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A Mobile Application for English Grammar Learning Among Primary School Students

Zamlina Abdullah
zamlinaabdullah@uitm.edu.my
Universiti Teknologi MARA (UiTM), Malaysia
ORCID iD: 0009-0006-3770-4564
(Corresponding Author)

Nurul Aisyah Jamaluddin
nrlasyh78@gmail.com
Universiti Teknologi MARA (UiTM), Malaysia

Nurazian Mior Dahalan
nurazian@uitm.edu.my
Universiti Teknologi MARA (UiTM), Malaysia
ORCID iD: 0009-0003-5846-1379

Azlin Dahlan
azlindah@uitm.edu.my
Universiti Teknologi MARA (UiTM), Malaysia

Mohamad Hafiz Khairuddin
hafizk@uitm.edu.my
Universiti Teknologi MARA (UiTM), Malaysia
ORCID iD: 0009-0004-4253-928X

Abstract

Mastering English grammar, especially tenses and subject-verb agreement, is often a major challenge for primary school students learning English as a second language. Traditional teaching methods often struggle to keep young learners interested, which leads to recurring mistakes in their writing and assessments. Hence, this paper aims to design and develop a mobile learning application named English Easy Grammar that makes grammar learning interactive through gamification. The application was developed using the ADDIE instructional design model, which consists of the Analysis, Design, Development, Implementation and Evaluation phases, and was built with the Construct 3 game engine. By introducing game mechanics such as progressive levels, virtual coins, instant feedback and daily rewards, the application turns grammar rules into easy, engaging and challenging activities. The application was evaluated through functional test cases and a usability test with five primary school students. The results showed that all respondents were able to complete the core tasks and that the application worked reliably, showing its potential as an accessible digital tool for early language

learning. Future work should cover a broader scope of language learning, enhance the gamification features and integrate advanced analytics tools to monitor user progress.

Keywords Mobile Learning (M-Learning); Gamification; English as a Second Language (ESL); English grammar; Construct 3; ADDIE Model

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Introduction

English is widely regarded as an international language, and in Malaysia it is taught as a second language (ESL). English is a compulsory subject from primary school onwards and is one of the core subjects in the Malaysian Certificate of Education, known as Sijil Pelajaran Malaysia (SPM). Grammar is often described as the set of rules that govern how words are used in a language, in both writing and speech, establishing how words, groups of words and sentences should be put together (Baskervill & Sewell, 2022). A solid understanding of grammar enables children to express their thoughts and emotions and to select the appropriate words for any given context. Children are expected to grasp and apply the grammar and punctuation rules outlined in the national curriculum.

Grammar, in particular, is considered the most difficult aspect of the English language, as it requires learners to memorise and apply many grammatical rules, such as those governing tenses and subject-verb agreement (Jirin et al., 2023). In a survey of 33 respondents, comprising 20 parents and 13 teachers, 72.7% of respondents indicated that they would prefer English as the school-based language, as English is a global language and the most widely spoken language in the world.

Traditional teaching approaches based on lectures, worksheets and passive learning activities are less effective in actively involving children in the learning process. The survey results showed that 46.2% of teachers find teaching English grammar to children aged 7 to 12 difficult. Frequent grammatical errors markedly affect examination performance, diminish the overall quality of students' written work and lower their assessment results.

Based on the above problem, there is a need for a mobile application for English grammar learning that engages users effectively. The proposed application supports English learning with gamification features such as coins, badges and daily rewards to make it more engaging for users. It serves as an alternative tool for primary school students to learn English grammar easily and enjoyably.

Literature Review

Overview of English Grammar Learning Challenges

Grammar is the system of a language, often described as the rules of a language. Learning grammar is crucial for ESL students, as it forms the foundation for effective communication and language proficiency. Combining explicit and implicit grammar instruction has been shown to support the development of the grammatical competence that learners need for authentic language use (Ellis, 2006). However, primary school students often face significant difficulties when attempting to master complex structures such as tenses and subject-verb agreement. Traditional pedagogical methods, which rely heavily on static textbook exercises and lecture-based instruction, struggle to sustain engagement among young learners. These conventional methods often create a passive learning environment,

resulting in recurring grammatical errors in student assessments. The shift towards more communicative and functional approaches to grammar teaching is also well established in the literature. A dynamic approach to grammar teaching accommodates the variability of language and the practical needs of learners (Larsen-Freeman, 2015).

