

KODULAR-BASED ARABIC LEARNING MEDIA FOR ISLAMIC JUNIOR HIGH SCHOOLS: DEVELOPMENT AND LEARNING OUTCOME EVALUATION

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Abstract

Background: The limited availability of interactive digital Arabic language learning media that align with the curriculum in Islamic Junior High Schools currently represents one of the main obstacles in optimizing student engagement and learning outcomes. **Research Objectives:** This study aims to develop and evaluate the effectiveness of a Kodular-based Arabic learning media named HiArab in improving the learning outcomes of seventh-grade students at Islamic Junior High Schools. **Methodology:** This study employed a Research and Development (R&D) by the ADDIE model. Data were collected through expert validation sheets, pre-test and post-test assessments, questionnaires, observations, and documentation. The sample consisted of 26 seventh-grade students at MTsN 2 Ponorogo selected through purposive sampling. **Results:** The findings indicate that the developed learning media is highly feasible and effective. Expert validation results showed an average feasibility score of 89.5%, categorized as highly feasible. The effectiveness test revealed a significant improvement in students' learning outcomes, with the average score increasing from 57.32 on the pre-test to 83.57 on the post-test. The N-Gain score of 0.61 falls within the medium-to-high improvement category, indicating a substantial learning gain. In addition, student responses to the media were very positive, with an average score of 86%, reflecting increased motivation, engagement, and ease of understanding Arabic vocabulary and pronunciation. **Unique Contribution:** This study contributes to Arabic language education by empirically demonstrating the effectiveness of mobile platforms and presenting a practical model for curriculum-based, interactive digital media in Islamic Junior High Schools. **Conclusion:** The development of HiArab proved to be highly engaging and significantly improved student learning outcomes, underscoring the transformative potential of strategic digital integration in pedagogy. **Recommendations:** Future research is recommended to extend its application across varied grade levels and subject areas, thereby strengthening digital innovation in Islamic education.

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Keywords:

Learning Media; Kodular; Arabic Language; Mobile Learning; Learning Outcomes.

Introduction

The development of digital technology over the past decade has brought significant changes to the education system, as technology has increasingly pervaded nearly every aspect of our lives in this digital era. Indeed, technology has revolutionized how our world functions and evolves.¹ This includes Arabic language learning.² Technology-based Arabic learning offers both opportunities and challenges in today's digital era.³ Learning activities that were once dominated by lectures and textbook use have now transformed into interactive media-based learning, enabling more personalized and adaptive learning experiences.⁴ Several studies have demonstrated that the integration of educational technology in language learning contributes positively to increasing students' motivation, vocabulary retention, and learning achievement.⁵ Thus, current educational models have proven that most learning activities cannot be separated from technological integration.⁶ Nevertheless, the implementation of technology in Arabic language learning at the Madrasah Tsanawiyah (MTs) level still faces challenges, particularly the limited availability of digital media that are relevant, curriculum-aligned, and easy for both teachers and students to use. This is important because language serves as a fundamental tool of communication in human interaction.⁷

From an empirical perspective, various studies indicate that low-code/no-code platforms such as Kodular offer an appealing solution, as they allow the development of learning applications without requiring advanced programming skills.⁸ Kodular provides opportunities for teachers to create contextual learning

¹ Alim Al Ayub Ahmed et al., "An Empirical Study on the Effects of Using Kahoot as a Game-Based Learning Tool on EFL Learners' Vocabulary Recall and Retention," *Education Research International* 2022 (February 2022): 1–10, <https://doi.org/10.1155/2022/9739147>.

² Zurqoni Zurqoni et al., "Has Arabic Language Learning Been Successfully Implemented?," *International Journal of Instruction* 13, no. 4 (2020): 715–30, <https://doi.org/10.29333/iji.2020.13444a>.

³ Noor Azli Mohamed Masrop et al., "Digital Games Based Language Learning for Arabic Literacy Remedial," *Creative Education* 10, no. 12 (2019): 3213–22, <https://doi.org/10.4236/ce.2019.1012245>.

⁴ Juan Peña-Martínez et al., "Reimagining Chemistry Education for Pre-Service Teachers Through TikTok, News Media, and Digital Portfolios," *Applied Sciences* 15, no. 14 (2025): 7711, <https://doi.org/10.3390/app15147711>.

