

Independent Project Proposal

by Jake Semmens

Submission date: 15-Oct-2025 01:43PM (UTC+0100)

Submission ID: 265528390

File name: 51179_Jake_Semmens_Independent_Project_Proposal_695044_262141247.docx (44.27K)

Word count: 1920

Character count: 12032

Research Proposal

The Design and Implementation of an Interactive
Student Portal with Messaging and Reward
Mechanisms

Preferred Supervisor: James Williams

Jake Semmens

1,625 Words

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1. Introduction

In the modern era, university students are heavily reliant on the use of online portals to access academic information, course materials, and communication tools. While many institutions provide basic platforms offering static information such as timetables and external links, these systems are often limited in function but not limited in potential.

The motivation behind this project stems from the need to improve the student digital experience by providing a platform that not only provides essential academic information but also spur on interaction and motivation. The implementation of a secure messaging system within the portal will enable students to communicate with each other and lecturers, supporting collaboration, peer learning, and more. The further implementation of a points-based rewards system also encourages student participation by rewarding positive behaviour such as lecture attendance, the completion of tasks, or contribution to in class discussion. This gamification aspect is informed by research suggesting that “gamification techniques, including points, badges, and leaderboards, can significantly enhance student motivation” [1].

The importance of this project lies in its ability to demonstrate full-stack software engineering principles in a practical, applied context. It requires database design, backend logic, frontend development, security considerations, and user interface design, reflecting a comprehensive skill set developed across two years of university studies.

This project aims to provide a modern, interactive, and secure student portal aimed at enhancing usability, communication, and overall student experience while also displaying a robust demonstration of applied software engineering skills.

2. Background to the Proposed Research

Digital and interactive systems in higher education are becoming increasingly common as universities look to improve student engagement, communication, and motivation. This shift has been supported by developments in gamification, communication tools, student portals, and ongoing debates around privacy, usability, and personalisation.

Gamification, the use of game-like elements such as points and leaderboards, has been widely studied for its ability to influence motivation and engagement. A number of studies show positive effects in higher education, including “significantly greater student engagement in forums and projects; higher rates of attendance, participation, and material downloads; increased quantity (and continued quality) of student contributions/answers, higher passing rates, increased volunteering, and undertaking of difficult assignments; as well as a reduction in student achievement gaps” [1]. In other words, gamification can boost both participation and outcomes when designed well.

However, the results are not always positive. A systematic review showed that while most students (59%) reported empowerment, motivation, and positive behavioural changes, a sizeable proportion (41%) experienced mixed or neutral effects. There are also examples outside of education where gamification has failed. For instance, at a Disneyland Resort Hotel, California, in 2018. “The hotel decided to use leaderboards updated in real-time to stimulate its workers to clean sheets and towels more efficiently. The initiative backfired hard because the competition degenerated the environment’s quality, caused extra stress, and increased the number of injuries on the job” [2]. These findings highlight that while gamification has strong potential, it must be carefully designed to avoid negative outcomes.

Alongside motivation, communication plays a significant role in academic success. Many students already use apps such as WhatsApp, Telegram, and Discord to collaborate and share resources. Research suggests that “most experimental studies reported positive effect, especially when MIM was used to supplement course content in interactive class activities” [3]. Messaging systems have been shown to improve motivation, participation, satisfaction, and perceived learning. In addition, “the availability of non-verbal cues, such as emoticons, emojis, and stickers, can convey emotions in student interactions and make online conversations livelier and friendlier” [3]. This evidence shows how messaging tools can provide a more engaging and collaborative environment compared to static email-based systems.

Even in specialised contexts, such as medical education, secure messaging has been trialled successfully. One study found that “students, faculty, and residents have high levels of satisfaction with utilization of Secure Chat and the impact it has on communication with team members and education” [4]. This demonstrates the wider potential of messaging systems when combined with strong usability and data protection.

Usability is another crucial factor for student systems. Even the most advanced features can be undermined by poor design. Research has shown “a significant positive relationship between portal system ease of use and functionality, and students’ satisfaction” [5]. Similarly, a study using eye-tracking methods found that “unclear layouts and poor categorisation hindered efficiency” [6]. If portals are cluttered or confusing, students are less likely to use them, regardless of their potential benefits.