Gamification in Education

Gamification is defined as the use of game design elements in non-game contexts, such as educational platforms (Deterding et al., 2011). According to existing studies, incorporating features such as progressive levels, immediate score tracking and visual feedback can change students' attitudes towards otherwise dry subjects. By introducing immediate rewards such as virtual coins and achievement badges, the learning atmosphere shifts towards active exploration rather than forced memorisation. This transition supports the principles of child-computer interaction and helps to build the behavioural retention necessary for long-term knowledge acquisition.

There are three classifications of gamification, namely internal gamification, external gamification and behaviour-change gamification (Nikmah, 2020). Gamified learning experiences can significantly improve the retention and understanding of educational content, particularly when tailored to learners' personality traits.

Comparative Analysis of Existing Applications

To establish a clear baseline for the design, several existing educational applications were examined during the analysis phase. *Fun English* (StudyCat, 2021) focuses heavily on supervised learning and basic vocabulary categorisation, making it highly effective for early vocabulary building. However, it demands intensive verbal interaction from the student. *LingoKids* (LingoKids Educational Group, 2022) relies heavily on an adaptive reward structure and predictive user pacing, although its advanced modules require an ongoing premium subscription. *LuvLingua* (LuvLingua Technologies, 2020) functions smoothly offline but lacks collaborative elements and dynamic content updates. Finally, *Hello English* (Culture Alley, 2023) provides real-time pop-up text explanations of user mistakes, but its dense interface layouts can easily overwhelm younger users. This study addresses these gaps by creating an offline-friendly, cleanly organised gamified application tailored specifically to primary-level grammar using the Construct 3 engine.

Methodology

This research project uses the ADDIE model, which consists of five sequential phases (Analysis, Design, Development, Implementation and Evaluation), to provide a structured workflow for producing the gamified learning application. Each phase serves as a benchmark to ensure that the tool targets the

identified learning gaps of primary school students while operating reliably on mobile platforms (Aldoobie, 2015).

Analysis Phase

The analysis phase focuses on understanding the primary problem, gathering system requirements and defining the constraints of the target users. Based on a questionnaire survey of 33 parents and teachers, children face obstacles when trying to master English language components, particularly tenses and subject-verb agreement.

Design Phase

The design phase constructs the structure of the application in terms of its user interface and pedagogical aspects. It produces a use case diagram, a flowchart and a low-fidelity storyboard created using Canva. The flowchart maps user transitions from the Welcome Screen, through a text-based name input, into the level selection menu and finally into the active grammar game layouts. Figure 1 shows the flowchart of the game application. A use case diagram, shown in Figure 2, was established to illustrate the interactions between the user and the system and its boundaries, tracing how a user accesses the game, earns points and checks daily login rewards (Satzinger et al., 2011).

