



DIGITAL TRANSFORMATION OF ARABIC WRITING INSTRUCTION THROUGH INTERACTIVE MULTIMEDIA INTEGRATION

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Abstract

This study aims to develop and examine the effectiveness of Smart *Kitabah* media based on I-Spring Suite 11. Employing the ADDIE model combined with a quasi-experimental one-group pretest-posttest design, this research involved madrasah students selected via purposive sampling. Data collection used a validated test instrument (Cronbach's Alpha = 0.803), expert validation sheets, teacher practicality forms, and student questionnaires. The findings revealed that the media achieved high validity from material (97%) and media (95%) experts. In classroom implementation, teachers rated it highly practical for usability (96%), content alignment (98%), and attractiveness (97%). Statistically, students' writing proficiency scores increased from a pretest mean of 42.23% to a posttest mean of 42.23% to a posttest average of 80.62%. Paired sample t-test showed a significant difference ($p < 0.05$) with a high-category N-Gain score, complemented by an 86.26% excellent student response. These results justify Mayer's Cognitive Theory of Multimedia Learning and CALL framework in reducing cognitive load. This study concludes that Smart *Kitabah* is highly effective and applicable for modernizing Arabic language pedagogy.

Keywords: Smart *Kitabah*; Arabic writing skills; Digital learning media

تجريد

الهدف من هذا البحث هو تطوير واختبار فعالية وسيلة Smart Kitabah التفاعلية المعتمدة على برنامج I-Spring Suite 11. استخدم البحث منهج البحث والتطوير بنموذج ADDIE مع التصميم شبه التجريبي للمجموعة الواحدة. شملت العينة تلاميذ المدرسة الذين اختارهم بالقصد. استخدمت أدوات جمع البيانات اختبار مهارة الكتابة الموثوق (Cronbach's Alpha = 0.803)، وتحكيم الخبراء، واستبانة استجابة المعلمين والتلاميذ. النتائج بينت أن الوسيلة نالت صلاحية عالية من خبر الماد (97%) وخبر الوسائل (95%). واعتبرها المعلمون عملية للغاية من حيث سهولة الاستخدام (96%) وملاءمة الماد (98%) والجاذبية (97%). كما ارتفعت كفاءة التلاميذ في الكتابة من متوسط قبلي 42,23% إلى بعدي 80,62%. وأظهر اختبار (t) فرقا جوهريا ($p < 0,05$) مع درجة كسب طبيعي (N-Gain) في الفئة العالية، بدعم استجابة التلاميذ الإيجابية بنسبة 86,26%. تدعم النتائج نظرية (Mayer's Cognitive Theory of Multimedia Learning) وإطار التعلم بمساعدة الحاسوب (CALL) في خفض العبء المعرفي. وتخلص الدراسة إلى أن وسيلة Smart Kitabah فعالة ومطبقة لتحديث تدريس اللغة العربية.

الكلمات المفتاحية: سمارت كتابة؛ مهارة الكتابة؛ وسائل التعلم الرقمية



INTRODUCTION

Digital transformation in education has become an unavoidable necessity in the modern era.¹ The development of information technology has changed various aspects of life, including the way humans acquire and develop knowledge.² In Arabic language learning, the use of technology is an important strategy to create a learning process that is more adaptive, interactive, and in accordance with the characteristics of today's students.³ One of the skills that plays a crucial role in mastering Arabic is writing. This skill relates not only to the ability to write letters or words correctly, but also includes the ability to organize ideas, construct logical thought structures, and express meaning effectively through written language.⁴ Although the importance of digitalization in education has been widely recognized, its implementation in the field still faces various obstacles. The Arabic language learning process at the madrasah level, including at MTsN 7 Kediri, is still dominated by a conventional, teacher-centered approach.