Students also expect more than just access to timetables or documents. Researchers argue that transactional features such as interactive tools are “as important as static content” [7]. Despite this, many existing portals remain limited, primarily serving as signposts to external systems. This creates a gap between student expectations and what most institutions currently offer.

Alongside functionality, privacy and data governance are also essential considerations. Research on smart campuses has highlighted “tensions between functionality and data security, particularly with platforms that combine IoT, messaging, and personalised learning” [8]. At the same time, “students are increasingly concerned about how their personal data is used” [9]. For a system to succeed, it must strike a balance between convenience and strong safeguards for personal information.

From this literature, several gaps emerge. Firstly, gamification has been tested extensively in e-learning environments, but rarely in general-purpose student portals. Second, while messaging systems are known to support engagement, most universities rely on external apps rather than embedding real-time communication securely within their platforms. And finally, usability studies consistently show dissatisfaction with existing portals, but few projects attempt to redesign them to meet modern expectations.

This project will address these gaps by redeveloping a student portal that combines traditional features with secure messaging and gamified rewards. In doing so, it explores not only the technical challenges of integration but also the wider question of how design choices affect engagement, satisfaction, and trust. By focusing on motivation and usability as much as functionality, the project contributes to ongoing debates about the future of digital learning environments and how they can better serve students.

3. Research Problem statement

Many university student portals remain underdeveloped, offering only static information such as timetables or links to external systems. These platforms fail to engage students, lack integrated communication tools, and do not motivate participation beyond basic academic requirements. At the same time, research shows that gamification and real-time messaging can improve motivation, collaboration, and satisfaction when applied effectively. The problem is that existing portals do not incorporate these features, resulting in a missed opportunity to enhance the student experience.

4. Research Aim & Objectives

Aim:

The aim of this project is to design and develop an improved student portal that integrates secure messaging, and gamification features to increase student engagement, motivation, and communication, addressing the limitations of existing university portals.

Objectives:

1. To review existing research on gamification, communication systems, and student portals to identify good practices.
2. To design and implement a prototype portal that integrates key features such as secure messaging, reward points, and interactive navigation.
3. To test and evaluate the usability, engagement, and security of the developed system.
4. To compare the proposed system against existing portals and highlight improvements in functionality and student experience.
5. To reflect on the challenges of integrating gamification and communication tools within academic systems.

5. Methodology

This project will use a software development approach combined with mixed research methods. The main goal is to build a working student portal while also evaluating how well it improves engagement, usability, and communication. Using both development and research ensures the project produces a functional system and meaningful insights about its effectiveness.

5.1 Methods

The project follows a pragmatic philosophy, focusing on delivering a practical solution rather than testing a single theory. The research strategy is primarily software development, supported by case study elements to compare the prototype with the existing university portals.

Development will use HTML, CSS, PHP, MySQL, and potentially other programming languages as the project develops. Usability testing will involve a small group of students completing tasks such as logging in, messaging, and checking rewards. Data analysis will combine quantitative metrics (task completion time, error rates, satisfaction scores) and qualitative feedback from open-ended survey questions. This combination ensures that both technical performance and user experience are assessed.

5.2 Materials

- **Data source:** Student interaction with the portal and survey feedback.

- **Data collection methods:** Task-based testing and online surveys. These provide measurable outcomes and personal perspectives, appropriate for evaluating engagement and usability.
- **Ethical considerations:** Participants will remain anonymous, participation is voluntary, and no sensitive data will be collected.
- **Software/tools:** HTML, CSS, PHP, MySQL, and potential for other programming languages and software depending on how the project develops; Excel for data analysis; Google Forms or MS Forms for surveys.
- **Hardware:** Personal PC for development, deployment, and testing. No special servers or cloud resources are required.

