

**Using Gamification Features to Enhance Online Learning for English in Primary
Schools**

by

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Dissertation submitted in partial fulfilment of
the requirements for the
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Universiti Teknologi PETRONAS

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CERTIFICATION

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A project dissertation submitted to the
Information System Programme
Universiti Teknologi PETRONAS
in partial fulfilment of the requirement for the
BACHELOR OF INFORMATION SYSTEMS (Hons)

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September 2021

CERTIFICATION OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgment, and that the original work contained herein have not been undertaken or done by unspecified sources of persons.

A handwritten signature in black ink, appearing to read 'Suhaimi Bin Mohd Saharan', with a long horizontal line extending from the end of the signature.

MUHAMMAD SUHAIMI BIN MOHD SAHARAN

ABSTRACT

Play is a natural part of a healthy child. Children will spend the day playing while learning in a variety of everyday situations. Meanwhile, the thing most children, including adults dislike the most is learning. However, if learning techniques are combined with gamification features, this can certainly encourage children in particular to learn more. Among the main objectives that need to be done in this study are, 1) To study teacher's perception about the educational use of a game as a supportive method for teaching and learning English, 2) To develop a game-based app that helps students in terms of spelling, pronunciation, and high-level words, 3) To evaluate the effectiveness of game-based web app for Learning English in primary school. However, applications that provide learning support systems in the form of gamification Malay in Malaysia are rather less. Primary school students, especially those between the ages of 7 to 9 are already proficient in using smartphones, therefore, the education sector can use educational techniques in the form of gamification to attract more students to learn. Not only that, but students will also be more diligent in learning and less stressed while doing activities that interest them. As such, this study carried out the activity of developing an application called GoPlay where it aims to educate children aged 7 to 9 years to learn English subjects. Therefore, a methodology has been identified and applied which is the Agile Software Development Life Cycle (SDLC). Agile SDLC is seen as most suitable as it is suitable for application development activities and agile where each phase can move freely before the final product is ready. The methodology is divided into four namely 1) Requirements, 2) Architecture and Design, 3) Development, and 4) Testing and Feedback. According to the schedule and planning that has been implemented, this application is expected to meet the main needs of users and create an application that can help children play while learning English subjects in a less stressful environment.

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ABBREVIATIONS AND NOMENCLATURES

CHAPTER 1

INTRODUCTION

1.1 Background of Study

Today, the world is shocked by the discovery of a virus that can claim the lives of millions of people, namely COVID-19. It is a highly contagious virus and difficult to identify symptoms that make it difficult for patients to realize that they have been infected. The virus will damage the kidney system or human respiratory system such as the lungs and even worse can result in death. Malaysia was also no exception to the virus when it recorded its first case on 25 January 2020 and as of today 13 July 2021, Covid-19 has killed more than four million people.

As a result of this epidemic, the situation has forced everyone regardless of age, gender, and so on to remain in their respective homes. As children aged 7 to 9, they tend to play outside, study with friends while doing some physical activities. At this age, they have a high level of curiosity, and this is like a golden age for them to play, explore and learn as much as possible. However, the virus does not recognize age and can attack anyone, including children. This forces primary school children to study at home using their own devices such as smartphones. Therefore, this causes children to easily lose focus as they are often distracted by environments such as televisions, video games, toys, and even worse is the lack of supervision by parents who have to work in the office.

There is no denying that play is a natural trait as a child, but one should not be complacent in education for the future. In an effort to help children play and learn at the same time, the GoPlay Web App is seen to be able to increase interest and enjoyment in learning especially in English subjects. This application was developed as an E-Learning Education Web App to educate children aged 7 to 9 years or more specifically primary school students in learning English. The GoPlay Web App is expected to help in terms of vocabulary, grammar, spelling, pronunciation, and even high-level words as well.

GoPlay is not a web app that intended to educate traditionally like paper and pencil, but it has implemented a gamification feature to help these children learn while playing. The main purpose of GoPlay is to stimulate and revive interest in learning in a fun and enjoyable environment. Gamification is a feature that rewards or points to each user when they successfully perform a task or answer a question correctly. Gamification is seen to be able to create an environment that is competitive with each other in a healthy form. Indirectly, this encourages these students to learn more to become champions in the game or in other words, get excellent marks in their English subjects.

1.2 Problem Statement

There are three (3) main problems faced by students, parents, and teachers in terms of social, communication, and technical such as:

- 1) Having difficulty staying focused in learning.
- 2) Teachers and parents have difficulty monitoring student activities.
- 3) Feature to track student records somewhat less.

Students aged 7 to 9 are indeed immature children and tend to play. While at home and studying without face to face, these children dare to play while in learning sessions, do not complete assigned homework assignments, ignore teacher instructions, and in turn, they lose focus and interest in learning. Furthermore, in their homes, there are televisions, toys, and more that distract them from studying.

Meanwhile, teachers often provide exercises in the form of paper and pencil for students to complete. Students are required to print each assignment and complete the assignment traditionally. As such, it has hampered the progress of students especially those who do not have equipment such as printers, proper gadgets, or good internet access. These children have to do such learning sessions for months making the children increasingly likely not to engage in their online learning sessions.

In addition, the teachers also remain in their homes as a result of this pandemic. This makes it difficult for teachers to monitor student activities, especially students who are relatively weak in the subject. It is difficult for teachers to communicate more closely and understand their students more deeply. To ensure that the knowledge reaches and is understood, the student must be interested and happy to learn so that it becomes easy to understand. Meanwhile, not all parents work at home because they are told to work in the office. Hence, children are left alone with gadgets without close monitoring by parents or teachers.

Educational web applications other than GoPlay that have gamification features of course already exist such as Kahoot, ClassDojo, Gimkit, and so on. However, the main function to encourage students to continue to play and learn is relatively less for example the use of badges, profiles that display all achievements, unlock new achievements, and so on. Most of these educational web applications provide room for students to play and compete together but to keep track of the progress of each game that players have been involved there is somewhat less. When the quiz ends, then it ends up there and not many records can be kept as proof of achievement or progress.

1.3 Objective

The objectives for this project are as follows:

- i. To study teacher's perception about the educational use of a game as a supportive method for teaching and learning English.
- ii. To develop a game-based web app that helps students in terms of spelling, grammar, and high-level words.
- iii. To evaluate the effectiveness of game-based web app for Learning English in primary school.

1.4 Scope of Study

This study **focuses** entirely on the importance of learning at a young age even while playing. This study wants to help students to learn in a fun and competitive environment among peers.

The target users for this study were children aged 7 to 9 years. **Target users** can also be known as primary school students in Malaysia, teachers, and even parents. However, among the **limitations** of this project is that the prototype developed only focuses on primary school students only. Hence, if students who are older or less than the main focus will be seen as less suitable to use this web app on the factors of age, maturity, knowledge, and so on.

1.5 Project Relevancy and Feasibility

The gamification concept applied to educative concepts allows the students to advance on their learning processes at their own pace, given the features of the web applications: easy and fast access, availability, and low cost. This in turn provides space for children aged 7 to 9 years to spend time playing but at the same time learning. Students' interest in learning will also increase as each exercise given has a sense of fun and excitement. The GoPlay web app is also expected to be able to help children aged 7 to 9 years old to use it more efficiently when the system is in English. Based on the planned schedule, the project is expected to be completed within 29 weeks. For the first 15 weeks, the author schedules a proposal, preliminary research, literature review, and methodology to be completed. For application development, the author has started for the first phase and is expected to continue in the next four months which is in the Final Year Project 2 timeframe.

CHAPTER 2

LITERATURE REVIEW

2.1 Motivation Strategy Using Gamification

Gamification has been used to support e-Learning (remedial education) in the latest research. This is an example of the game-informed schooling mentioned above. According to Sykes and Reinhardt in 2012, successful gamification and game-based language have the following elements which are clear and concise instruction, student-driven activities, organized interface, stimulating motivation, and quickness in feedback.

