

Introduction:

The objective of this evaluation is to find the problems in our quiz game design that prevent or inhibit the user from using the application. Another objective would be to show how the feedback received improved our design. This report was made with the help of group 66 who examined our game interface and offered feedback in regards to these issues.

Initial design:

This is a link to the moqups site where the initial design is available (S.C Evercoder Software S.R.L., n.d.): <https://app.moqups.com/oGEA4pz5eFJTtiArjx5qr70fxMmj4bxL/view/page/a0c994514>

Note: The interactions were not implemented during the first draft.

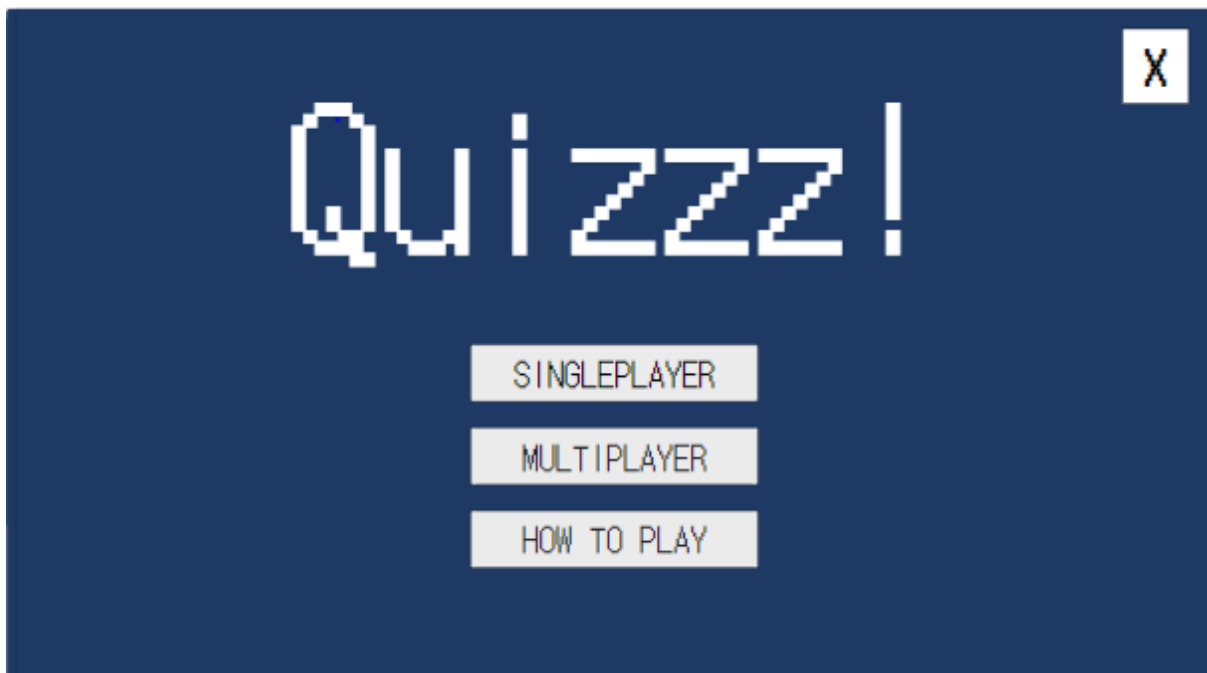


Figure 1: Main Menu

The main screen (**Figure 1**) is the first screen the user(s) encounters. By pressing the:

-“**SINGLEPLAYER**” button: The game takes the user to the Name Screen (**Figure 2**).

-“**MULTIPLAYER**” button: The game takes the user to the Name Screen (**Figure 2**) and checks if the name is already in the waiting room, displaying an error if it is.

-“**HOW TO PLAY**” button: Takes the user to a new screen displaying the rules of the game (**Figure 11**).

-“**X**” button: This button will close the game.

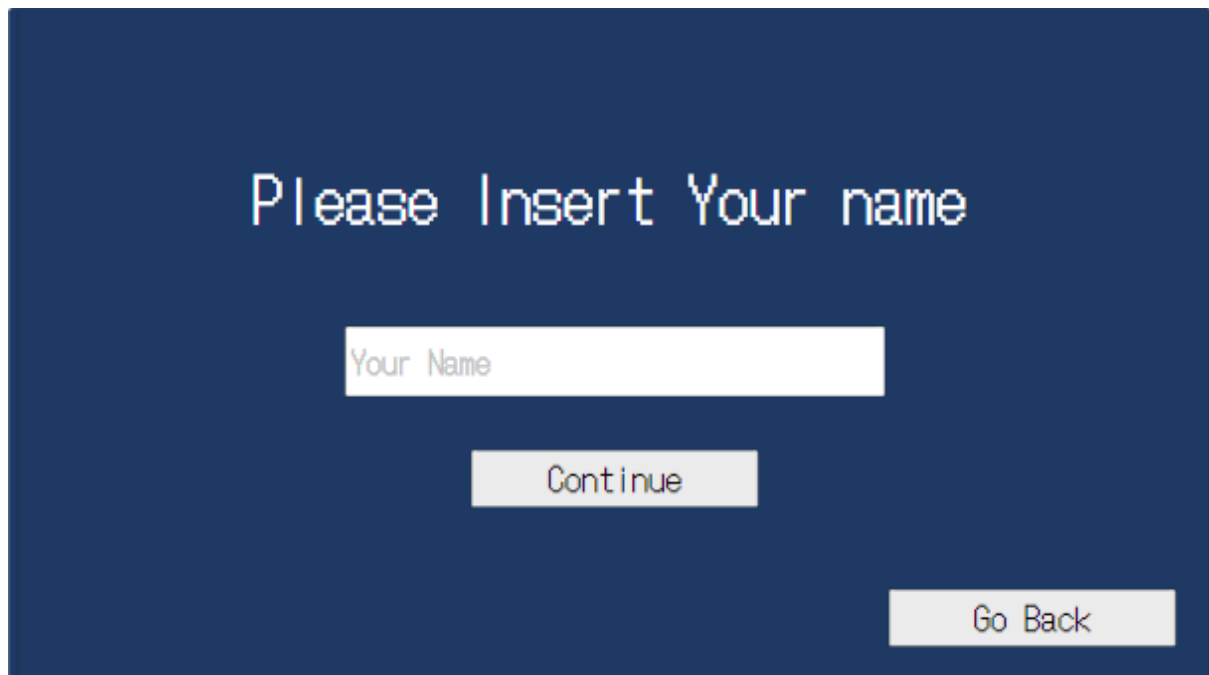


Figure 2: Name entry screen

In **SINGLEPLAYER**: the game will direct the user to the starting screen (**Figure 3**) to start a new game session.

In **MULTIPLAYER**: the game will direct the user to the waiting room (**Figure 10**).