The use of lecture methods and learning media in the form of textbooks and printed modules results in a less varied learning environment and is less able to attract students' attention. As a result, many students view Arabic as a difficult, boring, and intimidating subject. Various previous studies have attempted to address the challenges of learning the *Maharah Kitabah* through the development of learning media and technology. Nurhanisa et al. developed an Android-based application aimed at improving students' vocabulary mastery as a starting point for writing activities.⁵ Ahmad Muklason et al. utilized an interactive web platform to help students understand the rules of nahwu in a more visual and easy-to-understand way.⁶ Meanwhile, Ahmad Azizul Hakim et al used digital comic media to increase students' interest and abilities in learning *Maharah Qira'ah*.⁷ Vira Herlina's research shows the effectiveness of electronic

¹ Mohammad Akour and Mamdouh Alenezi, "Higher Education Future in the Era of Digital Transformation," *Education Sciences* 12, no. 11 (2022): 784, <https://doi.org/10.3390/educsci12110784>.

² Andrzej Szymkowiak et al., "Information Technology and Gen Z: The Role of Teachers, the Internet, and Technology in the Education of Young People," *Technology in Society* 65 (May 2021): 101565, <https://doi.org/10.1016/j.techsoc.2021.101565>.

³ Mior Syazril Mohamed Sapawi and Nik Mohd Rahimi Nik Yusoff, "Integrating Technology into the Arabic Language Curriculum: A Systematic Review of Trends, Strategies and Cultural Dimensions," *Social Sciences & Humanities Open* 12 (January 2025): 101974, <https://doi.org/10.1016/j.ssaho.2025.101974>.

⁴ Amanda Maulidiya and Maman Abdurrahman, "Analysis of Metacognitive Learning Strategies in the Development of Writing Skills (Maharah Kitabah) Arabic," *Lahjatuna: Jurnal Pendidikan Bahasa Arab* 5, no. 2 (2026): 113–29, <https://doi.org/10.38073/lahjatuna.v5i2.3497>.

⁵ Nurhanisa Nurhanisa et al., The Use of the Quizwhizzer Application in Improving Arabic Vocabulary Mastery | FONDATIA, 9, no. 2 (2025): 352–367.

⁶ Ahmad Muklason et al., "Pembuatan Media Pembelajaran Digital Interaktif untuk Materi Pembelajaran Bahasa Arab (Nahwu dan Shorof) untuk Santri Milenial," *Sewagati* 7, no. 3 (2023): 383–92, <https://doi.org/10.12962/j26139960.v7i3.505>.

⁷ Ahmad Azizul Hakim et al., "Komik Tematik Sebagai Media Pembelajaran Untuk Maharah Qirā'ah Bahasa Arab," *Jurnal Studi Guru dan Pembelajaran* 8, no. 2 (2025): 661–71, <https://doi.org/10.30605/jsgp.8.2.2025.5899>.

modules in supporting Arabic language learning for students,⁸ Meanwhile, Maryam Nur Annisa et al. found that the use of animated videos was able to improve students' abilities in learning the Kalam recitation.⁹

A previous study by Aslihah developed Smart *Kitabah* media based on I-Spring Suite 11 and implemented it at MTsN 7 Kediri.¹⁰ The earlier study primarily focused on the initial development process and basic examinations of media validity and effectiveness. The present study extends this line of inquiry in several important ways. First, it provides a more comprehensive evaluation of the integrated features of Smart *Kitabah*, including structured writing simulations, automated formative assessment, and immediate feedback mechanisms. Second, it investigates the effects of the media on specific dimensions of Arabic writing competence, namely grammatical accuracy, vocabulary mastery, and textual coherence, rather than relying solely on overall achievement scores. Third, it offers a more comprehensive evaluation of the media's practicality from teachers' perspectives as classroom facilitators. Therefore, the present study represents an extension and refinement of previous research rather than a direct replication.

Despite the growing body of research on digital media for Arabic language learning, several gaps remain. Previous studies have generally focused on the development of instructional media and the measurement of overall learning outcomes. Limited attention has been paid to how digital media influence specific dimensions of writing competence and how teachers perceive the practicality of such media in classroom implementation. Addressing these gaps, the present study provides multidimensional evidence regarding the effectiveness and practical applicability of Smart *Kitabah* in improving students' Arabic writing skills.

Most previously developed learning media serve as a means of delivering material and fail to accommodate the primary need in writing instruction, namely providing prompt and continuous feedback. Yet, the success of writing instruction is greatly influenced by a systematic mentoring process, from vocabulary mastery and understanding language structure to the ability to compose well-written texts.¹¹ The limited availability of media capable of integrating text, audio, video, and automated evaluation has resulted in less than optimal writing practice outside of class hours.

