

## Product Backlog (Team 11)

### Team Member:

Ivan Chan, Timothy Poozhikala, Ronak Bharad, Rei Orikata

### Problem Statement

It can be hard for students to motivate themselves to study. By giving them the option to add the questions they need, then turning it into an interactive and competitive game, it will give them an easy way to begin studying and learn the material they need to know. It would be a core part of learning as any player can cross question anyone and in order to win the game the player has to know the material well. It's a scientifically proven method of learning.

### Background Information

For many students or even individuals who are supposed to study for tests, there are a variety of applications available. From sites such as Quizlet, to other virtual note cards or online programs, students have access to many resources. However, none of these provide an interactive and fun way for the user to study. This is the issue that we aim to solve with our application. With the Educational Connect 4, one can learn the material in a fun and competitive way that will motivate them to study as well as ensure they they have an entertaining time.

### Environment

#### Languages

We will use Javascript for creating the actual connect 4 game, as well as communication between the front end and the server. HTML will be used for the front end designs of the website. CSS will be used for the style and designs of the website, while No-SQL will be used for the database to save information such as the questions, as it will allow for fast data retrieval. We will also use SQL for storing important user data securely. On the client side of the website, we will use Vue.js to format the website and ensure that it will be fast and responsive, while on the server side Express.js will be used to connect the server to the database. We will also find and use other APIs as time goes on.

### Functional Requirements

Backlog ID	Functional Requirement	Hours	Status (Sprint)
1	As a user, I would like to choose the specific subject of study.	7	Completed 1
2	As a user, I would like to play against a friend locally.	15	Completed 2
3	As a user, I would like to add my own multiple choice or T/F questions.	6	Completed 1
4	As a user, I would like to have more difficult	15	Not enough time

	questions the further I progress in a game		
5	As a user I would like to place a block and then answer the corresponding question.	10	Completed 2
6	As a user I would like to Increase/Decrease the size of the grid/game board.	5	Not enough time (would change entire framework of game)
7	As a user I would like to choose how many blocks to connect in order to win.	5	Not enough time (would change entire framework of game)
8	As a user I would like to play with power ups on certain tiles of the grid/ game board. (If time permits)	20+	Not enough time (would change entire framework of game)
9	As a user I would like to have a time limit to answer the question once I place my block.	8	Not enough time
10	As a user I would like to allow my friend to attempt the question if I failed to answer it correctly.	7	Not enough time (would change entire framework of game)
11	As a user I would like to mark questions that I had difficulty answering.	4	Not enough time
12	As a user I would like to have an option to play a bonus round of the questions that I could not answer. (If time permits)	5	Not enough time
13	As a user I would like to restart/ end a game before the game itself finishes.	3	Completed 2
14	As a user I would like to play against an AI when playing solo	20+	Completed 2
15	As a user I would like to vote for how good/bad a question is	12	Completed 2
16	As a user I would like to have a folder of incorrect questions at the end of the game to review	7	Completed 2
17	As a user I would like to filter and sort through categories as well as see the	10	Completed 1

	popularity of the categories		
18	As a user I would like to the option to have a random category of study	5	Completed 2
19	As a user I would like to register for an account and login to maintain the user data	15	Completed 1
20	As a user I would like to access settings for questions and game (such as selecting the category)	10	Completed 2
21	As a user I would like to read about the rules and learn about how to play the game	5	Completed 1

### Non-Functional Requirements

*As a user, I would like:*

1. A simple to navigate interface
2. Easily play against my friend locally
3. To have a simple template to write the questions

*As a developer, I would like:*

1. Our app to work on different browsers
2. To integrate well with backend
3. To implement an analyzing system that would make the game harder as it progresses
4. To have a secure connection from the user to the website
5. To have a reliable and secure database that stores the users' data
6. The connections between the UI, server and database will be strong.

