Development and Feasibility of an Android-Based Interactive Media for Learning Tahsin and Tajwid

Muhammad Zulfikri Nurliansyah[1*]; Muhammad Thariq Aziz[2]; Luthpi Saepuloh[3]

[1]*Information Technology Education, Universitas Muhammadiyah Sukabumi, Indonesia*
[1*]*Corresponding Email: mzulfikrin20@gmail.com*

Article History:
Received: Aug 20, 2025
Revised: Oct 24, 2025
Accepted: Oct 31, 2025
Online First: Nov 21, 2025

Keywords:
ADDIE Model,
Android Application,
Interactive Learning Media,
Tahsin and Tajwid.

Kata Kunci:
Aplikasi Android,
Media Pembelajaran Interaktif,
Model ADDIE,
Tahsin dan Tajwid.

Abstract: The integration of digital media into the learning process has become an important alternative for improving teaching quality and student engagement, especially when traditional methods face limitations in time and interactivity. This study aims to develop an Android-based interactive learning medium for Tahsin and Tajwid using the Research and Development (R&D) method through the ADDIE model, which includes the stages of Analysis, Design, Development, Implementation, and Evaluation. The developed product was tested on tenth-grade students at SMK Muhammadiyah 1 Sukabumi and validated by experts in media, content, and language to ensure its quality and functionality. The results showed that the learning media achieved a feasibility score above 85%, placing it in the "highly feasible" category. The "Ngetahsin" application proved effective in improving students' understanding, motivation, and engagement in learning Tahsin and Tajwid. Theoretically, this study contributes to the development of Islamic educational technology through multimedia-based mobile learning. Practically, it offers a relevant digital solution to strengthen Quranic literacy and support more effective, engaging religious education for students.

Abstrak: Integrasi media digital dalam proses pembelajaran kini menjadi alternatif penting untuk meningkatkan kualitas pengajaran dan keterlibatan siswa, terutama ketika metode pembelajaran tradisional menghadapi keterbatasan waktu dan kurangnya interaktivitas. Penelitian ini bertujuan mengembangkan media pembelajaran interaktif berbasis Android untuk materi Tahsin dan Tajwid dengan menggunakan metode Research and Development (R&D) melalui model ADDIE, yang terdiri dari tahap Analisis, Desain, Pengembangan, Implementasi, dan Evaluasi. Produk yang dihasilkan kemudian diuji pada siswa kelas X SMK Muhammadiyah 1 Sukabumi serta divalidasi oleh para ahli di bidang media, materi, dan bahasa untuk memastikan kualitas dan keberfungsian aplikasinya. Hasil penelitian menunjukkan bahwa media pembelajaran ini memperoleh skor kelayakan di atas 85%, sehingga dikategorikan sebagai "sangat layak." Aplikasi "Ngetahsin" terbukti efektif dalam meningkatkan pemahaman, motivasi, dan keterlibatan siswa saat mempelajari Tahsin dan Tajwid. Secara teoretis, penelitian ini berkontribusi terhadap pengembangan teknologi pendidikan Islam berbasis multimedia. Sementara secara praktis, aplikasi ini menawarkan solusi digital yang relevan untuk memperkuat literasi Al-Qur'an dan mendukung pelaksanaan pembelajaran agama yang lebih efektif dan menarik bagi peserta didik.

How to cite:
Nurliansyah, M. Z., Aziz, M. T., & Saepuloh, L. (2025). Development and Feasibility of an Android-Based Interactive Media for Learning Tahsin and Tajwid. *Edunesia : Jurnal Ilmiah Pendidikan, 6*(3), 1935-1952.

https://doi.org/10.51276/edu.v6i3.1561

A. Introduction

Tajwid is a fundamental aspect of Quranic literacy that ensures correct pronunciation and articulation of Arabic letters in accordance with established recitation rules. Although a person may possess a melodious voice, without a proper understanding of tajwid, Quran recitation cannot achieve its expected perfection (Fitriani, 2020). Thus, mastering tajwid is a crucial competency for every Muslim who wishes to recite the Quran correctly. However, a significant disparity remains between the importance of tajwid and the actual level of public mastery in Indonesia.

Data from the Ministry of Religious Affairs, based on the National Survey "Potential of Indonesian Society's Quran Literacy," revealed that Indonesia's Quran Literacy Index was recorded at 66.03, with only 44.57% of respondents able to recite correctly according to the rules of tajwid. In comparison, 38.49% had no Quran reading ability at all (Khafid, 2024). Research conducted by the Jakarta Institute of Quranic Sciences (IIQ) involving 3,111 participants across 25 provinces, supporting the findings, showed that 72.25% of Muslims in Indonesia still cannot read the Quran accurately (Muhyiddin, 2024). These findings underscore the need to develop more effective learning strategies and interactive media to enhance Quran recitation proficiency, particularly in mastering tajwid.

The advancement of information and communication technology (ICT) has brought significant changes to education, offering new opportunities to enhance learning quality and engagement (Siahaan & Hendratno, 2023). Studies by Luthpi et al (2022) have shown that digital-based learning can create more interactive and accessible environments for students. Similarly, Aryani et al (2023) found that the use of multimedia-based instructional materials can improve students' learning motivation and understanding. For example, Luthpi et al (2022) developed an inclusive e-learning system for deaf students that gained high validation scores from media and material experts, demonstrating that technology-based learning improves accessibility and motivation. Moreover, smartphone penetration in Indonesia has reached a very high level—92.14% among youth aged 15–24 (BPS, 2024). According to Statcounter (2025), Android currently dominates 89.49% of Indonesia's smartphone market, making it a highly potential platform for developing learning applications.

