?
I do not feel that it impacted me since I was able to continue and I was only briefly distracted
No
No
No.
No
No, I didn't notice this
No
No, I didn't lose any time even when the internet connection was down.
No, I did not. The overall experience was smooth.
yes, when I was offline i saw the time still running.
no
No
No
No, I didn't lose any time.
No

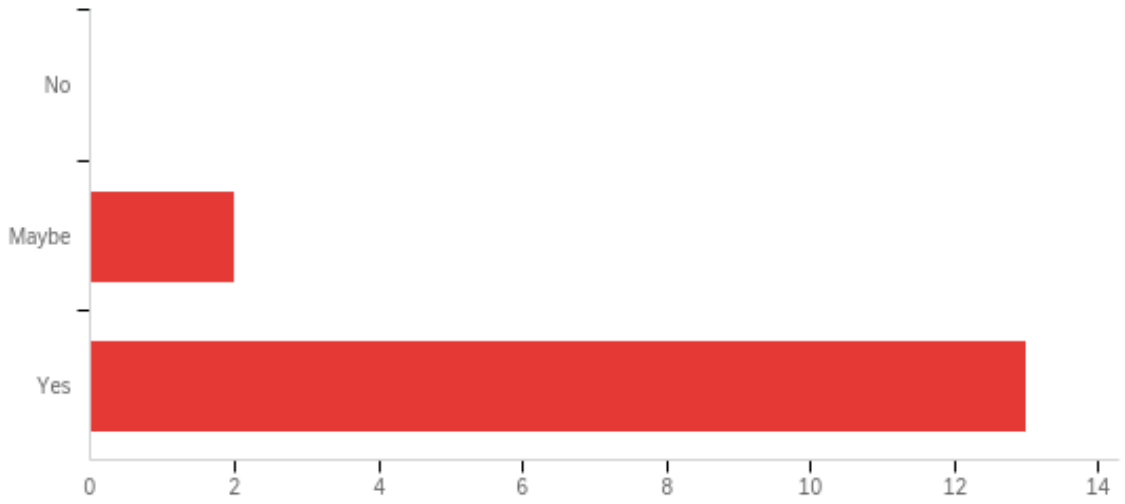
Q13 - The quiz system provided useful notifications when the internet connection was lost.



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	The quiz system provided useful notifications when the internet connection was lost.	2.00	5.00	4.20	0.83	0.69	15

#	Answer	%	Count
1	Not at all useful	0.00%	0
2	Slightly useful	6.67%	1
3	Moderately useful	6.67%	1
4	Very useful	46.67%	7
5	Extremely useful	40.00%	6
	Total	100%	15

Q7 - Were you immediately notified when an internet disconnection occurred?



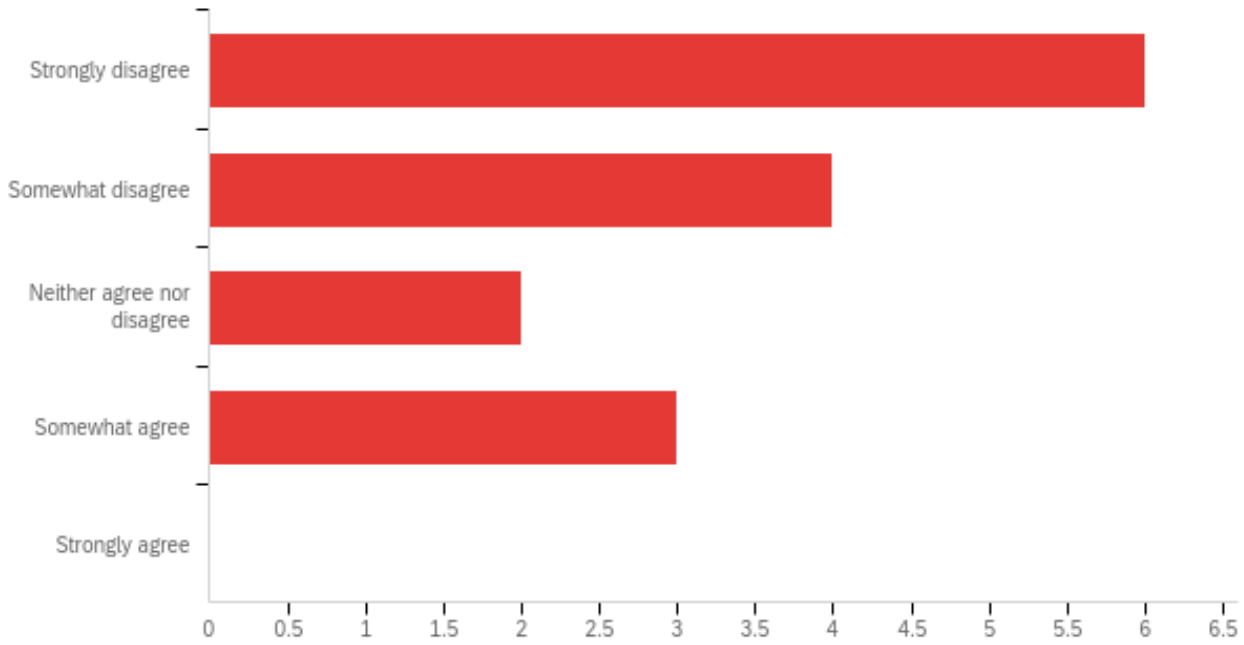
#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Were you immediately notified when an internet disconnection occurred?	2.00	3.00	2.87	0.34	0.12	15