⁵ Muhamad Ibnu Setiawan Pratama et al., "Development of The An-Najah Mobile Learning Application to Improve Students' Arabic Reading Skills," *Arabiyat : Jurnal Pendidikan Bahasa Arab Dan Kebahasaaraban* 12, no. 1 (2025), <https://journal.uinjkt.ac.id/arabiyat/article/view/47227>.

⁶ Nur Alim et al., "The Effectiveness of Google Classroom as an Instructional Media: A Case of State Islamic Institute of Kendari, Indonesia," *Humanities & Social Sciences Reviews* 7, no. 2 (2019): 240–46, <https://doi.org/10.18510/hssr.2019.7227>.

⁷ Evelina Fedorenko et al., "Language Is Primarily a Tool for Communication Rather than Thought," *Nature* 630, no. 8017 (2024): 575–86, <https://doi.org/10.1038/s41586-024-07522-w>.

⁸ Dominique Makowski et al., "NeuroKit2: A Python Toolbox for Neurophysiological Signal Processing," *Behavior Research Methods* 53, no. 4 (2021): 1689–96, <https://doi.org/10.3758/s13428-020-01516-y>; Cahyo Hasanudin et al., "Kodular: A Solution to Create an Instructional Material for Mobile Learning-Based Teaching Writing Skills in the Era Society 5.0," *Proceedings of International Conference on Science, Education, and Technology* 7 (2021), <https://proceeding.unnes.ac.id/ISET/article/view/2036>; Maria Theresia Lintang Larasati and Yudi Sukmayadi, "Mobile Learning Design for Sight Reading," *Proceedings of the 3rd International Conference on Arts and Design Education (ICADE 2020)* (Bandung, Indonesia), 2021, <https://doi.org/10.2991/assehr.k.210203.015>.

media tailored to instructional needs and accessible through Android devices widely used by students.⁹ However, field evidence shows that the adoption of this platform remains limited due to the lack of teacher training. As innovators, teachers are expected to develop learning innovations that foster students' interest in learning, including the utilization of appropriate media.¹⁰ In addition, there is a scarcity of references for developing media specifically for Arabic learning, and traditional learning resources still dominate instructional practices in Islamic schools.¹¹ This situation highlights a gap between the potential of educational technology and its actual implementation in the context of Arabic language education.¹²

Furthermore, Arabic language learning at the MTs level often remains focused on memorization, vocabulary acquisition, and grammatical structures without the support of interactive digital learning systems. This results in low student engagement and suboptimal learning outcomes. Meanwhile, mobile application-based technology has significant potential to facilitate microlearning, spaced repetition, and structured self-directed learning.¹³ Therefore, more in-depth research is needed on the integration of mobile-based Arabic learning media using the Kodular platform to improve student learning outcomes at the MTs level.

Previous studies have shown that mobile application-based learning media have a positive impact on students' motivation and learning outcomes in foreign language instruction.¹⁴ However, most existing studies still rely on commercial applications or generic e-learning platforms that are insufficiently flexible for adapting to local curricula.¹⁵ Meanwhile, research on Kodular demonstrates success in terms of product validity and user acceptance, yet few studies have applied it

⁹ M. Tegar Wicaksana and Erlina Erlina, "Development of Arabic Interactive Learning Media Assisted by Kodular for Grade VIII at Islamic Junior High School," *Language, Technology, and Social Media* 1, no. 1 (2023): 27–41, <https://doi.org/10.70211/ltsm.v1i1.21>.

¹⁰ Nurul Fitriah Alias and Rafiza Abdul Razak, "Revolutionizing Learning in the Digital Age: A Systematic Literature Review of Microlearning Strategies," *Interactive Learning Environments* 33, no. 1 (2025): 1–21, <https://doi.org/10.1080/10494820.2024.2331638>; Shaiana Vilella Hartwig et al., "The Effect of Ambient Temperature on Blood Pressure of Patients Undergoing Hemodialysis in the Pantanal-Brazil," *Heliyon* 7, no. 6 (2021): e07348, <https://doi.org/10.1016/j.heliyon.2021.e07348>.

