



Development of the Bestin Android App to Improve the Reading Qur'an of Students Elementary Schools

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article info

Article history:

Received: April 08, 2026

Received in revised form:
June 20, 2026

Accepted: June 21, 2026

Available online: June 30,
2026

Keywords:

Android App;
Learning Media;
Reading Qur'an;
Elementary School.

Published by Department of
Madrasah Ibtidaiyah Teacher
Education, Universitas Islam
Negeri Siber Syekh Nurjati
Cirebon, Indonesia in
Collaboration with the
Indonesian Islamic
Elementary Education
Lecturers Association

abstract

Background: The integration of mobile technology into elementary education has created new opportunities for improving students' engagement and learning outcomes. However, Quran learning at the elementary level remains largely dependent on conventional teaching methods, which often provide limited opportunities for interactive, self-paced, and technology-supported practice.

Aims: This study aims to develop and evaluate the effectiveness of an Android-based learning application called Bestin (*Belajar Surah At-Tin*) in improving the ability of fourth-grade elementary school students to read Surah At-Tin

Methods: This study employed the Design and Development (D&D) research method using the ADDIE model, consisting of five stages: analysis, design, development, implementation, and evaluation. The developed application was validated by content and media experts and subsequently tested with 24 fourth-grade elementary school students to evaluate its usability and effectiveness.

Results: Based on the content expert validation showed a feasibility score of 91.25%, while media experts gave a perfect score of 100%. A trial involving 24 fourth-grade elementary school students received very positive feedback the application was considered interesting, easy to use, and helpful in understanding the material. Student evaluation results showed an average score of 92,5 indicating a high level of acceptance and effectiveness.

Conclusion: The Bestin Android application is an effective, innovative, and interactive medium for Quran learning that significantly enhances students' Quran reading skills and learning outcomes. The findings suggest that integrating mobile learning technologies into elementary Islamic education can enrich students' learning experiences and promote collaborative support among schools, teachers, and parents.

How to cite this article: Aeni, A. N., Salmah, H. S., Agistie, D. S., Nurainun, S. R., & Muhammad, N. (2026). Development of the Bestin Android App to Improve the Reading Qur'an of Students Elementary Schools. *Al Ibtida: Jurnal Pendidikan Guru MI*, 13(1), 50–65. <https://doi.org/10.24235/al.ibtida.snj.v13i1.24592>

1. Introduction

The use of learning media is essential in enhancing the effectiveness of the teaching and learning process. Learning media support teachers in delivering information clearly and efficiently, serving as a communication bridge between teachers and students that facilitates better understanding of learning materials (Kumala, 2016). Another definition states that learning media is one of the elements in the teaching process that plays an important role in maximizing the achievement of the objectives of learning activities in the classroom (Olisna, Zannah, Sukma, & Aeni, 2022). The continuous use of appropriate digital learning media can facilitate student learning, enhance motivation, improve memory, and support the development of more effective and higher quality education (Adrizal, Guntur, & Pahlepi, 2020).

In the digital era, learning requires proficiency in mastering information and communication technology (Aeni, Djuanda, Maulana, Nursaadah, & Sopian, 2023). In this era, teachers and students need to adjust to the development of the internet, which brings benefits and disadvantages (Aeni, Hanifah, & Sunaengsih, 2019). One of the beneficial impacts in the field of education is that teachers and students can more easily gain additional insights, so books are no longer the only source of learning (R. R. Sari, Febrini, & Walid, 2021). Digital technology facilitates easier access to various things, including getting information and communicating across distances (Aeni, Juneli, Indriani, Septiyanti, & Restina, 2022). The use of mobile devices in education greatly supports the achievement of learning goals (Nurhasanah, Pinandoyo, Alamsyah, Prasetyo, & Zukri, 2023). The development of technology is accelerating because human needs continue to increase (Suryanti, 2018). Technology has developed into an important aspect of human life that cannot be separated from daily activities (Aeni, Hanifah, Djuanda, et al., 2024). Therefore, based on a study, there is an expectation for teachers to have adequate technological skills and continue to innovate in their teaching approaches (R. R. Sari et al., 2021). Innovative methods and technological proficiency effectively enhance learning dynamics and quality. Educational technology, as part of a scientific discipline aimed at addressing educational challenges, plays a crucial role in facilitating effective learning as a solution to those problems (Thaariq & Surahman, 2021).

