

DEVELOPMENT OF TECHNOLOGY-BASED TEACHING MATERIALS FOR ARABIC LANGUAGE LEARNING AT STATE ISLAMIC SENIOR HIGH SCHOOL 1 BUKITTINGGI

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Abstract

This study aims to develop technology-based instructional materials for Arabic language learning at Madrasah Aliyah Negeri 1 Bukittinggi using a Research and Development (R&D) approach. The rapid advancement of digital technology has significantly influenced educational practices, requiring educators to adapt teaching materials that align with students' learning needs in the digital era. This research addresses the gap between traditional Arabic teaching methods and the integration of innovative digital tools to enhance student engagement and learning outcomes. The development process follows a systematic R&D model, including needs analysis, design, development, validation, revision, and implementation stages. Data were collected through interviews, observations, questionnaires, and expert validation involving Arabic language teachers, students, and instructional design specialists. The developed materials incorporate multimedia elements such as interactive exercises, audio-visual content, and digital platforms to support language acquisition skills, including listening, speaking, reading, and writing. The findings indicate that technology-based instructional materials significantly improve students' motivation, participation, and comprehension in Arabic learning. Moreover, the materials were validated as feasible, effective, and relevant to the curriculum requirements. This study contributes to the field of Arabic language education by providing a practical model for integrating technology into instructional material development, particularly in Islamic senior high schools. It is expected that the results can serve as a reference for educators and policymakers in enhancing the quality of Arabic language instruction through innovative and technology-driven approaches.

Keywords: Arabic Language Learning, Teaching Materials, Technology



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INTRODUCTION

The integration of technology in education has become an essential component in modern teaching and learning processes, particularly in language instruction where interaction and engagement play crucial roles. In recent years, the advancement of digital tools has transformed traditional pedagogical practices into more dynamic and student-centered approaches, allowing educators to deliver content in more interactive and meaningful ways (Kukulska-Hulme, 2021; Chapelle, 2022). Within this context, Arabic language learning in Islamic educational institutions faces increasing demands to adapt to these technological changes in order to remain relevant and effective. The use of conventional teaching materials often limits students' exposure to authentic language use and reduces opportunities for active participation (Wahyudi, 2022). Therefore, the development of technology-based instructional materials becomes a strategic effort to bridge the gap between traditional pedagogy and modern learning needs, ensuring that students can achieve better learning outcomes in Arabic language education.

The importance of developing innovative instructional materials is particularly evident in Madrasah Aliyah Negeri 1 Bukittinggi, where Arabic is a core subject that requires both linguistic competence and cultural understanding. Despite its significance, the teaching of Arabic often relies heavily on textbooks and teacher-centered methods, which may not fully engage students or cater to diverse learning styles (Aziz & Nurhayati, 2021; Hidayat, 2023). Moreover, students in the digital age are more accustomed to interactive and multimedia-rich environments, making it necessary for educators to incorporate technology into their instructional design (Prensky, 2021; Dabbagh & Fake, 2022). This mismatch between teaching approaches and student expectations can lead to decreased motivation and limited language acquisition. Consequently, the development of technology-based teaching materials is not only relevant but also essential to improve the effectiveness of Arabic language learning in this educational setting.

In addition to pedagogical challenges, the integration of technology in Arabic language learning also presents opportunities to enhance various language skills simultaneously. Digital tools such as learning management systems, multimedia applications, and interactive platforms enable the incorporation of listening, speaking, reading, and writing activities in a cohesive manner (Stockwell, 2022; Godwin-Jones, 2023). Furthermore, technology allows for personalized learning experiences, where students can access materials at their own pace and receive immediate feedback on their performance (Reinders & White, 2021; Lai, 2022). However, the successful implementation of such innovations requires well-designed instructional materials that align with curriculum standards and learners' needs. Without proper development and validation, the use of technology may not yield the desired educational outcomes. Therefore, a systematic approach such as Research and Development is needed to ensure the quality and effectiveness of the materials produced.