Despite these opportunities, the integration of digital media in Islamic Religious Education (PAI) remains limited. Research indicates that many teachers continue to face challenges in adapting to and integrating technology effectively into their learning activities (Afnani & Attalina, 2025). Observations at SMK Muhammadiyah 1, Sukabumi City, revealed that PAI learning still relies heavily on printed materials and conventional lectures, with only three hours of study per week, according to Ministry Regulation No. 12 of 2024 (Kementerian Pendidikan, 2024). This limitation, coupled with the lack of interactive media, constrains students' engagement and comprehension of tajwid material. The condition reflects tendencies towards rote learning, where students memorize rules without understanding their application, resulting in limited competence in Quranic reading. In addition, hybrid learning has emerged as a viable solution for post-pandemic education,

https://doi.org/10.51276/edu.v6i3.1561

particularly in Islamic Religious Education, as it combines face-to-face and online approaches to enhance accessibility, cost efficiency, and learning engagement (Aziz et al., 2022).

Schools generally still use traditional media that is disconnected from local cultural values, whereas integrating local wisdom into digital learning can strengthen contextual understanding. Similarly, Firmansyah & Jiwandono (2022) argue that conventional teacher-centered learning tends to make students passive and less critical, thereby reducing their motivation to learn. The limited use of engaging learning media ultimately hinders knowledge transfer and diminishes students' comprehension of the subject matter.

Several previous studies have shown promising results in developing Android-based tajwid learning applications, creating a tajwid learning medium that was validated at 94.16% by media experts and 97.5% by material experts. (Afifah & Rohma, 2022) Developed "Smart Tajwid HS" using the ADDIE model, achieving over 90% feasibility. In contrast, Mubarok et al (2023) found that Android-based tajwid media increased community interest by 60% ($p < 0.05$). Similarly, Yamin & Kartika (2024) designed learning media with expert and user validation scores ranging from 87% to 100%, and Hasan & Suryadi (2025) developed the "MATA" application, which effectively improved student motivation. Although effective, these studies were mostly limited to text and audio materials without video integration, personalization features, or the use of modern frameworks such as React Native.

Existing tajwid learning media generally lack comprehensive interactivity and multimedia integration. Most are developed through website-based platforms such as Kodular.io or App Inventor, which restrict design flexibility and performance. In contrast, Malahella & Arwani (2020) explain that React Native enables efficient cross-platform mobile development using JavaScript while maintaining native-like performance. Similarly, Rohman (2024) state that React Native allows developers to build mobile applications more quickly without compromising user experience. Therefore, this study develops an interactive Android-based Tahsin and Tajwid learning application using React Native, integrating innovative features such as pronunciation audio, learning videos via YouTube, customizable user profiles, dynamic hadith reminders, and a modern UI/UX design created with Figma.

The application development follows the ADDIE model—Analysis, Design, Development, Implementation, and Evaluation—proposed by Robert Maribe (Branch, 2010). This model was selected because it provides a systematic and iterative framework that ensures product quality through continuous evaluation at every stage. (Hidayat & Muhammad, 2021) emphasize that the ADDIE model facilitates interaction between students, teachers, and learning environments to produce effective educational products. Meanwhile, Al Rasyid & Arifin (2023) highlight that the model's structured process allows developers to refine and improve learning media based on evaluation results from each phase, ensuring the final product meets user needs and pedagogical standards.

https://doi.org/10.51276/edu.v6i3.1561

In conclusion, this study offers both theoretical and practical contributions to Islamic educational technology. The novelty of this research lies in the integration of the React Native framework with multimedia-based learning (text, audio, and video) for Tahsin and Tajwid instruction, which has not been comprehensively implemented in previous studies. The purpose of this research is to develop an interactive and accessible digital learning application that enhances students' understanding and motivation in learning Tajwid through a modern, cross-platform approach. Theoretically, this study contributes to the advancement of Islamic education technology by demonstrating how modern mobile development frameworks can be effectively applied in religious learning. Practically, it provides teachers and students with an engaging learning tool that supports flexible, self-paced, and meaningful Quran recitation learning aligned with 21st-century education principles.

B. Method

Research Method and Design

This study employed a Research and Development (R&D) design, utilizing the ADDIE model, which comprises five systematic stages: Analysis, Design, Development, Implementation, and Evaluation. The ADDIE model was chosen for its structured and iterative process that ensures continuous improvement through feedback at every phase (Branch, 2010).

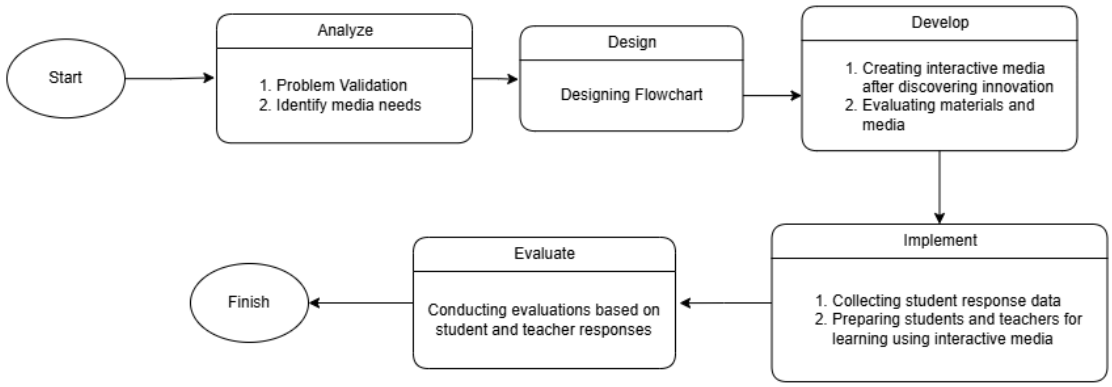


Figure 1. Research Flow of the Study

Research Subject

The study involved 42 tenth-grade students from SMK Muhammadiyah 1, Sukabumi City, across four departments: Accounting (AKL), Computer Network Engineering Technology (TKJT), Business and Marketing Management (MPLB), and Software Engineering (PPLG). Validation was conducted by two media experts (a lecturer in Information Technology Education and the Head of the TKJT Department), two material experts (a lecturer in Islamic Studies and an Islamic Education teacher), and one Islamic Education teacher, who served as the primary informant. The research was conducted at

https://doi.org/10.51276/edu.v6i3.1561

SMK Muhammadiyah 1, Sukabumi City, Cikole District, West Java, Indonesia, from March to July 2025, encompassing all stages of the ADDIE model.