¹¹ Abdullah Sahin, "Critical Issues in Islamic Education Studies: Rethinking Islamic and Western Liberal Secular Values of Education," *Religions* 9, no. 11 (2018): 335, <https://doi.org/10.3390/rel9110335>.

¹² Rashad Seyidov and Ahmet Çitil, "The Impacts of Contemporary Educational Technologies on Learning Arabic," *Evolutionary Studies in Imaginative Culture*, October 26, 2024, <https://esiculture.com/index.php/esiculture/article/view/2131>.

¹³ Haozhun Luo and Weiyan Li, "Impact of Microlearning on Developing Soft Skills of University Students across Disciplines," *Frontiers in Psychology* 16 (April 2025): 1491265, <https://doi.org/10.3389/fpsyg.2025.1491265>.

¹⁴ Kashif Ishaq et al., "Mobile-Assisted and Gamification-Based Language Learning: A Systematic Literature Review," *PeerJ Computer Science* 7 (May 2021): e496, <https://doi.org/10.7717/peerj-cs.496>.

¹⁵ Yun Bai, "A Mixed Methods Investigation of Mobile-Based Language Learning on EFL Students' Listening, Speaking, Foreign Language Enjoyment, and Anxiety," *Sage Open* 14, no. 2 (2024): 21582440241255554, <https://doi.org/10.1177/21582440241255554>; Michael Zisuh Ngoasong, "Curriculum Adaptation for Blended Learning in Resource-Scarce Contexts," *Journal of Management Education* 46, no. 4 (2022): 622–55, <https://doi.org/10.1177/10525629211047168>.



specifically to Arabic language learning or empirically examined its impact on student learning outcomes.¹⁶

Thus, the novelty of this research lies in three main aspects: (1) the development of a Kodular-based Arabic learning application aligned with the learning outcomes of the MTs Curriculum; (2) the use of a learning media design approach grounded in modern multimedia learning principles; and (3) the empirical testing of the application's effectiveness through a quasi-experimental design using experimental and control groups (pre-test & post-test control group design). This approach provides stronger empirical evidence compared to previous studies, which were limited to design and feasibility testing.

The purpose of this study is to develop and evaluate the effectiveness of a Kodular-based Arabic learning media "HiArab" as a tool to improve the learning outcomes of seventh-grade MTs students. This study not only focuses on developing the media but also evaluates its impact on student achievement through a controlled testing process.¹⁷ The rationale for this research assumes that digital learning media designed in accordance with instructional design principles, aligned with the curriculum, and enhanced with mobile-based interactive features can significantly improve learning motivation, information retention, and student learning outcomes.¹⁸ The widespread availability of mobile devices thus compels teachers to incorporate them into instructional practices and to guide students toward using their devices for educational purposes rather than recreation, thereby facilitating anytime, anywhere learning.¹⁹ Learning media serve as a bridge that conveys knowledge to learners.²⁰ Therefore, developing learning media through the Kodular platform holds great potential for optimizing Arabic language learning when tested empirically.

¹⁶ Fitri Nurjanah and Sri Emy Yuli Suprihatin, "The Development of Android-Based Learning Media Using Kodular in Making Suit Patterns Subject," *Jurnal Pendidikan Vokasi* 13, no. 3 (2023): 232–45, <https://doi.org/10.21831/jpv.v13i3.54542>; Pipi Deswita et al., "Development of Interactive Media Using Kodular in The Learning Evaluation Course: Supporting the Implementation of the Merdeka Curriculum," *Jurnal Penelitian Pendidikan IPA* 11, no. 12 (2025): 1428–36, <https://doi.org/10.29303/jppipa.v11i12.12488>; Yinghui Shi et al., "College Students' Cognitive Learning Outcomes in Flipped Classroom Instruction: A Meta-Analysis of the Empirical Literature," *Journal of Computers in Education* 7, no. 1 (2020): 79–103, <https://doi.org/10.1007/s40692-019-00142-8>.

¹⁷ Laura A. Outhwaite et al., "A New Methodological Approach for Evaluating the Impact of Educational Intervention Implementation on Learning Outcomes," *International Journal of Research & Method in Education* 43, no. 3 (2020): 225–42, <https://doi.org/10.1080/1743727X.2019.1657081>.