The quality of Islamic Education (PAI) learning at the primary school level is often affected by various challenges. The main focus of PAI subjects is students' proficiency in reading short surahs accurately and tartil (Nurkholizah, Yulianti, & Aeni, 2024). However, many students struggle to pronounce the correct makharijul letters, which leads to errors when reading the Qur'an. In addition, a limited understanding of tajweed is also a challenge in itself, thus hindering students from reading the Qur'an according to the correct rules. Students often struggle to understand the main message of a letter in the Qur'an, which can reduce their understanding of the message.

Parent-school cooperation is essential for building a nurturing educational atmosphere (Kholil, 2021). Establishing effective communication between teachers and parents is a good starting point for this cooperation, as it helps both parties understand their respective responsibilities in facilitating the learning process. Families and schools, as the two fundamental environments in a child's developmental ecosystem, are expected to establish a synergistic collaboration, as such partnership has been empirically shown to exert a substantial influence on students' academic achievement, learning motivation, and overall physical and

psychological well-being (Paccaud, Keller, Luder, Pastore, & Kunz, 2021). Children's understanding and development can be fully accelerated through good communication and effective cooperation between the two (Kholil, 2021). The family plays a fundamental role in a child's upbringing, and the growing complexity of educational demands makes the collaboration between school and family increasingly vital to support children's holistic development and academic success (Ergin, Dogan, & Cayak, 2024).

Fourth grade elementary school students will study Surah At-Tin, the 95th surah in the Qur'an with 8 verses, in the Islamic Education lesson. This learning includes the ability to read the surah correctly and tartil, understand the laws of reading nun sukun and tanwin, and explain the core message of the surah. In this study, researchers developed learning media using the BESTIN (Belajar Surah At-Tin) Android application. The BESTIN application functions as an Android application-based learning tool that aims to assist fourth grade elementary school students in learning Surah At-Tin. Students can also test their understanding through a quiz, record their reading which will be assessed by the teacher, and monitor their learning progress which can also be accessed by parents. The interactive BESTIN application facilitates effective, flexible, and collaborative Qur'an learning.

Various studies indicate that the use of technology-based learning media is able to improve the quality of learning, both in terms of conceptual understanding, learning motivation, and student engagement. Fauyan (2019) developed interactive multimedia based on iSpring for Indonesian language learning integrated with Islamic values and found that the interactive multimedia was considered feasible and effective in enhancing learning quality as well as fostering Islamic character among Madrasah Ibtidaiyah students. The integration of technology and Islamic values effectively creates a more meaningful learning experience.

In addition, Fitriana, Wijayati, & Utanto (2022) demonstrated that Android-based learning media in science subjects were effective in improving learning motivation and digital literacy among fifth-grade elementary school students, as evidenced by significant increases in posttest scores compared to pretest results and significant differences between experimental and control groups, with higher achievement in classes using Android-based media. Android applications provenly enhance motivation, learning outcomes, and the added value of formal education.

However, both studies primarily focused on general subject areas (language and science) and improvements in motivation or digital literacy, without specifically addressing Qur'anic learning or the development of tartil reading skills. In this regard, Febriyanti & Mustadi (2020) developed edutainment-based comic media for thematic-integrative learning in elementary schools. Their findings revealed that the developed media were highly feasible and effectively helped students understand learning concepts in a more enjoyable manner while increasing learning interest and engagement.

Furthermore, Rosmiati, Isrokatun, Hanifah, Rohman, & Khoerunnisah (2023) developed an Android-based mobile application designed to foster critical thinking skills among elementary school students. The application was validated by experts and found to be attractive to students, supporting the development of higher-order thinking skills through Android-based learning environments. Android media provenly enhances motivation while facilitating higher-order cognitive skills.

Nevertheless, to date, existing studies have not specifically addressed the development of Android-based learning media focused on Qur'anic instruction for a single surah, equipped with features such as tartil reading practice, student voice recording, and learning progress monitoring accessible to teachers and parents. Qur'anic learning, which requires accuracy in recitation, audio feedback, and active involvement of teachers and parents in assessment, has not yet been comprehensively addressed in previous research.

In the context of Islamic Education, Aeni, Hanifah, Rahimah, & Arifuddin (2024) developed an Android-based learning application using Smart Apps Creator (SAC) for fiqh materials in fourth-grade elementary schools. The results indicated that the application was highly feasible according to expert validation and effective in improving students' understanding of Islamic Education content. This study reinforces that Android-based applications represent a relevant and effective alternative for religious learning at the elementary level.