Data Collection Techniques

To ensure comprehensive data gathering, multiple techniques were applied:

1. Questionnaires: Three instruments were distributed:
   - Media expert validation questionnaire (20 items) covering interface design, usability, functionality, and audio aspects.Material expert validation questionnaire evaluating curriculum alignment, learning objectives, content accuracy, and interactivity (18 items)
   - Material expert validation questionnaire (18 items) assessing curriculum relevance, content accuracy, learning objectives, and interactivity.
   - Student response questionnaire (20 items) evaluating interest, engagement, comprehension, visual design, and usability.
2. Interviews: Semi-structured interviews with the Islamic Education teacher explored learning challenges, instructional methods, and existing media used in Quranic recitation classes.
3. Observation**:** Classroom observations were conducted to analyze learning processes, student participation, materials, and instructional media.
4. Documentation: Photographic and written documentation were collected during class observation and validation activities.

Research Instruments

The instruments consisted of expert validation sheets and student participant questionnaires designed using a five-point Likert scale: Very Appropriate (5), Appropriate (4), Fairly Appropriate (3), Inappropriate (2), and Very Inappropriate (1). Instruments for media and material experts, as well as student participants, each included 18–20 items distributed across relevant aspects of evaluation.

Data Analysis Techniques

To ensure validity and reliability, the data were analyzed through four stages:

1. Validity Testing**:** Expert validation results were examined using Aiken's V index, calculated as $V = \sum S/[n(C-1)]$, where $S = R - L_o$.
2. Reliability Testing**:** Internal consistency was assessed using Cronbach's Alpha in SPSS v25, with an α value of 0.6 or higher indicating acceptable reliability.
3. Feasibility Analysis**:** The overall feasibility percentage was determined based on Likert-scale responses, with a score of 61% or higher categorized as *feasible*.
4. Qualitative Analysis**:** Expert comments and interview data were analyzed descriptively to support the quantitative findings.

https://doi.org/10.51276/edu.v6i3.1561

Development Procedure

The ADDIE-based development procedure consisted of:

1. Analysis**:** Identifying student learning needs, challenges, and curriculum alignment for Quranic recitation materials (Q.S. al-Maidah/5:48 and Q.S. at-Taubah/9:105).
2. Design**:** Creating the instructional flow, interface mockups using Figma, and learning structure, including objectives, materials, and evaluation.
3. Development**:** Building the Android-based application using React Native, Visual Studio Code, and Expo, followed by expert validation and iterative revisions.
4. Implementation**:** Deploying the application in classroom trials with selected students and teachers to assess usability and effectiveness.
5. Evaluation**:** Conducting formative and summative evaluations using expert feedback and student responses to refine the final version of the interactive learning media.

C. Result

This section presents the research results based on the ADDIE development stages, including analysis, design, development, implementation, and evaluation. Below is a detailed explanation of each stage in the product development process:

1. Analysis

Preliminary data collection revealed significant gaps in current instructional practices for Islamic Education at the secondary vocational level. Interview results with the Islamic Education teacher (15 April 2025) indicated that instruction relied solely on printed textbooks, employing traditional lecture methods without digital media integration. In the context of Islamic Religious Education, similar challenges are also evident, where teachers tend to rely on conventional learning methods and limited use of digital media, indicating the need to strengthen digital-based pedagogy (Afnani & Attalina, 2025).

A student needs analysis conducted through questionnaires (n=43) yielded critical insights into learning experiences and obstacles. Table 1 presents the comprehensive student learning assessment data.

Table 1. Student Learning Experience and Needs Assessment

Indicator	Response Options	Frequency	Percentage
Feelings during learning	Enjoy	12	27.9%
	Ordinary	18	41.9%
	Sleepy	10	23.3%
	Pressured	3	7.0%
Current media used	Printed textbook/worksheet	43	100%
	Digital media	0	0%
Learning obstacles	Difficulty reading the Qur'an fluently	15	34.9%
	Lack of motivation and interest	11	25.6%
	Sleepiness during lessons	10	23.3%

https://doi.org/10.51276/edu.v6i3.1561

Indicator	Response Options	Frequency	Percentage
	Difficulty focusing	7	16.3%
Previous exposure to Android apps	Yes	8	18.6%
	No.	35	81.4%

Most students reported feeling ordinary (41.9%) or sleepy (23.3%) during learning sessions, while 100% relied on printed materials as their primary source of learning. The main learning obstacles identified were difficulty reading the Qur'an fluently (34.9%), lack of motivation and interest (25.6%), sleepiness during lessons (23.3%), and difficulty focusing (16.3%). Notably, 81.4% of students had never used Android-based learning applications prior to this study.

Classroom Observation and Learning Objectives

Classroom observation (23 April 2025) in the grade 10 Accounting class confirmed that while students could read Quranic verses fluently, they struggled to explain specific Tajwid terms. When asked to define "mad lin," no student could provide an accurate answer, indicating superficial comprehension limited to procedural reading without conceptual understanding of Tajwid rules.