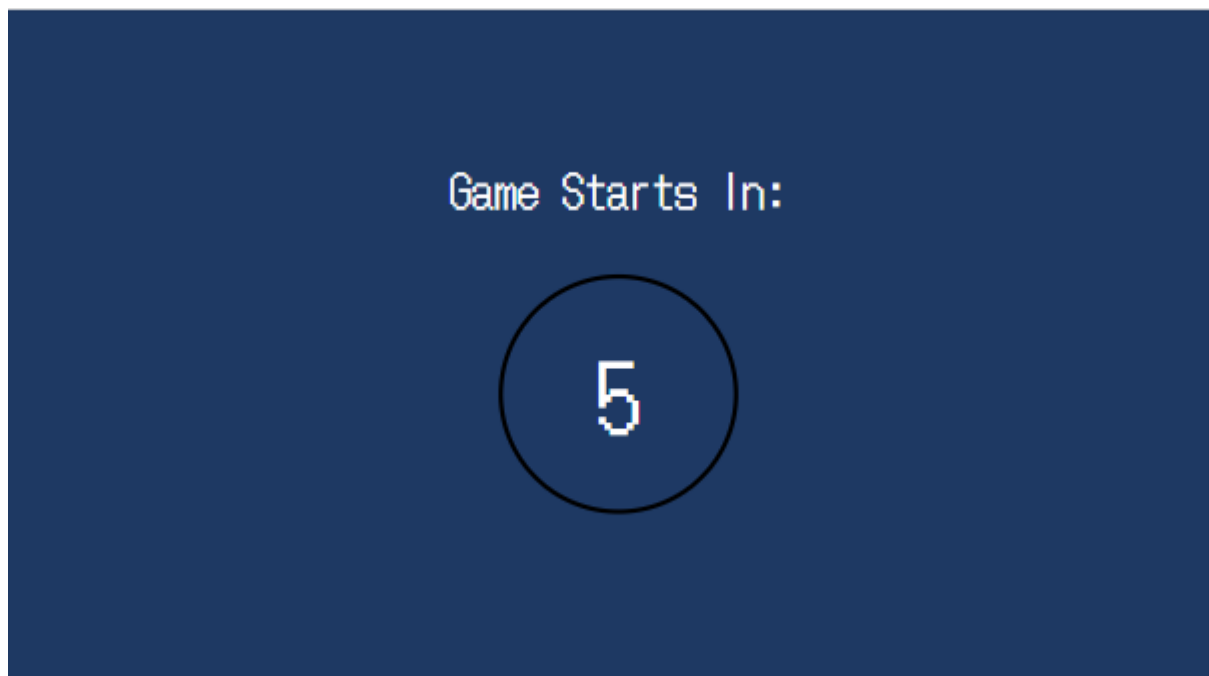


Figure 3: Starting screen

Waiting time until the game starts after pressing the button. It will redirect players to the first question of the game (**Fig 4**).

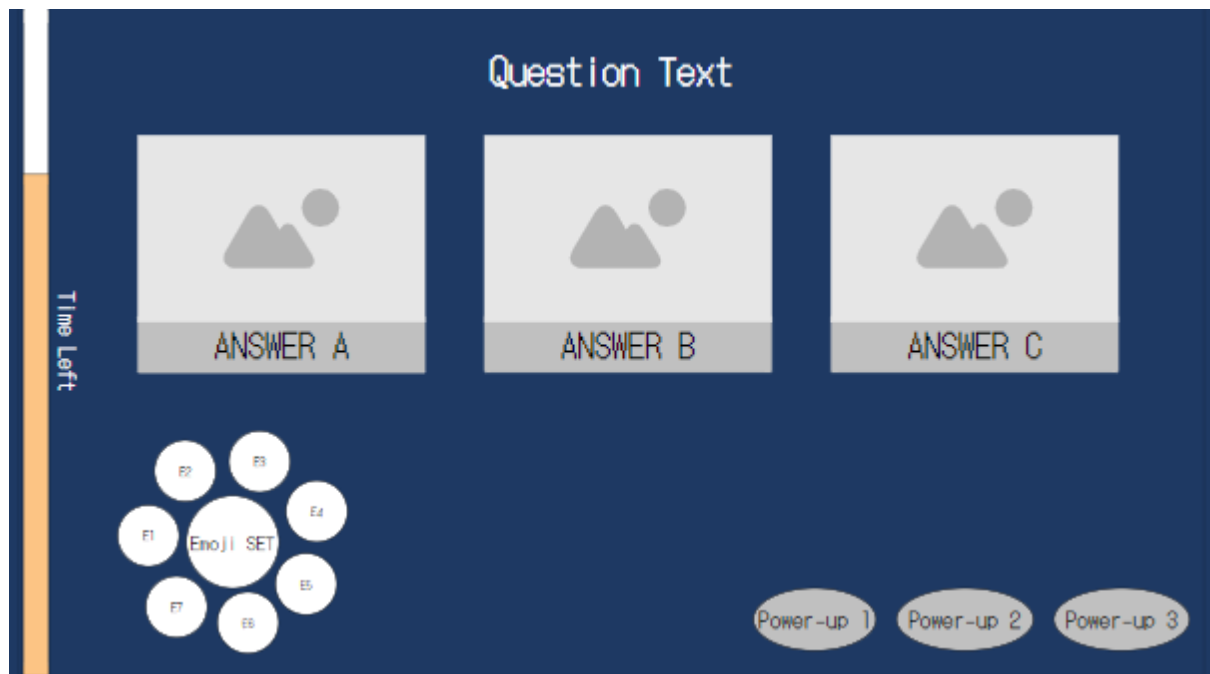


Figure 4: Question screen

On top of it, the question is asked with a timer on the left and three options. On the lower-left corner, an emoji set button is present and if hovered on by the user, it will pop up every emoji/reaction button (E1-E7). On the other side, in the lower right corner, the powerups are present, representing different powers.

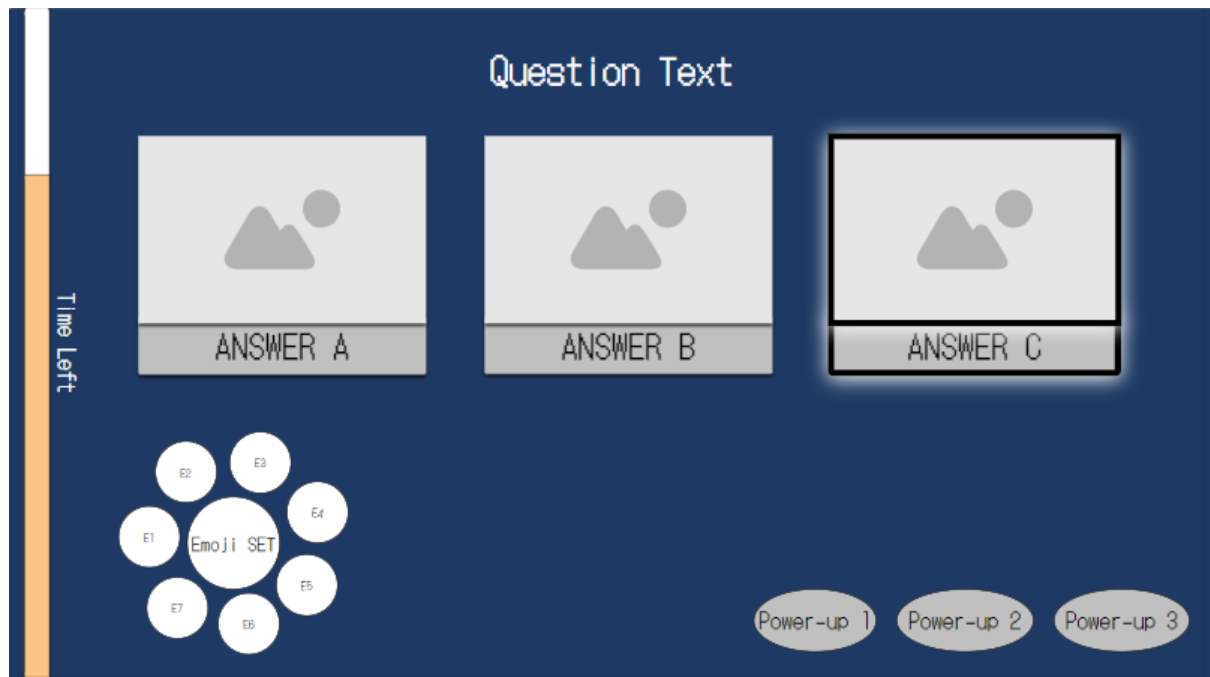


Figure 5: Question screen, selected answer

After one option is selected (which cannot be changed), until the time is up the answer will be highlighted.