Meanwhile, Mukti, Elvira, and Hussin (2023) developed a game-based Higher Order Thinking Skills (HOTS) science literacy assessment instrument using a digital platform for Madrasah Ibtidaiyah students. The findings showed that the use of digital technology with interactive features increased student enthusiasm and produced assessment instruments that were valid and reliable for measuring higher-order thinking skills. These results indicate that interactive digital integration is effective not only for content delivery but also for learning practice and evaluation.

Therefore, a clear research gap exists for the development of Android-based Qur'anic learning media that specifically focuses on tartil recitation of a single surah, incorporates comprehensive multimedia features (audio tutorials, recitation practice, student voice recording, and monitoring dashboards for teachers and parents), and evaluates its effectiveness through student learning outcomes areas that have not been sufficiently addressed by previous studies.

2. Methods

2.1 Research Design

This research employs the Design and Development (D&D) approach, utilizing the ADDIE model (Aeni, Aprilia, Suhartini, & Sulistiani, 2022). The ADDIE model incorporates five primary phases: analysis, design, development, implementation, and evaluation. These phases are organized methodically to guarantee the product's reliability through a process that is both quantifiable and scientifically sound (Waruwu, 2024). The ADDIE model was implemented as it thoroughly addresses students' thinking, emotional, and physical skill-based domains; each element is used in a logical, interconnected way, which makes it suitable for creating engaging instructional tools (Sutomo & Mashudi, 2022). Prior research has also identified various difficulties in teaching the Qur'an within elementary education, including an absence of suitable educational resources and difficulties in sustaining students' engagement throughout instruction (Mamat & Baharuddin, 2025).

2.2 Research Procedures

The examination phase identified learning challenges, such as students' difficulties in articulating makharijul huruf, limited tajwid knowledge, and understanding Qur'an chapters' main themes. Based on the identified needs, the design phase involved planning the learning content structure, interface layout, multimedia elements, and assessment activities. Furthermore, using Canva can enhance engagement through visually appealing and interactive layouts (Harianto, Ahmad, & Utami, 2025). Instructional materials were developed with Canva and Heyzine. Heyzine is a web-based tool that generates HTML flipbooks, accessible on Android, iPhone, tablets, and PCs, and downloadable for both digital and print use (Erawati, Purwati, & Saraswati, 2022). Canva provides pre-designed layouts, icons, videos, and other elements for digital learning materials and operates online without installation (Putri & Mudinillah, 2021). The media was tested with fourth-grade students to complete the implementation phase, and feedback was collected using questionnaires to evaluate students' reception and the usefulness of the media. The evaluation phase focused on assessing the product's effectiveness and efficiency, with inputs from students, material experts, and media specialists used to refine and optimize the media for classroom use.

2.3 Participants

The participants of this study were 24 fourth-grade elementary school students in Sumedang Regency. On March 11, 2025, a limited trial was conducted during the implementation stage of the ADDIE model. The validation process involved one media expert, represented by a university lecturer, and one material expert, represented by an Islamic Education teacher at the elementary school level.

2.4 Data Collection

Techniques for gathering data in Design and Development (D&D) research that utilizes the ADDIE model are executed step-by-step to secure data that bolsters the procedures of analyzing needs, planning product design, building prototypes, putting designs into action, and assessing outcomes. The different kinds of data in this research consist of both numbers-based and descriptive data. Opinions and advice from experts in the field, media specialists, and participants are looked at very closely as a source of descriptive data. Scores from student assignments, scored by field experts, media pros, and survey takers are examined using methods that compare and describe in detail for the quantitative data (Sutama, Prayitno, Narimo, Ishartono, & Sari, 2021). For this research, data gathering was carried out utilizing strategies that adhered to the ADDIE model's developmental stages; these strategies comprised watching students as they learned, surveys given to students after the implementation, and assessment of the material and media by specialists. Student learning actions were watched and engagement was measured during media usage. Concurrently, surveys were employed to gather numerical data about how students felt about the learning media's appeal, usability, and utility. Input from specialists was used to bolster the material's correctness and the media design's caliber before any changes were made.