Learning objectives were specified based on curriculum requirements: (1) Students can read, understand meaning, and apply Tajwid rules from Q.S. Al-Maidah/5:48 concerning competition in goodness, and (2) Students can read, understand meaning, and apply Tajwid rules from Q.S. At-Taubah/9:105 concerning work ethic.

2. Design

Based on analysis findings, the application architecture was designed with five interconnected modules to address identified learning needs. Figure 1 illustrates the complete navigation structure of the application.

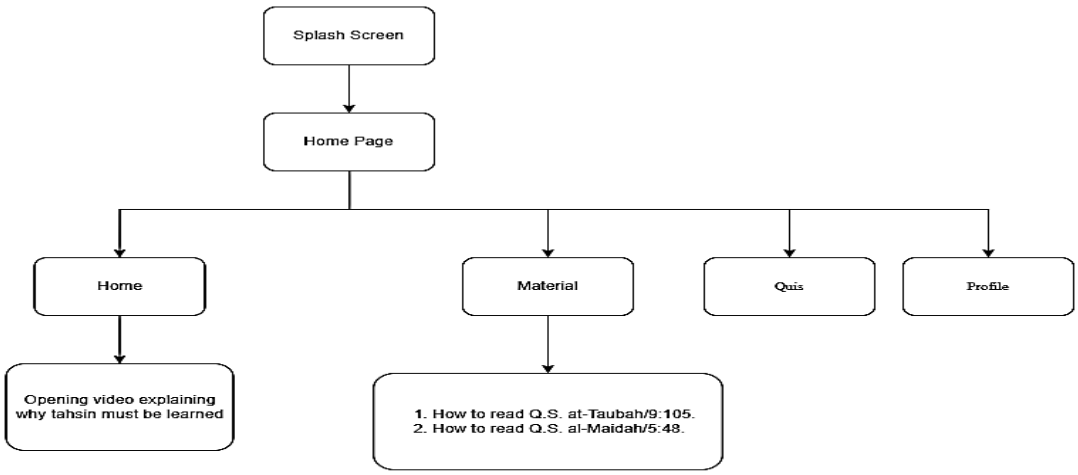


Figure 2. Ngetahsin Application Navigation Flowchart

https://doi.org/10.51276/edu.v6i3.1561

The navigation system incldes: (1) Splash Screen as the initial display before entering the main interface; (2) Home Screen providing access to four main menus: *Beranda*, *Materi*, *Quiz*, and *Profile*; (3) Beranda Screen displaying learning elements and learning objectives; (4) Materi Screen containing learning materials such as *How to read Q.S. at-Taubah/9:105* and *How to read Q.S. al-Maidah/5:48*; (5) Quiz Screen providing interactive exercises for learners; and (6) Profile Screen displaying user information.

The technical specifications were established using the React Native framework with JavaScript programming language. The development environment utilized Visual Studio Code with Expo CLI for compilation and testing. The application was designed to be compatible with all Android OS versions, with a total file size of 45.2 MB (in .apk format). Core features included audio playback functionality, video streaming integration from YouTube, image customization capabilities, and data persistence using in-memory storage (without browser storage APIs) to ensure compatibility and reliability.

Development

Two media experts evaluated the application across five aspects with 20 total items. The overall media validation yielded a feasibility rate of 87.8%, categorized as "Very Feasible." Table 2 presents detailed validation results by aspect.

Table 2. Media Expert Validation Results

Aspect	Expert 1	Expert 2	Total Score	Max Score	Percentage
Application Design	334	373	707	800	88.4%
User Experience (UX)	292	375	667	800	83.4%
Application Features	333	373	706	800	88.3%
Software Engineering	328	386	714	800	89.3%
Audio Quality	347	369	716	800	89.5%
Total	1,634	1,876	3,510	4,000	87.8%

Despite the high feasibility rating, experts provided constructive feedback for product refinement, including the removal of redundant navigation icons (Category and Profile icons from the top-right corner), the addition of a background music toggle feature, enhancements to the visual hierarchy in material list presentation, and the reduction of excessive button elements for a cleaner interface design.

Material Expert Validation and Content Refinement

Two material experts assessed content quality across six aspects with 18 total items. Material validation achieved 83.7% feasibility, categorized as "Very Feasible." Table 3 presents the detailed validation results.

https://doi.org/10.51276/edu.v6i3.1561

Table 3. Material Expert Validation Results

Aspect	Expert 1	Expert 2	Total Score	Max Score	Percentage
Curriculum Alignment (ATP)	265	261	526	600	87.7%
Learning Objectives Alignment	267	260	527	600	87.8%
Verse Visualization Accuracy	289	255	544	600	90.7%
Tahsin and Tajwid Compliance	271	258	529	600	88.2%
Recitation Accuracy	266	259	525	600	87.5%
User Interactivity	188	174	362	600	60.3%
Total	1,546	1,467	3,013	3,600	83.7%

Material experts recommended replacing extensive audio-text combinations with concise explanations and integrated YouTube video tutorials, adding a Google Forms quiz link for supplementary assessment, and enhancing interactive engagement features to improve user involvement, particularly addressing the lower interactivity score (60.3%).

Instrument Validity and Reliability Assessment

Validity testing using Aiken's V Index demonstrated that all 20 media expert instrument items achieved V values ranging from 0.75 to 1.00, indicating validity ($V > 0.60$). Material expert instrument similarly showed all 18 items with V values ranging from 0.875 to 1.00 (Valid). Student instruments were tested using Pearson Correlation analysis. All 20 items showed r-values between 0.618 and 0.868, exceeding the r-table value of 0.304 ($n = 42$, $\alpha = 0.05$), confirming validity.