¹⁸ Wendy James et al., "Improving Retention While Enhancing Student Engagement and Learning Outcomes Using Gamified Mobile Technology," *Accounting Education* 34, no. 3 (2025): 366–86, <https://doi.org/10.1080/09639284.2024.2326009>; Richard Mayer, *Multimedia Learning*, 3rd ed. (Cambridge University Press, 2020), <https://doi.org/10.1017/9781316941355>.

¹⁹ Azkia Muharom Albantani and Imam Fitri Rahmadi, "Mobile Devices for Arabic Learning in Junior High Schools: The Teachers' Perspective," *Jurnal Al Bayan: Jurnal Jurusan Pendidikan Bahasa Arab* 12, no. 2 (2020): 191–207, <https://doi.org/10.24042/albayan.v12i2.6385>.

²⁰ Nailul Izzah et al., "The Application of the Qarshun 'Ajibun Media in Students' Understanding of the Nahwu (Grammar) Subject," *Arabiyatuna: Jurnal Bahasa Arab* 8, no. 1 (2024): 283, <https://doi.org/10.29240/jba.v8i1.9741>.

This research is important because it contributes to the development of practical, affordable, and easily replicable technology-based Arabic learning media for teachers and Islamic educational institutions. In addition, the findings of this study are expected to provide a model for implementing educational technology that aligns with the current context of educational digitalization while bridging the gap between the need for digital learning media and their limited availability in Arabic language instruction at the MTs level.

Method

This study employed a Research and Development (R&D) approach using the ADDIE development model, which consists of five phases: Analysis, Design, Development, Implementation, and Evaluation.²¹ The ADDIE model was selected because it offers a systematic framework for developing digital learning media and ensuring their effectiveness in improving student learning outcomes.²²

In the analysis phase, a needs assessment was conducted through preliminary studies involving seventh-grade Arabic language students and teachers at MTsN 2 Ponorogo to determine the urgency and relevance of developing Kodular-based learning media. The design phase involved constructing system flowcharts, interface layouts, and learning content structure. The development phase consisted of creating the application using Kodular, followed by expert validation from media and material specialists to ensure product quality. The implementation phase was carried out through a limited trial involving seventh-grade students. The evaluation phase assessed the effectiveness of the media in improving learning outcomes and analyzed students' responses to the application.²³

This research was conducted at MTsN 2 Ponorogo with a sample of 26 seventh-grade students from the 2024/2025 academic year. Purposive sampling was used as the selected class met the criteria relevant to the research focus and had not previously used digital learning media for Arabic instruction.²⁴ Several instruments were employed during data collection, including needs assessment questionnaires, expert validation sheets, pre-test and post-test assessments, as well as student response questionnaires.²⁵ These instruments were developed based on the

²¹ E. Widyastuti and Susiana, "Using the ADDIE Model to Develop Learning Material for Actuarial Mathematics," *Journal of Physics: Conference Series* 1188 (March 2019): 012052, <https://doi.org/10.1088/1742-6596/1188/1/012052>.

²² Yuniarto Mudjिसusatyو et al., "The Use ADDIE Model to Improve the Competence of the Higher Education Task Force in Obtaining Competitive Funding for the Independent Campus Program," *Journal of Applied Research in Higher Education* 17, no. 5 (2025): 2109–38, <https://doi.org/10.1108/JARHE-12-2023-0580>.

²³ N. M. Dwijayani, "Development of Circle Learning Media to Improve Student Learning Outcomes," *Journal of Physics: Conference Series* 1321, no. 2 (2019): 022099, <https://doi.org/10.1088/1742-6596/1321/2/022099>.

²⁴ Steve Campbell et al., "Purposive Sampling: Complex or Simple? Research Case Examples," *Journal of Research in Nursing* 25, no. 8 (2020): 652–61, <https://doi.org/10.1177/1744987120927206>.

