Unique English: An English Learning Application for Remedial Program Using Gamification Approach

Yab Li Yu¹, Muhammad Fakri Bin Othman²*, Mohd Helmy Abd Wahab³, Syed Zulkarnain Syed Idrus⁴
¹,²Department of Multimedia in Faculty Computer Science and Information Technology, Universiti Tun Hussein Onn Malaysia, 86400 Batu Pahat, Johor, Malaysia
³Computational, Signal, Imaging and Intelligence Focus Group, Faculty of Electrical and Electronics Engineering, Universiti Tun Hussein Onn Malaysia, 86400 Batu Pahat, Johor, Malaysia
⁴,⁵School of Computer and Communication Engineering, Universiti Malaysia Perlis, Kubang Gajah Campus, 02600 Arau, Perlis, Malaysia
*Corresponding author’s e-mail address: fakri@uthm.edu.my

Abstract. Literacy and Numeracy Screening (LINUS) that implemented in Malaysia as an educational program to improve literacy and numeracy among Year 1 to Year 3 pupils in all primary schools has been terminated in 2019. However, school-level remedial program still exists and its related application is limited in the market as there is no centralized syllabus for English remedial program yet. Therefore, an English learning application for remedial program called Unique English is designed with Multimedia Mobile Content Development to overcome this problem by using previous LINUS centralized constructs. An application testing has been carried out in S.K. Pintas Raya, Parit Raja which involves pupils in remedial program and received satisfactory results with 83.2% positive feedbacks obtained thus it can be concluded that Unique English is suitable to be implemented in remedial program.

1. Introduction
Literacy, Numeracy and screening (LINUS) was implemented in Malaysia as an educational program that designed to improve the literacy of the English language among Primary Year 1 to Year 3 pupils [1]. The first LINUS program was launched in 2010, with only Malay literacy and Numeracy screenings provided while LINUS 2.0 is the later version of the previous LINUS program, adding English literacy in the screenings that launched in 2013 [2]. However, centralize LINUS program has been terminated in 2019 but school-level remedial program exists [3]. Remedial program is an educational program provided for students experiencing problems in mastering 3M’s basic skills, namely reading, writing and computing complexes due to environmental factors [4]. Every school shall have their own remedial program according to the needs of the pupils [5]. Since the remedial program at school-level replaces the centralized LINUS program, different school might have different formulas to reinforce pupils’ literacy and numeracy. Previous LINUS instrument can still be used according to the school’s will. Hence, the remedial program in school which uses previous LINUS instrument has rather limited application in the market, not to mention application for LINUS English literacy. The application for remedial program even non-exists in PlayStore as there is no centralize instrument for English remedial program yet.
In order to resolve the problem of the lacking of existing remedial system, an English learning application that uses gamification approach has been designed with the methodology of Multimedia Mobile Content Development. The game features have been designed to be more interactive with lots of graphical and audio feedbacks.

The objectives of creating the application is to design the content of Unique English for remedial program using gamification approach, to develop it based on Android mobile platform and Windows PC platform, and to test Unique English to the target users. At school, Windows PC platform is used with the presence of the teacher as pupils’ guidance, while Android mobile platform is used to revise what they learnt in school. An English teacher, Madam Roslinda Binti Abd Majid, from S.K. Pintas Raya, Parit Raja, Johor has been consulted as the Subject Matter Expertise and this application covers 5 out of 12 previous LINUS constructs.

2. Related works
The existing applications of LINUS application such as Literasi Membaca [6], LINUS Matematik Tahap 1 [7], and Beyond LINUS Fun with Sounds [8] have been reviewed and compared with proposed application, Unique English. Table 1 displays the comparison of various applications developed for LINUS.

| Application                  | Description                                                                 |
|------------------------------|-----------------------------------------------------------------------------|
| Literasi Membaca             | It focuses on reading skills, increasing participation and interest in reading literacy in Malay, up to Construct 2. Minimum platform that support this application is Android 4.1. Internet access is not required. It has Learn and Game Modules. The lack of home button and menu button might result in inconvenient experience. |
| LINUS Matematik Tahap 1      | It is a Mathematics interactive games that aims to improve the understanding of numeracy. Minimum platform that support this application is Android 4.1 and does not require internet access. It has Learn and Game Modules but lack of tutorial examples. |
| Beyond LINUS Fun with Sounds | It is specially designed for the young readers and learners who are beginning to enjoy reading and learning in English literacy. It covers construct 1 to construct 3. Minimum platform that support this application is Android 4.1. It uses level to indicate the progress. Voice recording feature is not usable unless users pay for it. |
| Proposed application, Unique English. | It is designed based on the previous LINUS instruments to improve the English literacy among Year 1 pupils for remedial program. It covers construct 1 to construct 5 from the LINUS instruments. The platform that support this application is Android 4.1 and above, Windows 7 and above. It has Learn and Game Modules and it uses interactive game elements and includes narrators and audio-graphic responses. |

The comparison made has highlighted the strengths and weaknesses of the existing application. Unique English covers more constructs as compared to the existing applications. Features like background music, sound effects and narration will be included to provide better experience.
3. Methodology
Multimedia Mobile Content Development (MMCD) has been chosen to be the methodology of the development process for this project as shown in figure 1.