The data collection methods employed dictated the design of the research tools. Student actions during the educational experience were documented using observation forms, which

served as the observation tool. The questionnaire was employed to gauge how students viewed the quality of the media after the implementation phase. Moreover, the expert review tools comprised material validation forms and media validation forms. Experts utilized these forms to deliver both qualitative and quantitative feedback on aspects such as the appropriateness of the material, the legibility of the presentation, the viability of the design, and how well the media facilitated learning.

2.5 Data Analysis

Both qualitative and quantitative methods were employed to scrutinize the data. Information of a qualitative nature was gathered via observation and evaluations from specialists, which was subsequently examined descriptively via a process involving data condensation, presentation, and interpretation. Simultaneously, numerical information gathered from questionnaires completed by students underwent percentage analysis and categorization to ascertain how well-received and impactful the learning resources were. This strategy aligns with earlier research methodologies that incorporated a mix of qualitative and quantitative data to thoroughly judge the excellence of educational resources, incorporating specialist feedback, media evaluations, and comparative descriptive assessments (Sutama et al., 2021).

3. Results

The ADDIE model is an acronym for Analyze, Design, Development, Implementation, and Evaluation (Hidayat & Muhamad, 2021). It is widely used in the development of teaching materials to improve learning effectiveness. The ADDIE model is capable of creating an effective learning environment in the classroom (Purwanto, Mentara, & Marhadi, 2023). Each stage in ADDIE plays a crucial role, starting from analyzing learning needs, designing strategies, developing materials, implementing activities, and evaluating outcomes (Dewi, 2018). In this study, the ADDIE model was applied as follows:

3.1 Analysis Stage

In the first stage of Analysis, Through literature reviews, teacher interviews, and school observations in Sumedang Regency, researchers identified key student challenges in reading the Qur'an: difficulties with makhraj, tajweed, and understanding the meaning of Surah At-Tin. Additionally, the lack of interactive learning media reduced student engagement, establishing the core requirements for developing the BESTIN application.

3.2 Design Stage

The second stage (Design) of developing the BESTIN application begins by identifying the fourth-grade elementary school Islamic Education (PAI) learning outcomes for the Quran-Hadith element within the Independent Curriculum on Surah At-Tin."

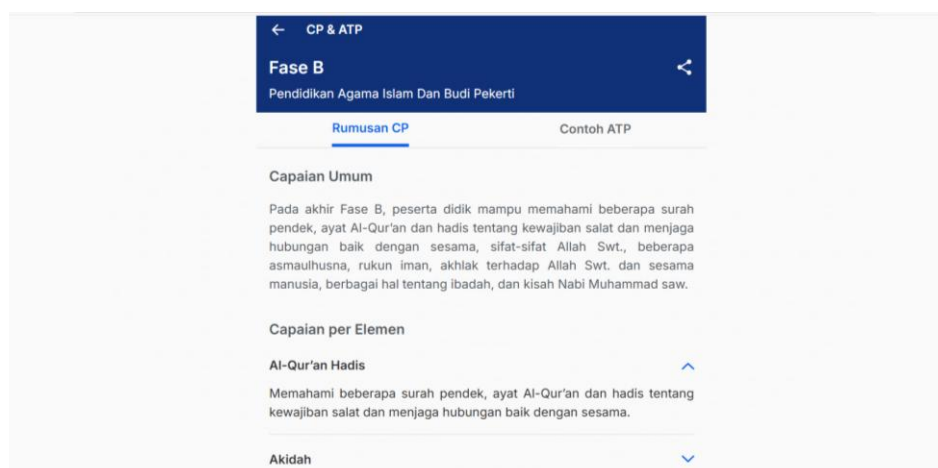


Figure 1. Analysis CP and TP

Second, designing in the Canva application by first adding elements. According to Tanjung and Faiza (2019), Canva has a variety of attractive designs, complete features that enhance creativity, practical use via devices, and saves time in making learning media. The design incorporated bright colors and visually appealing graphics, known to attract younger learners and increase engagement (Aeni, Erlina, Dewi, Hadi, & Ramadhani, 2022). Researchers chose appropriate colors to attract students' attention in the learning process. In addition, the selection of attractive images and shapes of elements also contributes to increasing students' interest in learning. Product typography must be age appropriate. Furthermore, the researcher recorded the sound using a voice recorder application on the cell phone which will be part of the product being developed.