Gamification isn't the same as gaming. A game is an organized activity that is generally done for fun meanwhile gamification is a method of influencing and inspiring people's behaviour. In non-game circumstances, people employ game design elements. It refers to the incorporation and use of game design principles and techniques. Gamification, according to Zichermann and Cunningham in 2011, is the application of game dynamics and structure to real-world problem-solving.

2.2 Using gamification to support learning English as a second language: a systematic review

Game components are utilized in gamification to engage learners with material and help them advance toward a goal. A badge, for example, is given to someone who properly login into a computer application. According to Kapp in 2012, receiving a badge is a game aspect, but it is unrelated to other game actions such as going to a new level, completing a puzzle, or matching two or more things. Bunchball defines game mechanics as the essential actions, processes, and control mechanisms used to 'gamify' activities and provide compelling learning experiences for students in 2010.

According to Bunchball in 2010 and Caballe and Clariso in 2016, game mechanics include but are not limited to point, level, badges, leader board, charity and presents, challenge,

space, storytelling, and virtual goods. The learners' emotions are triggered, stimulated, and driven by the game dynamics. According to Bunchball in 2010, game dynamics include but are not limited to status, success, reward, self-expression, competitiveness, altruism, challenge, enjoyment, and satisfaction.

2.3 Study of Gamification Effectiveness in Online e-Learning Systems

The focus on behavior, emotion, and cognition under the idea of engagement, according to Fredricks, Blumenfeld, and Paris, may give a deeper characterization of learning. Motivation is done by gamification and attracting a big number of people online at the same time. This allows them to always find a buddy. Gamification is the use of game design and incentive ideas in non-game settings [4].

In this instance, it is vital to encourage users to spend more time in the system to attain the required quantity and volume of practical skills, using contemporary e-learning concepts. Users should be encouraged to return to the system on a frequent basis, a process known as the retention cycle.

2.4 Development of English Learning System Using Gamification Approach

The vocabulary, reading, writing, and interrogative elements in the English learning system may be split into four categories. Vocabulary material is a multiple-choice exam designed to improve pupils' English vocabulary. Students will be given a specific topic to write about in the writing material, and they will be expected to write down their thoughts and views on the issue. When students complete working on the material and hit the submit button, their grammar and spelling errors will be immediately marked, allowing them to see where the issue occurred. Students will be asked to work on multiple-choice questions based on the paragraphs that were shown earlier in the reading material. Students will be required to fill in the blank sentence fields in the interrogative material by picking the available responses and then typing them into the blank sentence areas.

Gamification is a concept that incorporates game-like features into non-game applications in order to boost motivation, commitment, and affect user behaviour [5]. Points,

level, achievements, leader board, and task features are all game application elements that may be linked to non-game apps. There are several gamification components. The feature points, student level, and accomplishment badge are all gamification components. When students finish one of the resources in the learning menu, they will gain concept points as part of the gamification. The quantity of points earned by students has an impact on their level, which in turn has an impact on their accomplishment badge. All registered users' standings will be displayed on the leader board, which will be sorted according to the number of points earned.

2.5 Gamification's Effectiveness in Online English Teaching in the Pandemic Era

Gamification may be defined as the use of game design concepts in non-game situations. According to Botra et al, 2014, gamification refers to the use of game elements and dynamics to boost user motivation, excitement, and engagement. Based on Robson et al., 2015, the notion of gamification applies from lessons on leveraging game domains to affect user behaviour in non-game contexts. Depending on the domain of gamification usage, the user in question is a group of product users, workers of a company, students in a learning environment, and other gamification users.

According to Schönen in 2014, there are other notions that are comparable to gamification, including the concept of "serious game," which stresses the introduction of non-entertainment components into the gaming environment. Based on Oja and Riekkilä in 2011, a specific job is put into the game so that it may be done. Furthermore, according to Stenros in 2017, "play" is a free activity without impediments, whereas "game" is confined to acts with rules and context.

2.6 Gamification Applications in E-learning: A Literature Review

According to Dastjerdi in 2016, new teaching techniques have emerged in different teaching systems throughout the world to fulfil students' educational needs and give educational chances to pupils in locations with distinct environmental qualities and living situations. As a result, according to Urh et al. in 2015, the usage of gamification in the field of e-learning is rising and gaining in popularity. Gamification approaches are tactics, procedures,

and mechanisms that assist customers in determining how to apply game principles to a specific non-game situation.

Other than that, according to Toda et al. in 2019, the number of gamification styles has increased in recent years due to the term's widespread use, favourable outcomes, and growing interest in games, particularly for educational reasons. Meanwhile, according to Rodriguez et al. in 2018, gamification is another strategy that is gaining traction in education. According to Ding et al. in 2018, the potential benefit of gamified learning and education approaches has been proposed for a long time. There have been several research on gamification that have looked at gamified aspects.

2.7 The Effect of Games and Simulations on Higher Education: A Systematic Literature Review

In 2010, Peterson published a meta-analysis that looked at the use of computer games and simulations in language learning from a psycholinguistic and socio-cultural standpoint. The findings point to potential opportunities for efficient language acquisition, demonstrating that games can aid students in learning new languages.

The games and simulations that Peterson conducted have further strengthened the justification for the effects of gamification in education. The involvement of games can encourage students to learn new languages. Quite related to the study of the Development of M-Learning Applications in English for Primary Schools using Game-based because it wants to educate Malaysian students to learn a foreign language which is English.

2.8 Between Learning and Playing? Exploring Learners' Perceptions of Corrective Feedback In An Immersive Game For English Pragmatics

Learners who were intrinsically interested in learning English, who perceived themselves as competent during the game, and who had an enjoyable game experience had more positive perceptions. The effectiveness of feedback in game-based language learning might depend on how useful learners think it is, and on whether it stimulates intrinsic motivation as stated by Winne in 1987.

This last article tells that each activity and process that occurs in the application/prototype should be relevant to the age and level of maturity of users because balanced activities and processes, it can help users give a good reaction and perception of this m-learning technique. Reactions and feedback are very important for the study because they can be used as justification for the outcome of this study whether it is effective or otherwise.

CHAPTER 3

METHODOLOGY

3.1 Research Methodology

Each project must have its own methodology applied so that the project or study can be completed with minimum risk and completed in a timely manner. For the development of this mobile learning application and gamification study, the methodology chosen by the authors was the **Agile Software Development Life Cycle (SDLC)**.

Firstly, **Agile** is a combination of two model processes, namely incremental and iterative. Agile focuses on the process of achieving user satisfaction by performing rapid delivery. It is broken down into iterations, while one iteration is equivalent to two weeks. This means that every two weeks Agile activities will be repeatedly implemented until the product meets user requirements.

Meanwhile, **SDLC** is the life cycle for developing software. This is very much in line with GoPlay web application development activities such as design, development, and testing. The main reason the author chose SDLC is that the author wants to complete the application with a predetermined cost and time.

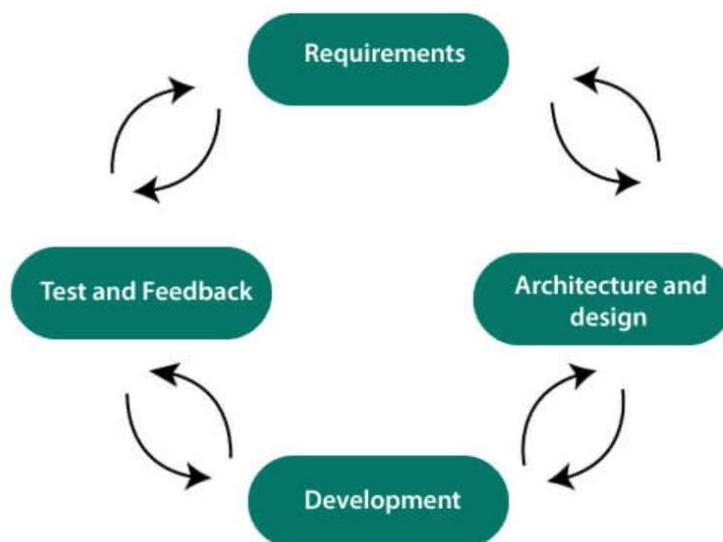


Figure 1: Agile SDLC methodology

3.2 Project Activity

Project activities are basically pillaring sections or tasks that have many sub-tasks under them. Similar to this study, there are several sub-tasks under the Agile SDLC process that make it fully complete as a methodology. The activity in this study not only involves the study of gamification but also involves the development activity of a web app which makes SDLC very relevant to be used as an element for this study.

