Pixel: A Convenient Learning Management System

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Overview

PixelLMS is a versatile web-based platform crafted to enhance online learning experiences. It integrates essential features like course management, secure login, role-based access, and communication tools to streamline education for institutions, training programs, and educators. Its design prioritizes ease of use, enabling educators and learners to focus on their goals without technical distractions.

Features

User Authentication and Authorization

PixelLMS ensures secure access with password hashing and token-based authentication. The system's role-based permissions grant specific access rights to students, teachers, and admins, ensuring data protection and system stability.

Course Management

The platform offers tools for teachers to create, organize, and manage courses. From defining objectives to uploading multimedia materials, it simplifies administration. Features like batch enrollment and progress tracking ensure an efficient workflow.

Task and Assessment Management

Teachers can assign tasks and manage submissions with ease. The system supports automated grading and detailed scheduling to align with diverse learning paths.

Messaging and Notifications

Built-in messaging enables direct and group communication, while notifications keep users updated on key events like deadlines or announcements. Discussion forums encourage collaborative learning.

File and Calendar Management

Users can upload and share files securely, while the integrated calendar allows event scheduling and visibility across teams. These features support seamless resource and time management.

Technical Details

Architecture

Using the Model-View-Controller (MVC) framework, PixelLMS ensures clean code organization and scalability. This design allows for easy maintenance and component updates.

Security Implementation

The platform employs token-based authentication to manage security and user sessions. The Middleware filter (`TokenInterceptor` class) handles unauthorized access, protecting sensitive operations. The backend integrates `TokenStore` and `PermissionChecker` for handling sessions, credential validation, and user permissions. Singleton patterns streamline resource management.

Error Handling

Global advice exception handling mechanisms provide clear feedback while ensuring system reliability, even under unexpected conditions.