6 Project Plan

Task	Start Date	Completion Date	Milestone
Project Proposal + Ethics Form	01/10/25	20/10/25	Proposal and Ethics Form submitted by 3pm.
Initial Research	20/10/25	31/10/25	Gathering initial research.
System Design	03/11/25	21/11/25	UI mock-up and database schema finalised.
Implementation - Backend	24/11/25	21/12/25	Database implementation.
Implementation - Frontend	29/12/25	30/01/26	Interactive portal prototype with messaging and gamification features.
Interim Viva Preparation	29/12/25	16/01/26	Interim viva presentation ready.
User Testing Recruitment	31/01/26	06/02/26	Recruit 10 – 15 participants and schedule sessions.
Initial Testing	31/01/26	06/02/26	Internal testing prior to participant testing.
Usability Testing	09/02/26	20/02/26	Conduct tasks with participants; collect quantitative and qualitative data
Data Analysis	23/02/26	16/03/26	Analyse participant data, feedback, and refine system based on results.
Final Usability Testing	16/03/26	27/03/26	Conduct tasks with participants to evaluate improvements after initial feedback.
Final Report	30/03/26	01/05/26	Final report submitted by 3pm.

Final Viva Prep	20/04/26	08/05/26	Viva presentation and talking points ready.
Exhibition	04/05/26	11/05/25	Poster and materials complete.

7. References

- [1] J. Rabaha, R. Cassidy and R. Beauchemin, "Gamification in education: Real benefits or edutainment?," Concordia University, Montreal, Canada, 2018.
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- [3] Y. Tang, K.F Hew, "Effects of using mobile instant messaging on student behavioral, emotional, and cognitive engagement: a quasi-experimental study," International Journal of Educational Technology in Higher Education, 2022.
- [4] L. Nicholas, D. Gurrero, D. Mannuru, "Intergrated secure messaging to enhance medical education: a mixed methods study", BMC Medical Education., 2022
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- [7] A. Abdelhakim, D. Carmichael, A. Ahmad, "Quality evaluation of university web portals: a student perspective", International Journal of Information and Operations Management Education, 2012.
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Independent Project Proposal

GRADEMARK REPORT

FINAL GRADE

GENERAL COMMENTS

87 / 100

PROJECT PROPOSAL – ACCA6020 INDEPENDENT PROJECT

Student: Jake Semmens - **Mark** 87

Intro / A&O (400 words)		
Project title; Identification of a specific problem to be investigated; Well-defined aims and SMART objectives; Explaining why this project is worth doing; Discussion of what the project needs to do in order to be a success; Description any deliverables that will be produced at the end of the project	20	18
Clear project title.		
Identification of a specific problem to be investigated and worthiness & value of the project is clearly outlined.		
The aims and objectives are well-defined.		
Discussion of what the project needs to do to be a success is		

clearly analysed and documented. Good. Intended deliverables that will be produced at the end of the project are also clearly explained.		
Background to the Project / Literature Review (400 words)		

Description of how the work to be done by in the project relates to the work identified in the literature review; Discussion of any ethical issues raised by the project Identifying what has already been done within the field; Topic familiarity; Brief literature review using appropriate sources – 6-8 journal papers and book chapters rather than just websites; Selection of relevant models & concepts		
Description of how the work to be done relates to identified research work is documented and cited. Good. Discussion of ethical issues raised by the project are identified and considered. There is some identification of what has already been done within the field, cited and referenced. Brief literature review using some appropriate sources. Use of citations in 1/2 areas could be extended.	20	18
Project Design (500 words)		
Clear statement of which development methods are to be used and why they are appropriate; Clear statement of which tools are to be used and why they are appropriate; Clear description of how data collected will be analysed	30	23

A research method is clearly documented. – A software development method could also be documented. Statement of which tools to be used and why they are appropriate is documented. Q. Will the application be hosted online for user testing?. Description of how data will be collected and analysed is documented. - Data collection tools could also be stated.		
Resources / Planning (200 words)		
List of any deliverables; Clear diagram showing both timing and resource use; Completed ethics form; Limited and relevant appendices Deliverables stated. Clear diagram showing timing is documented. Ethics form completed.	15	15

Document Presentation		
Correct spelling, grammar and punctuation; Flow of narrative/fluency; Coherence; Word processed ; Correct use of referencing with bibliography; Strict word limit Very good structure, format and presentation. Title page is clear and contains the necessary information, - presentation could be enhanced, consider using a Title page template. Overall an excellent project proposal submission. Well done.	15	13
TOTAL	100	87

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