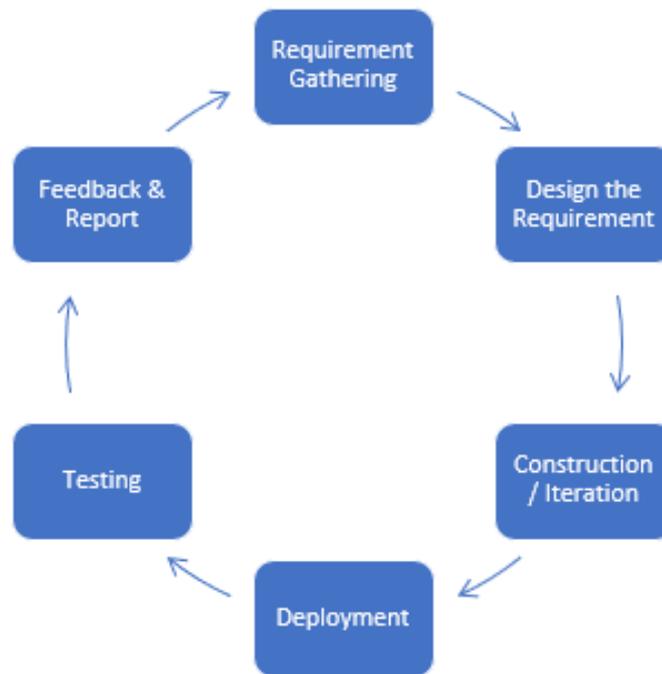


Figure 2: Software Development Life Cycle (SDLC)

3.2.1 Requirement Gathering

To collect requirements, data, and information for this study, I tried to get from teachers, parents, and students through **surveys**. The tool that I use when this survey process is done is Google Form. I break it down into 5 sections which is Demographic Profile, Importance of English subject, Effect of Online Class and Opinion on Mobile Learning Application.

Apart from that, I also did an **interview** session with a full-time housewife named Norzaimah Binti Ahmad, 46 years old about the activities of her children who are still in primary school. Mrs. Norzaimah said, her children easily lose focus because the environment

and the effect of online classes make these children less interested in being involved in their respective classes. Mrs. Norzaimah should force and remind her children about the class schedule because otherwise, they will be silent and deliberately not enter the class by doing the more fun thing for them which is playing.

3.2.2 Design the Requirement

Next, for this phase, I started the design flow after collecting all the requirements. The design that I did in this phase is a flowchart where it is the application process from login to the end of the operation. In preparing the flowchart, I use a tool from the internet that is lucid chart. It's free and can help me develop the simplest flowchart easily.

With the flowchart, it is easy for me to move to the next phase, which is application development because I can see the structure and direction of my development. Thus, I was able to avoid any risks or functions that did not meet the original objectives of this project.

3.2.3 Construction / Iteration

We reach the third phase; the construct or development process begins to run after getting the design and application flow. This simplifies the development process because it is direct to the main objective without wasting time with additional functions that do not meet the original requirements. This thus, saves time and cost with a simple application, minimal functionality within a predefined iteration period. Indirectly, all risks, additional work, obstacles, and challenges can be faced with more preparedness because the development flow has been completed and identified in advance. In this section, the author will divide the task between the front end and the back end because the system requires a User Interface and a database process to store user information.

3.2.4 Deployment

The deployment phase can begin after the first iteration is completed. In Agile, this phase does not have to wait for all processes/iterations to be completed before starting the

deployment phase. The product can be released and deployed to users to try so that if there are any changes in the requirements, it can be updated on the next iteration without having to delay time.

The deployment process can be divided into two, namely officially or informally. Initially, the deployment will be deployed informally where it is just a prototype and users can experience some functions that are not fully completed yet. Next, after it is fully completed within the stipulated period, the application will be officially deployed on Google Play Store where every Android smartphone user can install it.

3.2.5 Testing

The Testing phase can be carried out immediately after the first iteration ends. When the first iteration is completed, it means the product has completed the first phase for two weeks. Hence, the developer can perform some simple tests to ensure the functionality as required.

Next, the testing phase can be divided into another part which is User Acceptance Testing or called UAT. This is a test done by real users themselves to identify any bugs that developers have overlooked or want to update new requirements. UAT activities will be carried out once all iterations are completed and the product is fully completed.

3.2.6 Feedback & Discussion

In the last phase, the author will get feedback from users. Among the users who are more suitable to provide feedback are children aged 7 to 9 years, parents, and teachers. Through this feedback, the author will either update the application or use this information in the report. Feedback is very important to collect as this study is necessary to identify consumer opinions and reactions whether they are effective or otherwise.

In addition, the author will also prepare a report for this Final Year Project as the assignment of a final year student. This report also aims to be a reference material for further studies involving web applications, e-learning, gamification, and children's education.

3.3 Time Frame for the Project Development

Table 1: Gantt Chart for FYP I

TASKS/WEEKS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
<i>Project Proposal</i>	█	█															
<i>Preliminary Research Work</i>		█	█	█	█	█	█	█	█	█							
<i>Background & Introduction</i>		█	█														
<i>Objectives & Literature Review</i>				█	█	█	█										
<i>Data Collection & Analysis</i>				█	█	█	█	█	█	█							
<i>Design Development</i>						█	█	█	█	█	█	█					
<i>Methodology</i>						█	█	█	█								

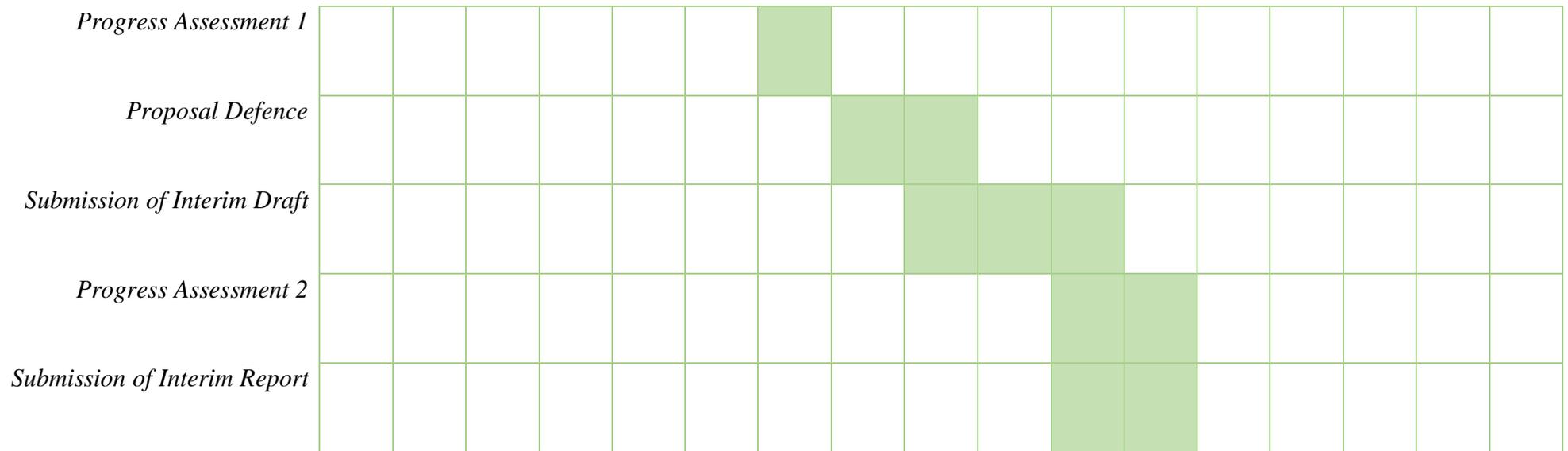
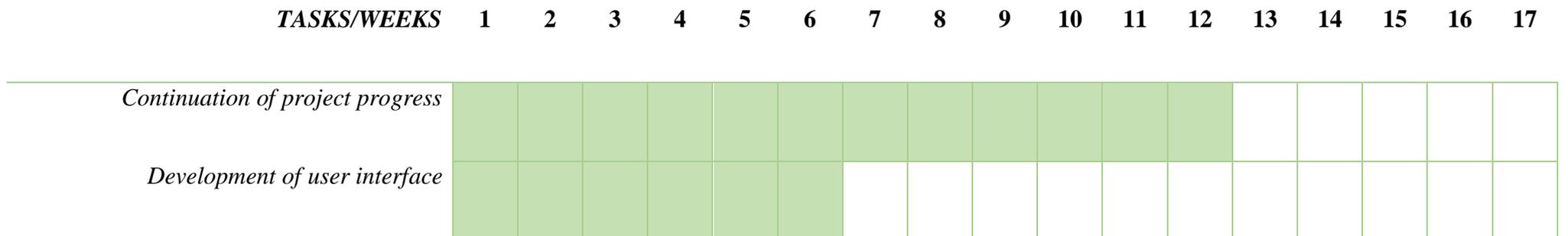


