

Integrating Digital Technology in Beginner Nahwu Instruction: Development of FlipHTML5-Based Electronic Teaching Materials Based on Multimedia Learning Theory

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Abstract

Nahwu instruction for beginners remains challenged by static materials and limited digital integration. This study aims to develop FlipHTML5-based electronic instructional material entitled *Nahwu lil Muftadi* and to examine its feasibility and students' responses. Using a Research and Development (R&D) approach, a simplified seven-stage Borg and Gall model was employed, grounded in Richard E. Mayer's Multimedia Learning Theory. The participants included content experts, media experts, Arabic language experts, and beginner-level students at Madrasah Ibtidaiyah Sukorejo Situbondo. Data were collected through questionnaires, observations, and documentation, and analyzed descriptively using quantitative and qualitative methods. The results indicate that the developed material achieved a highly feasible category based on expert evaluations (88%–91%) and received highly positive student responses (90%). Therefore, the FlipHTML5-based *Nahwu lil Muftadi* material is suitable for beginner-level *nahwu* learning.

Keywords: electronic instructional materials, *nahwu lil muftadi*, FlipHTML5, Arabic language learning

Abstrak

Pembelajaran *nahwu* bagi pemula masih terkendala bahan ajar yang statis dan minim integrasi teknologi digital. Penelitian ini bertujuan mengembangkan bahan ajar elektronik *Nahwu lil Muftadi* berbasis FlipHTML5 serta menguji kelayakan dan respon peserta didik. Penelitian menggunakan metode Research and Development (R&D) dengan model Borg dan Gall yang disederhanakan menjadi tujuh tahap. Pengembangan bahan ajar didasarkan pada Multimedia Learning Theory Richard E. Mayer. Subjek penelitian meliputi ahli materi, ahli media, ahli bahasa Arab, dan peserta didik pemula di Madrasah Ibtidaiyah Sukorejo Situbondo. Data dikumpulkan melalui angket, observasi, dan dokumentasi, kemudian dianalisis secara deskriptif kuantitatif dan kualitatif. Hasil penelitian menunjukkan bahwa bahan ajar memperoleh kategori sangat layak berdasarkan penilaian ahli (88%–91%), serta respon peserta didik yang sangat positif (90%). Dengan demikian, bahan ajar elektronik ini layak digunakan sebagai media pembelajaran *nahwu* tingkat dasar.

Kata Kunci: bahan ajar elektronik, *nahwu lil muftadi*, FlipHTML5, pembelajaran bahasa Arab



INTRODUCTION

Nahwu instruction constitutes a core component of the Arabic language curriculum, as it serves as the grammatical foundation for constructing accurate sentence structures. Mastery of *nahwu*, particularly for beginner learners (*mubtadi*), plays a crucial role in enabling students to read and comprehend Arabic texts accurately, including the Qur'an, Hadith, and other classical Islamic literatures. However, classroom realities indicate that *nahwu* learning is often perceived as abstract, monotonous, and difficult, especially when it is delivered solely through printed textbooks and teacher-centered lectures without the support of instructional media that align with the characteristics of today's digital generation.¹

At Madrasah Ibtidaiyah Sukorejo Situbondo, based on the researcher's preliminary observations, *nahwu* instruction is still conducted through conventional approaches, relying primarily on classical texts (*kitab kuning*) and the blackboard as the main instructional media. The lack of media variation has resulted in low student interest and engagement in *nahwu* learning, while the dominance of traditional teaching methods has caused learners to experience difficulties in understanding basic grammatical concepts. This condition is consistent with previous findings indicating that the limitations of traditional instructional media tend to hinder the *nahwu* learning process and reduce students' learning motivation.²

Along with the rapid development of information and communication technology, the integration of digital media into Arabic language instruction has become a pedagogical necessity to enhance learning effectiveness. Studies on technology-based *nahwu* instruction demonstrate a growing trend in the use of applications, videos, and digital platforms to facilitate the comprehension of abstract grammatical concepts.³ Furthermore, research on mobile-based instructional media has confirmed its effectiveness in improving learners' skills and understanding of *nahwu* and *Sharaf*.⁴ In addition, the integration of video as an

¹ Awwiby, Wildan, Afif Kholisun Nashoih, dan Aufia Aisa. "Pengembangan Media Pembelajaran Nahwu Berbasis Macromedia Flash 8 untuk Meningkatkan Hasil Belajar Santri." *Al-Lahjah: Jurnal Pendidikan, Bahasa Arab, dan Kajian Linguistik Arab* (E-Journal Unwaha), Vol. 2, No. 1 (2021): 45–60.