#	Answer	%	Count
1	No	0.00%	0
2	Maybe	13.33%	2
3	Yes	86.67%	13
	Total	100%	15

Q3 - Did any circumstances impact your ability to complete the quiz to the best of your ability?

Did any circumstances impact your ability to complete the quiz to the best of your ability?
No
No
It was smooth
No
No
No
No
No.
No
No.
no
The notifications did make a little nervous when it showed the connection was lost but I was glad I was able to continue to complete my quiz.
Not really
No.
No

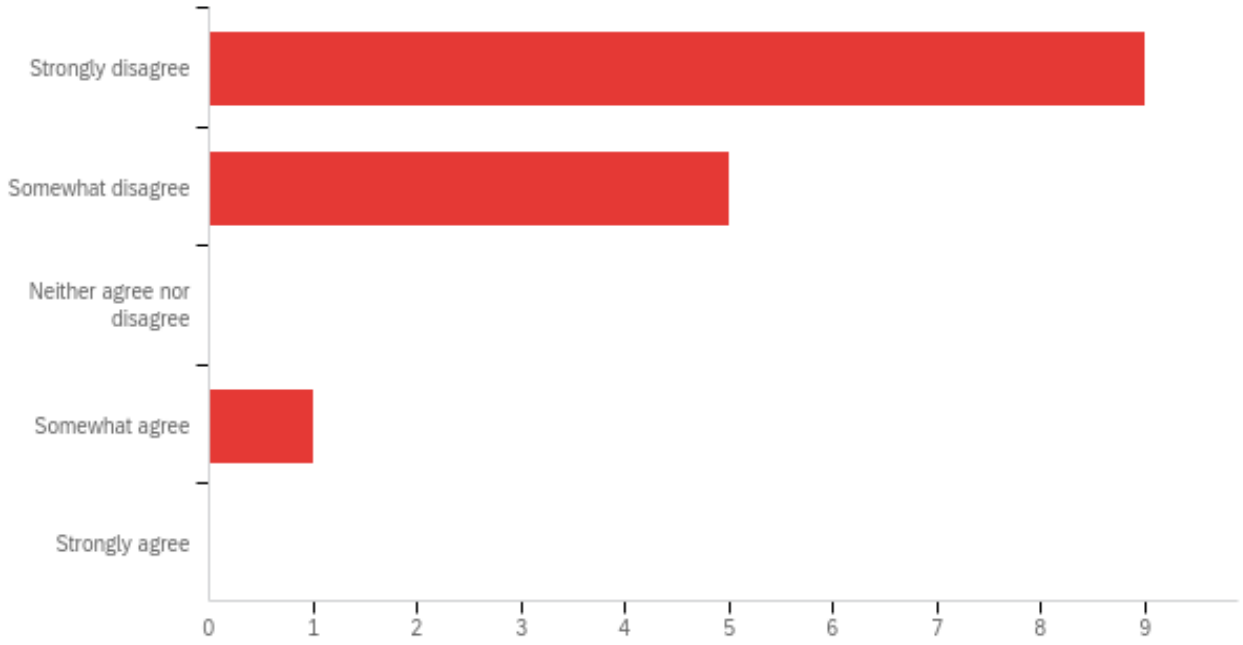
Q9 - You felt a degree of anxiety or frustration the internet connection was lost.



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	You felt a degree of anxiety or frustration the internet connection was lost.	1.00	4.00	2.13	1.15	1.32	15

#	Answer	%	Count
1	Strongly disagree	40.00%	6
2	Somewhat disagree	26.67%	4
3	Neither agree nor disagree	13.33%	2
4	Somewhat agree	20.00%	3
5	Strongly agree	0.00%	0
	Total	100%	15