Table 2: Gantt Chart for FYP II



<i>Create navigation structure</i>																
<i>Progress Assessment 1</i>																
<i>Demonstrate & run simple test</i>																
<i>Refine & Fix coding error</i>																
<i>Testing application functionality</i>																
<i>Submission of Draft Dissertation</i>																
<i>Submission of Dissertation (soft bound)</i>																
<i>Viva Oral Presentation</i>																
<i>Progress Assessment 2</i>																
<i>Submission of Project Dissertation (hardbound)</i>																

3.4 Key Milestone

Table 3: Milestone for FYPI & FYPII

Key Milestone	Timeline
Final Year Project 1	
Project Proposal	Week 2
Preliminary Research Work	Week 11
Background & Introduction	Week 3
Objectives & Literature Review	Week 6
Data Collection & Analysis	Week 7
Design Development	Week 7
Methodology	Week 7
Progress Assessment 1	Week 7
Proposal Defence	Week 9
Submission of Interim Draft	Week 11
Progress Assessment 2	Week 12
Submission of Interim Report	Week 12
Final Year Project 2	
Continuation of project progress	Week 12
Development of user interface	Week 5
Create navigation structure	Week 5
Progress Assessment 1	Week 6
Demonstrate & Run simple test	Week 8
Refine & Fix coding error	Week 9
Testing application functionality	Week 9
Submission of Draft Dissertation	Week 11
Submission of Dissertation (soft bound)	Week 12
Viva Oral Presentation	Week 15
Progress Assessment 2	Week 15
Submission of Project Dissertation (hardbound)	Week 17

3.5 Tools

This section the author describes the tools used to conduct the study. With this tool, a prototype can be completed and can be used as strong evidence in realizing the outcome of this study. It involves application development in terms of front end, back end, hardware, and software.

3.5.1 Front-end

Basically, the front end is the main display layout to the user. To prepare the UI, several tools have been used by the author. The first is **Visual Studio Code** where it is an IDE for author to write code. Next, the author uses the **Angular framework** to help the author develop a web app. This framework is special for web app development and has various libraries that are suitable for web app development.

Visual Studio Code	Angular Framework
	

3.5.2 Back-end

The back-end process takes place behind the scenes. Users will not see any movements and processes that occur but can only see the outcome through the User Interface. The back end is important for processes such as data storage, data retrieval such as GET and POST, organizing and organizing data efficiently.

Among the tools used by the author is Firebase which is one of Google's products. Hence, it is very reliable and quality. The main task of Firebase is for authentication, which is the login or sign-up process, database storage, hosting, and more.

3.5.3 Hardware

In this project, among the hardware involved is a laptop. It aims to implement coding in the IDE and test prototypes using browsers such as Google. In addition, testing can also be done through any gadget as long as it has a good internet connection and its own browsers such as Safari, Opera, Mozilla, Edge, and others.

3.5.4 Software

In an IT project, the software is the most important tool. GoPlay also requires software such as Visual Studio Code to write code easily. In addition, GitHub Desktop is also needed to make it easier for writers to store, transfer and keep track of each coding activity. Next, the third software is Firebase which serves as a cloud database and authentication. Firebase is a product of the giant company Google; therefore, its quality is very excellent and reliable.

CHAPTER 4

RESULT AND DISCUSSION

4.1 Data gathering and Analysis

As stated in the table in the completion of this project, data gathering was done to collect information with a qualitative and quantitative approach.

4.1.1 Interview

First of all, the author has conducted an interview session with a primary school teacher named Puan Erni Yanti. The 23 -minute interview session aimed to gather information on teachers 'perceptions of gamification, students', parents 'and teachers' acceptance of playful learning, and some opinions or improvements from a teacher's point of view.

The interview session was conducted by the author and interviewed the teacher who taught the English subject directly. Before the interview session begins as well, the author first explains a bit of the prototype that is being developed at the moment. This is to make it easier for Puan Erni Yanti to understand and get an idea about the prototype that is being carried out. And after that, only then did the writer start the interview session with some questions.

Examples of questions that have been asked by the author to Mrs. Erni Yanti:

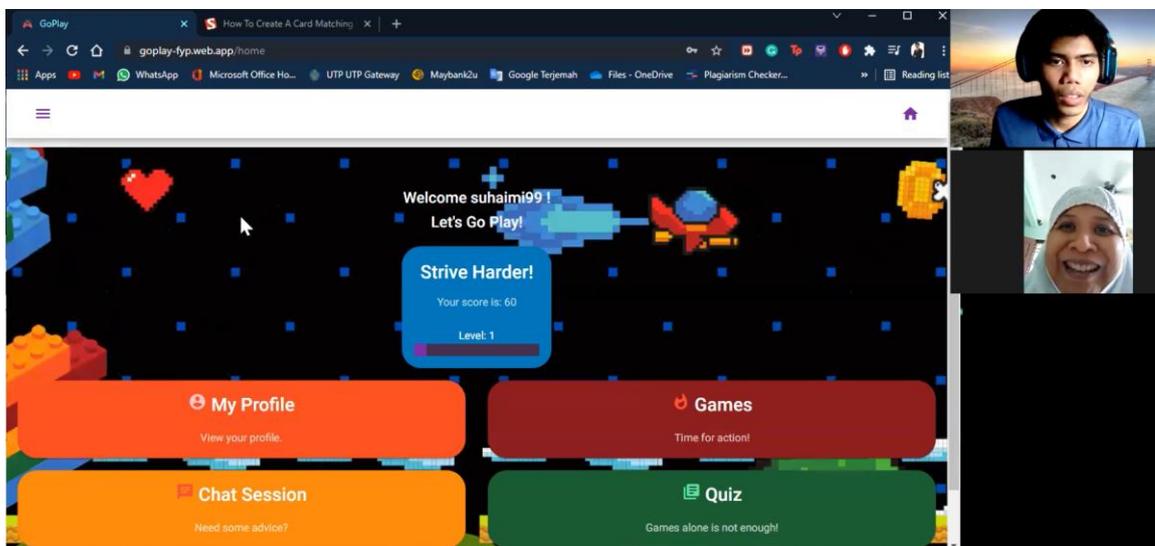
- a. Have you heard the term gamification before? If so, can you explain a little bit about what you know about gamification?
- b. From the teacher's point of view, is the element of gamification that we have just discussed suitable to be applied in online education, especially in English subjects?

- c. In the teacher's experience, what elements of gamification can I add to encourage them to continue learning? What are examples of games that are suitable for online learning?
- d. During the Covid-19 outbreak, all learning was converted to online learning. In your opinion, is student focus more easily distracted when studying online? If so, what makes it difficult for students to focus on online classes?
- e. So, in your experience, what do you do to increase student interest during online classes? How do you keep students interested and focused on online classes?
- f. Throughout Puan Erni's experience as a teacher, does the form of questions also play a role in educating students? Does the form of the question also influence the way and interest of students to learn? What do you think about it?