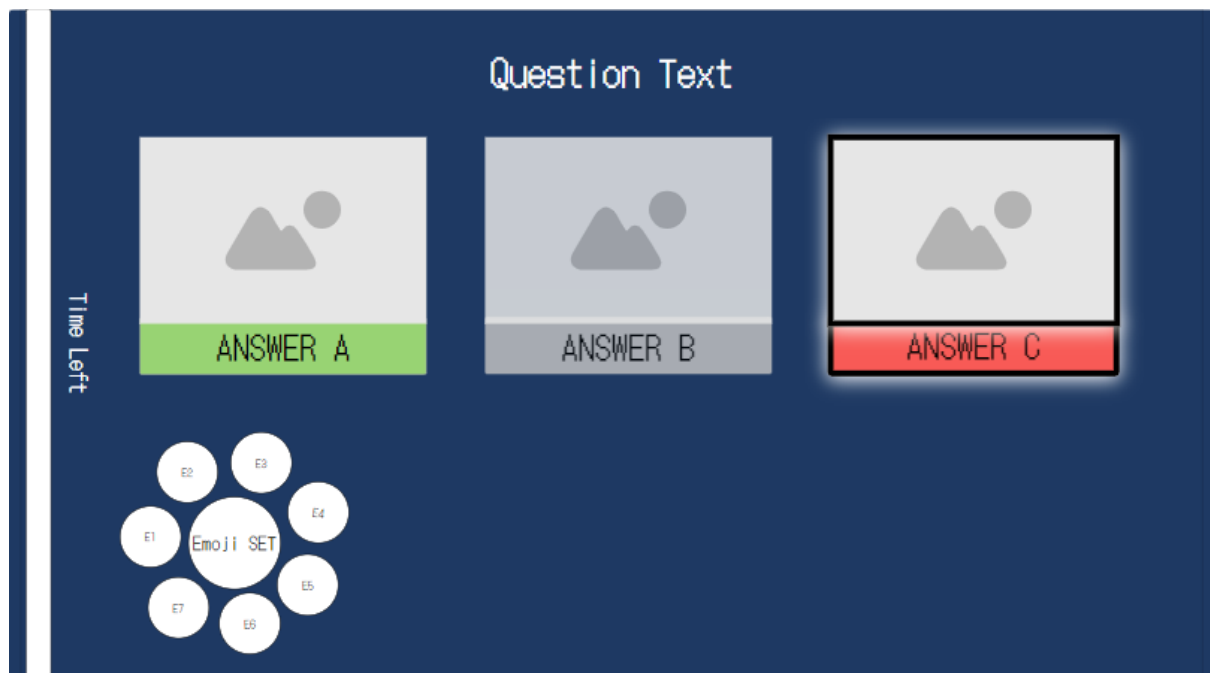


Figure 6: Question screen, wrong answer selected (Multiplayer)

After the time runs out, in the **multiplayer** game, if we choose the wrong answer we will be provided with the right one and then the game forwards the player to the intermediate leaderboard (**Figure 12**).

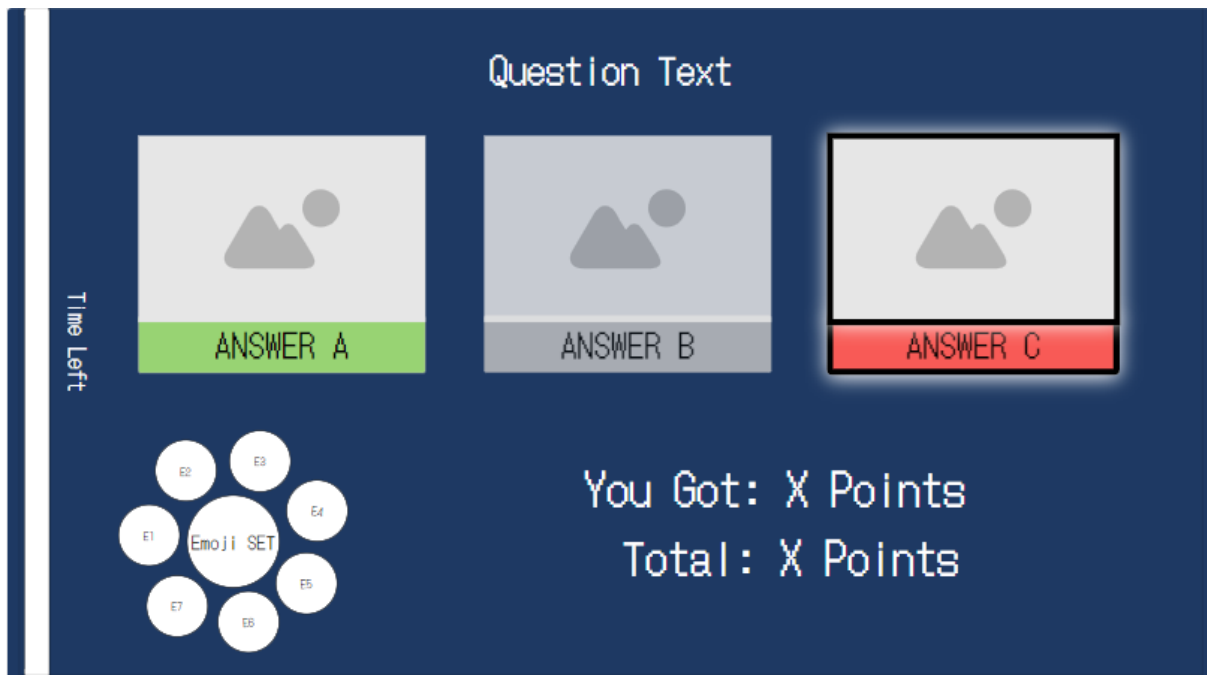


Figure 7: Question screen, wrong answer selected (Singleplayer)

After the time runs out, in the **singleplayer** game, if we choose the wrong answer we will be provided with the right one and with the amount of points we earned, being followed by our total amount of points.