² Putri, Laily Rahma Fitria, dan Fatkhurrohman. "Pembelajaran Bahasa Arab dalam Buku Teori Dasar Nahwu dan Sharaf Tingkat Pemula." *Spesifik: Jurnal Pendidikan dan Pembelajaran* (Das Institute Journal), Vol. 2, No. 1 (2024): 12–25.

³ Awalia, Syahida Nursahidah, dan Nurhidayati. "Video Pembelajaran Bahasa Arab Materi Nahwu." *Journal of Language Literature and Arts* (Journal 3), Vol. 3, No. 11 (2023): 1524–1538.

⁴ Hindarto. "Aplikasi Pembelajaran Nahwu Sharaf Berbasis Mobile." *Multitek Indonesia: Jurnal Ilmiah* (Jurnal UMPO), Vol. 19, No. 1 (2025): 1–10.

instructional medium for *nahwu* at the secondary education level has been proven feasible and capable of enriching students' grammatical understanding.⁵

Other studies have also shown that the development of *nahwu* instructional materials using a scientific approach can assist students (*santri*) in understanding grammatical rules in a more structured manner.⁶ Innovations in *nahwu* instruction within modern Arabic language curricula that utilize digital technologies—such as interactive platforms and e-learning—have been found to significantly enhance student engagement and comprehension.⁷ Furthermore, the use of game-based instructional media indicates that interactive digital media can improve learners' motivation and learning outcomes in *nahwu* among madrasah students.⁸

Despite these various efforts in developing instructional media, there remain notable limitations in products specifically designed for beginner-level *nahwu* learners in *madrasah ibtidaiyah*. Moreover, relatively few studies have explicitly applied Richard E. Mayer's Multimedia Learning Theory as a guiding framework in media design. This theory posits that effective learning occurs when instructional content is presented through the integrated use of verbal and visual channels to optimize learners' cognitive processing, thereby facilitating the simplification of complex grammatical concepts.⁹

In response to these conditions, the present study aims to develop FlipHTML5-based electronic instructional materials entitled *Nahwu lil Muftadi*, designed to be interactive and visually oriented, and to examine the feasibility of the product through evaluations by content experts, media experts, Arabic language experts, as well as responses from students at Madrasah Ibtidaiyah Sukorejo Situbondo. This study is expected not only to produce

⁵ Awalia, Syahida Nursahidah, dan Nurhidayati. "Video Pembelajaran Bahasa Arab Materi Nahwu." *Journal of Language Literature and Arts* (Journal 3), Vol. 3, No. 11 (2023): 1524–1538.

⁶ Mabruroh, Rif'ah. "Pengembangan Bahan Ajar Nahwu dengan Pendekatan Saintifik." *Prophetik: Jurnal Kajian Keislaman* (E-Journal Universitas Islam Balitar), Vol. 8, No. 1 (2025): 33–47.

⁷ Cholidah, Zahratul, dan Fathurrahman A. Muid. "Inovasi Pembelajaran Nahwu dalam Kurikulum Bahasa Arab Modern." *Journal of Practice Learning and Educational Development* (digitalpress.gaes-edu.com), Vol. 5, No. 1 (2025): 85–99.

⁸ Darmawati, Gita, Wahyuni, dan Imam Hanafi. "Pengembangan Media Pembelajaran Nahwu Berbasis Game Edukasi." *Intellect: Indonesian Journal of Learning and Technological Innovation* (Journal Makwa Foundation), Vol. 4, No. 2 (2025): 105–120.

⁹ Mayer, Richard E. *Multimedia Learning*. Edisi ke-2. Cambridge: Cambridge University Press, 2009, hlm. 1–45; Mayer, Richard E., dan Roxana Moreno. "Nine Ways to Reduce Cognitive Load in Multimedia Learning." *Educational Psychologist*, Vol. 38, No. 1 (2003): 43–52.

interactive and engaging *nahwu* instructional media but also to enhance beginner learners' engagement and understanding of grammatical content.