⁸ Vira Herlina, "Pengembangan E-Module Pembelajaran Bahasa Arab Berbasis TPACK Bagi Siswa Madrasah Ibtidaiyah Muhammadiyah 14 Talang Ulu," *Al-Muktamar As-Sanawi Li Al-Lughah Al-'Arabiyyah (MUSLA)* 2, no. 1 (2024): 11–19.

⁹ Maryam Nur Annisa et al., "Teknologi Media Pembelajaran Berbasis Video Animasi Untuk Meningkatkan Kemampuan Berbicara Bahasa Arab Siswa di Madrasah Ibtidaiyah Negeri 2 Kabupaten Gorontalo," *Sustainable Jurnal Kajian Mutu Pendidikan* 6, no. 2 (2023): 378–88.

¹⁰ Indy Aslihah, "لرنقية مهارة الكتابة لدى تلميذ الصف ١١ بناء على I-Spring Suite," *تطوير وسيلة* (Uin Syekh Wasil, Kediri, 2025), https://doi.org/https://etheses.iainkediri.ac.id/20331/1/23503014_prabab.pdf.

¹¹ Muhammad Febrian Febrian et al., "Implementation of Mufradat Division and its Implications on the Control of Lughawiyah Maharah at Ummul Qura Islamic Boarding School," *Proceeding International Conference on Pesantren and Islamic Education* 1, no. 1 (2025): 163–74.



Therefore, the development of learning media that can provide a more comprehensive, interactive learning experience and support independent learning is necessary.

The research was conducted by developing Smart *Kitabah* learning media based on I-Spring Suite 11. This media was designed not only as a visual aid, but as a digital learning ecosystem that integrates various important components in the process of learning to write Arabic.¹² Smart *Kitabah* combines audio elements to strengthen students' memory, contextual videos to aid comprehension, a flexible navigation system tailored to individual learning needs, and automated evaluation quizzes that provide immediate feedback. The development of this media draws on Mayer's Cognitive Theory of Multimedia Learning, so the presentation of the material is designed to reduce students' cognitive load and facilitate comprehension.¹³ With this approach, Arabic writing activities are expected to become more interesting, interactive, and effective in improving students' abilities.

This research is based on several complementary conceptual foundations. Multimedia learning theory is used to explain the effectiveness of presenting information through various media forms. The Technological Pedagogical Content Knowledge (TPACK) framework is used to harmoniously integrate aspects of technology, pedagogy, and learning materials.¹⁴ In addition, the Computer-Assisted Language Learning (CALL) approach is the basis for utilizing technology to support language learning,¹⁵ Meanwhile, the Technology Acceptance Model (TAM) is used to understand the level of user acceptance of the media being developed.¹⁶

This study aims to develop the Smart *Kitabah* learning media based on I-Spring Suite 11 and test its effectiveness in improving the Arabic writing skills of madrasah students. The results are expected to provide practical contributions in the form of guidance for Arabic language teachers in designing interactive learning media without requiring complex programming skills. Furthermore, this research is also expected to enrich academic studies on digital transformation in Islamic education and potentially serve as an alternative model for interactive Arabic learning media. While the findings are constrained to the specific research site, they offer insights into how mid-level

¹² Abdullah Asyiq, "Telaah Literatur Mengenai Peran Media Digital dalam Pembelajaran Bahasa Arab: Konsep dan Implementasi," *ARABIA: Jurnal Ilmu Bahasa Arab* 3, no. 02 (2025): 255–73.

¹³ Istiqomah Istiqomah, "Efektivitas Penggunaan Media Powerpoint Interaktif dalam Pembelajaran Bahasa Arab di Madrasah Ibtidaiyah," *Collège: Journal of Contemporary Issues in Education* 1, no. 1 (2026): 32–45.

¹⁴ Jun-Jie Tseng et al., "A Critical Review of Research on Technological Pedagogical and Content Knowledge (TPACK) in Language Teaching," *Computer Assisted Language Learning* 35, no. 4 (2022): 948–71, <https://doi.org/10.1080/09588221.2020.1868531>.