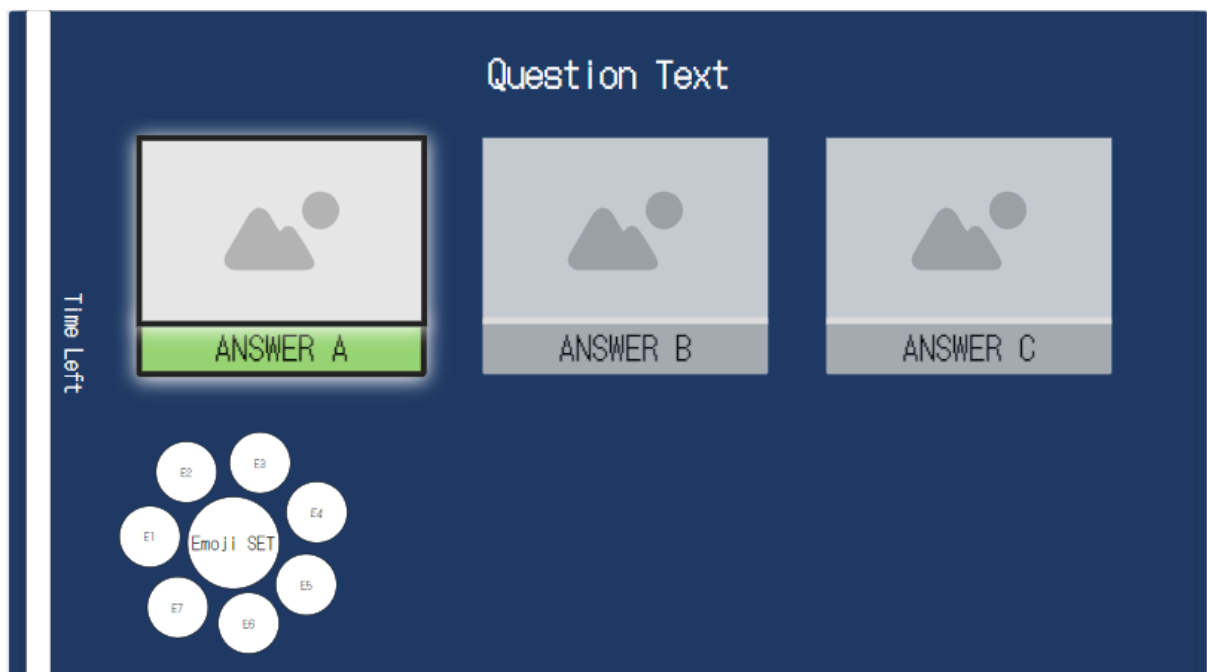


Figure 8: Question screen, correct answer selected (Multiplayer)

After the time runs out, in the **multiplayer** game, if we choose the right answer we will be shown that we selected the right one and then the game forwards the player to the intermediate leaderboard.

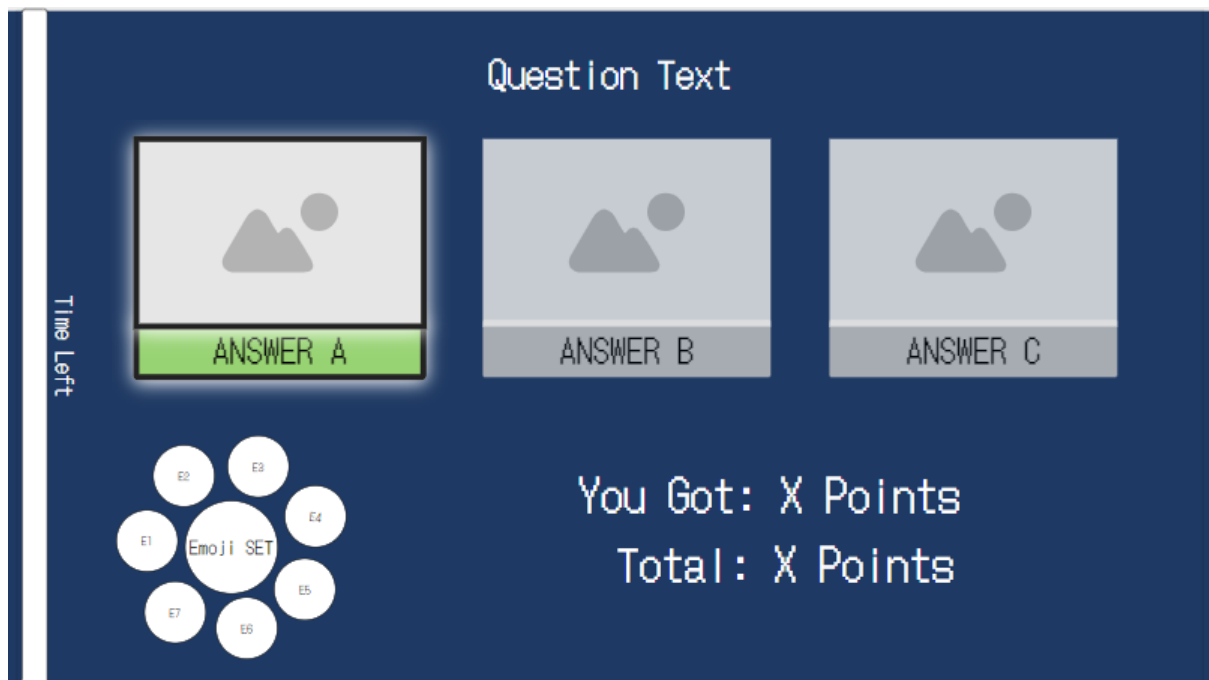


Figure 9: Question screen, correct answer selected (Singleplayer)

After the time runs out, in the **singleplayer** game, if we choose the right answer we will be shown that we selected the right one and then provided with the number of points we earned, being followed by our total number of points.



Figure 10: Waiting room screen (Multiplayer)

When any player in the waiting room presses “**START GAME**”, all players in the waiting room will be directed to the game start screen (**Figure 3**) to start a new game session. When a player presses “**GO BACK**”, it takes them back to the name screen (**Figure 2**) and they can change their name to something else.

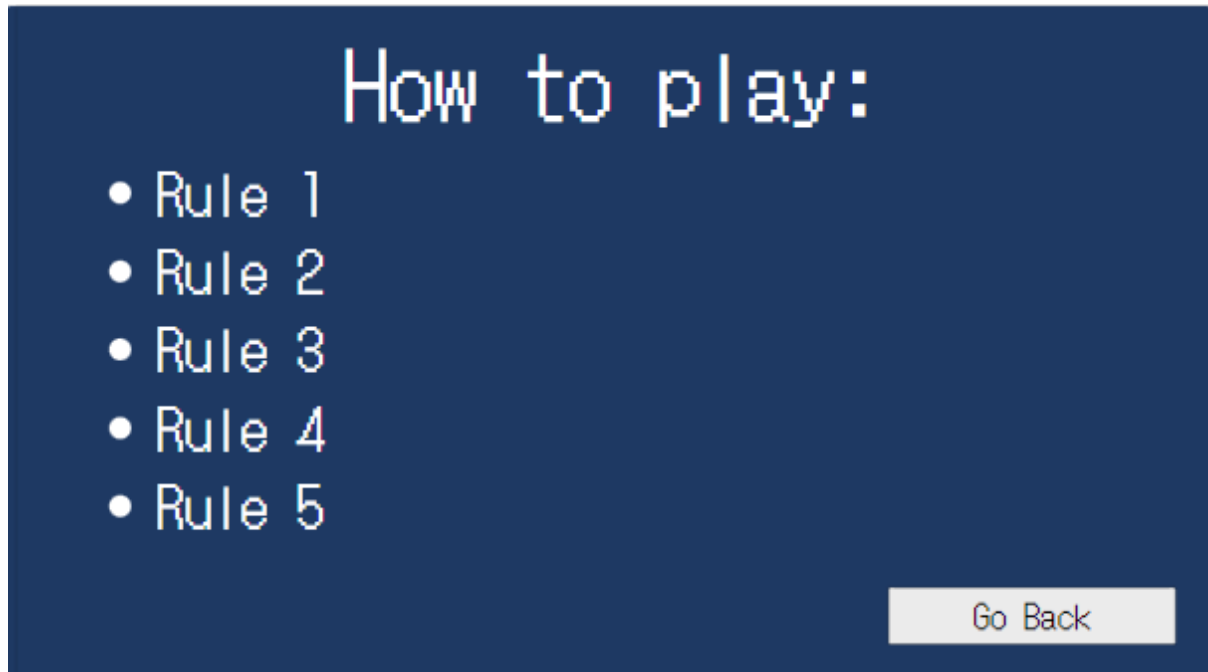


Figure 11: How to play screen

On the main screen, when a player presses the “**HOW TO PLAY**” button they will be redirected to a page (**Figure 11**) containing the rules of the game and an explanation on how to play it. A “**GO BACK**” button is present which when pressed will take them back to the main screen (**Figure 1**).

