

Access to Quality Education: Minnow

Lab 2

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## 1 Introduction

### 1.1 Purpose

This Software Requirements Specification (SRS) document will serve to provide a blueprint for the creation of the *Minnow* software. It will ensure a unified and streamlined development experience for all involved, including but not limited to developers, clients, stakeholders, and quality assurance testers.

## 1.2 Scope

Access to quality education remains a pervasive issue, particularly in underserved communities and for individuals with diverse learning needs. Traditional teaching methods often fail to address different learning styles, disabilities, or socio-economic challenges, leaving many students without the necessary resources to thrive. Despite advances in technology, the education system struggles to integrate tools that promote equitable and personalized learning opportunities at scale.

Minnow is the solution to fixing this problem, a website that allows students and teachers to bridge the gap their current materials cannot accomplish. It will foster collaboration with dashboards for students, teachers, and parents. *Minnow* will provide an educational platform that personalizes learning experiences through adaptive lesson plans and multimodal tools including *text-to-speech* and closed captioning. It will come with built-in accessibility features, gamified learning, and multilingual support. It will also leverage modular learning, cloud technologies, and real-time communication. Minnow will enhance engagement and ensure equitable education for all.

### **1.3 Definitions, Acronyms and Abbreviations**

**Accessibility Tools** – Features such as text-to-speech, closed captioning, and visual aids that support diverse learners.

**Gamification** – The use of interactive lessons, quizzes, and rewards to enhance student engagement.

**Multimodal Learning** – An approach that integrates various forms of content delivery, including visual, auditory, and interactive methods.

**Personalized Learning** – Adaptive lesson plans that adjust based on a student's strengths and weaknesses.

**Role-Based Access** – A security feature that ensures users (students, teachers, parents) have appropriate permissions based on their role.

**Secure Authentication** – Measures to protect user privacy and maintain data security.

**Virtual Tutoring** – Online support resources designed to assist students outside of traditional classroom settings.

## 1.4 References

Team Crystal, (2025, October 06). Lab 1 – Minnow Product Description.

Retrieved October 28, 2025 from [https://mray008.github.io/CS411W\\_CrystalProject/labs.html](https://mray008.github.io/CS411W_CrystalProject/labs.html)

“Challenges of Traditional Schooling: World Schools.” *World Schools - Find the Best International Schools Worldwide*, 17 Apr. 2024, <https://world-schools.com/challenges-of-traditional-schooling/>.

National Center for Education Statistics. *The Condition of Education 2024*. U.S. Department of Education, Institute of Education Sciences, 2024,  
<https://nces.ed.gov/pubs2024/2024144.pdf>.

Oudat, Qutaibah, and Mohammad Othman. *Embracing Digital Learning: Benefits and Challenges of Using Canvas in Education*. 06 2024,  
<https://doi.org/10.5430/jnep.v14n10p39>.

“What Is the Problem with Traditional Education Methods? - High School of America.” *High School of America - High School Diploma Online | Online High School and Homeschool Curriculum*, 3 Aug. 2022, [www.highschoolofamerica.com/why-traditional-education-methods-are-becoming-outdated/](http://www.highschoolofamerica.com/why-traditional-education-methods-are-becoming-outdated/).

Manjaly, Stalin J. “Duolingo Accepted Universities in USA for 2024 Intake.” LeapScholar, 13 Nov. 2024, <https://leapscholar.com/blog/duolingo-accepted-universities-in-usa/>.

“Learn a Language for Free.” Duolingo, 11 Feb. 2025, <https://www.duolingo.com/>.

*The unrealized promise of high-quality instructional materials*. NASBE. (n.d.).  
<https://www.nasbe.org/the-unrealized-promise-of-high-quality-instructional-materials/>.

Sy Doan, Anna Shapiro - “Do teachers think their curriculum materials are appropriately challenging for their students? findings from the 2023 American Instructional Resources Survey” | rand. (n.d.). [https://www.rand.org/pubs/research\\_reports/RRA134-21.html](https://www.rand.org/pubs/research_reports/RRA134-21.html).

