

1 - Introduction

AthenaSP is an interactive student portal designed to improve communication, engagement, and accessibility within higher education environments. Many universities currently rely on multiple disconnected platforms for messaging, coursework, reminders, and academic resources, creating unnecessary complexity and increased cognitive load for students.

This project explores whether integrating **real-time messaging** and **gamification features** into a single centralised platform can create a more engaging and user-friendly student experience.

2 – Aim & Objectives

Aim:

To design and develop an interactive student portal that combines secure messaging and gamification features to improve student engagement, communication, and overall user experience.

Objectives:

- Review existing research on student portals, communication systems, and gamification
- Design and develop a fully functional prototype
- Evaluate the system's usability, engagement, and security
- Compare AthenaSP against existing university platforms
- Investigate the benefits and challenges of integrating communication and gamification within higher education systems

3 – Research Overview

Literature Review Summary

Existing university platforms often suffer from fragmentation, requiring students to switch between multiple systems such as Moodle, Microsoft Teams, Outlook, and email services. This tool-switching increases cognitive load and negatively impacts usability and engagement.

Key Findings from Research

- Real-time messaging improves collaboration and communication
- Gamification features increase motivation and participation
- Leaderboards, points, and badges encourage engagement
- Intuitive design and accessibility are essential for adoption
- Centralised systems reduce frustration and improve efficiency

Research Gap Identified

While messaging systems, gamification, and usability have been widely studied individually, there is limited research into combining these features within a single secure student portal. AthenaSP addresses this gap by integrating these systems into one cohesive platform.

4 – Design & Implementation

The final system is a centralised web-based student portal called AthenaSP. The platform was developed using PHP, MariaDB, HTML, CSS, and JavaScript within a local XAMPP environment.

Core Features

- Secure real-time messaging system
- File attachment support
- Points and reward mechanisms
- Badges and achievement tracking
- Dynamic leaderboard system
- Role-based access control
- Lecturer and student user accounts
- Google Translate integration
- Responsive dashboard interface



5 – Testing & Results

A mixed-methods approach was used for evaluation. A survey was completed by 15 participants and structured observations with interviews were conducted with 5 participants, comparing AthenaSP to the current UWTSB HWB portal.

Key Results:

- **100%** of participants preferred AthenaSP over the existing university portal.
- Centralisation reduced mental strain and tool-switching.
- Gamification features scored highly for motivation and enjoyment.
- Participants completed tasks faster with fewer tabs and logins.
- Messaging performed fully in the local environment.
- Overall, the results demonstrated clear improvements in usability, engagement, and user satisfaction.

24. I would prefer using AthenaSP over my previous separate tools (e.g., Moodle + Teams + Outlook) for future studies. [More details](#)



6 - Conclusion

Project Outcome

AthenaSP successfully demonstrates how combining **secure real-time messaging** and **gamification systems** within a single centralised platform can improve the student experience in higher education.

The platform reduced fragmentation and cognitive load while increasing communication, motivation, and engagement among users.

Key Achievement

The project provides a strong proof-of-concept for the future development of interactive and student-focused university portal systems.

7 - Recommendations

Future Enhancements

- Deploy AthenaSP on a live university environment.
- Introduce WebSocket support for full real-time communication
- Expand gamification with collaborative challenges and progression systems
- Add improved lecturer management tools
- Integrate AI assistants and document features
- Add improved communication tools like video messaging.

Potential Impact

AthenaSP demonstrates the potential for more engaging, efficient, and inclusive digital learning environments across higher education institutions.

Explore AthenaSP Online

Scan the QR code to access the full AthenaSP exhibition hub.

Available Content:

- Full project report (PDF)
- Survey xlsx file
- NotebookLM generated project podcast
- NotebookLM generated project explanatory video