Table 4. Instrument Reliability Test Results

Instrument Type	Cronbach's Alpha	Number of Items	Category
Media Expert	0.633	20	Reliable
Material Expert	0.633	18	Reliable
Student Response	0.767	20	Reliable

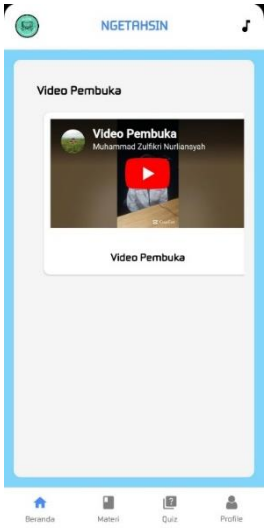
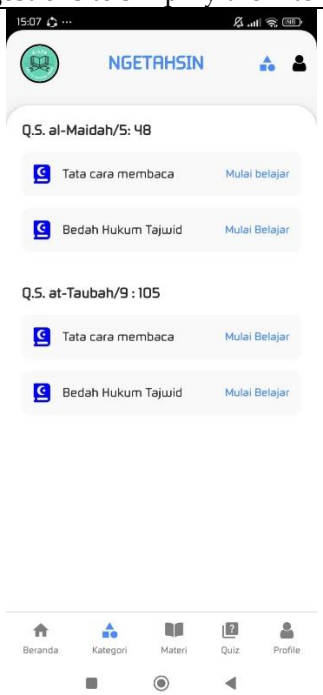
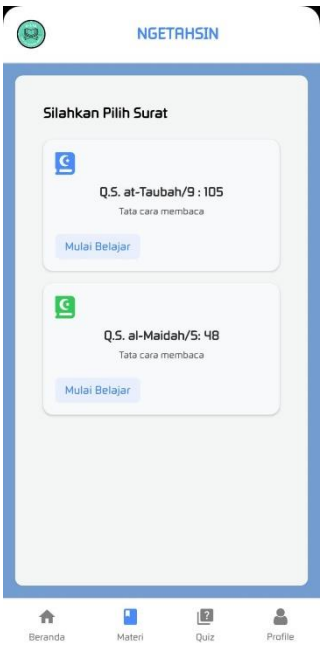
All instruments demonstrated acceptable reliability ($\alpha \geq 0.60$), ensuring consistency and dependability in measurement across all evaluation phases.

Post-Revision Interface and Content

Following expert recommendations, significant revisions were implemented. Media revisions included simplifying the top navigation by removing the Category and Profile icons, while retaining only the Music toggle. The redesign of the material list featured improved visual contrast and reduced button density. Additionally, a background music feature with user control was added. Table 5 illustrates these interface improvements.

https://doi.org/10.51276/edu.v6i3.1561

Table 5. Interface Improvements Before and After Revision

No	Before	After
1.		
	The top-right category and profile icons were removed and replaced with a music icon to enable background sound, based on expert suggestions to simplify the interface.	The revised interface features the addition of a background music icon and the removal of unnecessary icons, resulting in a cleaner layout.
2.		
	The material list previously contained too many buttons, resulting in visual clutter.	The layout was refined to reduce the number of buttons and improve readability.

https://doi.org/10.51276/edu.v6i3.1561

Implementation

Following completion of development and expert validation phases, implementation trials were conducted with 42 students across four vocational departments (X AKL, X TKJT, X MPLB, and X PPLG) at SMK Muhammadiyah 1 Sukabumi. The overall student response reached 85.3% feasibility, indicating strong acceptance and perceived effectiveness of the "Ngetahsin" application. Table 5 presents comprehensive results of student assessments.

Table 6. Student Response Assessment Results

Aspect	Total Score	Max Possible Score	Percentage	Category
Interest in Media	710	840	84.5%	Very Feasible
Material Comprehension	721	840	85.8%	Very Feasible
Visual Design Appeal	713	840	84.9%	Very Feasible
Engagement Level	715	840	85.1%	Very Feasible
Usability	725	840	86.3%	Very Feasible
Overall Total	3,584	4,200	85.3%	Very Feasible

The revised application was tested on 42 tenth-grade students from four departments. The overall student response reached 85.3%, categorized as *Very Feasible*. These findings confirm that students perceived the media as attractive, easy to use, and helpful for understanding Tajwid rules. Overall, the development of the "Ngetahsin" Android-based interactive media achieved mean feasibility scores between 85% and 88%, categorized as **"**very feasible**."** These findings demonstrate that the media is not only technically and pedagogically sound but also well-received by students as an engaging and effective digital learning tool for teaching Tahsin and Tajwid.

Evaluation

In accordance with the ADDIE model's evaluation phase, formative evaluation was conducted throughout all stages of development. The evaluation process encompassed expert validation (media and material experts), instrument reliability and validity testing, and the implementation of a small-scale trial with student end-users. The comprehensive evaluation framework ensured that all feedback loops were incorporated into product refinement, from the design phase through final implementation.

Evaluation was conducted continuously throughout all stages of the ADDIE model, including expert validation and student trials. The triangulated results from all evaluations—media (87.8%), material (83.7%), and students (85.3%) consistently fall within the *Very Feasible* category. The "Ngetahsin" Android-based learning media achieved a mean feasibility score ranging from 85–88%, confirming that the product is *Very Feasible* for classroom use. This suggests that integrating multimedia features, such as video tutorials and interactive quizzes, effectively enhances engagement and comprehension in learning Tahsin and Tajwid.

https://doi.org/10.51276/edu.v6i3.1561

D. Discussion

The development of the "Ngetahsin" Android-based interactive learning application using React Native has successfully addressed critical gaps in Quranic recitation education at SMK Muhammadiyah 1, Sukabumi City. The feasibility test results demonstrate that this learning media meets high standards across multiple evaluation dimensions, with media expert validation reaching 87% and material expert validation achieving 83%, both categorized as "Very Feasible." These findings are particularly significant given the persistent challenges in Islamic Religious Education, where data from the Ministry of Religious Affairs shows that only 44.57% of Indonesian Muslims can read the Quran properly according to tajwid rules. Research from the Jakarta Institute of Quranic Sciences reveals that 72.25% of Muslims in Indonesia still cannot read the Quran correctly.