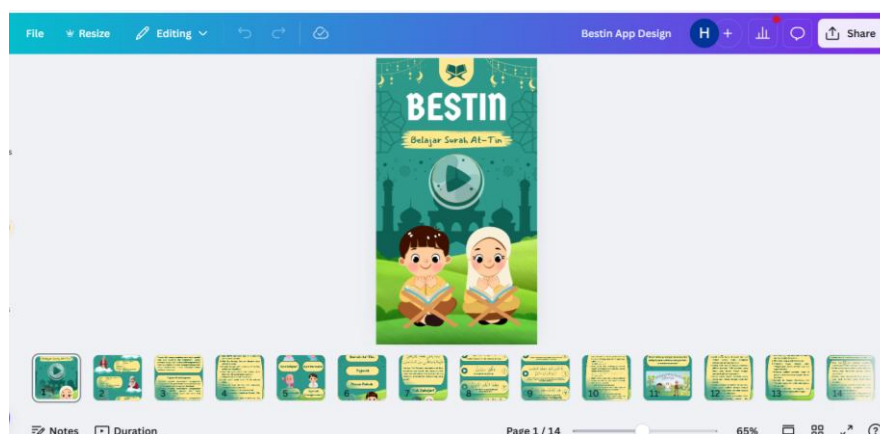


Figure 2. Design BESTIN App

The researcher also developed an interactive educational game through the Wordwall web platform. Wordwall is an application that can be used as a learning medium, a learning resource, or an engaging online-based assessment tool for students (Sari & Yarza, 2021). The game was created with several types of quizzes, such as connect the verse, complete the verse and multiple choice, which aimed to evaluate students ability to read, understand tajweed, as well as the main message of Surah At-Tin in a more fun way. In addition, to ensure active and continuous student participation, the researchers integrated the game with Google Classroom, so that teachers can

easily monitor student progress. Grade tracking and activity logs help detect specific student difficulties.



Figure 3. Quiz BESTIN App

3.3 Development Stage

In the third stage of Development, previous designs were integrated into the Heyzine Flipbook application. Researchers added interactive features including button sound effects, background music, clickable images, and embedded audio to enhance the learning experience. The final product was then exported as an Android-compatible file to ensure easy student access across various devices.



Figure 4. Flipbook BESTIN

3.4 Implementation Stage

The implementation stage, involving the trial of the BESTIN application in Sumedang, effectively improved fourth-grade students' understanding of the surah. This stage involved a hands-on teaching experiment, where students used the application to learn Surah At-Tin through a combination of guided practice, group discussions, and independent exercises.

3.5 Evaluation Stage

In the fifth stage of Evaluation, the researchers assess the effectiveness of the Android application using assessment instruments provided to experts or validators. The focus of this validation is on the media design and content created by the researchers. Validator feedback improves application quality. Additionally, input from students is also necessary for further application development. During this evaluation stage, the researchers make final revisions to

the developed product based on feedback and comments from experts, as well as small groups reflected in the response questionnaires, ensuring that the final product is suitable or appropriate for use in the learning process (Anafi, Wiryokusumo, & Leksono, 2021) This study aims to produce empirical data regarding the extent to which fourth-grade elementary school students understand the Tilawah material and Surah At-Tin. Through the evaluation of the BESTIN Android Application, it can be concluded that this application has a high standard and is suitable for use in the teaching and learning process of PAI in elementary schools.

3.5.1 Material Expert Validation

The material expert validation indicates that the 'BESTIN' Android application is highly viable, featuring accurate Qur'an and Hadith texts, structured presentation, and alignment with student needs. Consequently, the app effectively boosts learning motivation, fosters positive character, and supports a constructive educational environment.

Table 1. Product Assessment by Material Experts

Assessment Descriptors	Value
Suitability of Material	95,00%
Material Presentation	90,00%
Writing	85,00%
Good Impact	95,00%
Average	91,25%

Overall, the 'BESTIN' application achieved an overall score of 91.25% (73/80 points) from the material expert, placing it in the 'very feasible' category for elementary school Islamic Education. While material suitability and educational impact scored the highest (95.00%) and writing quality scored the lowest (85.00%), all assessed aspects exceeded 85%, confirming that the app fully meets established educational quality standards.

3.5.2 Media Expert Validation

Media expert validation yielded a perfect score for the application's design, navigation ease, and alignment with student characteristics. The use of vibrant colors, clear visuals, and a simple layout effectively fosters a positive user experience, enhances focus, and reduces cognitive load in self-directed learning.