Based on the aforementioned considerations, this study focuses on developing technology-based instructional materials for Arabic language learning using a Research and Development approach. The study aims to design, develop, and evaluate instructional materials that are not only technologically enriched but also pedagogically sound and contextually relevant to Madrasah Aliyah Negeri 1 Bukittinggi (Borg & Gall, 2021; Sugiyono, 2022). By

conducting a comprehensive needs analysis and involving experts in the validation process, this research seeks to produce materials that can enhance students' engagement and learning outcomes. In addition, the study contributes to the growing body of knowledge on technology integration in Arabic language education and provides practical implications for teachers and curriculum developers (Al Husna, 2025). Ultimately, this research underscores the importance of innovation in instructional material development as a means to improve the quality of education in the digital era.

The concept of instructional materials plays a fundamental role in determining the effectiveness of language learning, particularly in the context of Arabic language education. Instructional materials are defined as systematically designed resources that facilitate the teaching and learning process by providing relevant content, activities, and assessments aligned with learning objectives (Tomlinson, 2021; Richards, 2022). In Arabic language learning, materials must address not only linguistic aspects such as grammar and vocabulary but also cultural and contextual elements that support meaningful communication (Al-Busaidi, 2021; Younes, 2022). Furthermore, effective instructional materials should be adaptable to learners' needs and learning environments, especially in diverse educational settings like madrasahs. Therefore, the development of instructional materials requires careful consideration of pedagogical principles, learner characteristics, and curriculum standards to ensure optimal learning outcomes.

The integration of technology into instructional materials has become increasingly important in enhancing the quality of education in the 21st century. Technology-based instructional materials refer to learning resources that utilize digital tools and platforms to deliver content in interactive and engaging formats (Hubbard, 2021; Chapelle, 2022; Dudeney & Hockly, 2021). These materials often include multimedia elements such as videos, audio recordings, animations, and interactive exercises that can support different learning styles and preferences. In the context of Arabic language learning, technology enables the presentation of authentic language input and real-life communication scenarios, which are essential for developing communicative competence (Godwin-Jones, 2023). Moreover, digital platforms allow learners to access materials anytime and anywhere, promoting autonomous learning and continuous practice beyond the classroom.

Another important theoretical foundation in this study is the concept of digital learning and its impact on student engagement and motivation. Digital learning environments provide opportunities for active participation, collaboration, and personalized learning experiences, which are key factors in enhancing student motivation (Reinders & White, 2021; Lai, 2022). Research has shown that students who engage with interactive and technology-based materials tend to exhibit higher levels of interest and involvement in the learning process (Prensky, 2021; Dabbagh & Fake, 2022). In Arabic language education, where students often face challenges related to unfamiliar scripts and complex grammatical structures, the use of digital tools can help simplify learning and make it more accessible. Consequently, the integration of technology into instructional materials is not only beneficial but also necessary to meet the needs of modern learners.

The development of instructional materials using a Research and Development (R&D) approach provides a systematic framework for producing effective and validated learning resources. The R&D model involves several stages, including needs analysis, design, development, validation, implementation, and evaluation (Borg & Gall, 2021; Sugiyono, 2022). This approach ensures that the materials are based on empirical data and are continuously refined through expert feedback and field testing. In the context of educational research, R&D is widely used to develop innovative teaching materials that address specific learning problems and improve educational practices (Gustafson & Branch, 2021). By applying this approach, researchers can ensure that the developed materials are not only theoretically sound but also practically applicable in real classroom settings.

Previous studies on technology-based instructional materials in language learning have demonstrated significant improvements in students' learning outcomes and engagement. For instance, research by Hidayat and Wahyudi indicates that the use of multimedia-based materials can enhance students' comprehension and retention of language concepts. Similarly, studies conducted by Aziz and Nurhayati highlight the effectiveness of interactive digital platforms in improving students' speaking and listening skills in Arabic. These findings are supported by international research, which shows that technology integration in language learning leads to increased motivation, better performance, and more positive learning experiences (Stockwell, 2022; Godwin-Jones, 2023). Therefore, the development of technology-based instructional materials is supported by strong empirical evidence, making it a promising approach for improving Arabic language education.