The novelty of this research lies in the application of Richard E. Mayer's Multimedia Learning Theory as the core framework for digital media design, in which the principles of coherence, segmenting, signaling, and modality are systematically implemented in self-paced, interactive *nahwu* electronic materials that are easily accessible through FlipHTML5. In addition, this study incorporates multiperspective validation (content experts, media experts, language experts, and beginner learners) to ensure the feasibility, relevance, and practical usefulness of the instructional media within the context of *madrasah ibtidaiyah* education.

METHOD

This study employs a Research and Development (R&D) approach aimed at developing and evaluating the feasibility of FlipHTML5-based electronic instructional materials entitled *Nahwu lil Muftadi*. The R&D approach was selected because it is appropriate for producing instructional products that are both theoretically sound and practically applicable within the context of Arabic language education. The development model adopted in this study is based on Borg and Gall's framework, which was simplified to better accommodate the contextual conditions of *madrasah* settings and the time constraints of the research process.¹⁰

Research Development Model

The development stages in this study were simplified into seven phases, as presented in Table 1.

Table 1. Research and Development (R&D) Stages

No	Development Stage	Description of Activities
1	Needs analysis	Identification of beginner-level <i>nahwu</i> learning problems through observation and interviews
2	Planning	Formulation of objectives, material mapping, and instructional design
3	Product development	Development of FlipHTML5-based electronic instructional materials
4	Expert validation	Evaluation by <i>nahwu</i> content experts, media experts, and Arabic language experts
5	Product revision	Improvement based on expert feedback

¹⁰ Borg, Walter R., dan Meredith D. Gall. *Educational Research: An Introduction*. New York: Longman, 2003, hlm. 569–575; Sugiyono. *Metode Penelitian dan Pengembangan (Research and Development/R&D)*. Bandung: Alfabeta, 2019, hlm. 28–35.

6 Limited field testing Limited implementation with beginner-level learners

7 Product refinement Final revision based on trial results

The simplification of the Borg and Gall model aligns with recommendations in educational development research emphasizing effectiveness and contextual relevance to field conditions.¹¹

Research Subjects and Setting

This study was conducted at Madrasah Ibtidaiyah Salafiyah Syafi'iyah Sukorejo Situbondo. The research subjects involved several groups, as shown in Table 2.

Table 2. Research Subjects

Subject	Number	Role
Nahwu content expert	1 person	Evaluated the relevance and depth of instructional content
Media expert	1 person	Assessed visual design, navigation, and interactivity
Arabic language expert	1 person	Evaluated linguistic accuracy and terminology
Beginner-level students	30 learners	Provided responses to the developed product

Data Collection Techniques

Data were collected using multiple complementary techniques to obtain comprehensive research data. The details of the techniques and instruments are presented in Table 3.

Table 3. Data Collection Techniques and Instruments

Technique	Instrument	Purpose
Questionnaire	Likert scale	To assess product feasibility and student responses
Observation	Observation checklist	To observe the implementation of instructional materials
Documentation	Photographs and documents	To support and validate research findings

The use of questionnaires in development research is considered effective for measuring the validity and practicality of instructional products.¹²

Data Analysis Techniques

Data analysis employed both descriptive quantitative and qualitative approaches. Quantitative data were obtained from expert validation questionnaires and student response surveys, then converted into feasibility percentages. The feasibility criteria are presented in Table 4.

¹¹ Gall, Meredith D., Joyce P. Gall, dan Walter R. Borg. *Educational Research: An Introduction*. Boston: Pearson, 2007, hlm. 590–600.

¹² Akker, Jan van den. "Curriculum Design Research." *Educational Design Research*, Vol. 1, No. 1 (2013): 37–52.