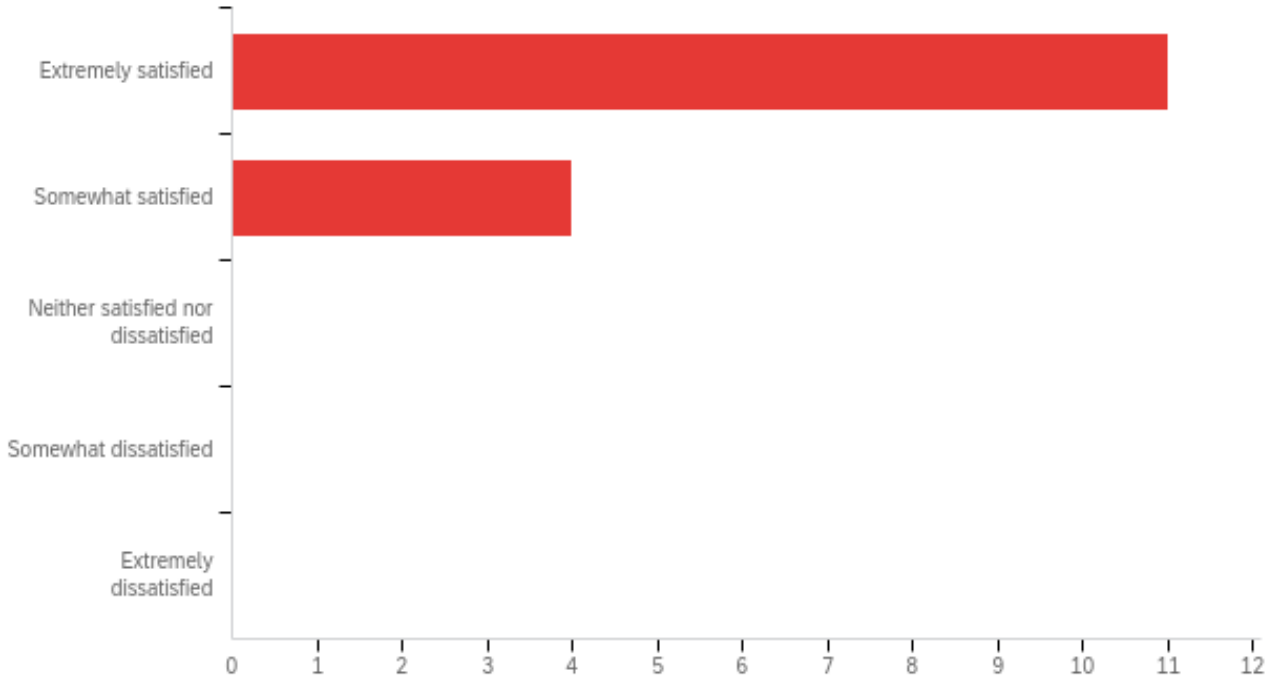
Q12 - You felt that there might not be enough time to complete the quiz due to the simulated technical issue?



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	You felt that there might not be enough time to complete the quiz due to the simulated technical issue?	1.00	4.00	1.53	0.81	0.65	15

#	Answer	%	Count
1	Strongly disagree	60.00%	9
2	Somewhat disagree	33.33%	5
3	Neither agree nor disagree	0.00%	0
4	Somewhat agree	6.67%	1
5	Strongly agree	0.00%	0
	Total	100%	15

Q4 - Based on your most recent interaction with our quiz application, how satisfied are you with the quiz system?



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Based on your most recent interaction with our quiz application, how satisfied are you with the quiz system?	1.00	2.00	1.27	0.44	0.20	15

#	Answer	%	Count
1	Extremely satisfied	73.33%	11
2	Somewhat satisfied	26.67%	4
3	Neither satisfied nor dissatisfied	0.00%	0
4	Somewhat dissatisfied	0.00%	0
5	Extremely dissatisfied	0.00%	0
	Total	100%	15

Q5 - If you would like to share any additional comments about your most recent interaction with our quiz application.

If you would like to share any additional comments about your most recent interaction with our quiz application.
Allowing me to continue the quiz made me feel less stressed
The quiz was great!
Its good
It is very useful for students to not get diverted during their exam time.
NA
N/A
addition of a sound alert to the notification might be better because some people might miss the notification at the bottom right and get panicked.
Everything seems amazing.
Because the student's attention is primarily focused on the question, the size of the banner informing us that we are disconnected from the internet should be more prominent as the student may not be able to observe the status of the internet at the bottom right corner at that time.
This experience was better than the first. Even though it wasted time still while offline I was able to continue taking the quiz. The notifications were much less intrusive than the first by far.
Although I felt less anxious as I could proceed with the exam, I felt somewhat nervous as I was not sure whether the page will be saved after the network reappears, or I will have to reload to make the submit button work. A notification to confirm that even though the network is disconnected, the same page will work without reloading after network restoration would be helpful.
I am glad it prompted me that I can continue to complete the quiz.
Looks good
This application is very user friendly and time efficient.
Although I felt less anxious as I could proceed with the exam, I felt somewhat nervous as I was not sure whether the page will be saved after the network reappears, or I will have to reload to make the submit button work. A notification to confirm that even though the network is disconnected, the same page will work without reloading after network restoration would be helpful.