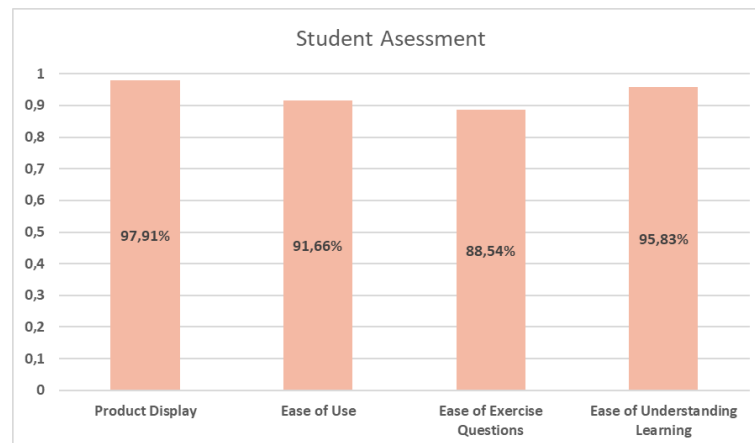
Table 2. Product Assessment by Media Experts

Assessment Descriptors	Value
Product Suitability	100,00%
Product Display	100,00%
Ease of Access	100,00%
Good Impact	100,00%
Average	100,00%

Media expert validation resulted in a perfect score of 100.00%. By fulfilling all eligibility criteria, the BESTIN application is categorized as highly feasible for teaching Islamic Education in elementary schools.

3.5.3 Student Responses

On March 11, 2025, a limited trial involving 24 fourth-grade elementary school students in Sumedang Regency was conducted to obtain students' responses to the BESTIN application. During the trial, students interacted directly with the application, including exploring the interface, completing practice exercises, and using the audio guidance features. The interface, activities, and tartil audio were rated effective.



Graph 1. Product Assessment by Student

The student response questionnaire for the BESTIN application showed highly positive results across all aspects: product display (97.91%), ease of use (91.66%), ease of answering exercises (88.54%), and ease of understanding material (95.83%). Overall, students perceived the application as a highly supportive learning medium.

3.5.4 Learning Outcomes

The average score of 92.5 indicates that most students achieved the intended learning objectives after using the application. These findings suggest that the BESTIN application has the potential to support learning outcomes in *tartil* reading of Surah At-Tin.

4. Discussion

4.1 The Effectiveness of BESTIN in Supporting Qur'anic Learning

Learning can be understood as a process in which teachers provide support to help students acquire knowledge, develop skills, and shape attitudes and beliefs (Rusman, 2017). At the elementary school level, Islamic Education (PAI) holds a central role in developing students' character and spirituality, particularly through learning the Qur'an. Nevertheless, various studies indicate that many elementary school students still experience difficulties in reading the Qur'an with proper *tartil*, such as limited fluency in connecting letters and challenges in recognizing and pronouncing hijaiyah letters accurately (Irawati, Anwar, Ruswandi, & Arifin, 2022). This condition highlights the need for learning approaches that are not only instructional but also capable of guiding students toward fluent and meaningful Qur'anic reading.

Along with developments in educational technology, the use of applications as learning media has become increasingly relevant. Applications are software programs designed to

perform specific functions within a system (Nasution, Siswanto, & Suryana, 2023). In educational contexts, applications may function as interactive learning tools that combine visual, audio, and practice-based elements. The BESTIN application was developed with this approach in mind, offering features such as audio recitation, animations, instructional videos, and practice activities.

The effectiveness of the BESTIN application can be observed from students' learning outcomes. Based on the learning evaluation results, students achieved an average score of 92.5, which indicates a high level of mastery after using the application. This result suggests that the BESTIN application was able to support students in improving their ability to read Surah At-Tin accurately and fluently. This learning outcome was supported by the results of expert validation and positive student responses, indicating that the application was feasible, user-friendly, and appropriate for use in the learning process. The presence of structured exercises and audio guidance appears to help students better understand the material and practice independently, contributing to more effective learning outcomes.

4.2 Comparison with Previous Studies

These findings are in line with international studies on mobile learning. Pedraja-Rejas, Muñoz-Fritis, Rodríguez-Ponce, & Laroze, 2024 found that mobile learning environments support students' comprehension and academic achievement through flexible and interactive learning experiences. In addition, a meta-analysis by Dong, Chiu, Zhou, & Zhang, 2024 confirmed that mobile-based learning interventions significantly enhance academic performance among school-aged learners. The consistency between these findings and the results of this study strengthens the position of BESTIN as an effective mobile learning medium for elementary Qur'anic education.

