

Project Proposal - Teifion Gibson

by Teifion Gibson

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Improving Engagement with Home Learning Resources by Gamification of Self Study

Research Proposal

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1. Introduction

With studies focused on student learning and engagement there is a present and identified trend for the creation of these resources being utilised within the context of school/university level education. While its effects are present for application in educational resources little research and software has been created for the application of gamification within education at home, such as self interest learning.

This project will be utilising gamification to develop a solution in the creation and utilisation of self interest learning.

As defined in the study "Exploring Gamification Research Trends Using Topic Modelling" gamification is defined as "the process of applying game design principles, mechanics and elements to non-game contexts to motivate and engage users" [6] this project will be focusing on the creation of a gamification solution, that can be applied in the context of home learning.

This project is being done as a gap has been identified within the research; this gap is that most papers focusing on gamification focus on its application within educational context, such as the study "Combining Quest-Based Learning Gamification with Agile Project Management in Higher Education" [2].

The primary motivation for the creation of this project is to deepen understanding of gamification contexts, as well as learning and understanding how they can be applied to the creation of a game project.

The author of the project has a distinct interest in education and games development, and wishes to further their understanding and utilisation of development software including game engines.

2. Background to the Proposed Research

Within the paper "The Game Effect: Comparison of Game and non game Learning Environments Using the Example of "Arctic Economy" " [1] it describes describes the creation of a game based solution to evaluate the gamification of student work to improve student learning and attention, this study focused on students studying economics. The paper had identified that gamification for specific facts has been utilised sporadically in game based educational applications or in game based applications [1]. This study adapted a game based approach to compare it to a traditional non game based approach, this paper conducted the study on an undergraduate economics course, The study had separated the students into three groups, the study had found the non game group performed worse on average for factual information retention [1].

The paper "Combining Quest-Based Learning Gamification with Agile Project Management in Higher Education" [2] utilises an approach designed to be a quest based learning approach, utilising gamification for project management, with the goal of improving user engagement and learning outcomes [2]. The study focused on computing students at university level. Students from two universities had participated in this study. To find student satisfaction and learning with this approach students were asked to answer a questionnaire on a four point scale, from one being fully disagree and four being fully agree. The study found that 34% of the students that participated with the alternative approach utilised the approach, additionally knowledge acquisition was found to be higher when utilising this gamification approach [2].

Within the paper "Transforming Programming Education: The Effectiveness of Motivational Scenario-Based Design in Serious Games" [3] the paper identifies that with traditional study, students in it have issues learning foundational theory concepts [3]. This study chose to tackle this by creating a framework for "A motivational scenario based design" [3] to improve student motivation, and engagement with resources. The study found that with their gamification implementation there was a significant improvement in students programming knowledge in the students who utilised the gamification [3]. Additionally it found it improved students' motivation in the topic [3]. This data shows that gamification can be utilised to improve student engagement.

The paper "Analyzing Students' Self-Perception of Success and Learning Effectiveness Using Gamification in an Online Cybersecurity Course" [4] focuses on students self perception of success and learning effectiveness when using non compulsory gamification in for their online cybersecurity course, this paper had the students after their course proposed a questionnaire that asked the students to rate their opinion of the gamification of the course [4]. The paper had found that student's results did improve significantly for the students who participated in the gamification of the course when compared to the students that did not utilise the gamification elements [4]. The paper additionally stated however that "it is considered a quasi-experiment design and we only can assert that there exists a correlation between grades and play the game." [4].

The paper "Enhancing Web Development Education with Game-based and Gamification Learning: A Study of Engagement, Motivation and Performance" focused on web development with the goal of increasing student engagement, motivation and performance utilising gamification [5], the gamification was designed to target and focus on students needs, and the objectives of the lesson task, this study separated participants into two groups, one with traditional learning and one course which utilised gamification [5]. The study had found there were no statistically significant improvements to students' engagement [5], additionally there was also no statistically significant improvement in pre and post motivation [5]. This implies that forcing students to utilise gamification has little effect on their motivation and engagement.

