1. Elicitation of Results

We conducted interviews with three users of quiz platforms, including two students and one teacher. The aim was to understand their experiences, frustrations, and expectations when using tools like Kahoot and Quizlet.

Interview Participants

- **Tom** (Student), email: yanbalkomtom@gmail.com
- **Alessia** (Student), email: alessiapozzolungo978@gmail.com
- **Jamie** (Teacher): smsc019@hotmail.com

Questions and Responses

Q1: How much do you use Kahoot (out of 5)?

- **Tom:** 2
- **Alessia:** 3
- **Jamie:** 3

Q2: What do you use quiz platforms for the most?

- **Tom:** Kahoot
- **Alessia:** Quizlet
- **Jamie:** Kahoot

Q3: What is the most important feature for you?

- **Tom:** The ability to compete live.
- **Alessia:** The ability to get explanations after a wrong answer, helping to understand the correct response.
- **Jamie:** The ability to view detailed statistics after each game to understand which questions were more challenging and where students need improvement.

Q4: What is your biggest hesitation when using quiz platforms? (For teachers)

- **Jamie:** Ensuring the platform is user-friendly for all students and avoiding technical issues that could disrupt the lesson.

Q5: How engaging are your classes with quiz platforms?

- **Jamie:** 4/5

Q6: What problems do you have with quiz platforms in terms of engagement and interest?

- **Tom:** The competition can sometimes be distracting.
- **Alessia:** Quiz platforms don't test understanding in a fun and engaging way, making the experience boring.
- **Jamie:** Students don't have access to the same detailed statistics as teachers, missing the opportunity to reflect deeply on their performance.

Q7: What changes would improve the experience of using the app?

- **Tom:** Not much from the student side; it's pretty straightforward. Maybe more focus on the content, such as having an explanation of the answers rather than being too focused on the competition alone.
- **Alessia:** If a host's connection disconnects, it shouldn't affect all other players, as it disrupts the quiz.
- **Jamie:** Sending a detailed performance review to both the teacher and students, and allowing students to reattempt quizzes on their own.

Further Interview:

Some further, more detailed questions were asked to one of the interviewees to gain more insight of how users use these quiz platforms.

Interview Participants

- Alessia

Questions:
Q1: What problems do you have with leaderboard/point systems with quiz tools?
"Students may feel discouraged when they see if they are on the bottom of the leaderboard, leading them to quit the game or be embarrassed"

Q2: Is there anything you dislike about the range of game modes/ options there are available for quiz tools?
"Some game modes can be confusing. It is better if there are clear instructions on how to play that game mode."

Q3: What improvements could be made with quiz tools in terms of keeping you engaged with your learning?
"Different game modes or explanations on the questions if you answer it wrong so you can continue to learn your mistakes and improve the next time. "

Q5: Do you have any issues with other users knowing whether you answered a question correctly/incorrectly?
"Yes, it can cause embarrassment which can cause some students to disengage with the game."

Q6: Are there any problems with the type of questions/content that quiz tools use to test your knowledge on certain topics?
"No."

Q7: Does it frustrate you when quiz tools don't provide reasoning behind why answers are correct/incorrect?
"Yes because without an explanation, you will not be able to learn."

Q8. Do you have any problems with the user interface or overall aesthetics/visuals of quiz tools?
"No."

Q9: Do you ever face the problem of having the same group of students winning the quizzes? If so, would you like a more randomized chance of winning?
"No."

Q10: Are there any problems with quiz tools in terms of connectivity and overall flow of usage?
"Yes, if a host disconnects then it affects all the other players."

Q11: Would you like to keep track of your overall progress across different completed quizzes?
"Yes, so I can track my learning progress and see how much I have improved."

Q12: Do you have any problems with not being provided feedback or any metrics measuring your performance when using quiz tools?
"Yes, implementing feedback will be useful to know my overall score and what areas I need to improve on."

2. User Stories

Based on the elicited information, we created three user stories to represent the most significant requirements of the system.