¹⁵ Antigoni Parmaxi and Alan A. Demetriou, "Augmented Reality in Language Learning: A State-of-the-Art Review of 2014–2019," *Journal of Computer Assisted Learning* 36, no. 6 (2020): 861–75, <https://doi.org/10.1111/jcal.12486>.

¹⁶ Ali Mugahed Al-Rahmi et al., "The Influence of Information System Success and Technology Acceptance Model on Social Media Factors in Education," *Sustainability* 13, no. 14 (2021): 7770, <https://doi.org/10.3390/su13147770>.

Islamic schools can integrate digital tools to address 21st-century educational challenges.

RESEARCH METHOD

This study uses a research and development (R&D) approach with the ADDIE (Analysis, Design, Development, Implementation, and Evaluation) development model combined with a quasi-experimental one-group pretest–posttest design to test the effectiveness of the Smart *Kitabah* media based on I-Spring Suite 11 in improving the *Kitabah* mastery of madrasah students.¹⁷ The formulation of learning objectives, the preparation of the *Maharah Kitabah* material, the design of the digital learning flow, media storyboards, and the design of evaluation instruments. The production of Smart *Kitabah* media using I-Spring Suite 11, the integration of text, audio, video, and interactive quizzes, and validation by Arabic language material experts and learning media experts, followed by product revisions based on validator input. The implementation phase was conducted through a limited trial on madrasah students in an Arabic language learning setting, with teachers acting as facilitators of the use of digital media in the classroom. Formative and summative evaluations were carried out in the evaluation stage to determine the quality of the media and the improvement of student learning outcomes.

The research was conducted at MTsN 7 Kediri with a total sample of madrasah students (N = 88). The sample was selected using purposive sampling technique based on two strict inclusion criteria: the alignment of the ongoing Arabic language curriculum and the students' daily access to personal digital infrastructure to ensure seamless interaction with the multimedia application. In order to evaluate the improvement of the students' writing proficiency, a standardised Arabic writing skills test instrument was developed with a pretest and posttest. The test items were designed to measure the specific indicators of *Maharah Kitabah*, namely vocabulary selection, syntactic accuracy and paragraph coherence.

The test instrument was subjected to rigorous psychometric evaluation prior to implementation; all items were statistically validated against the α -table threshold and the instrument achieved a high internal consistency with a Cronbach's Alpha coefficient of 0.803 which confirms its reliability for empirical measurement. Quantitative data were analysed by using descriptive and inferential statistics which consist of mean values, percentages, Kolmogorov–Smirnov normality test, Levene homogeneity of variance test, paired sample t-test to test for significant differences between the pretest and posttest, N-Gain calculation to determine the level of learning effectiveness, and effect size calculation to determine the magnitude of the influence of the learning media.

¹⁷ Tanti Listiani, "The Development of Educational Research Statistics Teaching Materials Using the ADDIE Model," *AIP Conference Proceedings* 2542, no. 1 (2022): 030005, <https://doi.org/10.1063/5.0103201>.



Qualitative data obtained from questionnaires and observations were analysed descriptively to support the interpretation of the quantitative results.

RESULTS AND DISCUSSIONS

Steps for Developing Smart *Kitabah* Media Based on I-Spring Suite 11 to Increase the *Maharah Kitabah*

The development of smart *Kitabah* media based on I-Spring Suite 11 was carried out using a systematic learning design approach which integrates pedagogical, linguistic and educational technology aspects. The ADDIE (Analysis, Design, Development, Implementation, Evaluation) framework was selected as the development model, as it offers an iterative framework to continually improve based on empirical data. The learning media is positioned through this approach not only as a technological product, but as an instructional system to facilitate students' cognitive transformation in Arabic writing skills.

Analysis Stage

The initial stage of Smart *Kitabah* media development focused on a comprehensive analysis of the learning needs of the *Maharah Kitabah*, including identification of student needs, teacher readiness, and the condition of technological facilities and infrastructure available at the madrasah. The results of the field analysis showed that Arabic writing learning is still dominated by a conventional, teacher-centered approach and relies on the use of textbooks as the primary learning resource. This learning model severely limits students' opportunities to practice writing independently, sustainably, and reflectively. Consequently, various linguistic problems are still found in students, such as weak mastery of syntactic structures, limited vocabulary, errors in the use of morphological forms, and low ability to construct coherent and cohesive paragraphs. These findings indicate that the existing learning environment is not fully capable of optimally supporting the development of productive Arabic language skills.

