



# **GAMIFICATION OF LEARNING PROGRAMMING LANGUAGE**

**MS. AKIRA  
MR. CHAWAKORN**

**PANYAWONGKHANTI  
WATANAKUL**

**A PROJECT REPORT SUBMITTED IN PARTIAL  
FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE  
BACHELOR OF ENGINEERING IN COMPUTER ENGINEERING**

**FACULTY OF ENGINEERING & INTERNATIONAL COLLEGE  
MAHIDOL UNIVERSITY**

**2023**

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Computer Engineering Project  
entitled  
**GAMIFICATION OF LEARNING PROGRAMMING LANGUAGE**

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Thesis  
entitled  
**GAMIFICATION OF LEARNING PROGRAMMING LANGUAGE**

was submitted to the Faculty of Engineering & International College,  
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for the degree of Bachelor of Engineering (Computer Engineering)  
on  
July 15, 2024

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Ms. Akira Panyawongkhanti

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### บทคัดย่อ

บทคัดย่อภาษาไทย (not required for your project proposal, but it is mandatory for the black book)

คำสำคัญ : ลาเท็ก / วิทยานิพนธ์ (~5 คำ)

9 หน้า

**GAMIFICATION OF LEARNING PROGRAMMING LANGUAGE**

STUDENTS	Ms. Akira Panyawongkhanti ICCI Mr. Chawakorn Watanakul ICCI
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**ABSTRACT**

The C language is one of the most versatile programming language, yet its confusing syntax and case sensitivity can scare off potential learners. By integrating the gamification aspect into the learning process itself, we hope to create an effective way of learning the C programming language for learners that are interested. Statistical data, key findings, and conclusion will be added later on when the project is near its completion.

**KEYWORDS :** LaTeX / Thesis (~5 words)

9 Pages



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# CHAPTER 1

## INTRODUCTION

### 1.1 Background

C programming language is known to be some of the most versatile programming language. Not only is it useful for most fields in technology, it is also a base for other languages such as C++ and C#. The problem of C language is that the language itself is case sensitive and has confusing syntax. This small problem can be a deal breaker for some of the learners if this is their first programming language. We came to the conclusion that by turning the process of learning into something more enjoyable then it might help the learners to ease into the C programming language. We will be achieving this by the process of gamification.

Gamification has been a known concept for a decade now, yet the examples of effective usage are far and few in between. One known example is Duolingo. However, an effective learning application for programming languages has not been developed yet.

There have been studies on the effectiveness of the gamification of programming languages including a published paper with meta-analysis, though there have been no studies to try and improve the process using the framework suggested by said paper. Our project will be focused on utilizing some parts of the suggested framework.

## 1.2 Objective

(Must use action verbs)

1. To integrate gamification into programming language learning.
2. To provide personalized learning experience based on learner's skill and abilities.

## 1.3 Scope

1. The programming language will be C.
2. The platform that the project will be hosted on is Android.
3. The number of lessons that will be in the application will be based on the contents of EGCI113 Fundamental Programming.

## 1.4 Expected Results

(Indicate expected outcomes of the project)

1. The proposed application will help user focus on learning the language.
2. The proposed application will aid user's learning journey.
3. The proposed application will create enjoyable learning experience.

## 1.5 Timeline

**Table 1.1 Project Timeline**

Plan	Timeline							
	2024							
	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1: Study								
2: Ch.1								
3: Ch.2								
4: Ch.3								
5: Ch.4								
6: Ch.5								
7. Presentation								

## **CHAPTER 2**

### **LITERATURE REVIEW**

This chapter will cover the articles that we used to help design and develop the system and the structure of the project. Some of the points that are made in these articles will be used to help better the process of our project by improving from the mistakes discovered by them.

#### **2.1 Gamification for education purposes: What are the factors contributing to varied effectiveness? [1]**

This paper explores the effectiveness of using gamification for educational purpose by doing content analysis on 44 articles that the author have selected.