1. **User Story 1 (For Students):**
   - **As a student**, I want a feature that provides explanations for wrong answers so that I can understand why I got the question wrong and learn from it.
   - **Acceptance Criteria:**
     - When a student answers a question incorrectly, a message pops up to tell the user that the answer entered in incorrect
     - The message appears immediately after the incorrect answer is selected. A button on the message called 'Next' .
     - The message will include an explanation of the correct answer.
     - Student can press 'Next' button after they finish reading the explanations and go to the next question - as the student click the button, the message will disappear and the next question will be displayed on screen
2. **User Story 2 (For Teachers):**
   - **As a teacher**, I want to see detailed statistics after each quiz so that I can evaluate which questions were most challenging for students and provide extra support where needed.
   - **Acceptance Criteria:**
     - After the quiz, the teacher will be automatically directed to a detailed summary of class performance.
     - The summary is generated right after the quiz is finished
     - The statistics show how students performed on each question and which questions were most difficult.
     - There is a download option placed on the top bar.
     - The teacher can download the statistics to the desktop for later review.
3. **User Story 3 (For Students and Teachers):**
   - **As a student or teacher**, I want the ability to continue the quiz even if the host's connection is lost so that the quiz experience is not disrupted for all participants.
   - **Acceptance Criteria:**
     - If the host's connection is lost, the quiz continues for all other players.
     - Players remain in the quiz without having to rejoin.

- The host is able to rejoin the quiz by re-entering the quiz code and joining as usual after the connection issue is resolved
- The host will be automatically directed in the quiz again when the quiz code is submitted successfully
- The host must rejoin before the quiz ends in order keep participating

4. User Story 4 (For Students)

- **As a student,** I want a fun and interactive way to learn without feeling shame or embarrassment, so that I can confidently improve my academic performance.
- **Acceptance Criteria:**
  - Constructive and motivational feedback is provided when users select an incorrect answer.
  - Leaderboard positions of the user to be kept anonymous if they are not in the top 5.
  - Whether a user answered a question correctly/incorrectly must be hidden but still reflective if they are in the top 5 leaderboard rankings.
  - A user's answer must not be visible to other users

3. Use Case

UC1: Providing Feedback After Incorrect Answers

- **Goal in Context:** To ensure that students learn from their mistakes by providing explanations for incorrect answers.
- **Scope:** The quiz platform (Kahoot).
- **Primary Actor:** Student
- **Precondition:** The student is in the middle of a quiz and did not answer a question correctly.
- **Trigger:** The system detects an incorrect answer.
- **Main Success Scenario:**
  1. The student selects an answer to a quiz question.
  2. The system determines the answer is incorrect.
  3. The system provides a detailed explanation of the correct answer.
  4. The student reviews the explanation and continues with the quiz.
- **Success End Condition:** The student receives feedback for the wrong answer and can continue the quiz.
- **Exception Scenario:**
  1) The student did not answer the question.
     - The system should inform the student that no answer is provided and still provide an explanation of what is the correct answer and explain why all the other options are incorrect
- **Postcondition:** The student understands why the answer was incorrect and moves forward with improved knowledge

UC2: Not feeling shame or embarrassment by quiz performance

- **Goal in Context:** To ensure that students do not feel shame or embarrassment based on their quiz performance
- **Scope:** The quiz platform (Kahoot).
- **Primary Actor:** Student
- **Precondition:** The student is in the middle of a quiz and is not performing well.
- **Trigger:** The system detects the user is performing in the lower quartile.
- **Main Success Scenario:**
    1. The student is performing poorly in the quiz.
    2. The system shall analyse this and provide motivational feedback.
    3. The system does not inform the student of their current ranking
    4. The system keeps the student's performance anonymous to other students
    5. The quiz ends and the student may feel disappointed but not embarrassed to the point where they lose motivation to learn.
- **Success End Condition:** The student receives encouragement/motivation and their performance is kept anonymous to other students.
- **Exception Scenario:**
    1) The student is not making a serious attempt
        - The system should still perform the above functions
- **Postcondition:** The student still feels encouraged to try and do better and is not deterred to learn from their mistakes.

4. Validation

We reached out to the same users to validate the extent to which these use cases would adequately describe the problem they're trying to solve. Here is their feedback:

Validation 1:

 Alessia: "All of these use cases adequately solve my problem which is finding a fun and interactive way to learn, so that I can improve my grades "

Validation 2:

Tom: "I think the idea of continuing the quiz even if the host disconnects is really useful. That's happened to me before and it was frustrating. Now since the host can just simply rejoin, I can just continue with the Kahoot without wasting time to start all over again."

Validation 3:

Jamie: "Detailed statistics for students and teachers would be a great addition, as it would allow both parties to reflect and focus on improvement. The use case where students can see an explanation for incorrect answers is also a great idea. It saves me time from having to explain everything again after the quiz, and students can save time by not having to take notes while I'm explaining. "