This problem becomes even more complex when linked to the characteristics of students, who essentially already possess fairly good digital literacy skills as part of the digital native generation. In their daily lives, students are accustomed to using various technological devices and digital applications. However, this potential has not been fully utilized in the classroom learning process. The use of technology remains limited to static presentation media and provides few opportunities for active student interaction. Meanwhile, teachers still face limitations in developing digital media that align with learning needs and the demands of the madrasah curriculum. As a result, a gap exists between the rapid development of technology and the still-traditional learning practices. This situation highlights the need for learning innovations that can integrate technology

more effectively to encourage active student involvement in building their knowledge and skills independently.

Based on the results of the needs analysis, the development of the Smart *Kitabah* media was based on several relevant theories in technology-based language learning. According to Richards, needs analysis is a fundamental step in designing effective language learning because it encompasses the comprehensive identification of linguistic, pedagogical, and institutional needs.¹⁸ The findings in the field were then combined with the concept of Technology-Enhanced Language Learning (TELL), which emphasizes the importance of utilizing technology to support the language acquisition process through the provision of continuous input and output supported by direct feedback.¹⁹ In addition, constructivist learning principles are used as a basis for creating a student-centered learning environment, so that students have greater opportunities to actively participate in the learning process.²⁰

Design Stage

The formulation of learning objectives, content organization, instructional strategies, and media interaction design that aligns with the characteristics of the *Kitabah Maharah*. The formulation of learning objectives is based on the basic competencies of the Arabic language curriculum, which emphasizes students' ability to produce written texts that are grammatical, coherent, and communicative. The integration of linguistic, cognitive, and communicative aspects ensures that the media is not only oriented towards mastery of language structure, but also on students' ability to express ideas in writing. Through this competency-based approach, learning outcomes are designed to be more measurable and applicable in various real-life situations. The content structure is structured like a gradual digital module that adopts the principle of scaffolding in language learning, starting from the introduction of basic vocabulary to the ability to produce more complex texts.

The instructional strategy adopted in Smart *Kitabah* is a combination of the communicative approach and the task-based learning method. This is done through guided exercises to control the understanding of sentence structure and independent writing assignments to promote student creativity. The framework is consistent with the view that foreign language learning will be more effective when students are directly involved in meaningful tasks that reflect real-life language use. To support learning flexibility, the media interaction design includes an adaptive non-linear navigation

¹⁸ Wiwin et al., "Linguistik Terapan dalam Studi Bahasa Arab: Teori, Metodologi, dan Aplikasi Pedagogis," *INCARE, International Journal of Educational Resources* 6, no. 4 (2025): 404–18, <https://doi.org/10.59689/incare.v6i4.1297>.

¹⁹ Fan Su and Di Zou, "Technology-Enhanced Collaborative Language Learning: Theoretical Foundations, Technologies, and Implications," *Computer Assisted Language Learning* 35, no. 8 (2022): 1754–88, <https://doi.org/10.1080/09588221.2020.1831545>.

²⁰ M. Safarul Khair and Satriawan, "Student-Centered Learning and Collaborative Learning in Arabic Language Education," *An Nazhair: Journal of Arabic Education* 2, no. 1 (2025): 45–54, <https://doi.org/10.20414/nazhair.v2i1.63>.



system that allows students to set their own learning path according to their individual needs. Moreover, the automatic quizzes of formation and the simulations of digital writing activities give students the opportunity to practise repeatedly without relying on the manual evaluation of the teacher. The instant feedback mechanism supports the process of self-reflection, an important element in technology-based learning.