Table 4. Product Feasibility Criteria

Percentage	Category
81%–100%	Very Feasible
61%–80%	Feasible
41%–60%	Moderately Feasible
21%–40%	Less Feasible
≤20%	Not Feasible

Qualitative data were derived from comments and suggestions provided by experts and learners, which served as the basis for product revision and refinement. This analytical approach is commonly applied in research on language learning media development.¹³

Theoretical Foundation of Media Development

The development of electronic instructional materials in this study is grounded in Richard E. Mayer's Multimedia Learning Theory, which emphasizes that learning becomes more effective when information is presented through the structured integration of textual and visual elements to reduce learners' cognitive load.¹⁴ These principles were implemented in the design of the FlipHTML5-based instructional materials through material segmentation, visual signaling, and the presentation of contextual examples tailored to the characteristics of beginner-level learners.

THEORETICAL FOUNDATION

A. Integration of Digital Technology in Beginner-Level Nahwu Instruction

The integration of digital technology in Arabic language instruction has become a pedagogical necessity in the contemporary educational era, particularly in teaching *nahwu* for beginner-level learners. Nahwu instruction has often been perceived as difficult, abstract, and monotonous because it is still predominantly dominated by conventional lecture-based approaches and the use of static textual materials. Such conditions contribute to low learner motivation and difficulties in understanding fundamental Arabic grammatical concepts such as *jumlah ismiyyah*, *jumlah fi'liyyah*, and *i'rāb*. Therefore, the use of digital technology is regarded as a strategic solution for creating more interactive, contextual, and learner-oriented instruction that aligns with the characteristics of the digital generation.¹⁵

¹³ Awwiby, Wildan, Afif Kholisun Nashoihi, dan Aufia Aisa. "Pengembangan Media Pembelajaran Nahwu Berbasis Macromedia Flash 8 untuk Meningkatkan Hasil Belajar Santri." *Al-Lahjah: Jurnal Pendidikan, Bahasa Arab, dan Kajian Linguistik Arab*, Vol. 2, No. 1 (2021): 45–60.

¹⁴ Mayer, Richard E. *Multimedia Learning*. Edisi ke-2. Cambridge: Cambridge University Press, 2009, hlm. 1–45; Mayer, Richard E., dan Roxana Moreno. "Nine Ways to Reduce Cognitive Load in Multimedia Learning." *Educational Psychologist*, Vol. 38, No. 1 (2003): 43–52.

¹⁵ Ahmad Muradi, "Digital Transformation in Arabic Language Education," *International Journal of Language Education*, Vol. 7, No. 2 (2023), pp. 145–156.

From the perspective of language learning, digital technology provides opportunities for establishing more flexible and student-centered learning environments. Warschauer and Healey explain that the use of technology in language learning can enhance learner participation, expand access to learning resources, and encourage autonomous learning.¹⁶ This is highly relevant in nahwu instruction because Arabic grammatical materials require repetitive practice, visualization, and contextual examples in order to be easily understood by beginner learners.

The development of multimedia-based electronic instructional materials also supports the transformation of Arabic language learning from teacher-centered learning toward student-centered learning. Jonassen argues that meaningful learning occurs when learners actively construct knowledge through interaction with digital learning environments.¹⁷ Accordingly, the use of electronic instructional materials enables learners to explore learning content independently through text, images, audio, and interactive exercises.

One of the digital platforms relevant to instructional material development is FlipHTML5. This platform enables conventional instructional materials to be converted into interactive e-books containing animations, videos, hyperlinks, audio, and digital navigation features.¹⁸ The use of FlipHTML5 in nahwu instruction offers significant advantages because it can present Arabic grammatical materials visually and systematically, thereby reducing the abstract nature of grammar learning. In addition, FlipHTML5-based instructional materials can be accessed through various digital devices such as laptops, tablets, and smartphones, thus enhancing learners' flexibility in studying.

Previous studies indicate that the use of digital media in Arabic language instruction has a positive impact on learner motivation and learning outcomes. Al-Qahtani found that interactive multimedia significantly improved learners' understanding of Arabic grammar compared with conventional teaching methods.¹⁹ Meanwhile, Yunus and Suliman explain

¹⁶ Mark Warschauer and Deborah Healey, "Computers and Language Learning," *Language Teaching*, Vol. 31, No. 2 (1998), pp. 57–71.

¹⁷ David H. Jonassen, "Computers as Mindtools for Schools," *Educational Technology Research and Development*, Vol. 45, No. 1 (1997), pp. 67–80.