According to the paper, previous researchers deemed engagement as the main factor on how to measure the effectiveness of gamification but the topic still remains controversial as the results from previous empirical studies as varied.

Results from the content analysis showed that the result from gamified learning are also varied depending on the user. Some users showed improvements in understanding of the subject while others are less motivated and performed worse than control group.

The future work is to experiment the effectiveness of gamification on different types of users.

## **2.2 Practices, purposes and challenges in integrating gamification using technology: A mixed-methods study on university academics [2]**

This paper explores how gamification are utilized in higher education and its challenges.

Five main themes were found to be critical in enhancing the process; motivating the students, engaging the students, facilitating problem-solving skill, facilitating interactions, and achieving specific goals.

Authors pointed out a problem which is that academics are not able to utilize gamification fully is due to the lack of understanding the process which leads to poor execution.

The future work is to implement the themes to observe whether those themes are critical to the gamification process.



## CHAPTER 3

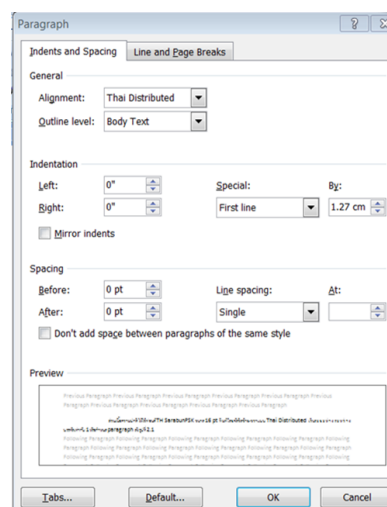
### METHODOLOGY

Describe what you did so that others can follow to recreate your work/system/experiment proposed in this project. You should provide addiquet details about your work, system, algorithm, or design. This includes technical methods used (e.g., machine learning techniques, library, tools), data collection and preparation/pre-Processing, hyperparameter configurations, measurements, evaluation approaches or techniques used to evaluate your work performance. (It is recommended to writing this chapter after completing CH2 Literature Review)

#### 3.1 System Design

You may start with an overview of your system/algorithm design by using the followings:

- Flowchart
- System, Design, or Block Diagram
- Phedu Code
- Others (figures or even tables)



**Figure 3.1 Paragraph arrangement (example)**

### **3.2 Data**

### **3.3 Methods**

### **3.4 Hyperparameter Configurations**

### **3.5 Performace Evaluation**

## **CHAPTER 4**

### **RESULT**

This chapter reports your experiment results or study report proposed in previous chapter. It typically consists of 1) Results in terms of tables or figures and 2) explanation or discussion of your results, study, or key findings.

#### **4.1 Results**

(Experiment/Results in the forms of tables or/and figures)

#### **4.2 Discussions**

(Interpretation or the meaning of your experiment/results)

## **CHAPTER 5**

### **CONCLUSION**

This chapter summarizes all of your work. It typically starts with the brief explanation of what you do such as the objective of your work, design, data, experiment results, key findings, interpretation of your experiment and/or result. The obstacles of your work can also be discussed and finally followed by future work.

#### **5.1 Conclusion**

...

#### **5.2 Obstacles**

...

#### **5.3 Future Work**

...

## REFERENCES

- [1] Z. Luo. Gamification for educational purposes: What are the factors contributing to varied effectiveness? *Education and Information Technologies Volume 27*, pages 891--915, 2022. doi: <https://doi-org.ejournal.mahidol.ac.th/10.1007/s10639-021-10642-9>.
- [2] N. A. Muhammad Kamarul Kabilan and K.-M. Chuah. Practices, purposes and challenges in integrating gamification using technology: A mixed-methods study on university academics. *Education and Information Technologies Volume 28*, pages 14249--14281, 2023. doi: <https://doi-org.ejournal.mahidol.ac.th/10.1007/s10639-023-11723-7>.