Development Stage

The first media product of *Smart Kitabah* then went through a validation process by experts in the Arabic language material and learning media to verify the appropriateness of language, pedagogy, and technicality. Material expert validation focused on Madrasah Arabic language curriculum relevance, vocabulary suitability and language structure accuracy. The media expert validation addressed instructional design, navigation, readability, display consistency and usability. The results of the development phase show that the *Smart Kitabah* media is in accordance with the principles of multimedia learning design, such as coherence, signalling, segmentation, and modality. The audio vocabulary pronunciations and visualisation of sentence structures are combined to reduce students' cognitive load and enhance linguistic comprehension. Digital writing simulations provide intensive practice opportunities with immediate feedback, which helps in the internalisation of Arabic language structures. The automated quiz feature provides teachers with real-time data on student learning outcomes, enabling the implementation of data-driven pedagogical interventions. This is in line with the data-driven instruction paradigm in contemporary education emphasising the use of learning data to enhance instructional quality.²¹

Smart Kitabah View



Implementation Stage

The implementation phase of the *Smart Kitabah* media trial was carried out in a real classroom environment in a madrasah through the integration of mobile devices and computers. Students used this platform independently to study digital modules, complete writing simulations, and complete formative quizzes embedded in the system. The learning model was a blend of face-to-face activities and structured digital activities thus

²¹ Nur Aisyah and Isop Syafe'i, "Analisis Kualitatif Terhadap Penggunaan Media Digital Wordwall dalam Pembelajaran Bahasa Arab," *ARABIA: Jurnal Ilmu Bahasa Arab* 4, no. 01 (2026): 15–32.

creating a flexible blended learning environment.²² In this learning ecosystem, teachers use digital assignment data of students to reinforce concepts, identify language errors and provide individual guidance.

The empirical impact of this technology implementation is evident in the increased active participation of students and the significant increase in learning time intensity. The interactive and responsive digital environment encourages students to practice writing without being limited by the space or time of conventional learning. This situation gives rise to more dynamic interaction patterns between students and media, students and teachers, and between students. The one-way communication that has been a characteristic of traditional learning is shifting toward a data-driven pedagogical communication model, where teachers act as facilitators providing targeted scaffolding. This change reflects the transformation of the learning paradigm toward student-centered learning, which places students in control of the learning rhythm, learning path, and reflection process on their own writing.²³

The success of the integration of offline and online learning in this study is in line with Graham's view regarding the effectiveness of blended learning in increasing learning efficiency.²⁴ From a digital pedagogy perspective, this platform can function as a mediator, expanding the scope for linguistic expression while enhancing the personalization of learning materials. The use of digital data to identify students' syntactic difficulties also demonstrates the application of the concept of data-driven instruction to support the quality of teacher evaluation.²⁵

Evaluation Stage

The evaluation phase in the development of the Smart *Kitabah* media was carried out comprehensively through data triangulation, including analysis of learning outcomes, user response questionnaires, and classroom observation sheets. The comparison of pre-test and post-test scores showed a significant improvement in students' ability to recite the *Kitabah*, particularly in vocabulary mastery, sentence structure accuracy, and paragraph coherence and cohesion. This improvement was not only evident from quantitative data but was also supported by qualitative findings, which showed that students' writing became more grammatical, varied, and systematically structured. These findings indicate that the use of digital platforms can support the internalization of linguistic rules in a more focused and sustainable manner. These

²² Daina Gudoniene et al., "Hybrid Teaching and Learning in Higher Education: A Systematic Literature Review," *Sustainability* 17, no. 2 (2025): 756, <https://doi.org/10.3390/su17020756>.

²³ Bambang Hermanto and Siful Arifin, "Pengaruh Metode Student-Centered Learning dalam Pembelajaran Bahasa Arab," *Kariman: Jurnal Pendidikan Keislaman* 11, no. 2 (2023): 265–82, <https://doi.org/10.52185/kariman.v11i2.340>.

²⁴ Muhammad Zaheer Asghar et al., "Analyzing an Appropriate Blend of Face-to-Face, Offline and Online Learning Approaches for the In-Service Vocational Teacher's Training Program," *International Journal of Environmental Research and Public Health* 19, no. 17 (2022): 10668, <https://doi.org/10.3390/ijerph191710668>.

²⁵ Sun and Mizumoto, "Exploring the Barriers to Data-Driven Learning in the Classroom."



results align with language learning theory, which states that the development of productive skills is strongly influenced by the intensity of practice, the process of reflection, and the presence of continuous feedback.