The preliminary analysis revealed that students at SMK Muhammadiyah 1 Sukabumi demonstrated a fluent reading ability but lacked a conceptual understanding of tajwid terminology and its application. When asked to define "mad lin," no student could provide an accurate answer, indicating superficial comprehension limited to procedural reading without deep understanding. This phenomenon reflects a fundamental problem in traditional Islamic education where rote learning dominates over meaningful comprehension. The "Ngetahsin" application's integration of multimedia elements—audio pronunciation, YouTube video tutorials, and interactive quizzes—directly tackles this problem by providing multimodal learning opportunities that engage students beyond passive text reading. The 85.8% student approval rating for material comprehension suggests that the multimedia approach successfully facilitated deeper engagement with tajwid concepts.

The high feasibility ratings from both media and material experts validate the application's technical excellence and pedagogical soundness. The media expert validation of 87% across five aspects—application design (88.4%), user experience (83.4%), application features (88.3%), software engineering (89.3%), and audio quality (89.5%)—demonstrates that the application meets professional standards for educational technology products. These results are comparable to those of Nadawiyyah & Anggraeni (2021), who reported feasibility values of 94.16% (media) and 97.5% (material) for their Android-based tajwid application, developed using the ADDIE model. Their higher score may be attributed to the simplicity of the material scope, which focuses only on basic tajwid rules. At the same time, the Ngetahsin application integrates broader content with interactive audio and video elements. Similarly, Yamin & Kartika (2024) achieved 87–100% validity and 97% practicality in their Mad Thabi'i and Mad Jaiz Munfashil Android media, which also used the ADDIE framework. The slightly lower feasibility score in this study (85–88%) may be attributed to the inclusion of more diverse multimedia features and a larger user group (vocational students) with varying digital literacy levels.

These variations highlight that while all studies confirm the *very feasible* category, context, and learner characteristics strongly influence evaluation outcomes. TPA and MTsN students, as examined by previous studies, are generally more accustomed to religious

https://doi.org/10.51276/edu.v6i3.1561

terminology than SMK students. Therefore, despite lower numeric results, Ngetahsin demonstrates greater pedagogical innovation and inclusivity in a more heterogeneous educational environment.

From a socio-cultural perspective, the success of the Ngetahsin media aligns with Indonesia's growing trend of digital religiosity, where Islamic learning increasingly adapts to smartphone-based platforms. With Android dominating over 89% of Indonesia's mobile market (Statcounter, 2025), integrating tajwid materials into mobile applications ensures accessibility for younger generations who are already immersed in digital ecosystems. The combination of Islamic values and modern UX design represents a contextualized response to 21st-century learning needs—supporting not only religious literacy but also digital literacy among Muslim youth.

The student response assessment yielded an overall feasibility rating of 85.3%, demonstrating strong end-user validation across five dimensions: interest in media, material comprehension, visual design appeal, engagement level, and usability. Rather than interpreting this only numerically, these results indicate that students found the media both engaging and relevant to their daily technology use. This reinforces the idea that Islamic learning applications can effectively bridge traditional teaching and modern digital learning practices when culturally grounded and pedagogically sound.

In summary, the Ngetahsin application not only aligns with previous Android-based tajwid media studies but also advances the field by integrating interactivity, authenticity, and socio-cultural relevance. It reflects the evolution of Islamic education in Indonesia toward a digitally mediated, student-centered, and contextually grounded learning paradigm.

E. Implication

The implications of this study extend across theoretical, practical, and policy dimensions, offering significant contributions to the development of educational technology and Islamic Religious Education practice. Theoretically, this research validates the applicability of the ADDIE instructional design model to mobile application development for religious education, demonstrating that systematic development processes yield high-quality educational products across various content domains. The convergence of expert validation (87% media, 83% material) and user acceptance (85.3%) confirms that structured development methodologies produce theoretically sound and practically viable learning solutions, extending instructional design principles from secular educational contexts into faith-based learning environments.

The research extends multimedia learning principles to Quranic education, establishing that the cognitive theory of multimedia learning effectively guides the design of Islamic educational technology. By integrating audio pronunciation, visual text, video demonstrations, and interactive assessments, the "Ngetahsin" application operationalizes CTML principles—contiguity, modality, and redundancy—within a culturally and religiously specific context. This bridges secular educational psychology theories with

https://doi.org/10.51276/edu.v6i3.1561

Islamic pedagogical practices, creating a foundation for future research in faith-based educational technology.

For Islamic Religious Education teachers, the application offers practical solutions to pervasive instructional challenges. With only 40% of non-ICT teachers prepared for technology integration, user-friendly applications requiring minimal technical expertise become essential. The intuitive interface enables teachers to implement flipped classroom strategies, assigning video tutorials and pronunciation practice as homework while dedicating face-to-face time to clarifying complex tajwid concepts. The integrated Google Forms quiz links enable effortless formative assessment, allowing teachers to monitor student progress without investing time in manually creating assessments.

At the policy level, this research supports government initiatives to improve national Quranic literacy, which currently stands at 66.038 index level. The study provides empirical evidence that well-designed mobile applications can scale quality Islamic education beyond classroom walls, potentially reaching millions of learners lacking access to qualified tajwid instructors. Policymakers should consider incentivizing the development of similar educational applications through grants and partnerships, while establishing quality standards and vetting processes to ensure doctrinal accuracy and pedagogical soundness in Islamic educational apps.