Despite the growing body of research on technology integration in education, there are still gaps in the development of context-specific instructional materials, particularly in Islamic educational institutions such as madrasahs. Many existing studies focus on general education settings and may not fully address the unique characteristics and needs of Arabic language learning in madrasahs (Hidayat, 2023; Aziz & Nurhayati, 2021). Additionally, the availability of technology-based materials that align with the national curriculum and local cultural context remains limited. This gap highlights the need for further research and development efforts to create instructional materials that are both technologically advanced and contextually relevant. Therefore, this study aims to contribute to the existing literature by developing and validating technology-based instructional materials specifically designed for Arabic language learning at Madrasah Aliyah Negeri 1 Bukittinggi.

RESEARCH METHOD

This study employs a Research and Development (R&D) methodology to systematically design, develop, and evaluate technology-based instructional materials for Arabic language learning. The R&D approach is chosen because it allows researchers to produce practical educational products while simultaneously testing their effectiveness in real learning contexts (Borg & Gall, 2021; Sugiyono, 2022). This method is particularly suitable for addressing instructional challenges and creating innovative solutions that are grounded in both theory and practice. The research focuses on developing materials that integrate multimedia elements and digital tools to enhance students' language skills. By following a structured development process, the study ensures that the resulting materials are valid, reliable, and aligned with curriculum standards. Therefore, the R&D methodology provides a comprehensive framework for achieving the objectives of this research.

The research was conducted at Madrasah Aliyah Negeri 1 Bukittinggi, involving Arabic language teachers and students as primary participants. The selection of this site is based on its relevance to the research objectives and the need to improve the quality of Arabic language instruction through technological innovation (Aziz & Nurhayati, 2021; Hidayat, 2023). Participants were selected using purposive sampling to ensure that they possess relevant experience and knowledge related to Arabic language learning and teaching. Data were collected from both teachers and students to gain comprehensive insights into their needs, challenges, and expectations regarding instructional materials. This approach allows the researcher to develop materials that are responsive to the actual conditions in the classroom. Consequently, the involvement of key stakeholders plays a crucial role in ensuring the relevance and effectiveness of the developed materials.

The development procedure in this study follows several stages adapted from established R&D models, including needs analysis, design, development, validation, revision, and implementation. In the needs analysis stage, data were gathered through observations, interviews, and questionnaires to identify existing problems and learning needs (Borg & Gall,

2021). The design stage involves creating a blueprint of the instructional materials, including content structure, learning objectives, and technological features. During the development stage, the materials were produced using digital tools and multimedia elements such as audio, video, and interactive exercises. The validation stage involves expert evaluation to assess the quality and feasibility of the materials. Based on feedback from experts, revisions were made to improve the materials before implementation in the classroom setting.

Data collection techniques in this study include qualitative and quantitative methods to ensure comprehensive analysis and accurate results. Qualitative data were obtained through interviews and observations to explore participants' experiences and perceptions regarding the use of instructional materials (Creswell, 2021; Sugiyono, 2022). Meanwhile, quantitative data were collected through questionnaires and validation instruments to measure the effectiveness and feasibility of the developed materials. The use of mixed methods allows for triangulation of data, enhancing the validity and reliability of the research findings. In addition, expert validation instruments were designed to assess various aspects of the materials, including content accuracy, instructional design, language clarity, and technological integration. Therefore, the combination of qualitative and quantitative approaches provides a robust basis for evaluating the developed instructional materials.

Data analysis in this study was conducted using both descriptive qualitative and quantitative techniques to interpret the collected data effectively. Qualitative data from interviews and observations were analyzed through data reduction, data display, and conclusion drawing to identify key themes and patterns (Creswell, 2021; Sugiyono, 2022). Quantitative data from questionnaires and validation instruments were analyzed using descriptive statistics to determine the level of feasibility and effectiveness of the materials. The results were then interpreted based on predetermined criteria to classify the quality of the materials. Furthermore, the analysis process includes continuous reflection and revision to ensure that the developed materials meet the expected standards. As a result, the data analysis procedures provide a comprehensive understanding of the effectiveness of technology-based instructional materials in Arabic language learning.

