

ABSTRACT

The rapid development of information technology requires vocational high school students in the Software Engineering (RPL) major to have a structured learning guide aligned with industry needs. However, observations at SMKN 1 Banjar revealed the absence of a mobile-based learning medium capable of guiding students in selecting their learning pathways. This research aims to develop RoadMap.dev, a mobile learning application that provides learning roadmaps, evaluation quizzes, progress tracking, leaderboard, and an AI-based chatbot feature.

The research method applies a Research and Development (R&D) approach using the Extreme Programming (XP) model, which consists of planning, design, coding, and testing phases. The system design process began with a preliminary study through observation, interviews, and a needs survey involving 32 RPL students. The evaluation phase employed black-box testing to assess system functionality and usability testing using a 20-item Likert scale questionnaire integrated with the Self-Determination Theory (SDT) framework.

The black-box testing results showed that all main functions operated as expected, except for certain boundary cases in the quiz feature. Usability testing produced an average score of 4.48 (very good category). The SDT integration revealed that the Competence dimension achieved the highest score (4.60), followed by Autonomy (4.45) and Relatedness (4.35). These findings indicate that RoadMap.dev successfully provides a structured learning guide, supports self-directed learning motivation, and aligns with the needs of vocational high school students majoring in Software Engineering.

Keywords: *mobile learning, learning roadmap, vocational students, extreme programming, usability testing, self-determination theory*