

## PROJECT REQUIREMENTS

### Project Name

ClassQuest

### Functional Requirements

1. User Accounts and Authentication
    - a. Students and teachers have individual accounts. Teachers sign up using email, username, initializing double authentication. Students join the classroom with code, first name, and creating unique password.
    - b. Teachers manage the classroom, reset student accounts, and control access.
    - c. Secure login system with minimal data collection.
  2. Avatars and Customization
    - a. Each student has a 2D avatar with progressive upgrades at level milestones.
    - b. Different avatars with different powers like healers replenish hearts, mages replenish shields, guardians protect. The powers are being restored over the weekend.
    - c. Cosmetics items that can be purchased from shops and stored in inventory. Hats, shields, pets, accessories appear as overlays.
  3. Game Mechanics
    - a. Core mechanics include earning XP, gold and hearts.
    - b. Side quests (assignments) represented on a visual map with checkpoints.
    - c. Boss battles (exams) where correct answers damage the boss and wrong answers damage the guild.
    - d. Random daily events to create variety and engagement.
  4. Rewards and Penalties
    - a. In game progression: XP and gold for assignments, exams, and in-game tasks.
    - b. Teachers can issue manual rewards or penalties like loss of XP, gold, hearts. Teachers must approve quest completion before rewards are granted.
    - c. Partial rewards possible for group work even if some members fail to participate.
    - d. Item shop for students to spend gold on upgrades or cosmetic items.
  5. Collaboration and Competition
    - a. Students grouped into guilds that collaborate during boss battles and quests.
    - b. Leaderboards show limited ranking (individual placement and distance from next place). Teachers should be able to show the top 10 in the class.
    - c. Guild collaboration includes unlimited "helping" (healing, protection, etc.).
    - d. The teacher can see the full leaderboard for complete performance data.
  6. Teacher Tools
    - a. Dashboard for creating and managing quests, boss battles, and random events.
    - b. Templates for quests and assignments to save setup time.
    - c. Manual override to adjust XP, gold, hearts, or penalties.
    - d. Ability to run demo games.
  7. Parent Involvement (future development, not in focus)
    - a. Parent accounts with view-only access to student progress.
    - b. Option to provide cosmetic contributions via quests.
  8. Security and Privacy
    - a. Compliance with FERPA/provincial data rules.
    - b. Only minimal personal data collected.
    - c. Teacher permission to reset passwords when students forget them.
  9. Content Flexibility
    - a. Teachers create their own quests, assignments, and exam questions.
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- b. The system can adapt for all subjects by providing templates for different use.
  - c. Teachers can share quests and boss battles across school.

## Technical/Performance Requirements

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[This section should list the technical requirements for the project (e.g., the required technology infrastructure) and any performance requirements (e.g., the minimum response time).]

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1. Technology Infrastructure
  - a. Platform Delivery: Web-based application accessible on Chromebooks (primary classroom device) and standard browsers.
  - b. Device Support: Must run on low-end hardware used in schools (Chromebooks, tablets, PCs) without requiring extra installations.
  - c. Server Hosting: Cloud-hosted backend with secure authentication and data storage.
  - d. Data Storage: Minimal personal data (first name + last initial, generated username, password). Compliance with FERPA and provincial privacy regulations.
  - e. Scalability: System must support classroom-level deployment with the ability to expand across schools and districts.
  - f. Teacher Tools: Accessible via web browser; requires no technical/database knowledge.
2. Performance Requirements
  - a. System Uptime: 99.9% availability during school hours.
  - b. Response Time: Core interactions (loading quests, updating XP, leaderboard refresh) should occur in under 2 seconds on classroom internet connections.
  - c. Concurrency: Must support at least 30+ simultaneous student users per classroom session without degraded performance.
  - d. Data Sync: Teacher updates to XP, gold, or penalties must propagate to student devices in real time (<1 second latency).
  - e. Load Handling: Must handle spikes during boss battles or guild events when many actions happen at once.  
Security: All communication encrypted (HTTPS/TLS). Passwords stored with hashing + salting. Teacher/admin controls require role-based access.
  - f. Backup & Recovery: Automated daily backups of user data and progress. Recovery system to restore functionality within 1 hour of failure.
3. Accessibility & Compatibility
  - a. Compatible with major browsers (Chrome, Firefox, Edge, Safari).
  - b. Basic accessibility included at MVP stage; scalable for future screen reader support, dyslexia-friendly fonts, and color-blind modes.
  - c. Mobile companion support optional in future, but platform must be optimized for classroom Chromebooks.