4.1.2 Discussion

From the interviews conducted, Puan Erni Yanti strongly agreed on the application of gamification into children's learning. Learning will be more effective when there are elements of gamification such as scores, player levels, rewards, and more.

This interview session was also very helpful to the writer when Mrs. Erni Yanti gave some suggestions to improve the question section in the web app. It is better to put words that are easy to understand to maintain the interest of students, especially for those who are less interested in learning or students who are slow learners.



4.1.3 Use Case Diagram

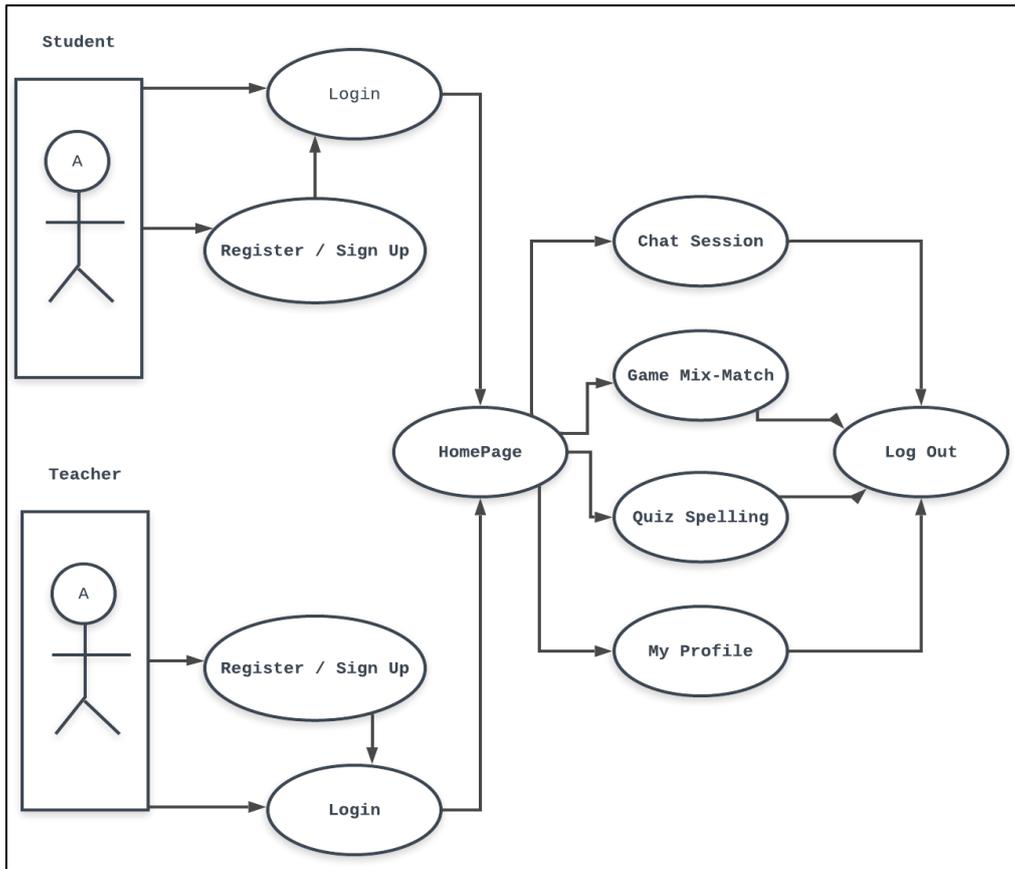


Figure 3: Use Case Diagram for GoPlay web app

Through the use case diagram, it can show more clearly the flow of the GoPlay web app system because it can provide an overview and visuals.

In the GoPlay web app, users will register first. Here the user needs to choose either the user as a student or instructor. This is because students and instructors have little difference in terms of function. Students cannot create a special room for chat sessions, but not for teacher. The teachers can create a new room because they have the advantage of access as an instructor. Therefore, students can only enter the room provided by their respective teachers.

Students and teachers have access to the Quiz, Game, and profile sections respectively. Players' scores and levels will also be highlighted to increase the spirit of competition.

4.1.4 Questionnaire Survey Analysis

For the last method is the author using survey analysis method. In the **first section**, I started to explain and summarise about this project because I want respondents to understand the objectives, goals, and output of my study.

Hi! A very good day to you all.

I am Muhammad Suhaimi bin Mohd Saharan, a Final Year student at the Universiti Teknologi PETRONAS. First of all, I would like to thank you for taking the time to answer my survey today.

The goal of this project is to develop an Education App but based on games. The main objective is to view the effectiveness of games on the learning of children aged 7 to 12 years old.

As we all knew, the COVID-19 pandemic has limited the activities of everyone including children who need to attend school. It is a golden time for children aged 7 to 12 to play while learning in a time full of curiosity. However, the time for them to play has been affected and learning has had to be carried out in their respective homes.

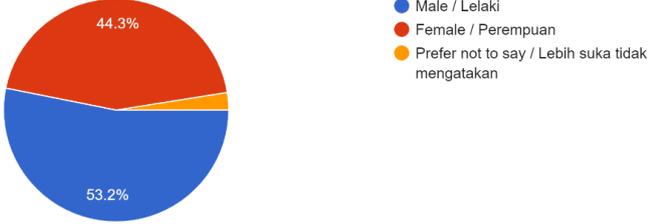
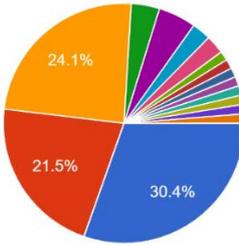
Therefore, this survey aims to collect opinions and feedback from you on the method of games into children's learning.

Figure 4: First section of survey Google Form

While the **second section**, I asked respondents to fill in the Demographic Profile such as name, gender, and so on. This is because my main target is to get respondents who work as teachers and parents in particular.

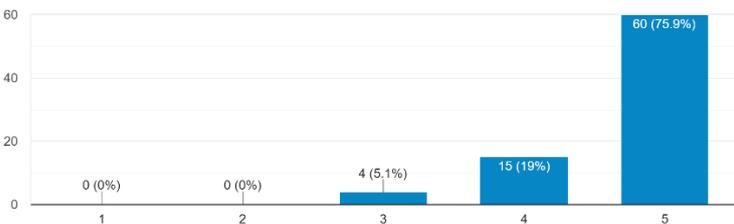
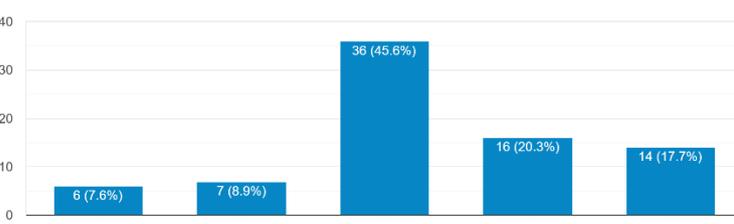
Table 4: Section 2 Survey

Total Respondent	Section 1: Demographic Profile
	Name 79 responses

Gender	<p>Gender 79 responses</p>  <p> ● Male / Lelaki ● Female / Perempuan ● Prefer not to say / Lebih suka tidak mengatakan </p>
Do you have any immediate family members aged 7-12?	<p>Do you have any immediate family members aged 7-12? 79 responses</p>  <p> ● None / Tiada ● Child / Anak ● Sibling / Adik beradik ● Students / Pelajar ● niece ● Anak buah ● Cousin ● Niece </p> <p>▲ 1/2 ▼</p>

In **section three**, I asked respondents to fill in the importance of the English subject because I want to develop an application to teach English so, I need to know their response to this subject. I would like to know whether or not the English subject is relevant or is there a subject that is more suitable for this study.