### Use Cases

1. Case: Choose the specific subject of study

#### Action

1. Click "Choose Category" button
3. Select a category
5. Select a subcategory

#### System Response

2. Drop-down boxes with categories are shown
4. Drop-down of sub-categories are shown
6. Menu disappears and category is selected

2. As a user, I would like to play against a friend locally.

#### Action

1. Click option for local multiplayer
2. Click game start button
4. One player places a block
6. Player answer

#### System Response

3. Game starts with local multiplayer
5. Prompt with question appears
7. Question is either evaluates as right or wrong
8. It becomes the second player's turn
9. Display that it is the second player's turn

10. The second player goes, this repeats

3. As a user, I would like to add my own multiple choice or T/F questions.
 

<b>Action</b> 1. Click the create question button 2. The user select the category 3. The user selects either “true or false” or multiple choice 4. The user fill out the question 5. The user writes the answers if the question is multiple choice 6. The user selects “Done” button	<b>System Response</b> 2. A pop-up appears 7. The pop-up disappears
---	---
  
4. As a user, I would like to have more difficult questions the further I progress in a game
 

<b>Action</b> 1. The user is close to winning and places a piece	<b>System Response</b> 2. The AI sees that the user is close to winning 3. A question with an elevated difficulty is called 4. The user is prompted with the question
---	--
  
5. As a user I would like to place a block and then answer the corresponding question.
 

<b>Action</b> 1. The user places a piece  6. The user answers the question	<b>System Response</b> 2. The system sees that a piece is placed 4. The system retrieves a question 5. The user is prompted with the question 7. The system analyzes the answer for correctness 8. The piece is either placed or not placed if the answer is correct/incorrect
---	---
  
6. As a user I would like to Increase/Decrease the size of the grid/game board.
 

<b>Action</b> 1. The user selects “Start Game” 3. Choose size of grid 4. Click “Ok”	<b>System Response</b> 2. Goes to page with game options 4. Display preview of grid 3. Game board is created with new size grid
--	--
  
7. As a user I would like to choose how many blocks to connect in order to win.
 

<b>Action</b> 1. The user selects “Start Game” 3. Choose number of pieces for win condition 4. Click “Ok”	<b>System Response</b> 2. Goes to page with game options
--	---
  
8. As a user I would like to play with power ups on certain tiles of the grid/ game board. (If time permits)
 

<b>Action</b> 1. Places a piece  6. Answer the question	<b>System Response</b> 2. The system sees that a piece is placed 4. The system retrieves a question 5. The user is prompted with the question 7. The system analyzes the answer for correctness 8. The piece is either placed or not placed if the answer is correct/incorrect
--	---

9. The section where the piece was placed is Analyzed  
10. If the tile has a power-up, the player receives it
9. As a user I would like to have a time limit to answer the question once I place my block.  
**Action**  
1.Places a piece  
**System Response**  
2. The system sees that a piece is placed  
4. The system retrieves a question  
5. The system activates a time limit  
6. A timer is displayed for the user
10. As a user I would like to allow my human opponent to attempt the question if I failed to answer it correctly. (If time permits)  
**Action**  
1.Places a piece  
6. Answer the question  
10. Answer the question  
**System Response**  
2. The system sees that a piece is placed  
4. The system retrieves a question  
5. The user is prompted with the question  
7. The system analyzes the answer for correctness  
8. The piece is either placed or not placed if the answer is correct/incorrect  
9. If the answer is incorrect, human opponent gets to try the same question  
11.The system analyzes the answer for correctness  
12. The piece is either placed or not placed if the answer is correct/incorrect
11. As a user I would like to have a double jeopardy grid tile, where I can place one more block if I correctly answer the question. (If time permits)  
**REMOVE**
12. As a user I would like to mark questions that I had difficulty answering.  
**Action**  
1.Places a piece  
6. Answer the question  
7. Mark the question  
**System Response**  
2. The system sees that a piece is placed  
4. The system retrieves a question  
5. The user is prompted with the question  
8. The system sees the mark  
9. The system adds the marked question to user's database
13. As a user I would like to have an option to play a bonus round of the questions that I could not answer. (If time permits)  
**Action**  
1.Places last piece  
**System Response**  
2. The system sees that the game is over  
3. Shows the user 3 options: play again with same questions, play again with questions that the user got wrong, end game