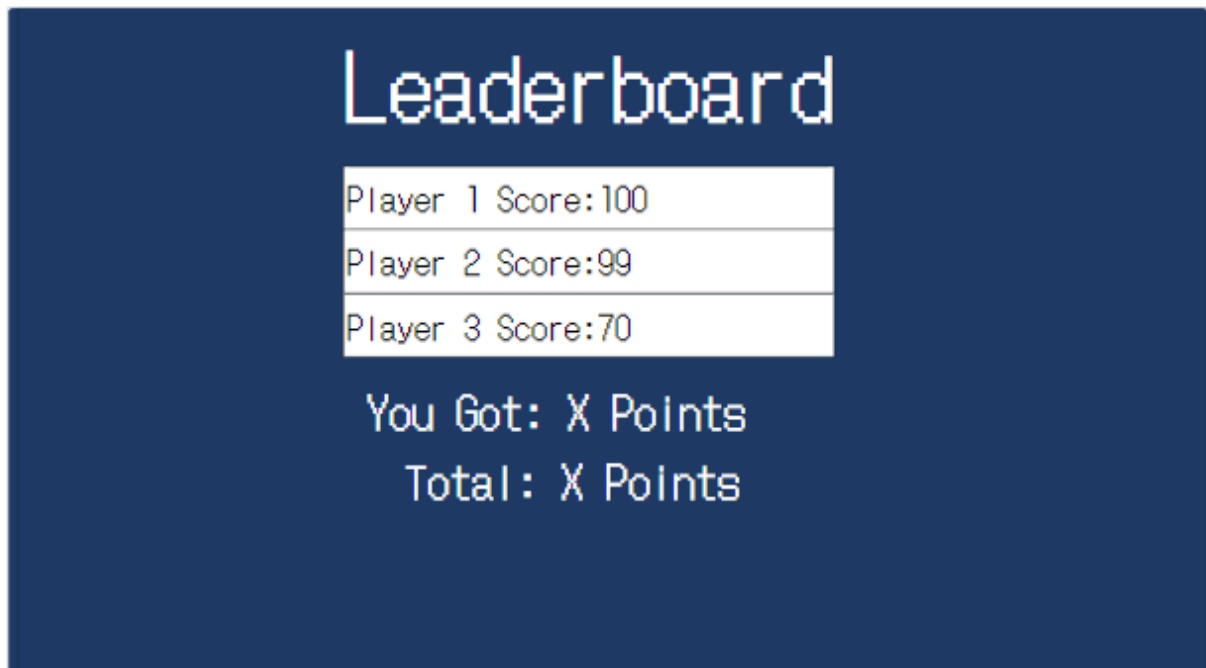


Figure 12: Intermediate leaderboard

After a question has been completed in multiplayer (**Figures 6 and 8**) an intermediate leaderboard will be shown containing the players' score and the top scores of the players in the current game.



Figure 13: Final Leaderboard

This is the Player leaderboard that is going to be displayed at the end of the game session.

In **multiplayer**: The scores of different players are displayed in descending order.

In **singleplayer**: The scores of previous games and current games of the user are displayed in descending order.

Methods:

- Experts:

We recruited 6 students from a Computer Science Bachelor's Degree. They are Junior HCI reviewers, currently in training.

- Procedure:

The experts were instructed to see and evaluate our UI design. The UI design was made with the help of Moqups (S.C Evercoder Software S.R.L., n.d.), a website that helps you create things such as mockups, diagrams and prototypes. What the experts needed to do was review the pdf we provided to them, which had photos of every single possible page of our UI with explanations on how they interact with each other. When it comes to heuristics, the experts were instructed to use Jakob Nielsen's "10 Usability Heuristics for User Interface Design" (Nielsen, 1994) to evaluate our UI design.

- Measures:

The results are measured based on the 10 usability heuristic principles created by Jakob Nielsen. The experts reported issues on the draft design of the app that was violating the previously mentioned principles. The raw results consisted of a document listing all the problems divided into every principle that was breached. Furthermore, the issues are reviewed and then divided into the ones we can and will be solved and the impossible to be fixed ones.

Results:

Taking into account the comments by the first group and reconsidering some of our own design choices, we decided to fix the following issues which were considered the most important ones:

- **Issue (Visibility of system status) #1:** *(Specified by reviewers: 4 times)*

In the intermediate leaderboard, a scroll bar could be added so a player can see him/herself in the leaderboard. As an alternative, you could display the current ranking of each player.

Frequency/Impact: 5/5

- **Issue (Error prevention) #2:** *(Specified by reviewers: 3 times)*

The player should know that they cannot fill in duplicate names.

Frequency/Impact: 2/3

- **Issue (Visibility of system status) #3:** *(Specified by reviewers: 3 times)* After answering a question "you got" is unclear and should maybe be: "this round".

Frequency/Impact: 5/1

- **Issue (Visibility of system status) #4:** *(Specified by reviewers: 3 times)*
In both singleplayer and multiplayer game modes, the user may be a bit confused by the stage at which the game is. Additional information such as remaining questions or current questions out of the total number of questions should be added to guide the user through the game.

Frequency/Impact: 3/2

- **Issue (Visibility of system status) #5:** *(Specified by reviewers: 1 time)*
It is unclear if the picture is also part of the button or just a picture you can click to enlarge.

Frequency/Impact: 1/1

- **Issue (User control and freedom) #6:** *(Specified by reviewers: 5 times)*
There could be a forfeit/quit game button during the game for users that would like to quit their game and be returned to the main menu.

Frequency/Impact: 4/4

- **Issue (Consistency and standards) #7:** *(Specified by reviewers: 4 times)*
There should be a clear section where the emojis that the users click are displayed.

Frequency/Impact: 5/3

- **Issue (Visibility of system status) #8:** *(Specified by reviewers: 1 time)*
In the waiting room screen, the users cannot distinguish themselves from the other users. It would be nice if the users' names are highlighted.

Frequency/Impact: 1/1

Conclusion:

When we got to prioritising the issue we decided to use a severity matrix in order to decide on what was most important to solve. The frequency metric of the issue is a combination of how often the reviewers pointed out the issue in their evaluations and how often it would come up when playing the game. The severity metric was decided in a discussion between our group members. What we felt was a more important issue got a higher severity metric. We came up with the following severity matrix:

Frequency Impact	1	2	3	4	5
	1	2	3	4	5
1	#5,#8				#3
2			#4		
3		#2			#7
4				#6	
5					#1

After reviewing the issues using a severity matrix and the number of times they were specified by the reviewers, we decided to prioritise and solve them in the following order:

- **Issue #1:**

Solution, Figure 19: We made the player info bold, and changed the background of the specific row in the leaderboard table. Since we wanted the intermediate leaderboard to remain simple, we decided against adding scrolling features to it. Furthermore we decided to only show the top 3 players and the top 3 players alongside them if necessary.