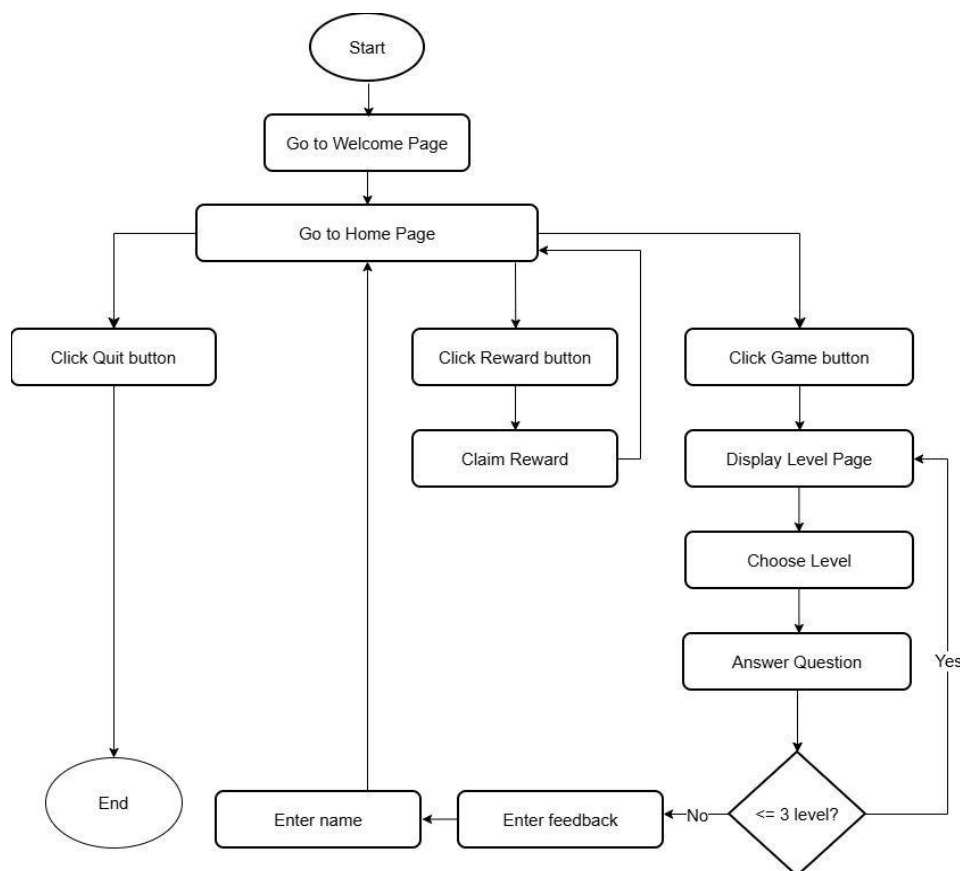


Figure 1. Flowchart of Game

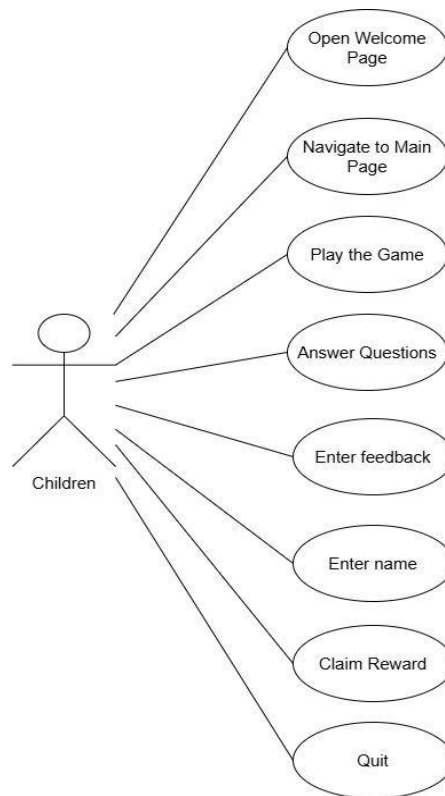


Figure 2. Use Case Diagram

English Easy Grammar Development Phase

During the development phase, the blueprints from the design phase are translated directly into an operational application. Canva was used to support development, and Construct 3 was selected as the game engine owing to its efficient, event-driven canvas rendering and strong cross-platform capabilities (Scirra Ltd., 2024). Construct 3 integrates visual events and logic blocks to support the development of interactive content.

Users can play all three levels of the grammar game, with each level gradually increasing in difficulty. Each user's score is tracked separately for each level, enabling specific monitoring of their progress in English grammar. Users must start at Level 1 and unlock subsequent levels by successfully completing the previous one. Each level features distinct challenges, such as collecting stars or avoiding obstacles, to maintain engagement. Scores achieved during gameplay are saved automatically upon completion of each level.

Users are directed to the question page after collecting stars in the game. Each question presents a sentence with a missing word and three multiple-choice options. Users can select one answer per question, and their response is immediately evaluated for correctness. Correct answers contribute to the player's overall score, while incorrect answers are recorded and the same question cannot be re-

attempted. Each correct answer awards the student 10 coins. Users can also claim a daily reward, which motivates continued engagement.

Implementation Phase

The implementation phase involved a group of primary school students, in order to observe how the application supported their language learning and to identify challenges in a real-world environment. The developers provided one-to-one guidance to help the students become familiar with the application, which also ensured that they were confident in using it independently.

Evaluation Phase

The English Easy Grammar mobile application underwent functionality and usability testing to assess its reliability and user experience.

Functionality testing, carried out by the developers, is essential to verify the reliability and effectiveness of the system. The main goal of this testing process is to confirm that the system's functions conform to the requirements. Each feature of the system was rigorously tested to ensure that it performs as expected. This process involves executing each function within the system and comparing the observed outputs against the expected results outlined in the design specifications. A comprehensive series of test cases, developed from the system's specific requirements, was employed during this phase. These test cases were designed to cover a wide range of scenarios, ensuring that all aspects of the system were thoroughly evaluated.

A questionnaire was distributed to five primary school students and their responses were recorded. Usability testing is a method used to evaluate the user interface and overall usability of the English Easy Grammar application. The primary objective is to assess whether the system is intuitive, easy to use and meets the needs of its target users. During the testing process, actual users were asked to complete specific tasks, such as navigating the game, answering quiz questions, claiming rewards and submitting feedback. Their interactions with the system were observed, and feedback was collected regarding ease of navigation, clarity of instructions and overall satisfaction. This process helped to identify usability issues and areas for improvement, allowing the system to be refined to enhance the overall user experience. By incorporating user feedback, the system was optimised to provide a seamless and engaging grammar learning experience.

