

Product Backlog

Team Member:

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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

- Javascript - We will use this for creating the actual connect 4 game, as well as communication between the front end and the server.
- HTML - We will use this for the front end designs of the website.
- CSS - We will use this for the style and designs of the website
- No-SQL - We will use this for the database to save information such as the questions, as it will allow for fast data retrieval.
- SQL - We will use this for storing important user data securely

Client side

- Vue.js - We will use this framework to format the website and ensure that it will be fast and responsive

Server side

- Express.js - We will use this to connect the server to the database.

Functional Requirements

Backlog ID	Functional Requirement	Hours	Status (Sprint)
1	As a user, I would like to choose the specific subject of study	7	1
2	As a user, I would like to play against a friend	15	2

	locally.		
3	As a user, I would like to add my own multiple choice or T/F questions.	6	1
4	As a user, I would like to have more difficult questions the further I progress in a game	15	2
5	As a user I would like to place a block and then answer the corresponding question.	10	2
6	As a user I would like to Increase/Decrease the size of the grid/game board.	5	2
7	As a user I would like to choose how many blocks to connect in order to win.	5	2
8	As a user I would like to play with power ups on certain tiles of the grid/ game board. (If time permits)	20+	2
9	As a user I would like to have a time limit to answer the question once I place my block.	8	2
10	As a user I would like to allow my friend attempt the question if I failed to answer it correctly. (If time permits)	7	2
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)	4	2
12	As a user I would like to mark questions that I had difficulty answering.	4	1
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)	5	2
14	As a user I would to restart/ end a game before the game itself finishes.	3	2
15	As a user I would like to have the questions get more difficult when I am closer to winning.	15	2
16	As a user I would like to play against an AI when playing solo	20+	2

17	As a user I would like to vote for how good/bad a question is	12	1
18	As a user I would like to have a folder of incorrect questions at the end of the game to review	7	1
19	As a user I would like to filter and sort through categories as well as see the popularity of the categories	10	1
20	As a user I would like to have the option to have a random category of study	5	1
21	As a user I would like to register for an account and login to maintain the user data	15	1
22	As a user I would like to access settings for questions and game	10	1
23	As a user I would like to read about the rules and learn about how to play the game	5	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.

Action

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

System Response

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

Action

1. The user is close to winning and places a piece

System Response

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.

Action

1. The user places a piece
6. The user answers 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

6. As a user I would like to Increase/Decrease the size of the grid/game board.

Action

1. The user selects "Start Game"

System Response

2. Goes to page with game options

- | | |
|------------------------|---|
| 3. Choose size of grid | 4. Display preview of grid |
| 4. Click "Ok" | 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.
- | | |
|--|-----------------------------------|
| Action | System Response |
| 1.The user selects "Start Game" | 2. Goes to page with game options |
| 3. Choose number of pieces for win condition | |
| 4. Click "Ok" | |
-
8. As a user I would like to play with power ups on certain tiles of the grid/ game board. (If time permits)
- | | |
|------------------------|--|
| Action | System Response |
| 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 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 | System Response |
| 1.Places a piece | 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 | System Response |
| 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 if the answer is correct/incorrect |
| | 9. If the answer is incorrect, human opponent gets to try the same question |
| 10. Answer the 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.

Action

1. Clicks restart
3. Clicks yes

System Response

2. Display popup to confirm a restart (yes/no)
4. System resets the game

1. Clicks end
3. Clicks yes

2. Display popup to confirm a end (yes/no)
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.

Action

- 1.Places a piece

System Response

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

Action

- 1.Places a piece
6. Answer the question
11. 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. Our AI places a block and retrieves a question
10. The user is prompted with 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

Action

1. Game Over, Review

6. Review/Play Again

System Response

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
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

Action

1. Start Game/Restart

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 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