- **Issue #6:**

Solution, All figures: We added a “Back to Menu” button on every question and leaderboard page, letting the user be able to forfeit/quit the game at any point. Since we realised it is frustrating for players to completely close in order to go back to the menu we decided that there should be a back button on every page which either brings the player back to the previous page or the menu, whichever is more applicable.

- **Issue #7:**

Solution, Figures 14-17: The whole emoji/reaction part was completely redesigned, introducing multiple functionalities, and solving numerous issues. As the previous design allowed no space for displaying reactions we decided to redesign it with a more conventional chat box design in mind.

- **Issue #3:**

Solution, Figure 19: We changed the text from the after question leaderboard from “You Got” to “ This Round:” so that the confusion about the received points and total points is solved.

- **Issue #2:**

Solution, Figure 18: We made a pop-up error that will mention that the name is taken and that the user should choose another one. We decided to solve this issue in

this way because it would be hard and unpleasant for the user to scroll through the entire player list to find out if his name is already there. Furthermore, new users will be joining so the list will constantly alter.

- **Issue #4:**

Solution, Figures 16 and 17: We added the mentioned information before the actual question in the following format: "Question m/n: Text " where "m" is the number of the current question and "n" is the total number of questions, to inform the user from now on the state and stage of the game.

- **Issue #5:**

Solution, Figures 15-17: We separated the pictures from the actual button to make sure that everything is clear.

- **Issue #8:**

Solution, Figure 21: The name of the user is highlighted now in bold, the user now being able to distinguish himself from others.

Improvements:

After looking over the feedback we have received from the experts, we have reworked the UI of our quiz app and made a definitive version. For further inspection, you can view/interact with our new UI via this link:

<https://app.moqups.com/dl0ZPa5ovDPMpLk2j2qfw1YZxEpvKbxM/view/page/ad64222d5>

Below are some screenshots of the new look, in the pages of the game where the design was remade:

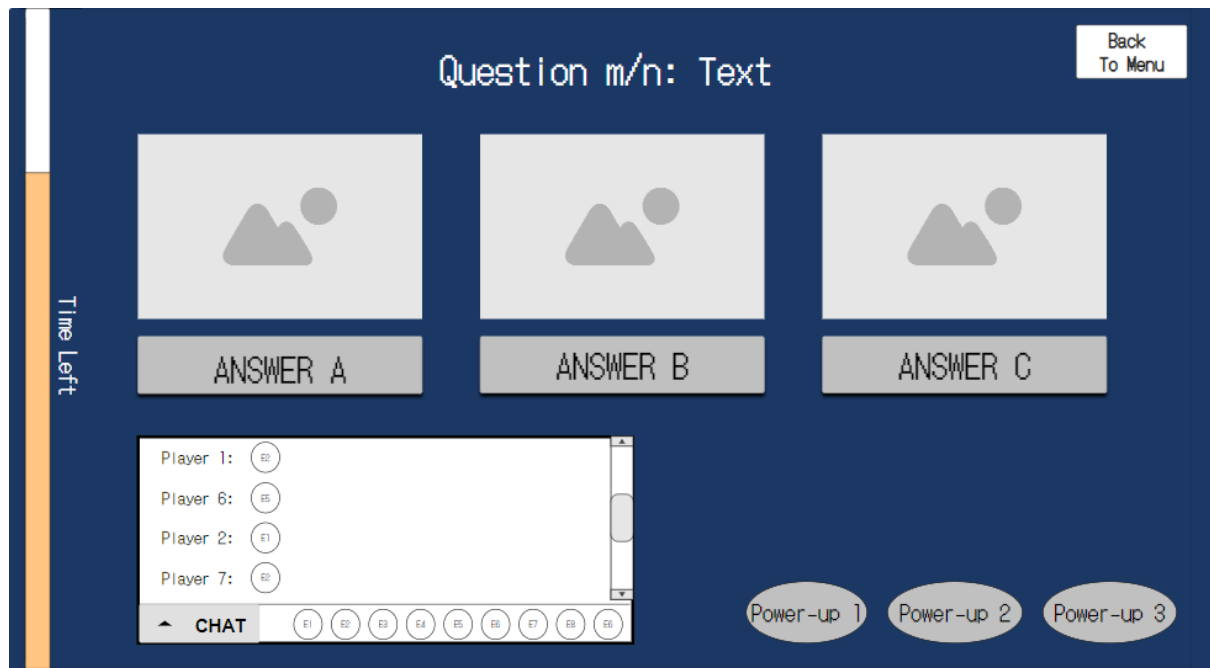


Figure 14: Reworked question page (Updated from 4)

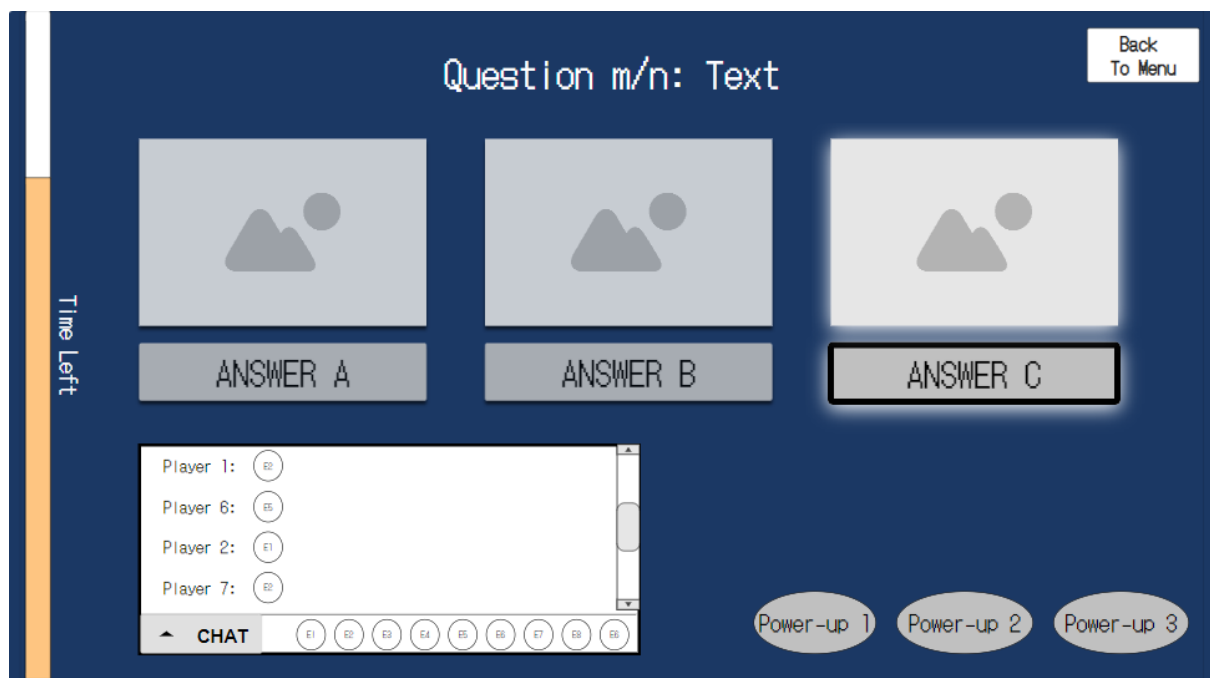


Figure 15: Reworked question page, answer selected (Updated from 5)