²⁵ Janita P. C. Chau et al., "Development and Evaluation of a Technology-Enhanced, Enquiry-Based Learning Program on Managing Neonatal Extravasation Injury: A Pre-Test/Post-Test Mixed-Methods Study," *Nurse Education Today* 97 (February 2021): 104672, <https://doi.org/10.1016/j.nedt.2020.104672>; Sri Astutik and Binar Kurnia Prahani, "The Practicality and Effectiveness of Collaborative Creativity



competency indicators of Arabic language learning and were validated by experts. Reliability testing was conducted using Cronbach's Alpha with a minimum reliability threshold of 0.70.²⁶

Data collection techniques included written tests (pre-test and post-test) to measure improvements in students' learning outcomes after using the Kodular-based media. Questionnaires were used to obtain students' responses toward the media, while documentation supported the data during the learning process. Collected data were analyzed both quantitatively and qualitatively. Media validity was analyzed by calculating the percentage of total scores to determine feasibility based on established criteria, with scores above 80% considered highly feasible. The effectiveness of the media was measured using the N-Gain Score following formula.²⁷ Meanwhile, student response data were analyzed using percentage formulas to determine levels of acceptance and learning experience.

The model of a Kodular-based Arabic learning media "HiArab" were validated by two experts: one in Arabic language education and one in instructional media, both holding doctoral degrees and recognized for their strong professional and pedagogical competence. Validation focused on content relevance, clarity, and alignment with learning objectives. Reliability testing using Cronbach's Alpha produced a coefficient of 0.87, indicating high internal consistency. These indicators served as the basis for concluding the success of implementing Kodular-based learning media in improving Arabic learning outcomes among seventh-grade students at MTsN 2 Ponorogo.

Result and Discussion

Development of Kodular-Based Learning Media

This study resulted in the development of a Kodular-based Arabic learning media designed to improve the learning outcomes of seventh-grade students at MTsN 2 Ponorogo. The development and implementation processes were supported by data generated from interviews, observations, documentation, learning assessments, expert validation questionnaires, and student response questionnaires.²⁸

Initial data collection was conducted through an interview with the seventh-grade Arabic language teacher at MTsN 2 Ponorogo on February 7, 2025. The interview findings indicated that students required a mobile application-based

Learning (CCL) Model by Using PhET Simulation to Increase Students' Scientific Creativity," *International Journal of Instruction* 11, no. 4 (2018): 409–24, <https://doi.org/10.12973/iji.2018.11426a>.

²⁶ Jamal Ksiksou et al., "Validity and Reliability Assessment of the Arabic Version of the Social and Emotional Competencies Questionnaire in a Moroccan Nursing Student Population," *Iranian Journal of Psychiatry*, ahead of print, December 29, 2024, <https://doi.org/10.18502/ijps.v20i1.17402>.

²⁷ L. Rosdiana and R. M. Ulya, "The Effectiveness of The Animation Video Learning Earth's Layer Media to Improve Students' Concept Understanding," *Journal of Physics: Conference Series* 1899, no. 1 (2021): 012172, <https://doi.org/10.1088/1742-6596/1899/1/012172>.

²⁸ Hsiao-Ping Hsu et al., "Developing Elementary Students' Digital Literacy Through Augmented Reality Creation: Insights From a Longitudinal Analysis of Questionnaires, Interviews, and Projects," *Journal of Educational Computing Research* 57, no. 6 (2019): 1400–1435, <https://doi.org/10.1177/0735633118794515>.

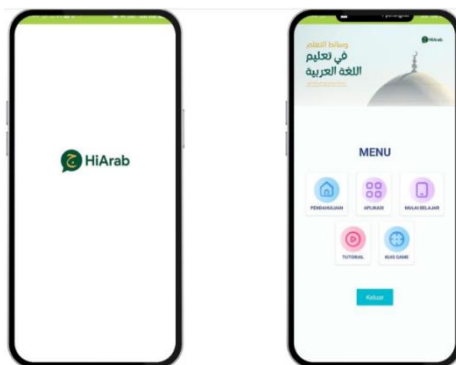
learning media that could be accessed anytime and anywhere, consistent with the increasing use of smartphones among students. The teacher reported that Arabic learning in the classroom remained constrained by students' limited abilities in reading vocalized Arabic texts, understanding vocabulary, and practicing pronunciation.

The ideal learning media should contain curriculum-aligned Arabic materials and include interactive features such as vocalized text reading exercises, pronunciation audio, a digital dictionary, and comprehension assessments. Additionally, the interface needed to be engaging and user-friendly to enhance students' motivation and support independent learning. The teacher also emphasized the need for a feedback system and learning progress monitoring features to track students' development.