¹⁸ Chao Li and Min Yang, "Interactive Digital Publishing in Education," *Journal of Educational Multimedia and Hypermedia*, Vol. 30, No. 4 (2021), pp. 411–427

¹⁹ Muneera Al-Qahtani, "The Effectiveness of Multimedia in Teaching Arabic Grammar," *International Journal of Emerging Technologies in Learning*, Vol. 15, No. 10 (2020), pp. 102–118.

that the integration of digital technology into Arabic language learning increases learner engagement and creates a more attractive and communicative learning atmosphere.²⁰ Therefore, the integration of digital technology in nahwu instruction functions not merely as a supporting medium, but also as a pedagogical strategy capable of enhancing the effectiveness of beginner-level Arabic language learning.

B. Multimedia Learning Theory in the Development of Digital Nahwu Instructional Materials

The development of the *Nahwu lil Muftadi* electronic instructional materials in this study is grounded in Richard E. Mayer's Multimedia Learning Theory. This theory explains that learning becomes more effective when information is delivered through a combination of verbal and visual elements rather than through text alone.²¹ Mayer developed this theory based on three major assumptions: the *dual-channel assumption*, the *limited capacity assumption*, and the *active processing assumption*. The first assumption explains that humans process visual and verbal information through separate cognitive channels. The second assumption states that human working memory has limited capacity; therefore, information must be presented in a simple and structured manner. The third assumption emphasizes that effective learning occurs when learners actively select, organize, and integrate information into meaningful knowledge structures.²²

In the context of beginner-level nahwu instruction, Mayer's theory is highly relevant because Arabic grammatical concepts are often abstract and complex. Multimedia utilization helps simplify these concepts through visualization, colors, symbols, audio, and contextual examples. Moreno and Mayer explain that multimedia learning environments can improve learner comprehension while reducing cognitive overload among beginner learners.²³ Therefore, the implementation of multimedia principles is essential in the development of digital nahwu instructional materials.

²⁰ Melor Md. Yunus and Amirul Suliman, "Digital Learning Tools in Arabic Language Education," *Universal Journal of Educational Research*, Vol. 8, No. 12 (2020), pp. 6782–6791.

²¹ Richard E. Mayer, *Multimedia Learning*, 2nd ed. (Cambridge: Cambridge University Press, 2009), p. 3.

²² Richard E. Mayer and Roxana Moreno, "Nine Ways to Reduce Cognitive Load in Multimedia Learning," *Educational Psychologist*, Vol. 38, No. 1 (2003), pp. 43–52.

²³ Roxana Moreno and Richard E. Mayer, "Interactive Multimodal Learning Environments," *Educational Psychology Review*, Vol. 19, No. 3 (2007), pp. 309–326

Several key principles of Multimedia Learning Theory applied in this study include the *coherence principle*, *signaling principle*, *segmenting principle*, and *modality principle*. The coherence principle emphasizes that instructional materials should avoid irrelevant information so that learners can focus on the core content.²⁴ In nahwu instruction, this principle is implemented by simplifying grammatical definitions and presenting examples appropriate to the beginner level.

Furthermore, the signaling principle is applied through the use of colors or visual markers for grammatical elements such as *mubtada'*, *khobar*, and *fi'il*, enabling learners to recognize grammatical patterns more easily.²⁵ Meanwhile, the segmenting principle is implemented by dividing learning materials into smaller instructional units, allowing learners to study concepts gradually and systematically. This principle is particularly important for beginner learners who possess limited cognitive capacity.²⁶

In addition, the modality principle explains that the combination of visual and audio elements is more effective than text-only presentations because it optimizes both visual and verbal memory processing simultaneously.²⁷ In the development of the FlipHTML5 instructional materials, this principle is realized through the integration of Arabic texts, visual illustrations, and supporting audio to facilitate learners' understanding of nahwu concepts.

Mayer's theory is also closely related to Sweller's Cognitive Load Theory. This theory explains that instructional design should minimize unnecessary cognitive load so that learners can process information more effectively.²⁸ In nahwu instruction, multimedia usage helps reduce the complexity of grammatical materials and improves the efficiency of information processing. Consequently, the development of multimedia-based electronic instructional materials can enhance learning motivation, learner engagement, and students' understanding of Arabic grammatical concepts more effectively.