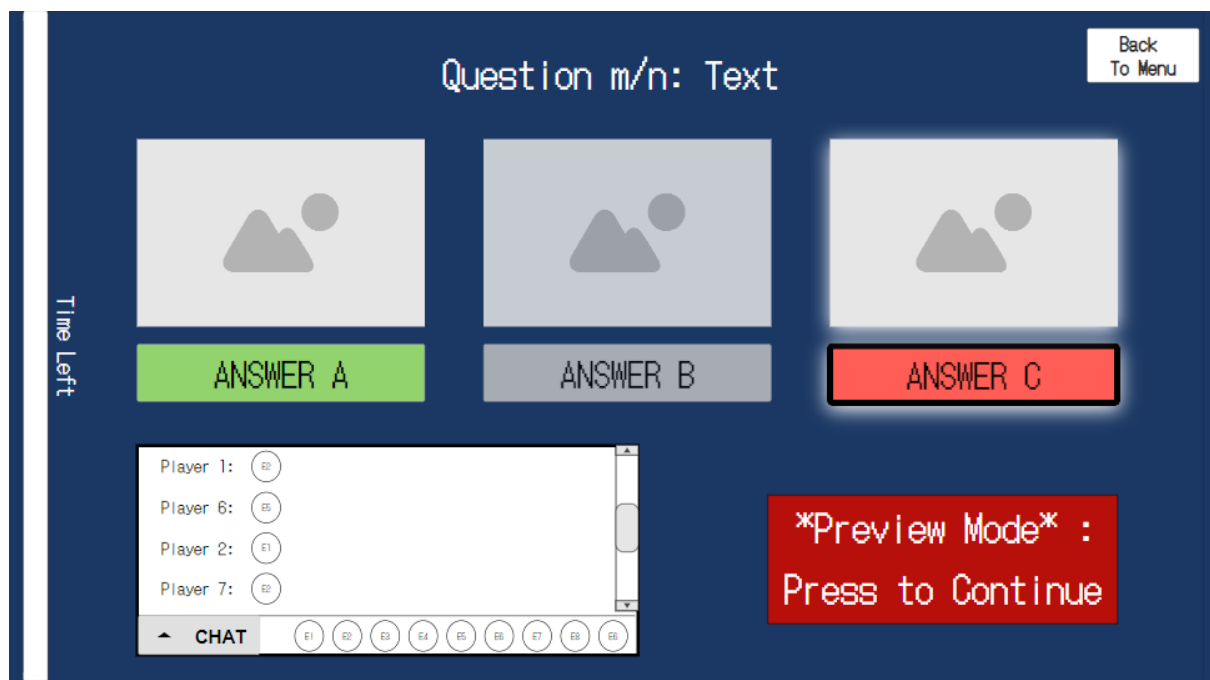


Figure 16: Reworked question page, wrong answer selected for multiplayer (Updated from 7)

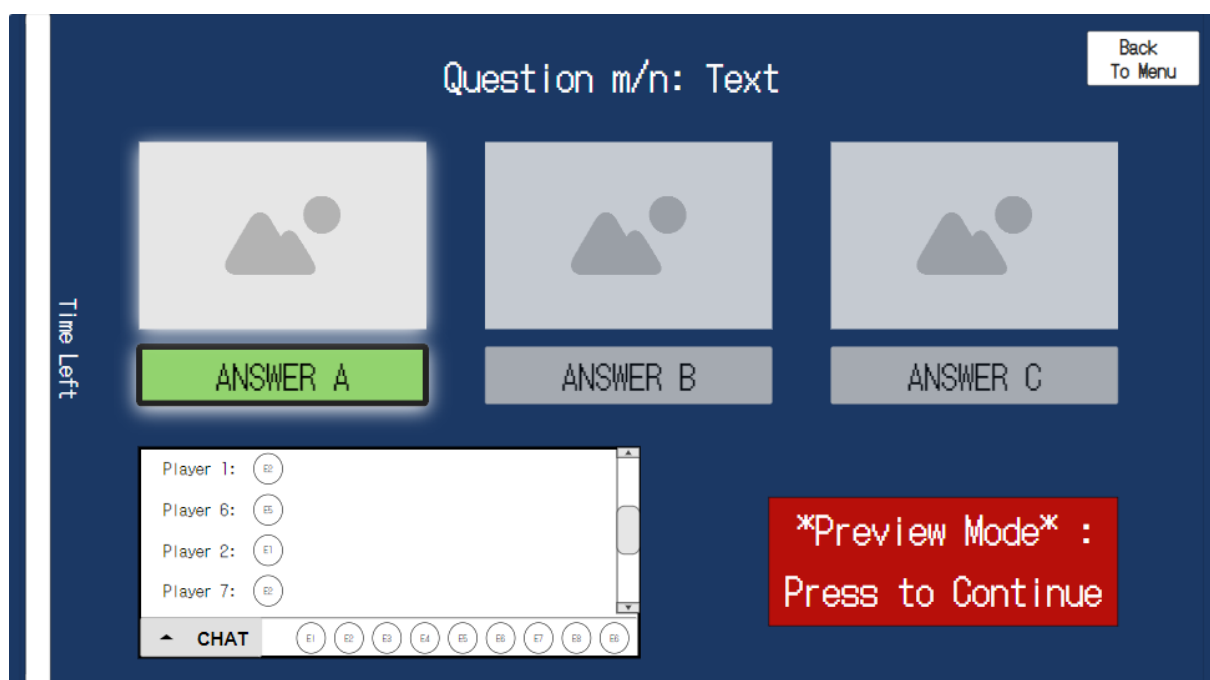


Figure 17: Reworked question page, right answer selected for multiplayer(Updated from 8)