4.3 The Contribution of Interactive Features to Student Engagement

Beyond learning outcomes, the interactive features of the BESTIN application also play a role in increasing students' motivation and engagement during the learning process. Interactive and mobile-based learning environments have been shown to positively influence students' motivation and performance, particularly in language learning contexts (Liu, Zhang, & Dai, 2025). Furthermore, (Zharylgapova et al., 2025) emphasized that educational mobile applications contribute to the development of students' cognitive abilities and learning interest. In this study, students appeared more confident and engaged when practicing Qur'anic reading through the application, which supported a more positive learning atmosphere.

The interactive features of the BESTIN application also contribute to students' learning engagement. Through audio reading, recording, and progress-tracking features, students can practice independently and monitor their own learning progress. In addition, the application allows students to access learning materials anytime and anywhere, providing greater flexibility in the learning process. These features support self-directed and personalized learning, enabling students to learn according to their individual needs and abilities.

4.4 Educational implications and future development of BESTIN

Although the application obtained very high validation scores, several aspects may still be enhanced in future development. The integration of gamification elements, individualized

feedback, motivational content, and additional interactive multimedia features may further increase student engagement and learning retention. Furthermore, incorporating real-life examples and empathy-oriented learning activities may strengthen students' affective development and deepen their understanding of Islamic values.

In general, the findings of this study indicate that the BESTIN application is not only effective as a learning medium but also relevant to the needs of elementary school students learning the Qur'an. The integration of interactive features, audio guidance, and structured practice activities allows students to learn more independently while remaining actively involved in the learning process. Therefore, the BESTIN application can be viewed as a practical and innovative learning medium that supports the improvement of learning outcomes and learning experiences in Islamic Education at the primary school level.

5. Limitations

This study has several limitations. First, the implementation of the BESTIN application involved only 24 fourth-grade elementary school students in Sumedang Regency, limiting the generalizability of the findings. Second, the study focused solely on learning Surah At-Tin, so the results may not be directly applicable to other Islamic Education materials. Third, the effectiveness of the application was evaluated without a control group, making it difficult to compare the results with conventional learning methods. Future research is recommended to involve larger samples, broader learning materials, and experimental designs to obtain more comprehensive findings.

6. Conclusion

This study concludes that the development of the BESTIN Android application is an important pedagogical innovation in Islamic Education learning in elementary schools because it is able to accommodate students' learning needs as a whole, covering cognitive, affective, and spiritual aspects. Conceptually, BESTIN shows that the use of technology-based learning media integrated with multimedia elements, independent learning activities, and a monitoring system involving teachers and parents can transform the learning of the Qur'an, which was originally conventional, teacher-centered, and limited by space and time, into a more flexible, interactive, and learner-oriented learning process. The findings of this study indicate that learning technology designed in line with the curriculum objectives and developmental characteristics of elementary school students not only improves the effectiveness and quality of learning but also encourages active engagement, independent learning, and strengthens students' motivation to understand and practice Islamic values. In addition, the use of the BESTIN application expands the learning space beyond the formal classroom and strengthens collaboration between schools and families in supporting the continuous learning process of students. Therefore, Android-based learning media, particularly the BESTIN application, does not merely serve as a tool, but as a strategic instrument that contributes to improving the accessibility, meaningfulness, and sustainability of Islamic Education learning at the elementary school level in line with the demands of current educational and technological developments.

Author Contributions

Ani Nur Aeni conceived the study, developed the research methodology, reviewed the findings, revised the manuscript, and provided overall academic guidance throughout the study. Hana Siti Salmah, Dinda Shalsa Agistie, Siti Rahmah Nurainun, and Norhazlin Muhammad contributed to the literature review, the design and development of the BESTIN application, data collection and analysis, implementation of the study, interpretation of the findings, and preparation of the manuscript. All authors participated in reviewing and approving the final version of the manuscript and agreed to be accountable for all aspects of the work.

Acknowledgments

The authors gratefully acknowledge the support of the participating elementary school, particularly the principal, teachers, and fourth-grade students involved in this research. The authors also thank everyone who contributed to the implementation of the study and supported the research process. Their cooperation and valuable contributions made this study possible.

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