

Product Requirements Document (PRD)

Name: Bridge

Version: 1

1. Objective

The overall goal of Bridge is to enhance the classroom experience by making learning interactive, engaging, and adaptive to different learning styles.

Problem:

Traditional learning methods often struggle to keep students engaged, especially in classrooms where lecture-based teaching dominates. Students may not be actively participating, leading to lower retention of knowledge and lack of motivation.

Users:

- **Primary Users:** Teachers and students in educational settings (K-12, higher education).
- **Secondary Users:** School administrators and educational institutions interested in improving student engagement and learning outcomes.

Primary Objective:

The primary objective of **Bridge** is to provide an interactive learning platform that:

- Engages students through gamified learning experiences.
- Allows teachers to monitor real-time progress and adapt lessons to student performance.
- Supports diverse learning needs through customized question difficulty and pacing, making learning both fun and educational.

By integrating gaming elements into the learning process, Bridge aims to foster a more dynamic and enjoyable learning environment that boosts student participation and understanding.

2. Key Features

Feature 1: Interactive Question Gameplay

- Players answer questions while navigating along a virtual road, encountering obstacles. The gameplay creates an engaging environment where players can progress by answering correctly, with bridges presenting more challenging questions.

Feature 2: Topic and Question Customization

- Teachers can select or create question sets based on various subjects or difficulty levels. This allows for tailored content, ensuring the game is aligned with specific learning goals and lesson plans.

Feature 3: Real-Time Progress Tracking

- Teachers can monitor student progress in real-time during gameplay, providing immediate feedback and adjusting instruction based on performance data.

Feature 4: Difficulty Scaling (Bridge Challenges)

- Harder questions, represented by bridges, challenge students at different points in the game, adapting to individual student performance or overall class level.

Feature 5: Multi-Player and Solo Modes

- Bridge can be played individually or in multiplayer mode, where students compete or collaborate in a classroom or virtual environment, adding a social learning aspect.

Feature 6: Leaderboards and Rewards

- A leaderboard system motivates students by showing their rank among peers, and rewards can be integrated to encourage continued engagement.

3. Use Cases

User Story 1:

As a teacher, I want to create a custom set of questions for my class, so that I can align the game with the lesson I'm teaching and reinforce key concepts.

User Story 2:

As a student, I want to play the game with my classmates in a competitive mode, so that I can challenge myself and see how my knowledge compares to others.

User Story 3:

As a teacher, I want to track real-time progress of each student during the game, so that I can identify who needs more help and adjust my teaching accordingly.

User Story 4:

As a student, I want to play the game in solo mode, so that I can practice and improve my understanding of the subject at my own pace.

User Story 5:

As a teacher, I want to review detailed analytics after a game, so that I can assess overall class performance and identify learning gaps.

User Story 6:

As a student, I want to encounter more difficult questions at specific points in the game (bridge challenges), so that I can push myself to master tougher topics.

4. User Flow

What is the journey the user will take through the product?

In Bridge, the user journey starts with the teacher logging in to create or select a question set and customize the game settings, such as the number of questions and difficulty level. Once set up, the teacher launches the game, and students join using a game code, creating their nickname and entering the game lobby.

During the game, students answer questions as they move along a virtual road, encountering regular obstacles and more difficult "bridge" challenges. The teacher monitors real-time progress through a dashboard, tracking each student's performance and providing support or adjustments as necessary. Students receive immediate feedback after each answer, which allows them to continue progressing in the game.

At the end, students see their final scores and rankings on the leaderboard, while teachers receive detailed analytics on both individual and class-wide performance. These insights help teachers adjust future lessons, address learning gaps, and offer targeted feedback,

making Bridge an engaging and data-driven educational tool for both students and teachers.

5. Functional Requirements

1. Interactive Question Gameplay

1.1. The system must allow students to move along a virtual road and encounter obstacles (questions).

1.2. Questions must be pulled from a pre-set or custom-created question bank.

1.3. Correct answers should advance the player, while incorrect answers provide immediate feedback and retry options.

2. Topic and Question Customization

2.1. Teachers must be able to create custom question sets or select from a pre-made library.

2.2. Question sets must be organized by topic and difficulty level, allowing flexibility for lesson planning.

2.3. Teachers should have the ability to set the number of questions and adjust the difficulty scaling (including bridge challenge points).

3. Real-Time Progress Tracking

3.1. The system must provide a teacher dashboard that tracks individual student performance in real-time.

3.2. Progress should be visually represented, with student scores, time spent on questions, and percentage of correct answers displayed live.

3.3. Teachers must have the ability to pause or adjust the game based on real-time progress feedback.

4. Difficulty Scaling (Bridge Challenges)

4.1. Certain questions (bridge challenges) must have higher difficulty, designed to test advanced knowledge.

4.2. The system must dynamically insert these bridge challenges at specific intervals during gameplay.

4.3. Feedback on these more difficult questions should be enhanced, offering hints or learning points before retrying.

5. Multi-Player and Solo Modes

- 5.1. Students must be able to play in multiplayer mode, competing or collaborating with classmates, or in solo mode.
- 5.2. Multiplayer functionality should allow real-time synchronization across multiple devices.
- 5.3. Game sessions should allow flexibility to switch between solo or multiplayer during setup.