![Figure 1. Components of MMCD Methodology [9].](image)

According to figure 1, the stages in MMCD are effective to create multimedia mobile content it focuses on content navigation and objects used [10].

3.1 Application idea creation stage
Application Idea Creation Stage prepares the information that will be needed for the development before starting to design and develop the application [9]. Table 2 shows the application idea that has been generated.

| Item                     | Note                                                                 |
|--------------------------|----------------------------------------------------------------------|
| Type of application      | Learning application                                                  |
| Target device            | Android mobile and Windows PC                                         |
| Target users             | Year 1 primary pupils                                                |
| Images                   | Icons, images in main interface, learn module, game module.           |
| Animation                | Game objects, score bar and timer animations.                         |
| Audio                    | Background music, sound effects and narration.                        |
| Application synopsis     | Unique English is an English Learning application for remedial program using gamification approach that designed to reinforce English literacy for Year 1 pupils.|

3.2 Structure analysis stage
Structure Analysis is the second stage in the MMCD methodology. In this stage, many of the design concept have been done beforehand. Content Structure listed the learning outcome or expected results gained at the end of each lesson. As for Navigation Structure, it illustrates how Unique English navigates between scenes. Flow Chart determines the application flow that is similar to the scripting logic. Storyboard shows a rough idea of what the system will look like in the end of the development. Besides, user requirement analysis, functional and non-functional analyses, software and hardware requirement analyses have been done too. An interview session was conducted with Madam Roslinda Binti Abd Majid, an English teacher in S.K. Pintas Raya, Parit raja, Johor, who is also the Subject Matter Expert of this project, to gain the user requirement analysis for Unique English.
3.3 Process design stage

The design process includes two sub components, which are designing objects and writing the single function prototype script. The object design of Unique English application includes the creation of buttons, graphical user interfaces and animation as shown in table 3.

| Object      | Design |
|-------------|--------|
| Button      | ![Button Design](image) |
| User Interface | ![User Interface Design](image) |
| Animation   | ![Animation Design](image) |

According to the design phase of Multimedia Mobile Content, writing a single function prototype is an important step before continue to the implementation stage. The prototype of loading scene has been written for this section as shown in figure 2.

![Code Snippet](image)

**Figure 2.** Code Snippet of a Single Function Prototype.

3.4 Main function development stage

This stage is where the main functions of Unique English is developed, which include clicking-based feature, drag and drop and voice recognition.

There are some game levels and learning lessons being implemented by the concept of clicking feature. These clickable game objects invoke the function in the script and execute some expected statements such as playing animation clips, performing computational operation, playing audio clips, comparing logical equation and even calling other functions as shown in figure 3.
As for drag and drop feature, the game level requires users to drag the targeted game object (fish) to the correct placeholder (behind the seaweed). Figure 4 shows the example of drag and drop game feature.

The last feature used is Voice Recognition in Windows platform. It is implemented in game level 3, entitled Unique Talent as shown in figure 5. As the name goes, this game level requires users’ voice in order to complete the level, if and only if the input is successfully recognized.

3.5 Testing stage

The subjects of testing are the Year 1 pupils involved in remedial program in SK Pintas Raya, Parit Raja, Johor. The main purpose of the testing stage is to measure the effectiveness of the application towards the targeted users and to make sure the objective of this application is achieved. The feedback from the targeted users would be taken into consideration for improvement.

4. Results and discussion

This section shows the fully functioning application used for testing process, and the analysis of the results of testing will be discussed.

4.1 Application Results

The application used for testing process is fully functioning and it contains all the features designed early in design phase. Some of the user interfaces will be shown in table 4.
Table 4. User Interface.

| Scene                        | User Interface |
|------------------------------|----------------|
| Home Scene                   |                |
| Main Menu of Learn Module    |                |
| Main Menu of Game Module     |                |
| Example Game Scene           |                |
| Level Complete               |                |

4.2 Application testing

The subjects of testing are 25 Year 1 pupils in SK Pintas Raya, Parit Raja. A set of questionnaires that covers 3 components (learning outcome acquisition, user acceptance level and functionality) was distributed to the target users.