F. Limitation and Suggestion for Further Research

This research acknowledges several limitations that contextualize the results and suggest directions for future investigation. First, the application was developed exclusively for Android operating systems, preventing iOS users from participating in the trial phase. Several students reported an inability to install the application on their iPhones, which limited sample diversity and potentially created equity issues in schools where students use diverse device ecosystems.

Second, the small-scale trial involved only 42 students from a single vocational school in Sukabumi City, restricting generalizability to other educational contexts with different student populations, institutional resources, or regional characteristics. Urban-rural differences, socioeconomic diversity, and technological infrastructure disparities were not systematically examined, leaving questions about application performance in settings significantly different from SMK Muhammadiyah 1 Sukabumi.

Third, the evaluation focused exclusively on feasibility assessment through expert validation and user satisfaction measurement, without examining actual learning effectiveness or long-term educational outcomes. While the 85.3% student approval rating indicates positive reception, this does not necessarily translate to measurable improvements in tajwid knowledge or recitation accuracy. The research did not include pre-test and post-test measurements, comparison groups, or retention testing to assess knowledge gains. Additionally, since this research used a non-experimental design, the study does not empirically test learning effectiveness or cognitive improvement outcomes.

https://doi.org/10.51276/edu.v6i3.1561

Based on these limitations, several directions for further research emerge. Future studies should develop cross-platform versions to ensure iOS compatibility and conduct comparative studies examining the differences between platforms. Expanding trials to multiple schools across diverse geographic regions would establish broader generalizability. Rigorous experimental designs incorporating pre-test and post-test measurements, control groups receiving traditional instruction, and delayed retention testing would provide definitive evidence of learning effectiveness beyond subjective satisfaction ratings. Longitudinal studies tracking sustained usage over academic semesters would reveal patterns of continued engagement and integration into regular study habits, informing retention strategies and design improvements to maintain long-term engagement.

G. Conclusion

This study successfully developed an Android-based interactive learning media for Tahsin and Tajwid, utilizing the ADDIE model to ensure quality through iterative evaluation at each stage. Validation results from media and material experts, along with implementation trials involving tenth-grade students, indicated high feasibility and strong user acceptance. The "Ngetahsin" application effectively enhances students' engagement and understanding of Quranic recitation through features such as audio pronunciation, integrated YouTube videos, dynamic hadith reminders, and interactive assessments. Theoretically, this study strengthens the application of the ADDIE model in Islamic educational technology, emphasizing its effectiveness in designing multimedia-based learning tools. Practically, the research offers an innovative and accessible digital solution to enhance Quranic literacy, foster active learning, and support the modernization of Islamic education, aligning with the needs of digital-native students in various educational settings.

References

Afifah, F., & Rohma, H. (2022). Pengembangan Aplikasi Smart Tajwid HS (Hidayatus Shibyan) Pada Kelas VIII Di MTS Mamba'ul Ma'arif Denanyar Jombang. *AL-ADABIYAH: Jurnal Pendidikan Agama Islam, 3*(2), 121–132. https://doi.org/10.35719/adabiyah.v3i2.389

Afnani, M. R., & Attalina, S. N. C. (2025). Studi Kesiapan Guru Dalam Mengintegrasikan Peran Teknologi Digital pada Pembelajaran Kurikulum Merdeka di Sekolah Dasar. *Nusantara: Jurnal Pendidikan Indonesia, 5*(2), 482–495. https://doi.org/10.62491/njpi.2025.v5i2-17

Al Rasyid, M. F., & Arifin, A. (2023). Perancangan Aplikasi Tajwid Asyik (Tasik) sebagai Media Pembelajaran Tajwid. *J-SAKTI (Jurnal Sains Komputer dan Informatika), 7*(2), 902-914. https://doi.org/10.30645/j-sakti.v7i2.695

https://doi.org/10.51276/edu.v6i3.1561

Aryani, V., Fajrie, N., & Kironoratri, L. (2023). Pengembangan Media E-Story Book Berbasis Kearifan Lokal dalam Pembelajaran Dongeng Sastra Anak Kelas III Sekolah Dasar. *Pendas: Jurnal Ilmiah Pendidikan Dasar, 8*(1), 1939-1954.

Aziz, M. T., Ariga, S., Etin, E., & Haris, A. (2022). Hybrid Learning dalam Pembelajaran PAI Pasca Pandemi Covid-19. *Edu Society: Jurnal Pendidikan, Ilmu Sosial dan Pengabdian Kepada Masyarakat, 2*(2), 690–695. https://doi.org/10.56832/edu.v2i2.229

BPS. (2024). Proporsi Individu yang Menguasai/Memiliki Telepon Genggam Menurut Kelompok Umur (Persen), 2021-2023. Retrieved from https://www.bps.go.id/id/statistics-table/2/MTIyMiMy/proporsi-individu-yang-menguasai-memiliki-telepon-genggam-menurut-kelompok-umur.html

Branch, R. M. (2010). Instructional design: The ADDIE approach. In *Instructional Design: The ADDIE Approach*. Springer US. https://doi.org/10.1007/978-0-387-09506-6

Firmansyah, A., & Jiwandono, N. R. (2022). Kecenderungan Guru dalam Menerapkan Pendekatan Student Centre Learning dan Teacher Centre Learning dalam Pembelajaran. *Jurnal Guru Indonesia, 2*(1), 33–39. https://doi.org/10.51817/jgi.v2i1.229

Fitriani, D. I. (2020). Penerapan Metode Tahsin untuk Meningkatkan Kemampuan Membaca Al-Qur'an Siswa Sekolah Menengah Atas. *Jurnal Pendidikan Islam Indonesia, 5*(1).