*From the desk of the CEO: Changing the systems that perpetuate poverty and low literacy.*

ProLiteracy. (n.d.). <https://www.proliteracy.org/news/from-the-desk-of-the-ceo-changing-the-systems-that-perpetuate-poverty-and-low-literacy/#:~:text=In%20the%20most%20recent%20National,of%20improvements%20among%20disadvantaged%20students>

Coe - education expenditures by country. (n.d.).

<http://nces.ed.gov/programs/coe/indicator/cmd/education-expenditures-by-country>

## 1.5 Overview

This Software Requirements Specification (SRS) document outlines the functional and non-functional requirements of the *Minnow* software system. The document is structured to provide a clear understanding of the system's purpose, its overall description, and the specific requirements needed for development and implementation.

The document is organized as follows:

- Section 2 provides an overall description of the system, including its product perspective, functions, user characteristics, constraints, assumptions, and dependencies.
- Section 3 details the specific requirements of the system, describing external interfaces, functional requirements, performance requirements, design constraints, and system attributes.
- Supporting information such as references, appendices, and additional relevant documentation is included as needed.

## 2 Overall Description

### 2.1 Product Perspective

*Minnow* is an adaptive learning platform designed to enhance education through personalized lesson plans and interactive engagement. It supports diverse learners with accessibility features and a collaborative dashboard for tracking progress. While *Minnow* supplements traditional education, it does not replace formal schooling, provide certifications, or guarantee academic improvement. Instead, it offers a flexible, curriculum-based resource accessible anytime with an internet connection.

## 2.2 Product Functions

<i>Real World Product vs. Prototype</i>			
Features & Functionality	RWP	Prototype (Planned)	Prototype (Actual)
<ul style="list-style-type: none"> <li>• Personalized learning</li> <li>• Multimodal tools</li> <li>• Gamified modules</li> <li>• Multilingual compatibility</li> <li>• Resource Library</li> <li>• Collaborative Dashboard</li> </ul>	<ul style="list-style-type: none"> <li>• Personalized learning</li> <li>• Multimodal tools</li> <li>• Gamified modules</li> <li>• Multilingual compatibility</li> <li>• Resource Library</li> <li>• Collaborative Dashboard</li> </ul>	<ul style="list-style-type: none"> <li>• Collaborative Dashboard</li> <li>• Gamified modules</li> </ul>	N/A

Figure 1: Real World Product vs. Prototype Table

As shown in *Figure 1* the product *Minnow* should at minimum contain:

- A collaborative dashboard
- Gamified modules

## 2.3 User Characteristics

Users of *Minnow* include Student Users, Educator Users, and Admin Users. Student users are typically under the age of 18 and are enrolled in some sort of formal education. Educator users are assumed to be adults in a position of power in a formal educational setting. Admin users are those within the *Minnow* development team. The following characteristics of each user type are assumed:

### 1. Student Users

- Users should be comfortable interacting with web-based technology, including but not limited to clicking, dragging, and selecting interactable modules, using the user's web browser of choice's integrated search bar, and understanding how to navigate a menu to access other pages of *Minnow*.
- Users should also have a basic understanding of their language of choice whilst using *Minnow*

### 2. Educator Users

- Users should be comfortable interacting with web-based technology, including but not limited to clicking, dragging, and selecting interactable modules, using the user's web browser of choice's integrated search bar, and understanding how to navigate a menu to access other pages of *Minnow*.
- Users should also have a basic understanding of their language of choice whilst using *Minnow*
- Users must be able to source or create ideas for their modules in *Minnow*.

### 3. Admin Users

- Users should be comfortable reading and understanding JSX syntax and code structure.
- Users must have a basic understanding of troubleshooting issues related to *Minnow*.
- Users are required to have a deep and thorough understanding of the workings of *Minnow*.

## **2.4 Constraints**

N/A

## **2.5 Assumptions and Dependencies**

N/A