

Game Application as A Tool for Enhancing English Learning: A Development Study

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Abstract - The rapid advancement of digital technology has encouraged educators to explore innovative tools that enhance language learning outcomes. This study reports the development of a mobile-based English learning game application designed to improve vocabulary acquisition, reading comprehension, and learner motivation. Using a design-based research framework, the application was developed through three stages: needs analysis, prototype development, and expert evaluation. Data were collected through questionnaires, user testing, and interviews involving 35 junior high school students and three English teachers. The findings show that the game application significantly increased students' engagement and supported improvements in targeted language competencies. Expert validation confirmed that the application met pedagogical, technical, and usability standards. This study concludes that interactive game-based applications can serve as effective supplemental tools for English learning. Suggestions for further development and recommendations for classroom implementation are also discussed.

Keywords: Security, Cryptography, Android, Data

I. INTRODUCTION

The rapid development of digital technology has fundamentally transformed the landscape of English language education. According to Gee (2007), digital environments create meaningful learning experiences because they provide problem-based, interactive, and immersive contexts in which learners actively construct knowledge. This shift reflects broader 21st-century educational demands, where digital literacy, critical thinking, and learner autonomy are essential competencies for students growing up in technology-rich societies.

English, as emphasized by Nation (2013), plays a central role in academic advancement, global communication, and participation in international communities. However, despite its importance, many English as a Foreign Language (EFL) learners continue to struggle with core skills such as vocabulary retention, reading comprehension, and sustained engagement. Krashen (1982) explains that these challenges often stem from limited comprehensible input and environments that lack authentic, meaningful language use. Similarly, Prensky (2001) argues that traditional classroom methods are increasingly mismatched with the learning preferences of “digital native” students who are accustomed to interactive digital experiences.

Game-based learning (GBL) has emerged as a promising response to these challenges. According to Kapp (2012), game-based elements—such as challenges, rewards, feedback, and story-driven tasks—promote intrinsic motivation and support

higher levels of learner engagement. This aligns with Csikszentmihalyi's (1990) concept of flow, which suggests that well-designed games maintain learners' attention by balancing difficulty and skill level. Moreover, researchers such as Shute and Ventura (2013) highlight that games provide low-stress learning environments where students can experiment, make mistakes, and receive immediate feedback—conditions that are highly conducive to language acquisition.

In the domain of EFL specifically, digital games have shown measurable benefits. Hung et al. (2018) found that vocabulary acquisition is significantly enhanced when learners engage with repeated, meaningful input through interactive activities. Likewise, Romero, Usart, and Ott (2015) report that game-based tasks encourage active participation and reduce anxiety—two key factors influencing language performance. These findings reinforce the idea that games can serve not only as recreational tools but as pedagogically meaningful systems capable of supporting structured language development.

Despite these advantages, the integration of game-based tools in EFL classrooms remains limited. According to Kim (2015), many educational institutions struggle to adopt digital game applications due to insufficient technological infrastructure, teacher training gaps, and the lack of curriculum-aligned applications designed specifically for language learning. Teachers often report that commercial games provide entertainment but do not correspond with learning outcomes or assessment standards. This

creates a practical gap between emerging digital learning theories and real classroom implementation.

Mobile-assisted language learning (MALL) further expands the potential for game-based approaches. Traxler (2009) notes that mobile devices offer accessibility, immediacy, and personalization—features that can transform informal moments into meaningful learning opportunities. However, as Anderson and Shattuck (2012) emphasize, effective educational technology must be grounded in systematic, research-based design processes to ensure pedagogical relevance and usability.

Given these considerations, there is a need for a curriculum-aligned, pedagogically structured, and empirically validated English learning game that supports junior-high learners. Developing such a tool through a rigorous design framework—such as Design-Based Research (DBR)—can ensure alignment between theory, classroom practice, and technological innovation. Therefore, this study aims to design, develop, and evaluate a mobile-based English learning game that enhances vocabulary learning, reading comprehension, and learner engagement.

This research contributes to the growing body of literature on educational technology by offering a model for designing game-based language learning applications. The results may guide teachers, developers, and educational institutions seeking to integrate game elements into English learning.

II. RESEARCH METHODS

This study employed Design-Based Research (DBR), which integrates iterative development with empirical investigation. The DBR model was chosen because it allows researchers to collaboratively design, refine, and evaluate digital learning tools in authentic educational settings.

At this stage, it is carried out by studying the basic theory that supports research, searching and collecting the required data. To collect the required data, the author used several techniques. (1) Direct Observation, namely the researcher makes direct observations at the school to obtain data related to the research, (2) Interview, namely the researcher directly meets face to face with the school principal to obtain more complete data regarding Algorithm Implementation, (3) Sampling, namely the researcher selects data that is available and in accordance with the research, namely the application of previous research and previous research theses to be used as samples in this research.

