

Access to Quality Education: Minnow

CS 411W Lab II Draft v2

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1. Introduction

Access to quality education remains a significant challenge for students in under-resourced communities, where traditional learning methods often fail to address diverse learning needs and accessibility barriers. Minnow is designed to bridge this gap by providing a web-based educational platform that delivers personalized, inclusive, and engaging learning experiences. By combining adaptive learning technology, accessibility tools, gamification, and offline access, Minnow empowers students to learn effectively anytime and anywhere.

1.1. Purpose

The purpose of this Software Requirements Specification (SRS) is to define the functional and non-functional requirements for the Minnow website. This document serves as a reference for developers, designers, and stakeholders to ensure that all expectations and goals are clearly defined prior to the implementation phase. It establishes a shared understanding of the system's intended features, behavior, and design constraints, promoting accuracy and consistency throughout the developmental lifecycle.

1.2. Scope

Minnow is a web-based educational platform designed to improve access to quality learning resources for students in under-resourced communities. The system supports personalized and inclusive learning through adaptive lessons, accessibility tools, and multilingual support. By integrating gamified learning elements, offline capabilities, and real-time feedback, Minnow aims to increase student engagement and academic performance. Teachers, parents, and students each have dedicated dashboards to monitor progress and facilitate communication. The overall goal is to reduce educational inequities by making effective learning materials available anytime and anywhere.

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1.3. Definitions, Acronyms, and Abbreviations

- **Accessibility Tools** – Features such as text-to-speech, subtitles, and visual aids that support diverse learning needs.
- **Adaptive Learning** – Technology-driven learning that adjusts difficulty or content based on student performance.
- **Gamification** – The integration of interactive elements such as quizzes, badges, and rewards to boost engagement.
- **Multimodal Learning** – Teaching through multiple modes, such as audio, video, and text.
- **Offline Access** – Ability to download lessons and complete them without internet connectivity.
- **Role-Based Access** – A security feature that ensures users only have permissions appropriate to their role (student, teacher, or parent).
- **SRS** – Software Requirements Specification.

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1.4. References

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1.6. Overview

The remainder of this document provides an overall description of Minnow, including its intended users, major functions, and core system context. Section 2 outlines the product's perspective, primary features, user roles, and relevant constraints. This document will serve as a foundation for later design and development stages.

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2. Minnow Product Description

Minnow is a web-based educational platform designed to increase access to quality learning resources for students in under-resourced communities. It provides an engaging, adaptive, and inclusive learning environment by combining personalized lesson paths, accessibility tools, and gamified learning elements. Minnow enables students to learn at their own pace, supports multiple languages, and allows offline access to lessons, ensuring continuity in education regardless of internet availability.

2.1. Product Perspective

Minnow functions as a standalone educational website that integrates cloud-based services and adaptive learning models. It operates within the educational technology ecosystem but is distinct from traditional e-learning platforms due to its focus on inclusivity, accessibility, and multilingual support. The website's modular architecture allows for scalable integration with existing educational systems and third-party APIs. Unlike many existing tools, Minnow emphasizes equitable access by offering offline lesson options, speech assistance, and parent-teacher dashboards for holistic student support.

2.2. Product Functions

The key functions of Minnow include:

- **Personalized Learning Paths:** Adaptive lesson delivery based on student progress and learning style.
- **Accessibility Features:** Tools such as speech synthesis, subtitles, and visual enhancements for diverse learners.
- **Gamified Learning Modules:** Interactive quizzes, rewards, and progress tracking to increase motivation.
- **Role-Based Dashboards:** Tailored interfaces for students, teachers, and parents to manage lessons and performance.
- **Multilingual Support:** Lessons available in multiple languages to reach diverse communities.
- **Offline Access:** Ability to download and complete modules without internet connection.
- **Cloud Synchronization:** Automatic progress updates when connectivity is restored.

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2.3. User Characteristics

- **Students:** Primary users who engage with lessons, complete assignments, and track progress. They range from elementary to high school levels, with varying levels of digital literacy.
- **Teachers:** Secondary users who assign lessons, monitor progress, and analyze performance data through the educator dashboard.
- **Parents/Guardians:** Supportive users who can monitor student performance and access recommendations to assist at home.
- **Administrators (Future Expansion):** System-level users responsible for maintaining data integrity and managing access permissions.

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2.4. Constraints

N/A

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2.5. Assumptions and Dependencies

N/A

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