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Moodle-based arabic sentence writing materials: A Hannafin and Peck development study

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Abstract

This study aims to develop Arabic sentence-writing learning materials (kitabah al-jumal) based on the Moodle Learning Management System for beginner-level students, particularly graduates of non-Islamic senior high schools who have limited foundational competence in Arabic. This research employed a Research and Development (R&D) design using the Hannafin and Peck model, which consists of analysis, design, and development and implementation stages, with the study limited to the product validation phase. The analysis stage involved observations, interviews with lecturers, and diagnostic tests to identify learners' needs. The design stage produced five core instructional units, PDF modules, learning videos, and their integration into Moodle. The development and implementation stage comprised product construction and expert validation, while product feasibility was assessed using questionnaires and analyzed using percentage calculations. The material expert provided a score of 77% (good/feasible) with several revision notes related to linguistic accuracy, whereas media expert validation scored 90.67% (very feasible) with no required revisions. Limited implementation with 32 students indicated that the product was easy to use and supported comprehension of basic sentence structures, suggesting that the developed materials are feasible and appropriate for beginner learners and may serve as a foundation for further Moodle-based Arabic instruction in higher education.

Keywords: Hannafin and Peck model, moodle, arabic sentence writing, material development, arabic language learning

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INTRODUCTION

The ability to write Arabic sentences (*kitabah al-jumal*) is a fundamental skill that must be mastered by students in Arabic language education programs, particularly in the early stages of their coursework. This skill serves as the foundation for acquiring more advanced writing competencies, such as composing paragraphs, argumentative texts, and academic papers in Arabic (Aljenobi, 2025; Yusuf et al., 2019). Mastery of basic sentence structures is consistently reported as a primary prerequisite for improving writing, reading, and translation skills (Koh, 2021). However, various studies indicate that beginning learners still encounter fundamental difficulties in understanding and forming both *jumlah ismiyyah* and *jumlah fi'liyyah* (nominal and verbal sentences) in terms of structure and meaning. These difficulties are reflected in learners' inability to identify the core elements of a sentence and to construct syntactic relations

accurately (Tungkagi et al., 2022).

These problems are more pronounced for students who have no prior experience learning Arabic in their earlier education. Graduates of *Madrasah Aliyah* (Islamic senior high schools) or Islamic boarding schools generally acquire foundational Arabic through systematic instruction, whereas graduates of general senior high schools (non-*Madrasah Aliyah*) lack initial grounding in sentence structure, basic vocabulary, and grammatical rules (Jamil & Agung, 2022). Differences in educational background have been shown to affect students' linguistic readiness, with non-Madrasah Aliyah students more frequently experiencing difficulties in understanding basic Arabic structures compared to those with an Islamic schooling background (Tungkagi et al., 2022). As a result, a competency gap emerges in students' mastery of basic vocabulary as well as their understanding of sentence structure (Pratama et al., 2022).

This competence gap is clearly visible among first-year students of Class D in the Department of Arabic Literature at Universitas Negeri Malang, who constitute the focus of this study. Initial observations, interviews with the course instructor, and diagnostic testing revealed that the basic proficiency of Class D students was significantly lower than that of their peers in other classes of the same cohort (Classes A–C). Students in Class D struggled to identify core sentence elements such as *mubtada'* (subject) and *khabar* (predicate) in *jumlah ismiyyah*, as well as *fi'l* (verb), *fā'il* (subject/doer), and *maf'ūl bih* (object) in *jumlah fi'liyyah*. Numerous sentence construction errors were observed, including incorrect placement of the *maf'ūl bih*, mismatches between verbs and subjects in gender and number, and omission of obligatory elements. These challenges directly affect their ability to master more advanced materials, such as complex sentence structures (*jumlah murakkabah*) and paragraph composition. This situation underscores the need for instructional materials on basic sentence writing that are systematic, gradual, beginner-friendly, and suitable for independent learning.

With the advancement of educational technology, LMS platforms such as Moodle offer significant opportunities to provide structured, interactive, and adaptive learning materials (Bendridi, 2021). Moodle has been shown to enhance learning motivation, facilitate repetitive practice, and strengthen understanding of language structures through features that support content presentation and interactive exercises (Aliyah & Hidayanti, 2022; David et al., 2022; Fahmi et al., 2022). Other studies affirm the effectiveness of Moodle in providing a well-organized learning pathway for beginning learners (Dobashi et al., 2022). Thus, the use of Moodle is highly relevant for addressing the needs of non-*Madrasah* students who require intensive reinforcement in fundamental linguistic concepts.

However, although Moodle has been widely used in the context of Arabic language learning, research that specifically develops *kitabah al-jumal* (sentence-writing) materials for beginner-level students, particularly those with non-*Madrasah* backgrounds, remains very limited. Most studies utilize Moodle for quizzes, reading exercises, or the delivery of general grammar content, without focusing on the development of basic sentence-writing materials. This gap indicates an unaddressed area of research, particularly regarding the provision of structured digital materials designed specifically for novice learners to practice writing simple Arabic sentences.

To address this need, the present study employs the Hannafin & Peck model of instructional design, which consists of three main phases: needs assessment, design, and development (Andriani et al., 2021; Hannafin & Peck, 1988). This model was selected because it is iterative, user–oriented, and well-suited for developing digital learning materials on an LMS platform like Moodle (Tegeh et al., 2014). In the Hannafin & Peck framework, continuous evaluation and revision occur throughout all phases, ensuring that the final product is refined according to feedback and learner needs. By adopting this model, the study aims to systematically develop Moodle-based materials for Arabic sentence writing and ensure their feasibility through expert validation.