This research will go through several stages. The stages in this research can be modeled on a Waterfall

diagram. There are several stages used in this research:

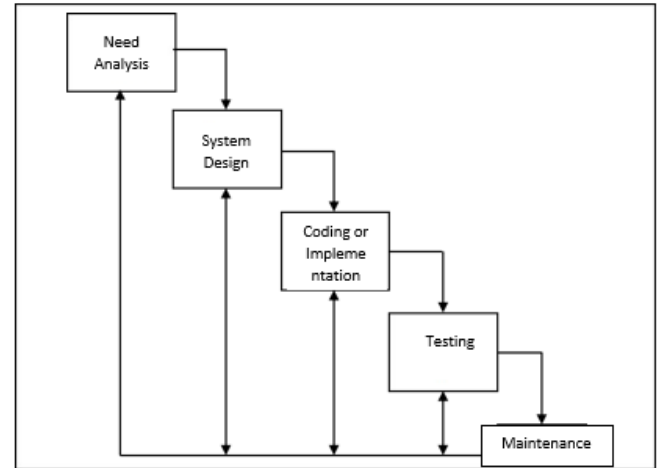


Figure 1. Diagram of Water

III. RESULT AND ANALYSIS

In this part, we will explain the display of the results of the application that has been created, which is used to clarify the existing displays in the Design of the Student Grade Data Security Application at school in Medan using the Android So that the results of implementation can be seen in accordance with the results of the program that has been created. Below we will explain each display in the program.

3.1 Main menu View

The main menu display is the first display that appears when the program is run. It functions as an input form for the admin username and password.

program. The registration display image can be shown in Figure 2.



Figure 2. Main Menu Display

3.2 Login Menu View

The login display is the first display that appears when the program is run. It functions as an input form for the program admin username and password. The login display image can be shown in Figure 3.



Figure 3. Login Menu View

3.3 Main Form View

FormThe main is the overall cryptographic program interface, where to use this cryptographic application can be done through the main form interface. In the main form there are several menus, namely, the file menu and the program menu. For more details, the main form display can be seen in Figure 4.

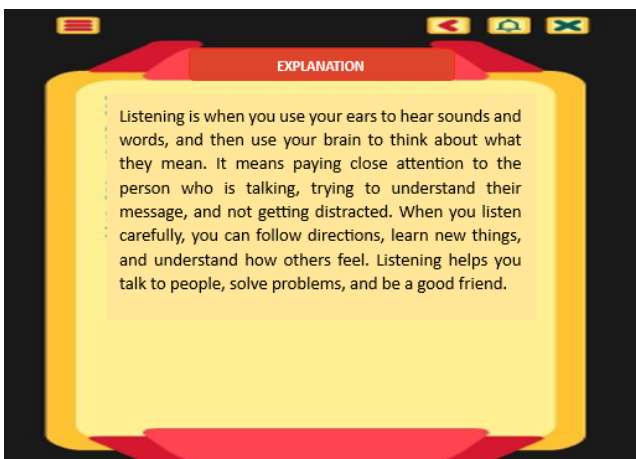


Figure 4. Login Menu View

3.4 Subject Data Form View

FormThis subject is used to display subject data at School. The following is a display of the subject data form which can be seen in Figure 5.

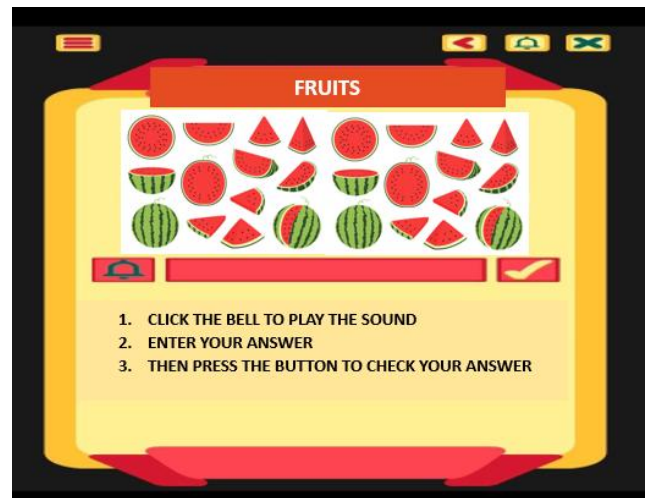


Figure 5. Subject Data Font View

3.5 Class Data Form View

FormThis class functions to display class data at School. The following is a display of the class data form which can be seen in.

3.6 Student Data Form View

FormThis student is used to display student data at School. The following is a display of the student data form which can be seen in.

VI. CONCLUSION

Based on the results of the discussion and trials that have been carried out, namely the Design of Student Grade Data Security Applications at School in Medan using the Android-Based RC4 Method, it can be concluded:

1. The application has been built and can maintain the security of student grade data at school with the RC4 method encoding system.
2. The system that has been built is capable of encrypting and decrypting student grades at school so that it can protect student grade data.

THANK-YOU NOTE

Titles for thanks and references are not numbered. Thank you to the IJCIS Team for taking the time to create this template.

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