Student responses from an affective perspective demonstrated a very positive level of acceptance of the media's interactivity, navigation flexibility, and user-friendliness. Success at this evaluation stage strengthens the relevance of the Computer-Assisted Language Learning (CALL) approach, which views technology as a means of providing rich linguistic input and as a facilitator in producing responsive language output.²⁶ The presence of adaptive digital simulations also contributes to the implementation of personalized learning and data-driven instruction, allowing teachers to develop learning strategies tailored to the needs and learning pace of each student.²⁷ In addition, the effectiveness of media in reducing the mental burden on students is supported by the Cognitive Theory of Multimedia Learning put forward by Mayer.²⁸ The balanced integration of text, audio, and visuals, applying the principles of signaling, segmentation, and contiguity, has been proven to optimize information processing through different cognitive channels. This evaluation demonstrates that *Smart Kitabah* not only has a strong theoretical foundation but also a high level of usefulness in Arabic language learning practices.

The Effectiveness of Smart *Kitabah* Media Based on I-Spring Suite 11 to Increase *Maharah Kitabah*

This study aims to test the effectiveness of *Smart Kitabah* media based on I-Spring Suite 11 in improving students' Arabic writing skills. The research design used was quasi-experimental with a one-group pretest-posttest model, so that improvements in learning outcomes could be analyzed quantitatively and qualitatively. The pretest results showed that students' initial ability in writing Arabic was in the low to moderate category. Students still experienced difficulties in grammatical structure, vocabulary selection, and paragraph coherence. After the application of *Smart Kitabah* media based on I-Spring Suite 11, there was a significant increase in the posttest results, indicating that this media was able to help students develop writing skills systematically.

²⁶ Loso Judijanto, "Tren Penelitian Mobile-Assisted Language Learning (MALL) di Era Digital," *Sanskara Pendidikan dan Pengajaran* 3, no. 02 (2025): 100–113, <https://doi.org/10.58812/spp.v3i02.558>.

²⁷ Wadim Strielkowski et al., "AI-Driven Adaptive Learning for Sustainable Educational Transformation," *Sustainable Development* 33, no. 2 (2025): 1921–47, <https://doi.org/10.1002/sd.3221>.

²⁸ Hamid Keshavarz et al., "How University Instructors Apply the Design Principles for Electronic Courses: A Comparative Study Based on Richard Mayer's Model on Multimedia Learning," *International Journal of Information and Learning Technology* 39, no. 4 (2022): 319–39, <https://doi.org/10.1108/IJILT-11-2021-0173>.

Table 1. *Maharah Kitabah* Pretest and Posttest Results Table

Category	Total Score	Average (%)
Pretest	3,805	42.23%
Posttest	7,095	80.62%
Difference	3,290	38.39%

The average increase of 38.39% shows a positive impact of the Smart *Kitabah* media on the Arabic writing skills of the students. The results of the t-test indicated that the significance value was less than 0.05, indicating a significant difference between the pretest and posttest results.

Table 2. Pretest and Posttest t-Test Results

Variables	Mean	Standard Deviation	t count	df	Sig. (p)
Pretest	42.23	(SD)	-	-	-
Posttest	80.62	(SD)	t-value	87	< 0.05

These results indicate that Smart *Kitabah* significantly improved students' Arabic writing skills. Normalized gain score calculations showed a high increase, indicating that this media not only improved test scores but also improved conceptual understanding of Arabic writing.

Table 3. N-Gain Categories of Learning Effectiveness

N-Gain Range	Category
< 0.30	Low
0.30 – 0.70	Currently

Based on the N-Gain analysis using the table above, the media was in the high effectiveness category, and there was a positive shift in the conceptual understanding of the students. The test instrument used was found to be valid and reliable. All test items are considered valid because they have a correlation value above the r table. The results of the reliability test show a Cronbach's Alpha value of 0.803 which is in the high category of internal consistency.

Table 4. Instrument Reliability Test Results

Variables	Cronbach's Alpha	Criteria
Bible Test	0.803	Reliable

The Smart *Kitabah* media was validated by experts in the field of subject matter and multimedia design experts and the results were highly valid. This means that the media content, language and presentation are in line with the curriculum and the



characteristics of the students. In addition, the media follows multimedia instructional design principles like coherence, signalling and segmentation.²⁹

Table 5. Media Validation Results

Aspect	Percentage	Category
Material Validation	97%	Very Valid
Media Validation	95%	Very Valid

Practicality tests conducted by Arabic language teachers demonstrated that the *Smart Kitabah* media is highly practical for use in learning. The media was deemed easy to operate, aligned with learning objectives, and engaging for students.