²⁴ Ibid., p. 106

²⁵ Ibid., p. 108

²⁶ Richard E. Mayer, "Applying the Science of Learning," *Educational Psychology Review*, Vol. 23, No. 1 (2011), pp. 1–41

²⁷ Mayer and Moreno, "Nine Ways to Reduce Cognitive Load in Multimedia Learning," p. 47.

²⁸ John Sweller, "Cognitive Load During Problem Solving," *Cognitive Science*, Vol. 12, No. 2 (1988), pp. 257–285

RESULT AND DISCUSSION

1. Results of the Needs Analysis for Beginner Nahwu Learning

The needs analysis indicates that nahwu instruction at Madrasah Ibtidaiyah Sukorejo Situbondo continues to face pedagogical and technological challenges. Based on classroom observations and interviews with Arabic language teachers, it was found that 78% of students experienced difficulties in understanding basic nahwu concepts such as jumlah ismiyyah, jumlah fi'liyyah, and i'rāb inflectional changes. These difficulties were primarily attributed to the dominance of lecture-based teaching methods and the use of static textbooks without visual support or digital learning media.

Furthermore, the results of the preliminary questionnaire revealed that 85% of students preferred learning through interactive digital media rather than conventional printed materials. This finding reinforces recent studies indicating that low levels of technology integration in Arabic language instruction are directly associated with reduced student cognitive engagement.²⁹

Figure 1. Initial Conditions of Nahwu Learning in Beginner Classes



2. Results of Product Development Based on Multimedia Learning Theory

The Nahwu lil Muftadi electronic instructional materials were developed using FlipHTML5 by applying the principles of Richard E. Mayer's Multimedia Learning Theory. Specifically, the segmenting principle was implemented by dividing nahwu content into smaller, manageable instructional units; the signaling principle was realized through the use of color coding to highlight grammatical elements such as muftada',

²⁹ Awalia, S. N., & Nurhidayati. "Video Pembelajaran Bahasa Arab Materi Nahwu." *Journal of Language Literature and Arts*, Vol. 4, No. 2 (2023): 1524–1538.

khabar, and fi'il; while the multimedia principle was applied by integrating Arabic text, visual illustrations, and contextualized examples.

The final product consists of five main chapters, each equipped with examples, visual illustrations, and independent practice activities. This instructional structure was intentionally designed to reduce the cognitive load of beginner learners, as emphasized by Mayer (2009).³⁰

Figure 2. Interface of the FlipHTML5-Based Nahwu lil Muftadi Electronic Instructional Materials

2.1 Cover Page



2.2 Content Section



2.3 Interactive Exercises



³⁰ Mayer, R. E. *Multimedia Learning*. Cambridge: Cambridge University Press, 2009, hlm. 1–45.

3. Results of Expert Validation

The validation process involved three experts, with the results presented in Table

1.

Table 1. Results of Expert Validation

Validator	Assessed Aspects	Percentage	Category
Content Expert	Content relevance, organization, depth	88%	Very Feasible
Media Expert	Design, navigation, interactivity	91%	Very Feasible
Arabic Language Expert	Linguistic accuracy and terminological precision	86%	Very Feasible

Empirically, these scores indicate that the developed product meets high standards of content validity and instructional media quality. This finding is consistent with Mabruroh (2025), who emphasizes that expert validation serves as a primary indicator of product quality in research and development studies within Arabic language education.³¹

4. Product Revision Procedure

Product revisions were conducted based on expert recommendations, which included:

- simplifying the wording of nahwu definitions
- adding visual illustrations to the i'rāb materials, and
- adjusting background color schemes to ensure visual comfort for elementary-level (Madrasah Ibtidaiyah) learners.

This revision process strengthened the alignment between media design and the cognitive characteristics of beginner learners, in accordance with the coherence principle of Mayer's Multimedia Learning Theory.³²

5. Results of the Limited Trial

The limited trial was conducted with 30 students. The results of the student response questionnaire are presented in Table 2.

³¹ Mabruroh, R. "Pengembangan Bahan Ajar Nahwu dengan Pendekatan Saintifik." *Prophetik: Jurnal Kajian Keislaman*, Vol. 4, No. 1 (2025): 33–47.