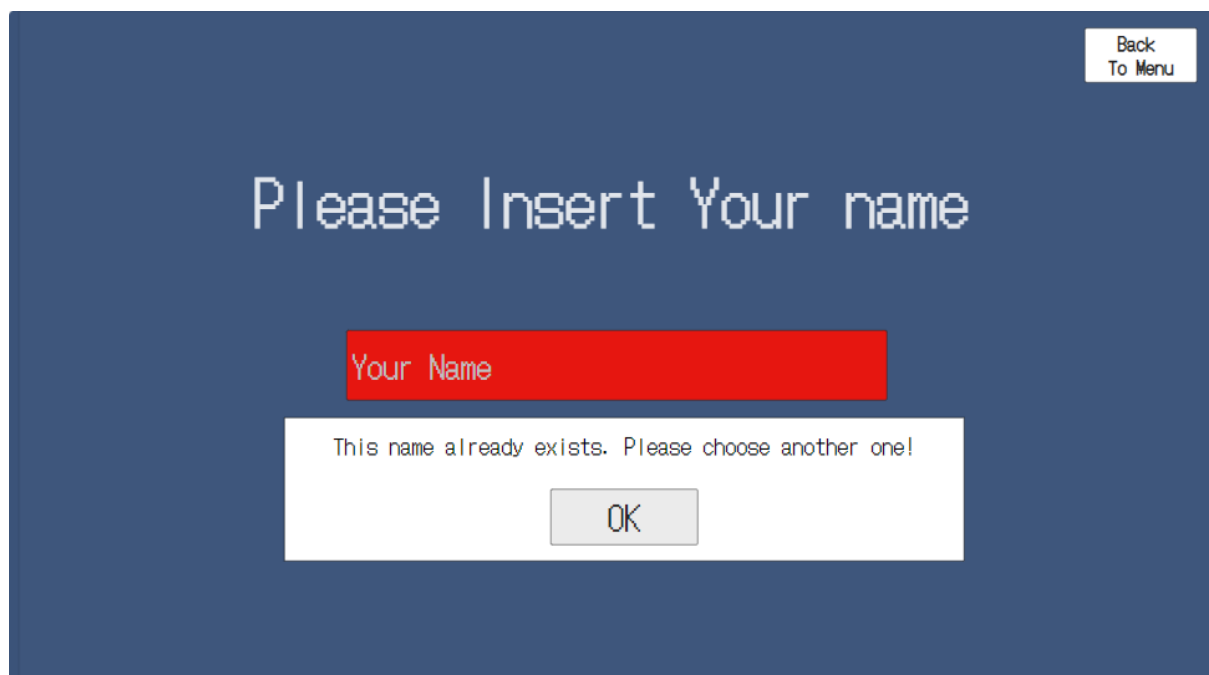


Figure 18: Invalid name pop-up in name entry screen

If you try to play on **MULTIPLAYER** from the figure 2 and the name you inserted is already in use an error pop-up will be displayed reminding the user is not able to use a name that is in use at that time

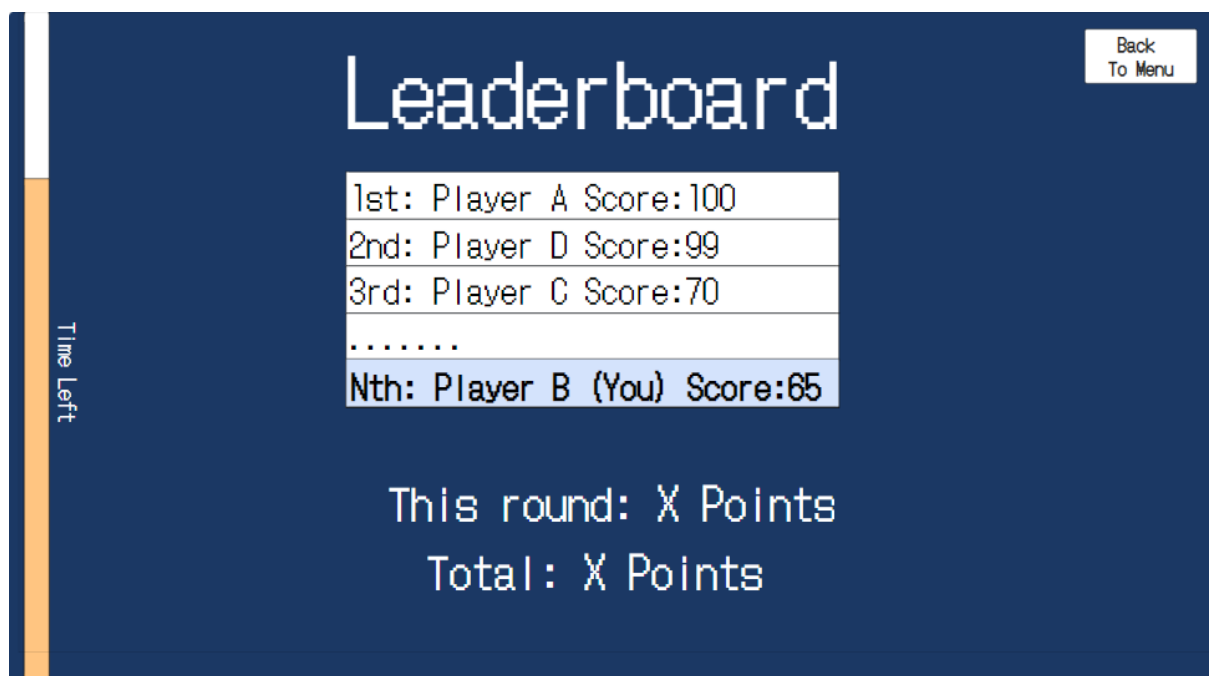


Figure 19: Leaderboard, after a question/during the game (Updated from 12)

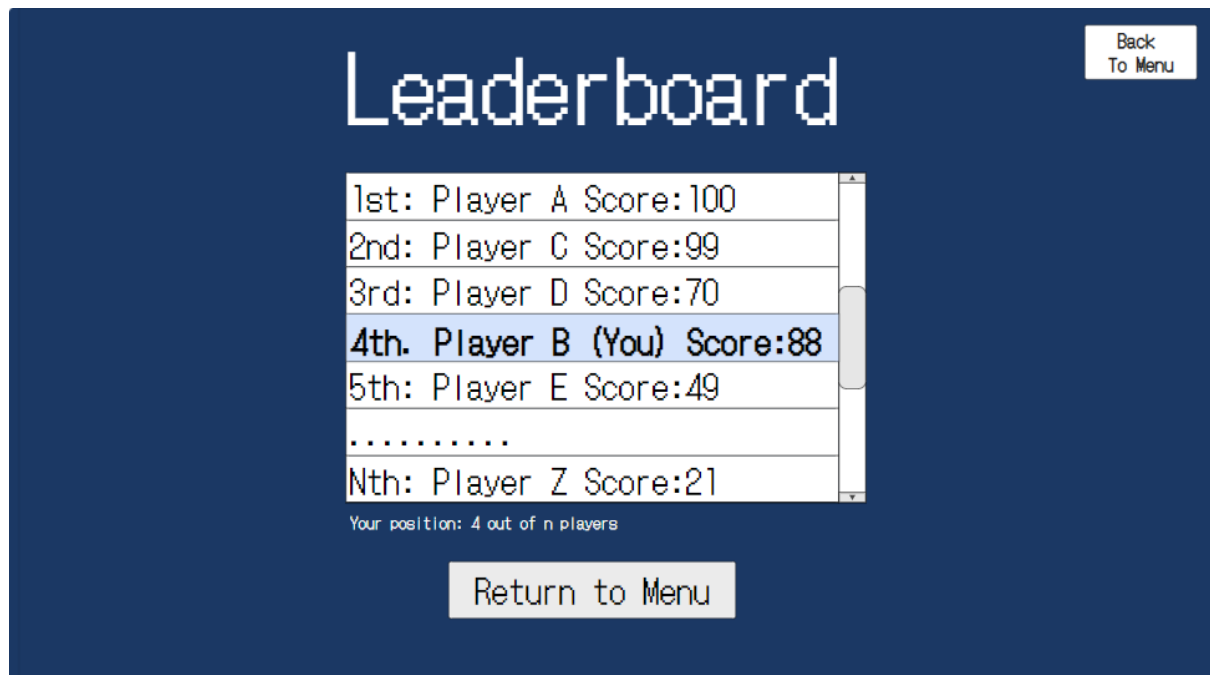


Figure 20: Final leaderboard (Updated from 13)



Figure 21: Reworked waiting room screen (Updated from 10)

References

- Nielsen, J. (1994). *10 Usability Heuristics for User Interface Design*. Nielsen Norman Group. <https://www.nngroup.com/articles/ten-usability-heuristics/>
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Bibliography

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