Table 5: Survey section 3

<p>From your point of view, is English an important subject to learn from an early age?</p>	<p>From your point of view, is English an important subject to learn from an early age? 79 responses</p>  <table border="1"> <thead> <tr> <th>Rating</th> <th>Count</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0</td> <td>0%</td> </tr> <tr> <td>2</td> <td>0</td> <td>0%</td> </tr> <tr> <td>3</td> <td>4</td> <td>5.1%</td> </tr> <tr> <td>4</td> <td>15</td> <td>19%</td> </tr> <tr> <td>5</td> <td>60</td> <td>75.9%</td> </tr> </tbody> </table>	Rating	Count	Percentage	1	0	0%	2	0	0%	3	4	5.1%	4	15	19%	5	60	75.9%
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<p>Do you agree that English is one of the most difficult subjects for children aged 7-12 years old to learn?</p>	<p>Do you agree that English is one of the most difficult subjects for children aged 7-12 years old to learn? 79 responses</p>  <table border="1"> <thead> <tr> <th>Rating</th> <th>Count</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>6</td> <td>7.6%</td> </tr> <tr> <td>2</td> <td>7</td> <td>8.9%</td> </tr> <tr> <td>3</td> <td>36</td> <td>45.6%</td> </tr> <tr> <td>4</td> <td>16</td> <td>20.3%</td> </tr> <tr> <td>5</td> <td>14</td> <td>17.7%</td> </tr> </tbody> </table>	Rating	Count	Percentage	1	6	7.6%	2	7	8.9%	3	36	45.6%	4	16	20.3%	5	14	17.7%
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Next, for **section four**, I would like to know about the effect of online classes on children aged 7 to 12 years. Since I want to help elementary school students, so I want to know the implications of online classes, are they negative, positive, or both?

Table 6: Section 4

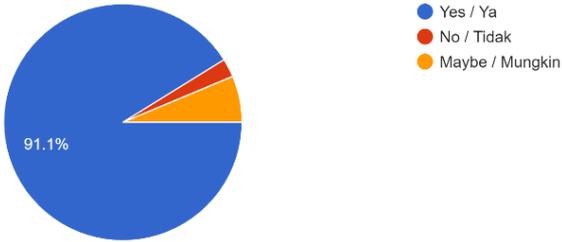
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Finally, in **section five**, I want to develop an E-learning app, therefore, I want to know the reactions and opinions of respondents about e-learning applications, whether they agree or oppose this idea.

Table 7: Survey section 5

<p>Do you agree that children will learn faster while playing games? Examples of games: Puzzles, Quizzes</p>	<p>Do you agree that children will learn faster while playing games? Examples of games: Puzzles, Quizzes 79 responses</p> <table border="1"> <thead> <tr> <th>Agreement Level</th> <th>Count</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0</td> <td>0%</td> </tr> <tr> <td>2</td> <td>0</td> <td>0%</td> </tr> <tr> <td>3</td> <td>7</td> <td>8.9%</td> </tr> <tr> <td>4</td> <td>27</td> <td>34.2%</td> </tr> <tr> <td>5</td> <td>45</td> <td>57%</td> </tr> </tbody> </table>	Agreement Level	Count	Percentage	1	0	0%	2	0	0%	3	7	8.9%	4	27	34.2%	5	45	57%
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<p>In your opinion, besides puzzles and quizzes, what other games can be included to increase student interest?</p>	<p>In your opinion, besides puzzles and quizzes, what other games can be included to increase student interest?</p> <p>79 responses</p> <ul style="list-style-type: none"> games but make it as education game having them gain their experience by do what they interested Video, youtube Melibatkn warna, jenis kenderaan, haiwan Muzik Activity that prefer student to do task together Tutorial of origami (arts) Singing 								
<p>If there an application regards to improvise a child's English learning, would you use it?</p>	<p>If there an application regards to improvise a child's English learning, would you use it?</p> <p>79 responses</p>  <table border="1"> <caption>Survey Results: Would you use it?</caption> <thead> <tr> <th>Response</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Yes / Ya</td> <td>91.1%</td> </tr> <tr> <td>No / Tidak</td> <td>(Not specified)</td> </tr> <tr> <td>Maybe / Mungkin</td> <td>(Not specified)</td> </tr> </tbody> </table>	Response	Percentage	Yes / Ya	91.1%	No / Tidak	(Not specified)	Maybe / Mungkin	(Not specified)
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No / Tidak	(Not specified)								
Maybe / Mungkin	(Not specified)								
<p>Do you have any suggestions on this project or study?</p>	<p>Do you have any suggestions on this project or study?</p> <p>79 responses</p> <ul style="list-style-type: none"> do learn what child experience and feel them. then u can catch their attention for learning. slide in on their shoes then you know what they want. None User friendly Make it free kalau boleh banyakkan kanak dalam aktiviti dunia nyata Make the game more interactive Kajian ini amat bagus ,sekurang2 kita dapat mengetahui pandangan serta pendapat dari ibu2 dan bapa2 yang mungkin lebih berpengalaman.. The colour scheme used must be the attractive one to attract the user or maybe the user can customize it. 								

Based on the survey, the author can see that the majority of respondents out of 79 respondents will support this web app learning regardless of teachers or parents. This Google Form survey further strengthens the authors' support that gamification influences students' interest in learning, especially in current pandemic situations. Moreover, many argue that e-learning that educates English is appropriate to implement, and more than 90 percent of respondents will use it once it is developed.

4.2 Prototype

4.2.1 Deliverable's Interface

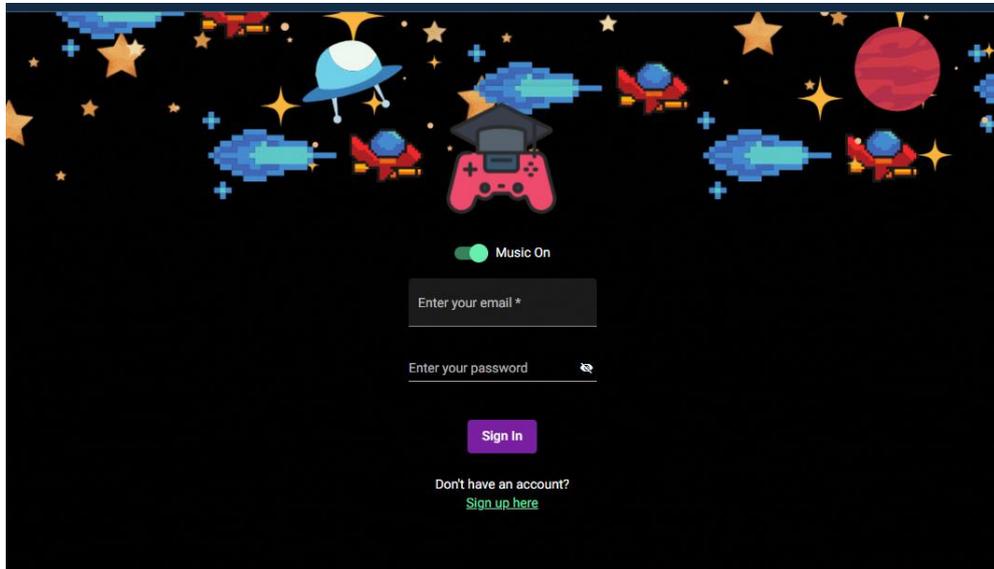


Figure 5: Login Page

Primarily, once a user visited the website, they will directly be on the log-in page. The login page was designed to allow a user to log in and they will have entire access to the website. Users must enter their email and password to log in, however, in the case where the user does not have an account, they will require to sign up.