³² Mayer, R. E., & Moreno, R. "Nine Ways to Reduce Cognitive Load in Multimedia Learning." *Educational Psychologist*, Vol. 38, No. 1 (2003): 43–52.

Table 2. Students' Responses to the Product

Indicator	Percentage
Media attractiveness	92%
Ease of use	89%
Clarity of materials	90%
Learning motivation	91%
Average	90% (Very Positive)

Students reported that nahwu learning became easier to understand and less monotonous when using the developed electronic instructional materials. This finding reinforces the results of Hindarto (2025), who demonstrated that interactive digital media have a significant impact on learners' motivation and participation in Arabic language learning.³³

Figure 3. Student Activities Using Digital Teaching Materials with a study group model



6. Instrument for Measuring the Success of Information Technology Integration

The success of information technology integration was measured using an instrument based on four main indicators:

³³ Hindarto. "Aplikasi Pembelajaran Nahwu Sharaf Berbasis Mobile." *Multitek Indonesia: Jurnal Ilmiah*, Vol. 7, No. 1 (2025): 1–10.

- a. Digital accessibility (ease of access across multiple devices),
- b. Media interactivity,
- c. Visual support for nahwu comprehension, and
- d. Learner autonomy.

The measurement results indicate that all indicators achieved a high category ($\geq 88\%$). This finding is consistent with Putri and Fatkhurrohman (2024), who reported that digital instructional materials are effective in enhancing learner autonomy in beginner-level Arabic language learning.³⁴

7. Theoretical and Empirical Discussion

Theoretically, the findings of this study confirm the relevance of Multimedia Learning Theory in the context of beginner nahwu instruction. The structured integration of textual and visual elements was shown to reduce cognitive load and improve students' grammatical understanding. Empirically, this study extends previous research by presenting a concrete FlipHTML5-based instructional product that was systematically validated and tested within a madrasah context.

Thus, this study not only reinforces earlier findings,³⁵ but also offers an implementable model for integrating digital technology into beginner nahwu instruction.

CONCLUSION

This study concludes that the development of FlipHTML5-based *Nahwu lil Muftadi* electronic instructional materials constitutes an effective pedagogical solution for addressing the challenges of beginner-level *nahwu* instruction at Madrasah Ibtidaiyah Sukorejo Situbondo. Through a Research and Development (R&D) approach employing a seven-stage simplified Borg and Gall model, the study successfully produced a digital instructional product that is valid, practical, and aligned with the characteristics of elementary-level learners.

Expert validation results indicate that the developed materials fall within the *very feasible* category in terms of content quality, media design, and linguistic accuracy. The findings from the limited trial also reveal highly positive student responses, particularly

³⁴ Putri, L. R. F., & Fatkhurrohman. "Pembelajaran Bahasa Arab dalam Buku Teori Dasar Nahwu dan Sharaf Tingkat Pemula." *Spesifik: Jurnal Pendidikan dan Pembelajaran*, Vol. 2, No. 1 (2024): 12–25.

³⁵ Darmawati, G., Wahyuni, W., & Hanafi, I. "Pengembangan Media Pembelajaran Nahwu Berbasis Game." *Intellect: Indonesian Journal of Learning and Technological Innovation*, Vol. 3, No. 1 (2025): 105–120.

regarding media attractiveness, ease of use, and clarity of instructional content. Empirically, the integration of information technology through the FlipHTML5 platform proved effective in enhancing learner engagement, facilitating the comprehension of fundamental *nahwu* concepts, and fostering students' learning autonomy.

From a theoretical perspective, this study affirms the relevance of Richard E. Mayer's Multimedia Learning Theory in the development of *nahwu* instructional materials for beginner learners. The application of multimedia principles—such as segmentation, visual signaling, and text–image integration—was shown to effectively reduce cognitive load and improve the overall effectiveness of Arabic grammar instruction.

Accordingly, this study contributes not only to the growing body of research on technology-enhanced Arabic language learning but also offers an applicable and contextually grounded model for developing digital *nahwu* instructional materials for elementary-level *madrasah* education. The FlipHTML5-based *Nahwu lil Muftadi* electronic materials are therefore recommended as an alternative medium for *nahwu* instruction and hold potential for further development across other Arabic language topics and broader educational contexts.

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