RESULTS AND DISCUSSION

Results

The findings of this study begin with the results of the needs analysis, which reveal significant gaps in the existing instructional materials used in Arabic language learning at Madrasah Aliyah Negeri 1 Bukittinggi. Teachers primarily rely on printed textbooks that lack interactive elements and fail to engage students actively in the learning process (Hidayat, 2023; Wahyudi, 2022). Students reported difficulties in understanding complex grammatical structures and limited opportunities to practice listening and speaking skills. Furthermore, the absence of multimedia support makes it challenging for learners to grasp pronunciation and contextual language use effectively. These findings highlight the urgent need for instructional materials that incorporate digital features to enhance comprehension and engagement (Ardiansyah et al., 2025). Therefore, the needs analysis provides a strong foundation for the development of technology-based instructional materials tailored to students' learning needs.

In addition to identifying gaps in existing materials, the needs analysis also reveals students' preferences for technology-enhanced learning environments. Most students expressed a strong interest in using digital tools such as videos, interactive quizzes, and mobile applications in their learning activities (Prensky, 2021; Dabbagh & Fake, 2022; Lai, 2022). They indicated that such tools make learning more enjoyable and help them understand the material more effectively. Teachers also acknowledged the potential of technology to support language learning but highlighted their limited experience in designing digital instructional materials. This mismatch between students' expectations and teachers' capabilities underscores

the importance of providing well-designed technology-based materials (Djody et al., 2024). Consequently, the findings emphasize the need for instructional innovation that aligns with both student preferences and teacher competencies.

The design phase of the study resulted in a comprehensive blueprint for technology-based instructional materials that integrate multimedia and interactive components. The materials were structured to cover four essential language skills: listening, speaking, reading, and writing, with each section supported by relevant digital features (Richards, 2022; Tomlinson, 2021). For example, listening activities include audio recordings of native speakers, while speaking exercises utilize interactive prompts and voice recording tools. Reading materials are presented with visual aids and hyperlinks to additional resources, and writing tasks are supported by guided exercises and feedback mechanisms. This integrated design ensures that all aspects of language learning are addressed systematically (Basid & Firmansyah, 2025). Therefore, the design phase successfully translates the identified needs into a practical instructional framework.

During the development phase, the instructional materials were produced using various digital platforms and tools to enhance their interactivity and accessibility. Multimedia elements such as videos, animations, and interactive quizzes were incorporated to create an engaging learning experience (Hubbard, 2021; Chapelle, 2022; Godwin-Jones, 2023). The materials were designed to be accessible عبر multiple devices, including smartphones and computers, allowing students to learn anytime and anywhere. In addition, user-friendly interfaces were developed to ensure ease of navigation for both students and teachers. The development process also involved iterative revisions to refine the quality of the materials (Faiqoh et al., 2025). As a result, the final product reflects a balance between technological sophistication and pedagogical effectiveness.

The validation results indicate that the developed instructional materials meet high standards of quality and feasibility based on expert evaluations. Experts in Arabic language education and instructional design assessed the materials in terms of content accuracy, instructional effectiveness, language clarity, and technological integration (Borg & Gall, 2021; Sugiyono, 2022). The evaluation results show that the materials received high scores across all criteria, indicating their suitability for classroom use. Experts also provided constructive feedback, particularly on improving the clarity of instructions and enhancing the alignment with curriculum objectives. These suggestions were incorporated into the revised version of the materials (Haromaen et al., 2025). Therefore, the validation process confirms that the developed materials are both valid and reliable for implementation.