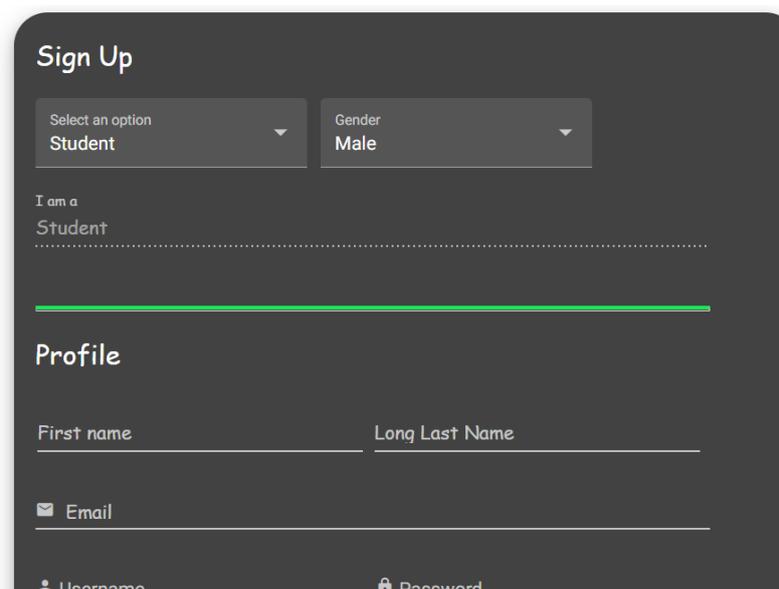
A screenshot of a sign-up form on a dark background. The form is titled 'Sign Up'. It contains two dropdown menus: 'Select an option' with 'Student' selected, and 'Gender' with 'Male' selected. Below these is a text input field with the placeholder 'I am a Student'. A horizontal line separates this section from the 'Profile' section. The 'Profile' section includes two text input fields for 'First name' and 'Long Last Name', followed by an 'Email' field with an envelope icon, and finally 'Username' and 'Password' fields with their respective icons.

Figure 6: Sign Up section

Next, a sign-up page was designed to allow the user to create a profile. The website was developed for students and teacher usage, therefore there will be an option to choose whether the user is a student or teacher. Basic information such as name, email, username, password, etc, will be required to be filled in by the user.

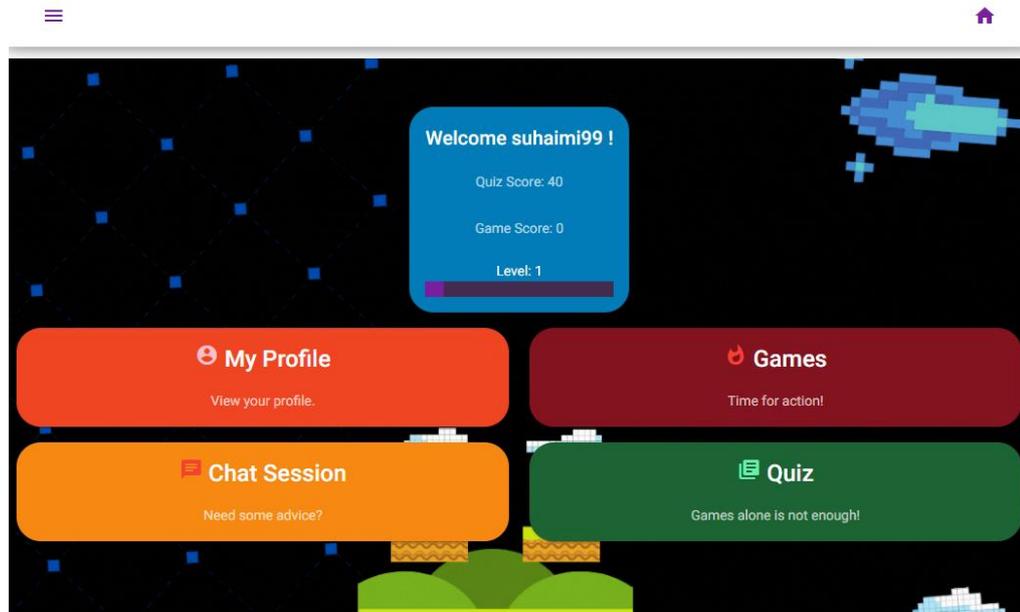


Figure 7: Home Page with score dashboard

Moving forwards, once the user has logged in, they will be directed to the home page. There are several elements on the home page. The first one is the information dashboard which is located on top of the page where it will show user's current quiz and game scores. Moreover, 'My Profile', which designed to view the user's profile, 'Chat session' was designed to allow students and teachers to have direct communication, 'Games' was included where it consists of certain games such as mix and match, and finally 'Quiz' section was provided to allow students to increase their thinking skills where quizzes are focuses on spelling and grammar.

Figure 8: Quiz section for Spelling

Furthermore, the quiz page was designed to increase students' knowledge. Here, the user is required to enter their username and may select the types of quizzes they wish to answer. For instance, there are quizzes on spelling and grammar. Once they have answered the quiz, it will display their current scores.

Figure 9: Game section for Grammar

In addition, the website also consists of game section as well, whereby there will be a situation given displayed in a picture, and the user is required to rearrange the words to make a correct sentence. On the top right, there are three (3) lifespans given to the user. In the case where the user submitted a wrong answer, the lifespan will decrease automatically.

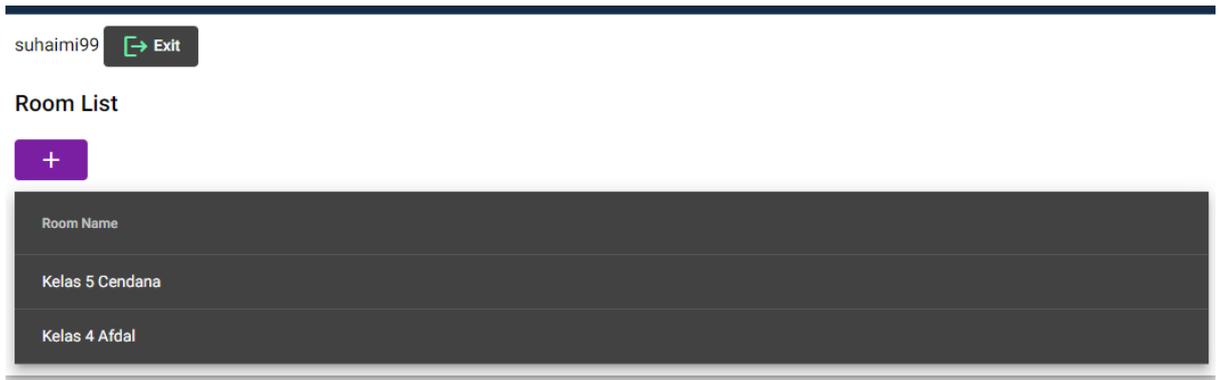


Figure 10: Section add new room

Finally, the chat session section is where it allows the students and teacher may communicate with each other directly. To create a room chat, the user must be a teacher otherwise the website would not allow the user to create a room chat. Once they have created a room, students will be able to view the chatroom. Sample of chat room are as below:

