

***DESIGN AND DEVELOPMENT OF AN INTERACTIVE LEARNING
ANDROID APPLICATION WITH LLM INTEGRATION TO
IMPROVE ELEMENTARY SCHOOL STUDENTS' LITERACY***

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ABSTRACT

Indonesia's literacy rate remains relatively low, as evidenced by the results of the Programme for International Student Assessment (PISA) 2023, which ranked Indonesia at position 68 out of 81 countries. This condition is influenced by traditional teaching methods, limited facilities, and insufficient access to quality reading materials. Previous research has attempted to improve student literacy through technology; however, there are still unaddressed gaps, including the absence of a platform that integrates a digital reading space, text-to-speech features, reading comprehension quizzes, and a reward system in a single application. This research develops an interactive Android-based learning application named Epic Story and focusing on students at SD Luqman Al Hakim. The application was developed using the Agile methodology with the Flutter framework and Gemini AI as the LLM. The application provides a digital reading space featuring flashcards and books, text-to-speech functionality to support reading fluency, automatically generated quizzes powered by Gemini AI, and a reward system to enhance student learning motivation. Testing was conducted using Black Box Testing with equivalence partitioning methodology and the System Usability Scale (SUS). Black Box Testing results demonstrated a 100% success rate across 49 test cases distributed across four development sprints. SUS testing with 36 respondents yielded an average score of 83.33, falling within the Acceptable category. Additionally, impact analysis of application usage was conducted through reading literacy improvement testing via pre-test and post-test, showing an increase from 64.44 to 80.00 with an N-Gain value of 0.531, and learning motivation testing using a 5-item questionnaire achieved a score of 12.78 out of 15, demonstrating positive student response toward the application.

Keywords: *Literacy, Android Application, Large Language Model, Flutter, Agile, Interactive Learning Application.*