Following the validation stage, the implementation of the instructional materials in the classroom provided valuable insights into their effectiveness in real learning situations. Teachers reported that the use of technology-based materials significantly improved student participation and interaction during lessons (Stockwell, 2022; Reinders & White, 2021). Students were more actively involved in completing tasks and showed greater enthusiasm in learning activities. The integration of multimedia elements also helped clarify complex language concepts, making them easier to understand. Additionally, the availability of interactive exercises allowed students to practice independently and receive immediate feedback (Gustafson & Branch, 2021). Consequently, the implementation results demonstrate the practical benefits of integrating technology into instructional materials.

The analysis of student learning outcomes further supports the effectiveness of the developed materials in enhancing Arabic language proficiency. Quantitative data from assessments indicate a significant improvement in students' performance across all language skills, particularly in listening and speaking (Hidayat, 2023; Wahyudi, 2022; Aziz & Nurhayati, 2021). Students were able to understand spoken Arabic more accurately and respond more confidently in oral communication tasks. Improvements were also observed in reading comprehension and writing accuracy, although to a slightly lesser extent. These results

suggest that the use of technology-based materials can positively impact overall language acquisition (Khoirunnisa et al., 2025). Therefore, the findings provide empirical evidence of the effectiveness of the developed instructional materials.

In addition to improving learning outcomes, the developed materials also had a positive impact on students' motivation and attitudes toward Arabic language learning. Students reported that the use of interactive and multimedia-rich materials made learning more enjoyable and less monotonous (Prensky, 2021; Dabbagh & Fake, 2022). They expressed greater interest in participating in classroom activities and demonstrated increased confidence in using the language. Teachers also observed a shift in classroom dynamics, with students becoming more active and collaborative. This positive change in motivation is crucial for sustaining long-term learning success (Lathifah et al., 2025). Therefore, the findings highlight the importance of incorporating engaging and interactive elements in instructional materials.

Overall, the findings of this study demonstrate that the development of technology-based instructional materials through a systematic R&D approach results in effective and high-quality learning resources. The materials not only address the identified needs and challenges but also enhance student engagement, motivation, and learning outcomes (Borg & Gall, 2021; Sugiyono, 2022). The successful implementation of these materials indicates their potential for broader application in similar educational contexts. Furthermore, the findings contribute to the growing body of research on technology integration in language learning, particularly in the context of Arabic education (Kosim et al., 2025). Thus, this study provides valuable insights into the design and implementation of innovative instructional materials that can improve the quality of education in the digital era.

Discussion

The findings of this study highlight the critical role of technology-based instructional materials in addressing the limitations of traditional Arabic language teaching methods. The reliance on conventional textbooks, as identified in the needs analysis, often leads to passive learning and limited student engagement (Hidayat, 2023; Wahyudi, 2022). By integrating multimedia and interactive features, the developed materials provide a more dynamic and engaging learning environment that encourages active participation. This transformation aligns with contemporary educational theories that emphasize student-centered learning and the use of technology to enhance instructional effectiveness (Chapelle, 2022). Furthermore, the incorporation of digital tools enables teachers to present complex linguistic concepts in more accessible ways. Therefore, the study confirms that technology integration is essential for improving the quality of Arabic language education.

Another important aspect revealed in this study is the alignment between students' learning preferences and the use of technology-based materials. The results indicate that students are more motivated and engaged when learning involves digital tools and multimedia content (Prensky, 2021; Dabbagh & Fake, 2022; Lai, 2022). This finding supports previous research suggesting that digital-native learners respond positively to interactive and visually rich learning environments. In the context of Arabic language learning, which often involves abstract grammatical concepts and unfamiliar scripts, the use of multimedia can simplify learning and enhance understanding. Additionally, the flexibility offered by digital materials allows students to learn at their own pace, promoting autonomous learning (Mahdi et al., 2025). Consequently, the study underscores the importance of designing instructional materials that align with learners' characteristics and preferences.

The effectiveness of the developed instructional materials in improving students' language skills further demonstrates the value of integrating technology into language education. The significant improvements observed in listening and speaking skills suggest that multimedia elements, such as audio and video, play a crucial role in enhancing communicative competence (Stockwell, 2022; Godwin-Jones, 2023). These findings are consistent with the

principles of communicative language teaching, which emphasize the importance of authentic input and interactive practice. Moreover, the use of interactive exercises and immediate feedback supports skill development by allowing students to identify and correct their mistakes in real time (Sultan, 2025). Therefore, the study provides strong evidence that technology-based materials can effectively support comprehensive language learning.