14. As a user I would to restart/ end a game before the game itself finishes.
- |                   |   |
|-------------------|---|
| <b>Action</b>     | <b>System Response</b>                          |
| 1. Clicks restart | 2. Display popup to confirm a restart (yes/no)  |
| 3. Clicks yes     | 4. System resets the game                       |
| 1. Clicks end     | 2. Display popup to confirm a end (yes/no)      |
| 3. Clicks yes     | 4. System ends the game, returns to main screen |
15. As a user I would like to have the questions get more difficult when I am closer to winning.
- |                  |  |
|------------------|--|
| <b>Action</b>    | <b>System Response</b>   |
| 1.Places a piece | 2. The system sees that a piece is placed  |
|                  | 3. The system retrieves a question based on this   |
|                  | $\frac{\text{The number of users answered the question correctly}}{\text{The number of users that answered the question overall}}$ |
|                  | as well as how close the user is to winning  |
16. As a user I would like to play against an AI when playing solo
- |                         |   |
|-------------------------|---|
| <b>Action</b>           | <b>System Response</b>  |
| 1.Places a piece        | 2. The system sees that a piece is placed   |
|                         | 4. The system retrieves a question  |
|                         | 5. The user is prompted with the question   |
| 6. Answer the question  | 7. The system analyzes the answer for correctness                                 |
|                         | 8. The piece is either placed or not placed<br>if the answer is correct/incorrect |
|                         | 9. Our AI places a block and retrieves a question                                 |
|                         | 10. The user is prompted with the question  |
| 11. Answer the question | 12.The system analyzes the answer for correctness                                 |
|                         | 13. The piece is placed if user gets it incorrect, and vice versa                 |
17. As a user I would to have a folder of incorrect questions at the end of the game to review
- |                      |  |
|----------------------|--|
| <b>Action</b>        | <b>System Response</b>                                   |
| 1. Game Over, Review | 2. The system sees that user has ended the game          |
|                      | 4. The system retrieves all the question that were wrong |
|                      | 5. The user is prompted with the question                |
| 6. Review/Play Again | 7. The system looks at the response                      |
|                      | 8. If review, user sees the wrong questions and learn    |
|                      | 9. If Play again, start the game with wrong questions    |
18. As a user I would like to filter and sort through categories as well as see the popularity of the categories
- |                       |  |
|-----------------------|--|
| <b>Action</b>         | <b>System Response</b>                               |
| 1. Start Game/Restart | 2. The system sees that user wants to start the game |
|                       | 3. The system gives the list of all topics           |
|                       | 4. The system will also give the most popular topics |
|                       | 5. The system will sort the topics by popularity     |
|                       | 6. The system will highlight the most popular        |

19. As a user I would like to the option to have a random category of study

**Action**

1. Start Game/Restart
- 
- 
- 
5. Select Surprise me

**System Response**

2. The system sees that user wants to start the game
3. The system gives the list of all topics
4. The system will also give option of surprise me
6. User selected surprise me indicating random topic

20. As a user I would like to register for an account and login to maintain the user data

**Action**

1. Sign up/Login
- 
- 
4. Login Page
- 
- 
7. Sign Up Page

**System Response**

2. The system looks at the response
3. If login, then give out options accordingly
5. Retrieve the user data from credentials
6. If sign up, get all the details
8. Store all the details in the database for further user
9. Start Game options

21. As a user I would like to access settings for questions and game

**Action**

1. Settings
- 
- 
- 
5. Settings Menu

**System Response**

2. The system sees that user wants to change the settings
3. The system pauses the game
4. The system shows the settings page
6. The system will act accordingly and shows further settings
7. Resumes the game after done

22. As a user I would like to read about the rules and learn about how to play the game

**Action**

1. Help

**System Response**

2. The system sees that user wants help with the game
3. The system pauses the game
4. The system shows all the rules of the game
5. The system will resume the game