The analysis results showed issues related to low learning outcomes and the limited use of technology-based learning media in the learning process. Based on these findings, the goal of this development was to create an interactive learning application aligned with the first-semester curriculum for seventh-grade students.

Following the development procedures detailed in the previous chapter, the final product was a learning media application named HiArab. This application is equipped with text, images, audio, game-based quizzes, and practice exercises, as illustrated in the figure below:

Figure 1. Multimedia Features in the Application



The Arabic learning application is equipped with several main menus designed to facilitate users throughout the learning process. The Introduction menu provides an overview of the application, the learning objectives, and instructions for use. The Application menu comprises the core Arabic learning materials aligned with the seventh-grade curriculum, complete with text, audio features, and usage examples. The Start Learning menu serves as an interactive space where students can study the material gradually through exercises and assessments. A tutorial menu is also provided to guide both students and teachers in operating the application easily. In addition, the Quiz Game menu offers educational games as an enjoyable form of evaluation, which helps increase students' learning motivation. At the bottom of the interface, an exit button is available for users to close the application conveniently. All menus are designed with a simple layout, intuitive icons, and user-friendly navigation.

The implementation stage produced three key pieces of evidence related to the effectiveness and feasibility of the media. The first piece of evidence was the learning test results, consisting of pre-test and post-test assessments administered to 26 students. Based on the documented scores, the average pre-test score before using the application was 57.32, while the average post-test score after using the Kodular-based media increased to 83.57. This improvement indicates a significant change in students' understanding of the Arabic material. The calculation of the N-Gain Score yielded a value of 0.61, which falls within the medium improvement category. Therefore, it can be concluded that the Kodular-based learning media is effective in improving students' learning outcomes, as shown in the table below:

Table 1. Classification of N-Gain Score

Category	Range of g
High	$g > 0.70$
Medium	$0.30 \leq g \leq 0.70$
Low	$g < 0.30$

The second piece of evidence comes from the feasibility test questionnaires administered to two validators, namely a material expert and a media expert. Based on the documented assessments, the material expert gave an average score of 88%, noting that the content aligns with the curriculum and is easy for beginner-level students to understand. Meanwhile, the media expert provided a score of 91%, stating that the application meets the criteria of usability, navigation, visual design, and functionality. Thus, the average feasibility score stands at 89.5%, which falls into the "highly feasible" category for use in instructional settings.

The third piece of evidence is derived from the student response questionnaire concerning the use of the Kodular-based learning media. Based on the processed data, the average score obtained was 86%. Observations during the learning process indicated that students appeared more enthusiastic and engaged, particularly when using the quiz features and the Arabic pronunciation audio provided within the application. Most students reported that the learning media made it easier for them to understand vocabulary, improve pronunciation, and learn independently without relying solely on the teacher's explanation.

Overall, the research findings obtained through interviews, observations, documentation, learning tests, expert validation, and student responses demonstrate that the Kodular-based learning media developed in this study is feasible, engaging, and effective in improving the Arabic learning outcomes of seventh-grade students at MTsN 2 Ponorogo. The substantial gain in learning outcomes, combined with positive feedback from students and experts, supports the view that this media offers a viable alternative for creating more engaging, independent, and technology-driven learning experiences.

The implementation of Kodular-based Arabic learning media yielded a statistically significant improvement in the learning outcomes of seventh-grade students at MTsN 2 Ponorogo. Results from the pre-test and post-test assessments demonstrated an increase in the mean score from 57.32 to 83.57. A paired-sample t-test confirmed that this difference was statistically significant ($p < 0.05$).