Hasan, W., & Suryadi, A. (2025). Pengembangan Media Pembelajaran Ilmu Tajwid Berbasis Android Studio untuk Meningkatkan Kemampuan Membaca Al-Qur'an pada Santri TPA. *SULIWA: Jurnal Multidisiplin Teknik, Sains, Pendidikan dan Teknologi, 2*(2), 153–162. https://doi.org/10.62671/suliwa.v2i2.84

Hidayat, F., & Muhamad, N. (2021). Model Addie (*Analysis, Design, Development, Implementation and Evaluation*) dalam Pembelajaran Pendidikan Agama Islam. *J. Inov. Pendidik. Agama Islam, 1*(1), 28-37.

Kementerian Pendidikan. (2024). Peraturan Menteri Pendidikan, Kebudayaan, Riset, dan Teknologi Republik Indonesia Nomor 12 Tahun 2024 tentang Kurikulum pada Pendidikan Anak Usia Dini, Jenjang Pendidikan Dasar, dan Jenjang Pendidikan Menengah. Retrieved from https://peraturan.bpk.go.id/Details/281847/permendikbudriset-no-12-tahun-2024

Khafid, S. (2024). Ternyata Angka Buta Huruf Al-Qur'an di Indonesia Masih Tinggi. Retrieved from https://pendidikan.harianjogja.com/read/2024/04/01/642/1168363/ternyata-angka-buta-huruf-alquran-di-indonesia-masih-tinggi

Luthpi, L., Rahmat, D., & Yudianto, A. (2022). Pengembangan Special E-Class pada Learning Management System untuk Mahasiswa Tunarungu. *Jurnal Inovasi dan Manajemen Pendidikan, 2*(2), 61–72. https://doi.org/10.12928/jimp.v2i2.5385

https://doi.org/10.51276/edu.v6i3.1561

Malahella, A. H., Arwani, I., & Tibyani, T. (2020). Pemanfaatan Framework React Native dalam Pengembangan Aplikasi Pemesanan Minuman Kopi pada Kedai Bycoffee. *Jurnal Pengembangan Teknologi Informasi dan Ilmu Komputer, 4*(9), 3178-3184.

Mubarok, N. H., Suarna, N., & Dikananda, A. R. (2023). Pengembangan Media Pembelajaran Tajwid Berbasis Aplikasi Android untuk Minat Belajar Membaca Al-Qur'an. *Jurnal Informatika dan Teknologi Informasi, 2*(2), 220-227. https://doi.org/10.56854/jt.v2i2.196

Muhyiddin. (2024). Menag Ungkap 72,25 Persen Muslim di Indonesia Buta Huruf Alquran. Retrieved from https://khazanah.republika.co.id/berita/so0o93483/menag-ungkap-7225-persen-muslim-di-indonesia-buta-huruf-alquran-part2

Nadawiyyah, H., & Anggraeni, D. (2021). Pengembangan Media Pembelajaran Tajwid Berbasis Aplikasi Android. *Jurnal Inovasi Teknologi Pendidikan, 8*(1), 26-40. https://doi.org/10.21831/jitp.v8i1.32661

Rohman, A. F. (2024). Perancangan Deteksi Wajah pada Aplikasi Berbasis React Native Menggunakan Metode Haar Cascade. *Jurnal Informatika dan Teknologi Pendidikan, 4*(1), 32–40.

Siahaan, K. F., & Hendratno, W. (2023). Penggunaan React Native dalam Pengembangan Aplikasi Media Pembelajaran Interaktif Perakitan Komputer untuk Meningkatkan Prestasi Belajar Siswa. *JTePen: Jurnal Teknologi dalam Pendidikan, 1*(1), 4-8.

Statcounter, G. (2025). Mobile Operating System Market Share Indonesia. Retrieved from https://gs.statcounter.com/os-market-share/mobile/indonesia#monthly-202101-202502

Yamin, Muh., & Kartika, A. A. (2024). Pengembangan Media Pembelajaran Berbasis Aplikasi Android Materi Hukum Mad Thabi'i, Mad Wajib Muttasil dan Mad Jaiz Munfashil. *Jurnal Riset dan Inovasi Pembelajaran, 4*(3), 1952–1961. https://doi.org/10.51574/jrip.v4i3.2170

Author's Biography

Muhammad Zulfikri Nurliansyah. Was Born in Sukabumi, 20 October 2002. Currently, I am a student in the Information Technology Education Study Program at Muhammadiyah University of Sukabumi (UMMI). As a student pursuing a bachelor's degree (S1).
Email: mzulfikrin20@gmail.com

https://doi.org/10.51276/edu.v6i3.1561

	**Muhammad Thariq Aziz, M.Pd.I.** Was Born in Magelang on 10 August 1988. Lecturer at Muhammadiyah University of Sukabumi (UMMI). Earned a Bachelor's degree in Arabic Language Education at UIN Sunan Kalijaga Yogyakarta and graduated in 2011. Moreover, he is currently pursuing a doctoral degree in Islamic Religious Education at Muhammadiyah University of Malang. Email: thariq@ummi.ac.id
	**Luthpi Saepuloh, M. Pd.** Born in Sukabumi, 15 January 1983, Lecturer at Muhammadiyah University of Sukabumi (UMMI). Earned a Bachelor's degree in Educational Technology at Universitas Pendidikan Indonesia and graduated in 2006, a master's degree in Educational Technology at Universitas Negeri Jakarta, and am now studying for a doctoral degree in Educational Technology at Universitas Negeri Jakarta. Email: luthpisaepuloh@ummi.ac.id