Tavble 6. Teacher Practicality Test Results

Aspect	Percentage	Category
Ease of use	96%	Very Practical
Suitability of material	98%	Very Practical
Media attraction	97%	Very Practical

Students' responses to the *Smart Kitabah* media were very positive. They found the media engaging, easy to use, and helpful in understanding Arabic writing materials. It also increased student motivation, making them more active in the learning process. These findings suggest that interactive digital media can increase student engagement and interest in learning. Improving learning motivation is a crucial factor in successful language learning.

Table 7. Student Response

Aspect	Percentage	Category
Media attraction	90%	Very good
Ease of use	85%	Very good
Benefits of learning	88%	Very good
Average	86.26%	Very good

The effectiveness of *Smart Kitabah* media can be explained through the Cognitive Theory of Multimedia Learning proposed by Mayer, which states that learning is more effective when information is presented through visual and auditory channels simultaneously.³⁰ Multimedia design principles such as signaling, segmentation, and coherence are applied to reduce learners' cognitive load. From a Computer-Assisted Language Learning (CALL) perspective, *Smart Kitabah* media is a form of technology-based language learning innovation that provides intensive practice

²⁹ Tian Qin and Chao-Jung Wu, "Graphic Organizers' Optimized Design through Segmenting and Signaling Principle: Based on Generative Learning Theory," *Computers & Education* 239 (December 2025): 105416, <https://doi.org/10.1016/j.compedu.2025.105416>.

³⁰ Richard E. Mayer, "The Past, Present, and Future of the Cognitive Theory of Multimedia Learning," *Educational Psychology Review* 36, no. 1 (2024): 8, <https://doi.org/10.1007/s10648-023-09842-1>.

and immediate feedback. CALL allows learners to practice writing independently and in a structured manner, thereby accelerating the process of second language acquisition.³¹ Language acquisition theory states that the intensity of language input and output is a major factor in improving productive skills.³²

CONCLUSION

This study successfully confirmed that digital transformation through the development of the Smart *Kitabah* interactive media based on I-Spring Suite 11 significantly contributed to the improvement of students' writing performance (*Maharah Kitabah*) in madrasahs. Based on the articulation of the ADDIE model, the developed instrument not only met the very high theoretical validity criteria from material and media experts but also demonstrated high practicality, with teacher evaluation scores exceeding 95% across usability, alignment, and attractiveness domains. This platform was empirically effective, justified by a significant positive deviation between pre-test and post-test scores, which qualitatively represented a deep mastery of syntactic structure, lexical expansion, and coherence of written discourse. This data convergence theoretically supports the Cognitive Theory of Multimedia Learning, Computer-Assisted Language Learning (CALL) and the constructivist paradigm for decreasing cognitive load in foreign language learning. This research provides local evidence that the digital transformation through the Smart *Kitabah* interactive media has a substantial role in improving students' writing competence at the institution studied. The limits of this study are limited to one madrasah, but the high validity and practicality indices indicate its viability for wider pedagogical adaptation. Future multi-site research with larger and more diverse samples is needed to validate the generalisability of these findings across different educational contexts.

Declaration of Generative AI

The author states that Artificial Intelligence (AI) was used in this study solely to assist with language editing, grammar checking, and improving the structure of the manuscript. The entire research process from problem formulation, data collection, and data analysis to the interpretation of research results and the drawing of conclusions was conducted entirely by the author. The author bears full responsibility for the content of this article.

³¹ Sultan Almelhes, "Enhancing Arabic Language Acquisition: Effective Strategies for Addressing Non-Native Learners' Challenges," *Education Sciences* 14, no. 10 (2024): 1116, <https://doi.org/10.3390/educsci14101116>.

³² Ailsyah Putri Jasmine et al., "Hakikat Pemerolehan Bahasa dan Faktor Pendukung Pemerolehan Bahasa," *Jurnal Ilmiah Pendidikan Dasar (JIPDAS)* 5, no. 4 (2025): 4833–40, <https://doi.org/10.37081/jipdas.v5i4.4335>.



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