Furthermore, the N-Gain value of 0.61 indicates a moderate level of effectiveness according to established benchmarks. These findings provide empirical evidence that application-based media can enhance learning effectiveness. The observed improvement is consistent with constructivist theory, which emphasizes that meaningful learning occurs when students actively engage with contextual stimuli and interactive learning experiences.²⁹

These findings are supported by previous studies indicating that mobile-based digital learning media can improve students' learning outcomes and motivation in learning foreign languages.³⁰ Other studies also reinforce this result, indicating that the use of Kodular-based applications in Arabic language learning significantly enhances students' language skills. Thus, learning media—often referred to as educational media play a crucial role, and the use of Kodular applications in Arabic language instruction is highly relevant and well-suited to the needs of digital-based learning.³¹ In terms of feasibility, validation results from material experts and media experts yielded an average score of 89.5%, categorized as highly feasible. This indicates that the Kodular-based learning media meets the standards of content accuracy, visual design, navigation, and technical functionality. These evaluation standards correspond to the criteria for learning media feasibility, which include pedagogical, technical, aesthetic, and linguistic aspects as outlined by consistent with the present findings, previous research also shows that learning media deemed feasible by experts tend to produce positive outcomes.³² When implemented in

²⁹ Andi Basuki and Chitra Resmi, "Learning Innovation in the Digital Age: Improving Digital Competence with Kodular-Assisted Zapraz," in *Proceedings of the 4th Business Innovation Sustainability and Technology International Conference (BISTIC 2024)*, vol. 307, ed. Ika Zutiasari et al., Advances in Economics, Business and Management Research (Atlantis Press International BV, 2024), https://doi.org/10.2991/978-94-6463-576-8_7; Joseph Zajda, "Constructivist Learning Theory and Creating Effective Learning Environments," in *Globalisation and Education Reforms*, vol. 25, by Joseph Zajda, Globalisation, Comparative Education and Policy Research (Springer International Publishing, 2021), https://doi.org/10.1007/978-3-030-71575-5_3.

³⁰ Muhamad Khairul Anuar Zulkepli et al., "The Impact of Mobile Applications on Arabic Language Acquisition: A Pedagogical Perspective," *International Journal of Research and Innovation in Social Science* VIII, no. VIII (2024): 4443–51, <https://doi.org/10.47772/IJRISS.2024.8080340>; Hamdan Husein Batubara et al., "Developing a Mobile-Assisted Project-Based Learning Model for a Learning Media Course," *International Journal of Interactive Mobile Technologies (IJIM)* 17, no. 17 (2023): 4–18, <https://doi.org/10.3991/ijim.v17i17.41705>.

³¹ K. Kustyarini et al., "The Importance of Interactive Learning Media in a New Civilization Era," *European Journal of Open Education and E-Learning Studies* 5, no. 2 (2020), <https://doi.org/10.46827/ejoe.v5i2.3298>; Rosmawati Mansor and Intan Farahana Kamsin, "The Importance of Creating a Control Structure Programming Module to Improve Students' Understanding," *International Journal of Academic Research in Business and Social Sciences* 15, no. 3 (2025): Pages 1331-1343, <https://doi.org/10.6007/IJARBS/v15-i3/25075>.

³² R. Van Beek et al., "Guidelines to Support the Design, and Selection and Appraisal of Multimedia Teaching Aids for Microbiology Education," *Microbial Biotechnology* 17, no. 8 (2024): e14553, <https://doi.org/10.1111/1751-7915.14553>; Ahmad Nur Mizan et al., "The Development of Arabic Learning Media Based on Android for Senior High School Students," *LISANIA: Journal of Arabic Education and Literature* 6, no. 2 (2022): 178–89, <https://doi.org/10.18326/lisania.v6i2.178-189>.



classroom settings.³³ Additionally, the student response score of 86% demonstrates that the learning media was very well received. Based on the Technology Acceptance Model (TAM), technology acceptance is influenced by perceived ease of use and perceived usefulness.³⁴ Questionnaire results and classroom observations revealed that students found the application easy to use, engaging, and helpful in understanding vocabulary and pronunciation in Arabic. These findings strengthen earlier studies indicating that mobile learning-based media can enhance student engagement motivation, and overall learning experience.³⁵

Overall, empirical evidence from learning tests, expert validation, and student responses confirms that the Kodular-based learning media is both feasible and effective in supporting Arabic language instruction. The findings also show that digital learning not only facilitates students' understanding of the material but also increases their motivation and learning autonomy.³⁶ Therefore, Kodular-based learning applications can serve as an alternative solution for developing innovative learning tools that are adaptive to technological advancements and responsive to students' learning needs in the digital era.³⁷

Conclusion

This study concludes that the Kodular-based Arabic learning media is proven to be effective, feasible, and responsive to the learning needs of seventh-grade students at MTsN 2 Ponorogo. The effectiveness of the media is evidenced by a significant increase in learning outcomes, from an average pre-test score of 57.32 to a post-test score of 83.57, with an N-Gain score of 0.61, indicating improvement in the medium-to-high category. The feasibility of the media is further supported by the validation results from material and media experts, who provided an average score of 89.5%, placing it in the "highly feasible" category for instructional use.