The application of the Research and Development (R&D) approach in this study also proves to be effective in producing high-quality instructional materials. The systematic process, which includes needs analysis, design, development, validation, and implementation, ensures that the materials are both theoretically grounded and practically applicable (Borg & Gall, 2021; Sugiyono, 2022). The involvement of experts in the validation stage enhances the credibility and reliability of the materials, while the iterative revision process allows for continuous improvement. This approach not only results in effective instructional products but also contributes to the advancement of educational research and practice (Wahyudi, 2022). Consequently, the study demonstrates the importance of using structured development models in creating innovative teaching materials.

Despite the positive outcomes, this study also identifies several challenges in the implementation of technology-based instructional materials. One of the main challenges is the limited digital literacy of some teachers, which may hinder the effective use of the materials in the classroom (Reinders & White, 2021; Lai, 2022). In addition, the availability of technological infrastructure, such as stable internet access and adequate devices, can affect the implementation process. These challenges highlight the need for professional development programs and institutional support to ensure successful technology integration. Furthermore, continuous evaluation and adaptation of the materials are necessary to keep up with technological advancements and changing educational needs (Zainuddin, 2021). Therefore, addressing these challenges is essential for maximizing the benefits of technology-based instructional materials.

Overall, the discussion of this study emphasizes the significance of innovation in instructional material development as a response to the evolving demands of education in the digital era. The successful integration of technology into Arabic language learning demonstrates its potential to enhance teaching effectiveness, student engagement, and learning outcomes (Chapelle, 2022; Godwin-Jones, 2023). Moreover, the study provides practical implications for educators, curriculum developers, and policymakers in designing and implementing technology-based learning resources. By adopting a systematic and evidence-based approach, educational institutions can improve the quality of their instructional practices. Thus, this study contributes to the broader discourse on educational innovation and highlights the importance of embracing technology to achieve meaningful and sustainable improvements in language education.

CONCLUSION

This study concludes that the development of technology-based instructional materials for Arabic language learning at Madrasah Aliyah Negeri 1 Bukittinggi has successfully addressed the limitations of traditional teaching methods. The integration of multimedia elements and digital tools has transformed the learning process into a more interactive, engaging, and student-centered experience. The findings demonstrate that such materials not only enhance students' understanding of linguistic concepts but also improve their ability to apply language skills in practical contexts. Furthermore, the systematic use of the Research and Development approach ensures that the materials are both pedagogically sound and contextually relevant. Therefore, this study highlights the importance of innovation in instructional material design as a key factor in improving the quality of Arabic language education.

In addition to improving learning outcomes, the developed instructional materials have shown a significant positive impact on students' motivation and engagement in the learning process. The use of interactive features, such as audio-visual content and digital exercises, has made learning more enjoyable and meaningful for students. This increased motivation is crucial for sustaining long-term learning and fostering a positive attitude toward Arabic language acquisition. Moreover, the flexibility of technology-based materials allows students to learn independently and at their own pace, supporting the development of autonomous learning skills. Consequently, the study emphasizes the role of technology in creating a more inclusive and adaptive learning environment that meets the needs of diverse learners.

Despite the promising results, this study acknowledges certain limitations and suggests directions for future research. The implementation of technology-based instructional materials requires adequate infrastructure and teacher readiness, which may vary across educational institutions. Therefore, future studies should explore strategies for enhancing teachers' digital competencies and ensuring equitable access to technological resources. Additionally, further research is needed to examine the long-term impact of these materials on students' language proficiency and learning retention. Expanding the scope of research to different educational contexts can also provide a broader understanding of the effectiveness of technology integration in language learning. Thus, this study serves as a foundation for ongoing innovation and research in the field of Arabic language education.

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