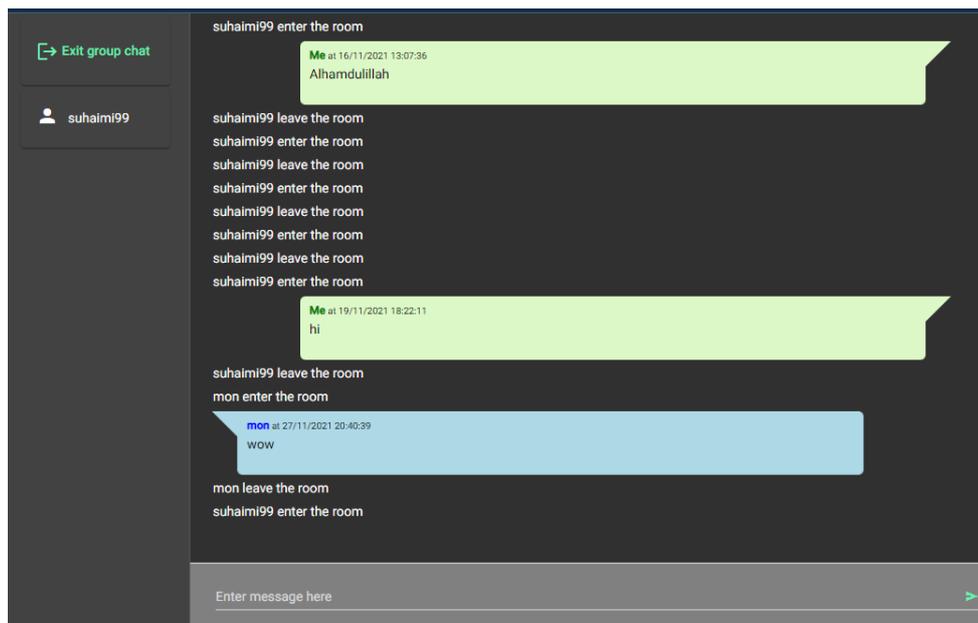


Figure 11: Chat UI

4.2.2 User Testing

i. Developer Testing

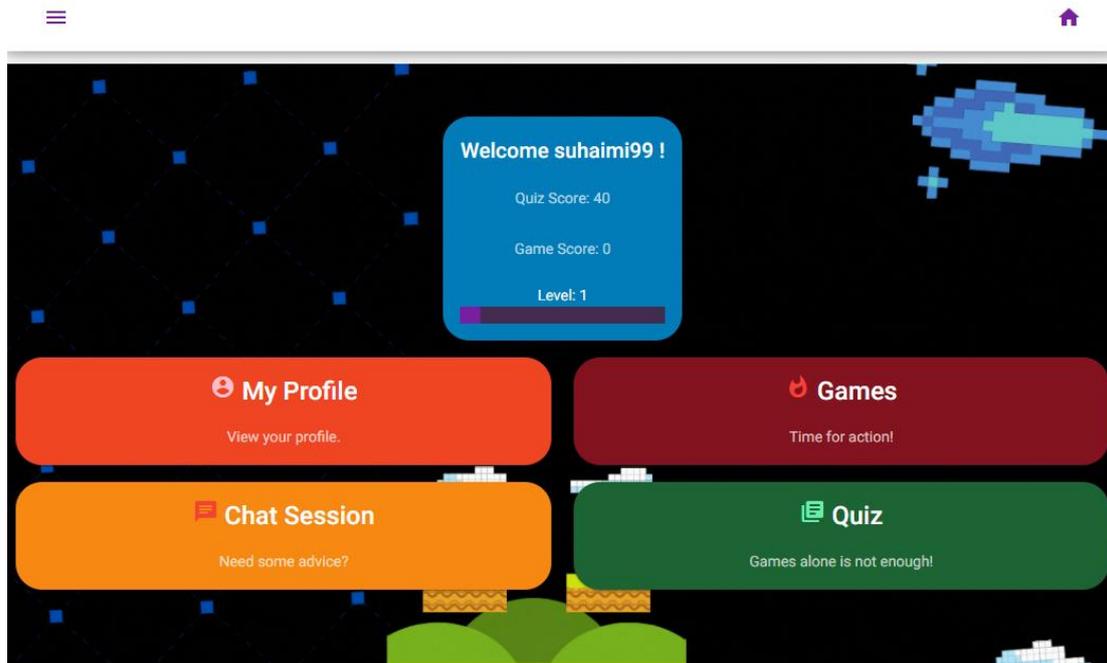


Figure 12: Homepage with dashboard

In the experimentation section, the author is also a developer for the GoPlay prototype. Here, the developer has conducted detailed testing in the Login page, Register, Homepage, Profile, Quiz, Games and Chat Session.

Each time a user registers, user data will be saved and will be authenticated before they can log into the web app. All data will be stored directly into the Firebase. Each time a user plays a game or answers a quiz, all scores will be updated into the user database and then will be displayed in the homepage dashboard.

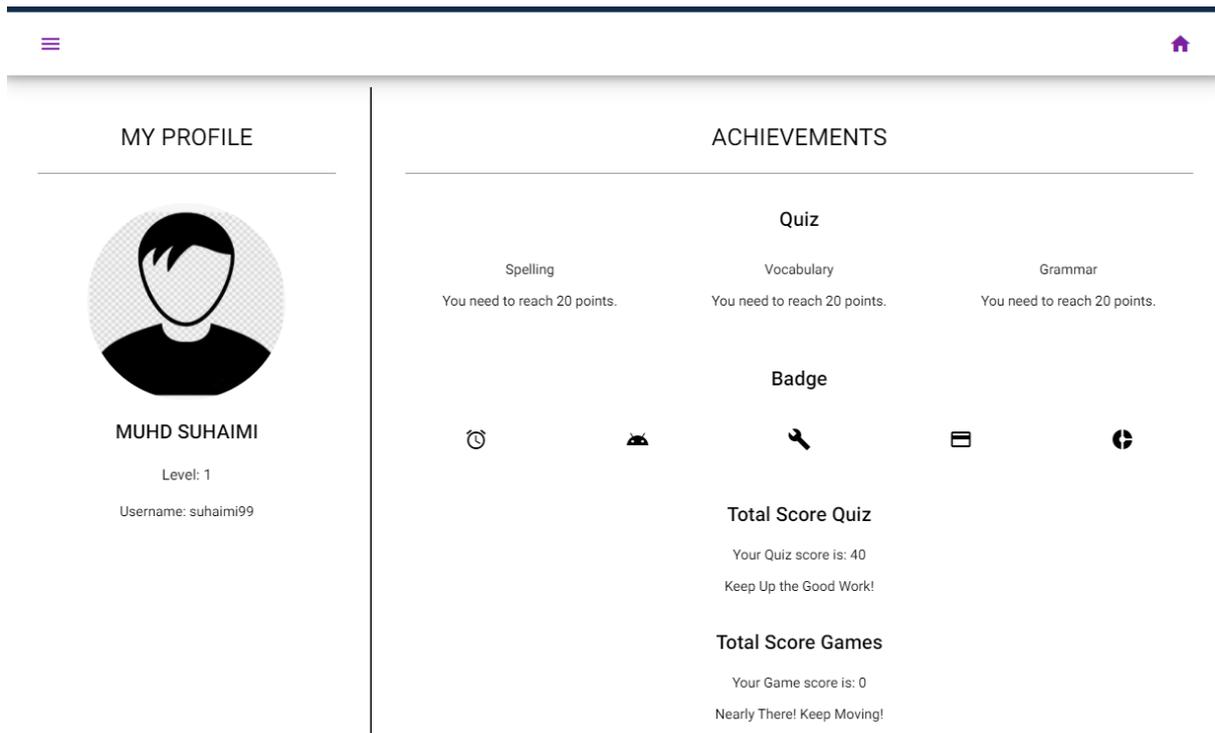


Figure 13: Profile page with some gamification's element

To make this web app have a gamification element, in the dashboard there are scores for games, quizzes, and also player levels. Each score will be updated into the database and can be displayed for the user to view and monitor his record. In addition, there is a profile for players to see the level, a little info about the player such as name and username, achievement, score, and badge successfully earned.

CHAPTER 5

CONCLUSION AND RECOMMENDATION

In conclusion, the methods and features of gamification can be implemented in tandem with education because it is able to encourage students, especially children to learn more. In a competitive situation, students will be more likely to compete for the best place in a challenge. Thus, gamification can help students to strive more to become champions in the game or in other words is to get excellent marks in English subjects. Indirectly, it helps children's development in education without putting them as much pressure as they do with interest and voluntarily without coercion.

5.1 Recommendation for Future Work

The activities of this project are running according to schedule and have now succeeded in achieving several objectives as below:

- a) **Review the perceptions of teachers and parents for feedback about gamification.**
A survey was conducted on 79 people and more than 90% agreed to adapt the gamification method in children's learning.
- b) **Evaluate and analyse user opinions on applications that educate English at the primary school level.** Based on the respondents who answered the survey agreed that English is very important to prepare for the future.
- c) **Develop more game and quiz in the web application that can encourage children to play while learning.** So far, only a few quizzes and one game has been successfully developed using Angular and connected with Firebase as its backend service.

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APPENDICES

APPENDIX 1: SYSTEM FLOWCHART