Results and Discussion

Functional Testing Results

Functional testing was conducted for all test cases to validate the system's operation. The tests ensured that every user interaction performed as expected, as shown in Table 1.

Table 1. Functional testing result

Test Case	Expected Result	Success/Failure
Welcome Page	User can open the app	Success
Main Page	The system displays the home page	Success
Reward Page	The system shows the reward page, and the user can claim the daily rewards	Success
Game Page	User is able to play the game smoothly	Success
Question Page	User is able to click the correct answer for the grammar question	Success
Feedback Page	User is able to give feedback on the system	Success
Name Page	User is able to fill in their full name, view the final score and view the coins achieved	Success

The testing confirmed that the application successfully handled all user interactions with the game.

Usability Testing Results

The usability testing results were recorded to evaluate how easily users can use the application, as shown in Table 2.

Table 2. Usability testing result

Number	Question	Respondent				
		1	2	3	4	5
1	Does the game run smoothly?	Yes	Yes	Yes	Yes	Yes
2	Does the user successfully get to claim daily reward?	Yes	Yes	Yes	Yes	Yes
3	Are the total coins and score displayed accurately based on the player's progress?	Yes	Yes	Yes	Yes	Yes
4	Are rewards only claimable once the specified conditions are met?	Yes	Yes	Yes	Yes	Yes
5	Can the user successfully submit full name through the Done button?	Yes	Yes	Yes	Yes	Yes

The usability test indicated that all respondents were able to complete the core tasks of the application successfully.

Conclusion

Conclusion

This application provides an interactive and appealing platform for users to understand grammar concepts through quizzes, mini-games and reward-based achievements. By incorporating gamification principles such as coins, badges and daily rewards, the application encourages users to participate actively in learning and to track their progress over time.

The scope of this gamified mobile application is focused solely on English grammar learning, excluding other language skills such as vocabulary, reading comprehension and writing. The gamification elements are limited to coins, badges and daily rewards, and user feedback indicated a desire for more customisable and engaging elements. Finally, the system currently lacks integration with advanced analytics tools for real-time monitoring of user progress and behaviour, which could further enhance the learning experience and provide deeper insights into its effectiveness. The usability evaluation in this study was limited to five primary school students and relied on binary (Yes/No) responses that mainly confirmed the application's operational behaviour. This small sample and simple instrument do not allow conclusions about learning gains or broader user satisfaction.

Future Work

To further improve the gamified mobile application for English grammar learning, several recommendations can be considered. Expanding the content to include other aspects of language learning, such as vocabulary building, reading comprehension and writing skills, would make the application more comprehensive and appealing to a wider audience.

Enhancing the gamification features, for example by incorporating adaptive difficulty levels, personalised rewards and collaborative challenges, could further boost user engagement and motivation. Integrating advanced analytics tools to monitor user progress, identify learning gaps and offer tailored recommendations would improve both the user experience and learning outcomes. Additionally, optimising the application for a broader range of devices, operating systems and screen sizes would ensure better compatibility and accessibility for all users. Future studies will involve a larger sample of primary school students and a standardised usability instrument, such as the System Usability Scale (SUS), using Likert-scale responses. Pre- and post-tests will also be conducted to measure improvement in grammar performance.

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Authors' Bio

Zamlina Abdullah is a senior lecturer in the Faculty of Computer and Mathematical Sciences at Universiti Teknologi MARA (UiTM) Melaka Branch, Jasin Campus.

Nurul Aisyah Jamaluddin is an undergraduate student in the Faculty of Computer and Mathematical Sciences at Universiti Teknologi MARA (UiTM) Melaka Branch, Jasin Campus.

Nurazian Mior Dahalan is a senior lecturer in the Faculty of Computer and Mathematical Sciences at Universiti Teknologi MARA (UiTM) Melaka Branch, Jasin Campus.

Azlin Dahlan is a senior lecturer in the Faculty of Computer and Mathematical Sciences at Universiti Teknologi MARA (UiTM) Melaka Branch, Jasin Campus.

Mohamad Hafiz Khairuddin is a senior lecturer in the Faculty of Computer and Mathematical Sciences at Universiti Teknologi MARA (UiTM) Melaka Branch, Jasin Campus.