The paper "Exploring Gamification Research Trends Using Topic Modelling" [6] identified that gamification is a popular search topic, and the study has chosen to focus on identifying trends of what topics are popular to research within the field and what trends are present within the research. The research had found thirteen common topics that gamification research focused on [6].

The conference "An Investigation into the Perception of Gen Z Students in Higher Education towards Gamification Techniques in Learning Computing Subjects" [7] examined how gamification techniques have been utilised for generation Z students in programming education [7]. The conference had noticed that "55% of students have encountered game-based learning in their current or previous study" [7]. It had also found that students favoured "immediate and transparent rewards" [7].

The conference "Higher education student's attitude towards using gamification and its relation with achievement" [8] focused on identifying a possible relation between student's use of gamification and their academic performance [8]. This study had found that university students had shown a positive attitude towards the gamification as well as high performance, however the study had also found that this did not correlate significantly to their academic performance. [8]

The conference “Combining Quest-Based Learning Gamification with Agile Project Management in Higher Education” [9] describes an approach implementation, designed to utilise gamification to assist in teaching in Higher education, this implementation was analysed via two case studies, on two different sets of students. The study had found that the implementation they developed had “potential for promoting knowledge acquisition, student engagement, satisfaction, and self-directed learning in the class topics.” [9]

3. Research Problem statement

This project aims to compile research into gamification, its successful implementations and then apply this research to the creation of a software with a self study course, to assist with knowledge acquisition. And gauge whether they will utilise a gamified platform for the acquisition of learning materials, and application of them for self study.

4. Research Aim & Objectives

The aim of this project is to develop a gamified educational system designed for home learning.

Objectives of this project are to identify a potential solution for the gamification of learning resources, focusing on a high education value while maintaining engagement and entertainment.

Another objective is to identify and analyse relevant research and utilise them to apply them to the creation of the game application.

Completion of project development within the specified project timeline. And analysis of if the timeline was correctly allocated and utilised.

5. Methodology

5.1 Methods

For the collection of research the following methods will be utilised, these methods are as follows.

The collection and application of qualitative and quantitative data, this data will be utilised within the paper to assist with analysis. This data collection will be voluntary and not contain any sensitive information

The research strategy within this paper for research will be utilising a mix of multiple sources, mostly utilising online references, found on a small variety of websites utilising search engines such as google scholar, and IEEE explore to collect a large variety of unique data and sources, as this is a topic with lots of materials online as it relates to the it field, i feel utilising online resources will improve the recency and accuracy of the data collected.

The plan is to evaluate the relevance of the collected data by a mixture of source analysis, and additionally, date checking for recency. This assists in highlighting if the found information is reliable, as well as a trustworthy source

5.2 Materials

For the finding and collection of this data I will be intending to utilise the following tools, these tools are as follows.

Google search allows me to quickly find news and information blogs.

Google scholar and IEEE Explore as it allows me to find scholarly articles and research papers on a desired topic.

Hardware requirements for the collection of this data are access to a computer device that has a stable connection to the internet. Additionally for the intended project I will require a computer that can run game development software.

6 Project Plan

20th October 2025 - project proposal hand in date.

End of November 2025 - background research completed.

End of December 2025 - project development and initial prototype concept created

End of February 2026 - project prototype finished collection and feedback and analysis of project begins

March 2026 - project research and data is fully collected and compiled and analysed.

April 2026 - project conclusion and final paper

7. References

[1]

R. T. Wittrin et al., "The Game Effect: Comparison of Game and Nongame Learning Environments Using the Example of 'Arctic Economy,'" IEEE Transactions on Learning Technologies, vol. 17, pp. 84–97, May 2023, doi: <https://doi.org/10.1109/tlt.2023.3274747>.

[2]

J.-M. Loebel, "Combining Quest-Based Learning Gamification with Agile Project Management in Higher Education," Nov. 2023, doi: <https://doi.org/10.1109/gem59776.2023.10389931>.