As shown in figure 6, there are 5 questions in Component 1 to determine the result of Learning Outcome Acquisition. Question 1, 2, 3, 4 and 5 are all related to 5 game levels in Unique English respectively. Each level has different objective and learning outcome and that is why it is important to determine whether users acquire what they expected to learn from each level. From the chart generated, it can be said that all 5 questions were answered with positive answer, indicating that the particular game level’s learning outcome was achieved. However, there are some negative answers and ambiguous answers as well. For Question 1, 84% of respondents answered ‘Yes’, 8% answered ‘No’ while another 8% answered ‘Not Sure’. As for Question 2 and Question 5, they both have the same results where 84% answered positive answer, 4% answered negative answer, whereas 12% of the respondents answered ‘Not Sure’. For Question 3 and Question 4, they both have 80% of respondents
for positive answers, 4% for ‘Not Sure’ and 16% for negative answers. Overall, most of the respondents provided positive answers, meaning that the particular game level produces a positive learning outcome.

Figure 6. Analysis of Component 1: Learning Outcome Acquisition.

Based on the result of Component 2 shown in figure 7, 92% of respondents think that Unique English has a pleasant user interface while 4% of them think otherwise, and another 4% are not sure about the answers. As for Question 2, there are 92% positive answers supporting the fact that they enjoy playing the game as it is easy to learn and easy to use, 0% of negative feedback and another 8% of unsure answers. Therefore, it can be said that the user acceptance level results in an acceptable and positive feedbacks from the users.

Figure 7. Analysis of Component 2: User Acceptance Level.

Component 3 in the questionnaires is about user acceptance level. Its purpose is to know the level of acceptance of the target users towards Unique English. According to figure 8, there are 88% of respondents who can hear and see the instructions and questions in the game clearly while 4% of them think otherwise, and another 8% are not sure about the answers. As for Question 2, there are 80% positive answers supporting the fact that they like to learn English by playing this game as compared to reading books, 0% of negative feedback and another 20% of unsure answers. For Question 3, 68% of the respondents can understand the use of the buttons in the game whereas 4% of them cannot, and another 28% of them are not sure about the answers. Therefore, it can be said that the functionality of Unique English is in the range from above average to high.
Overall, after analyzing the results gained for Learning Outcome Acquisition, User Acceptance Level and Functionality, it can be concluded that all 3 components received more positive and acceptable results from the respondents. All 25 respondents managed to complete Unique English during the testing process. Figure 9 shows the time taken for the respondents to complete Unique English application. There are 3 out of 25 respondents (12%) who completed the game within 15 minutes, and 8 out of 25 (32%) finished the game in 20 minutes. Most of the respondents completed the game between 20 to 25 minutes, which is 9 out of 25 (36%) respondents. There are 3 out of 25 respondents (12%) who used 25 to 30 minutes to complete the game, whereas 2 out of 25 (8%) respondents required 30 to 40 minutes to finish the entire Unique English application.

According to the subject matter expert, Madam Roslinda Binti Abd Majid, from S.K. Pintas Raya in Parit Raja, Johor, the total period of English class in primary is 9 periods per week, each period takes 30 minutes and one day can have 2 to 3 periods. Therefore, the amount of time available for remedial program in class is around 60 to 90 minutes per day if that particular day has English class. Besides, Madam Roslinda stated that the remedial program is fully depending on the English teacher; thus, she sees no problem using previous LINUS instrument for the remedial program as it was distributed from National Key Result Areas under Ministry of Education after all. To conclude, since the time taken for 25 respondents to complete the entire application are less than 40 minutes, and the English class normally takes 60 to 90 minutes, thus, Unique English is feasible and can be implemented for in-class remedial program with proven positive learning outcome.

5. Conclusion
In conclusion, Unique English is suitable for the target users to reinforce their English literacy by using this application during remedial program.

Unique English has several advantages, such as, it provides positive results in learning outcome acquisition and therefore it is believed to have the ability to reinforce pupil’s English literacy during remedial program; it has high User Acceptance Level where the user interface appears to be attractive and colourful to children and they enjoy using it; it has high multimedia interactivity like textual instruction, graphical response, voice instruction, voice recognition, and animation; the functionality
of Unique English is very well supported in both Windows PC and Android mobile platforms as shown in Appendix G, for remedial program at school and home-based revision aids respectively.

Besides, limitations were also identified. For instance, there are only 5 constructs covered in Unique English where users only need less than 40 minutes to complete it entirely; the questions asked in game module remained the same order each time users playing the game; voice recognition feature is hard to detect user’s voice if the environment is too noisy and therefore an external microphone might come in handy. Fortunately, there are some improvements that can be made in the future to enhance this application and resolve its current limitations. The future works suggested are, to provide updates to cover more constructs and increase more learning lessons and game levels; to randomize the order of how the questions are asked so that users will not get bored after playing multiple times; to provide voice recognition for Android mobile platform for home revision as well.

To sum up, Unique English successfully gamifies the previous LINUS instrument for current remedial program by following a well-planned Multimedia Mobile Content Development methodology and gained valuable feedbacks while carrying out user testing. All three objectives of this project have been achieved and it is hoped that this application can continue to be better in the future.

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