

ABSTRAK

IMPLEMENTASI TEKNOLOGI *PROGRESSIVE WEB APPS* UNTUK PEMBELAJARAN MULTIMEDIA DAN EVALUASI KELAS PADA SISTEM INFORMASI *E-LEARNING*

(Ahmad Renaldi Maulana, 2025 : 59 Halaman)

Kemajuan teknologi digital pada tahun 2024 membawa pengaruh besar terhadap dunia pendidikan, termasuk pada metode pembelajaran di pesantren. Salah satu inovasi yang semakin banyak digunakan adalah *Progressive Web Apps* (PWA), yang menawarkan pengalaman aplikasi web serupa aplikasi native tanpa perlu instalasi. Pondok Pesantren Ar-Rahman di Palembang telah mengintegrasikan teknologi dalam kurikulum, khususnya pada pembelajaran multimedia. Namun, keterbatasan akses materi yang fleksibel serta kurangnya media pembelajaran yang berbasis teknologi masih menjadi kendala dalam meningkatkan pemahaman santri. Penelitian ini bertujuan merancang dan mengimplementasikan sistem informasi *e-learning* berbasis PWA untuk mendukung pembelajaran multimedia dan evaluasi akademik di Pondok Pesantren Ar-Rahman. Metode Rapid Application Development (RAD) digunakan untuk mempercepat proses pengembangan dengan tetap melibatkan pengguna dalam setiap iterasi. Efektivitas sistem diuji menggunakan uji N-Gain guna mengukur peningkatan pemahaman dan capaian nilai santri. Hasil penelitian menunjukkan bahwa sistem *e-learning* berbasis PWA mampu memfasilitasi santri dalam mengakses materi pembelajaran secara fleksibel, kapan saja dan di mana saja. Guru juga terbantu dalam melakukan evaluasi capaian akademik secara real-time melalui fitur materi, Uts, ujian, serta forum diskusi. Implementasi sistem ini dinilai efektif dalam meningkatkan pemahaman santri pada materi multimedia serta mendukung proses pembelajaran yang lebih interaktif dan efisien.

Kata kunci : *Progressive Web Apps*,, *E-learning*,, *Multimedia*, Pembelajaran, *Rapid Application Development*. *N-Gain*.

ABSTRACT

IMPLEMENTATION OF PROGRESSIVE WEB APPS TECHNOLOGY FOR MULTIMEDIA LEARNING AND CLASS EVALUATION IN E-LEARNING INFORMATION SYSTEMS

(Ahmad Renaldi Maulana, 2025 : 59 Pages)

The advancement of digital technology in 2024 has had a significant impact on the field of education, including teaching methods in Islamic boarding schools (pesantren). One increasingly adopted innovation is Progressive Web Apps (PWA), which offer a web application experience similar to native apps without requiring installation. Pondok Pesantren Ar-Rahman in Palembang has integrated technology into its curriculum, particularly in multimedia learning. However, limited access to flexible learning materials and the lack of technology-based media remain challenges in improving students' comprehension. This study aims to design and implement a PWA-based e-learning information system to support multimedia learning and academic evaluation at Pondok Pesantren Ar-Rahman. The Rapid Application Development (RAD) method is used to accelerate the development process while involving users in each iteration. The effectiveness of the system is tested using the N- Gain test to measure improvements in student understanding and academic performance. The results of the study show that the PWA-based e-learning system enables students to access learning materials flexibly, anytime and anywhere. Teachers are also assisted in conducting real-time academic evaluations through features such as learning modules, midterm exams (UTS), final exams, and discussion forums. The implementation of this system is considered effective in enhancing students' understanding of multimedia content and supporting a more interactive and efficient learning process.

Keywords : *Progressive Web Apps,, E-learning,, Multimedia, N-Gain
Rapid Application Development.*