6. Leaderboards and Rewards

- 6.1. The system must display a leaderboard at the end of the game, ranking students based on their performance.
- 6.2. Teachers should be able to set custom rewards or incentives for top performers.
- 6.3. Leaderboard data should be saved for review and analysis after the game.

7. Customizable Game Settings

- 7.1. Teachers must be able to configure the number of questions, game duration, and difficulty before the game starts.
- 7.2. The system should support saving game settings for reuse in future sessions.
- 7.3. Students should be able to adjust game settings, such as avatar or profile customization.

8. Analytics and Reporting

- 8.1. The system must generate detailed performance reports for each student and class-wide results after the game.
- 8.2. Analytics should include correct/incorrect answers, time spent per question, and progression trends.
- 8.3. Teachers should have the ability to download or export performance data for future use.

6. Non-Functional Requirements

Performance Requirements:

- **Scalability:** The platform must support large groups of students (up to 100) in real-time multiplayer mode without performance degradation.
- **Response Time:** The system should provide real-time feedback within 1 second of answering a question, ensuring smooth gameplay.

- **Availability:** The system must have 99.9% uptime during school hours to ensure continuous availability for classroom use.
- **Cross-Platform Compatibility:** The game should run seamlessly across web browsers, tablets, and smartphones (iOS and Android) with consistent performance.

Security Requirements:

- **Data Encryption:** All communication between users (teachers and students) and the platform must be encrypted using SSL/TLS protocols to protect sensitive data.
- **User Authentication:** Teachers and students must authenticate using unique credentials to prevent unauthorized access to the system.

7. Success Metrics

How will success be measured?

Metric 1: User Engagement

- **How it will be measured:** Track the average time spent per game session by students and the frequency of game usage by teachers. A successful metric would show high engagement with students spending at least 20 minutes per session and teachers using the platform in 50% of their lessons each week.

Metric 2: Student Performance Improvement

- **How it will be measured:** Compare pre- and post-game assessment scores to measure knowledge retention and improvement. Success would be reflected by at least a 15% improvement in student scores after using Bridge over a semester.

Metric 3: Teacher Adoption Rate

- **How it will be measured:** Track the number of teachers registering for the platform and the percentage who actively use it. A target success metric would be 80% of registered teachers using the platform regularly within 3 months of registration.

Metric 4: System Reliability (Uptime)

- **How it will be measured:** Monitor system uptime, aiming for 99.9% availability during peak classroom hours. Success would be maintaining minimal downtime throughout the school year.

8. Assumptions

What assumptions are you making about the solution or its users?

Assumption 1: Teachers and students will have access to reliable internet connections and devices capable of running the Bridge platform, ensuring seamless participation in the game.

Assumption 2: Teachers are willing to integrate technology into their lesson plans and invest time in learning how to use Bridge effectively in the classroom.

Assumption 3: Schools will provide necessary support, including training and troubleshooting, to help teachers implement Bridge in their classrooms.

Assumption 4: Students will be motivated by the gamified learning approach and engage actively with the platform without needing constant external encouragement.

9. Dependencies

What other projects, teams, or resources are needed?

Dependency 1: IT and Infrastructure Support

Reliable server hosting and network infrastructure are required to ensure the platform is available and scalable for large groups of students. This will require collaboration with external IT teams or service providers.

Dependency 2: Content Creation Team

A team is needed to develop the initial library of question sets and templates for teachers. This may involve working with educators or subject matter experts to create high-quality, diverse content.

Dependency 3: Training and Support Team

A dedicated team is necessary to provide training resources (videos, guides) and real-time technical support for teachers as they adopt the platform in their classrooms.

Dependency 4: User Experience Design Team

A design team will be needed to refine the user interface and experience based on feedback from initial pilot testing, ensuring the product is easy to use for both teachers and students.

10. Timeline

What is the expected delivery schedule?

Milestone 1: Prototype Development (Month 1-2)

- Complete initial development of the core features (interactive gameplay, question customization, multiplayer/solo modes) and create a functional prototype based on the wireframes.

Milestone 2: User Interface & Experience Design (Month 2-3)

- Finalize the design of the user interface (UI) and improve the user experience (UX) based on early feedback from teachers and students through wireframe testing and feedback sessions.

Milestone 3: Testing and Feedback (Month 3-4)

- Conduct testing with a small group of teachers and students, gathering feedback on gameplay, interface usability, and technical performance. Incorporate feedback into the next development iteration.

Milestone 4: Beta Version Launch (Month 4-5)

- Release a beta version of the product to a larger group of schools for in-classroom use. Collect data on system performance, user engagement, and reliability.

Milestone 5: Full Release and Training Rollout (Month 5-6)

- Launch the final version of Bridge to all users with full teacher training resources, comprehensive support channels, and marketing outreach to schools and districts.

Milestone 6: Post-Launch Support and Updates (Month 6-12)

- Provide ongoing technical support, monitor system performance, and roll out periodic updates based on user feedback and any emerging needs in classroom environments.