[3]

L. C. Shum, Y. Rosunally, and K. Munir, "Transforming Programming Education: The Effectiveness of Motivational Scenario-Based Design in Serious Games," IEEE Transactions on Education, vol. 68, no. 4, pp. 394–406, Aug. 2025, doi: <https://doi.org/10.1109/te.2025.3584187>.

[4]

S. Ros, S. Gonzalez, A. Robles, L. L. Tobarra, A. Caminero, and J. Cano, "Analyzing Students' Self-Perception of Success and Learning Effectiveness Using Gamification in an Online Cybersecurity Course," IEEE Access, vol. 8, pp. 97718–97728, 2020, doi: <https://doi.org/10.1109/access.2020.2996361>.

[5]

S. E. Ojonuba, Güzin Türkmen, and Ş. Toker, "Enhancing Web Development Education with Game-based and Gamification Learning: A Study of Engagement, Motivation and Performance," IEEE Access, pp. 1–1, Jan. 2025, doi: <https://doi.org/10.1109/access.2025.3595510>.

[6]

A. Ayaz et al., "Exploring Gamification Research Trends Using Topic Modeling," IEEE Access, vol. 11, pp. 119676–119692, Jan. 2023, doi: <https://doi.org/10.1109/access.2023.3326444>.

[7]

M. M. Chong, P. Subramanian, M. Ting, and L. J. Ying, "An Investigation into the Perception of Gen Z Students in Higher Education towards Gamification Techniques in Learning Computing Subjects," in 2024 International Visualization, Informatics and Technology Conference (IVIT), Aug. 2024, pp. 165–170. doi: <https://doi.org/10.1109/ivit62102.2024.10692814>.

[8]

M. G. Celis, S. Y. Fajardo, G. V. Sambuceti, and R. Barros, "Higher education student's attitude towards using gamification and its relation with achievement," in 2023 IEEE 3rd International Conference on Advanced Learning Technologies on Education & Research (ICALTER), Dec. 2023, pp. 1–4. doi: <https://doi.org/10.1109/icalter61411.2023.10372929>.

[9]

J.-M. Loebel, "Combining Quest-Based Learning Gamification with Agile Project Management in Higher Education," in 2023 IEEE Gaming, Entertainment, and Media Conference (GEM), Nov. 2023. doi: <https://doi.org/10.1109/gem59776.2023.10389931>.

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GRADEMARK REPORT

FINAL GRADE

GENERAL COMMENTS

65 / 100

PROJECT PROPOSAL – ACCA6020 INDEPENDENT PROJECT

Student Teifion
Gibson Mark

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	13
Good solid title. A gap in the research has been identified and this will help to fill it. There is a clear deliverable, although it would be useful to be a bit more specific on this. The aim and objectives are generally good, although there is no need to analyse in depth how well the project keeps to the original timeline.		

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 The literature referenced is excellent, but you need to write it more as a narrative than as a description of several papers and their contents. You're not trying to describe the contents of the paper, you should be picking the important ideas from the paper and merging them into a discussion of what has been done and how this will impact your work.	20	12
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	18

Acceptable coverage of the data to be collected and analysed, but what types of data are you collecting? What kind of analyses do you plan to carry out? What software development tools and techniques are you planning to use? Consider using Feature Driven Development as an Agile software development technique. How are you going to collect the project requirements? How do you intend to test your application?		
Resources / Planning (200 words)		
List of any deliverables; Clear diagram showing both timing and resource use; Completed ethics form; Limited and relevant appendices Some discussion of research resources and hardware resources, but this also needs to cover software and human resources. What games engine do you plan to use? If you're going to test this on people then how many people do you think you'll need? The project plan needs more detail but the timings are broadly workable.	15	9
Document Presentation		

Correct spelling, grammar and punctuation; Flow of narrative/fluency; Coherence; Word processed ; Correct use of referencing with bibliography; Strict word limit A well-written and well-presented document apart from the occasional use of "I". The reference list is well set out and gives the full references.	15	13
TOTAL	100	65

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