³³ P. Raymond Joslyn and Timothy R. Vollmer, "Efficacy of Teacher-implemented Good Behavior Game despite Low Treatment Integrity," *Journal of Applied Behavior Analysis* 53, no. 1 (2020): 465–74, <https://doi.org/10.1002/jaba.614>.

³⁴ Abdulsalami Ibrahim and Elizabeth Shiring, "The Relationship between Educators' Attitudes, Perceived Usefulness, and Perceived Ease of Use of Instructional and Web-Based Technologies: Implications from Technology Acceptance Model (TAM)," *International Journal of Technology in Education* 5, no. 4 (2022): 535–51, <https://doi.org/10.46328/ijte.285>.

³⁵ Bundit Anuyahong and Nattida Pucharoen, "Exploring the Effectiveness of Mobile Learning Technologies in Enhancing Student Engagement and Learning Outcomes," *International Journal of Emerging Technologies in Learning (IJET)* 18, no. 18 (2023): 50–63, <https://doi.org/10.3991/ijet.v18i18.40445>; Jingxuan Bi et al., "Investigating the Impact of Technology-Based Education on Academic Motivation, Academic Perseverance, and Academic Self-Efficacy in English Language Learning Skills," *Education and Information Technologies* 29, no. 15 (2024): 20523–45, <https://doi.org/10.1007/s10639-024-12712-0>.

³⁶ María Dolores Díaz-Noguera et al., "Autonomy, Motivation, and Digital Pedagogy Are Key Factors in the Perceptions of Spanish Higher-Education Students toward Online Learning during the COVID-19 Pandemic," *International Journal of Environmental Research and Public Health* 19, no. 2 (2022): 654, <https://doi.org/10.3390/ijerph19020654>.

³⁷ A. Mashfufah et al., "Conceptual: Digital Book in the Era of Digital Learning Approaches (DLA)," *IOP Conference Series: Earth and Environmental Science* 243 (April 2019): 012107, <https://doi.org/10.1088/1755-1315/243/1/012107>.

Additionally, student responses to the media showed a highly positive acceptance rate of 86%, indicating that the Kodular-based media successfully enhanced students' motivation, engagement, and ease of understanding Arabic learning materials—particularly vocabulary and pronunciation. Thus, the media not only improves learning outcomes but also supports more interactive, independent, and digitally aligned learning experiences. A limitation of this study is its single-group design and relatively small sample size drawn from one school, which limits generalizability. The Kodular-based learning media is recommended for broader implementation in Arabic language instruction and further development across different topics and grade levels to achieve a greater impact on the overall quality of learning.

This study contributes to Arabic language education by empirically demonstrating the effectiveness of mobile platforms and presenting a practical model for curriculum-based, interactive digital media in Islamic Junior High Schools. In conclusion, the development of “HiArab” proved highly engaging and significantly improved student learning outcomes, underscoring the transformative potential of strategic digital integration in pedagogy. Future research is recommended to extend its application across varied grade levels and subject areas, thereby strengthening digital innovation in Islamic education.

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Author Contribution Statement

WM was responsible for the study, learning media development, data collection, data analysis, and manuscript preparation. MS contributed to the conceptualization, research design, validation process, data interpretation, critical revision of the manuscript, and provided academic supervision throughout the research process, and MF contributed to the literature review and layout

adjustments according to the journal template. All authors reviewed and approved the final version of the manuscript.

Declaration of Competing Interest

The authors declare that they have no known financial or personal relationships that could have appeared to influence the work reported in this paper.

AI Writing Statement

During the preparation of this manuscript, the authors used “Copilot and the Gemini Tool” to assist with, among other things, literature search, idea organization, language editing, and translation. The authors carefully reviewed and edited the AI-generated content and take full responsibility for the final content of this manuscript.

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