Thus, this study is essential to bridge the gap between the needs of beginner students and the availability of appropriate learning materials. The development of Moodle-based Arabic

sentence-writing materials using the Hannafin & Peck model is expected to offer an innovative solution for Class D students with low initial proficiency. In addition to its practical benefits for the learning process, this study also provides theoretical contributions to digital material design in Arabic language instruction at the university level. The specific objective is to produce a set of validated instructional materials that can facilitate independent learning and improve students' basic writing skills in Arabic.

METHODS

This study employs a Research and Development (R&D) approach by adapting the Hannafin & Peck model, which consists of three stages: analysis, design, and development & implementation (Hannafin & Peck, 1988). This model was selected because it is iterative, user-needs oriented, and suitable for developing digital materials based on the Moodle LMS (Tegeh et al., 2014). The study is limited to the stages of expert validation and initial usability testing, without including an effectiveness test.

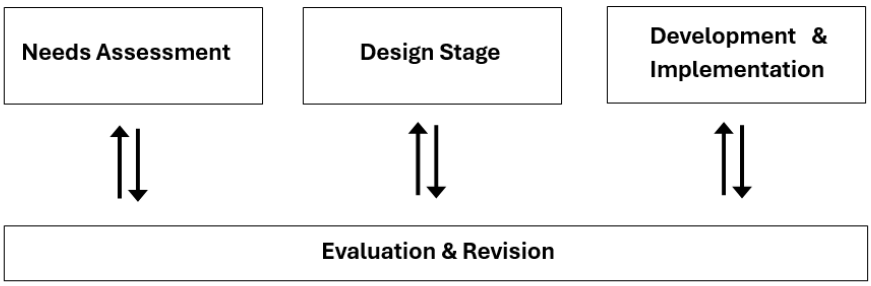

Figure 1. Hannafin and Peck Development Research Model

The iterative development process (adapted from Hannafin & Peck, (1988)). The model comprises three primary phases (Needs Assessment, Design, Development & Implementation) with ongoing evaluation and revision at each phase.

Participants and Setting

The development and validation process involved subject matter experts, media experts, and student participants. Two expert validators were engaged: (1) a material (content) expert who evaluated the appropriateness of the content, the instructional structure, and linguistic accuracy of the materials; and (2) a media expert who assessed the quality of the user interface, navigation, and functionality of the Moodle-based materials. In addition, 36 first-year students from Class D of the Arabic Literature department were involved during a limited implementation (user testing) phase to provide feedback on usability. The research was carried out in the Department of Arabic Literature at Universitas Negeri Malang during the first semester of the 2025/2026 academic year.

Development Procedures

a. Needs Assessment

This stage aimed to identify the learning needs and initial abilities of students (especially those from non-Islamic school backgrounds) in writing Arabic sentences. Data were collected through curriculum analysis, analysis of student characteristics, a questionnaire, and interviews with instructors regarding common student difficulties. The needs assessment provided the basis for determining the scope of content and specific objectives of the materials to be developed.

b. Design

In this stage, an initial blueprint of the Moodle-based Arabic sentence-writing materials was prepared, including the content structure, learning flow, and interface design. The material

outline was aligned with the Course Learning Outcomes (CLOs) of the *Kitabah Ibtida'i* (Basic Writing) course and the needs identified in the previous stage. Storyboards and content prototypes were created for each unit, specifying the integration of text, images, and exercises in Moodle. Particular attention was given to ensuring the sequence of topics was pedagogically sound, progressing from simpler sentence patterns to more complex ones, and that the design was accessible and engaging for beginners.

c. Development and Implementation

At this stage, the Moodle-based Arabic sentence-writing materials were developed in accordance with the design established during the design phase. The initial product was then validated by experts, including an Arabic language content expert and an instructional media/LMS expert, to assess the accuracy of the materials, their pedagogical suitability, and the quality of their interface and interactivity

Data Analysis Techniques

Data obtained from the validators were analyzed using descriptive quantitative analysis by calculating the mean score of each aspect and converting the results into qualitative categories. The validation process employed a 5-point Likert scale assessment instrument, and the data were analyzed using the following formula (Sugiyono, 2019).

$$P = \frac{\sum X}{\sum X_i} \times 100\%$$

RESULTS AND DISCUSSION

Results

The results of this study are presented according to the three stages of the Hannafin & Peck model: needs assessment, design, and development. The findings include an overview of student needs, the design framework of the learning materials, the development outcomes, and the feasibility of the product based on expert evaluations.

Needs Assessment Results

The needs analysis revealed important information about the students' backgrounds and difficulties in writing Arabic sentences, which guided the development of the materials. A questionnaire administered to 36 students in Class D indicated that although all students (100%) had previously studied basic Arabic in some form, the majority (72.2%) had never received formal instruction specifically in Arabic writing skills. Furthermore, 83.3% of students reported that they could not construct Arabic sentences without the help of digital translation tools, highlighting a significant lack of confidence and ability in free composition. Notably, 94.4% of the students expressed an urgent need for accessible learning materials that would support independent practice in writing. These quantitative results are summarized in Figure 2.

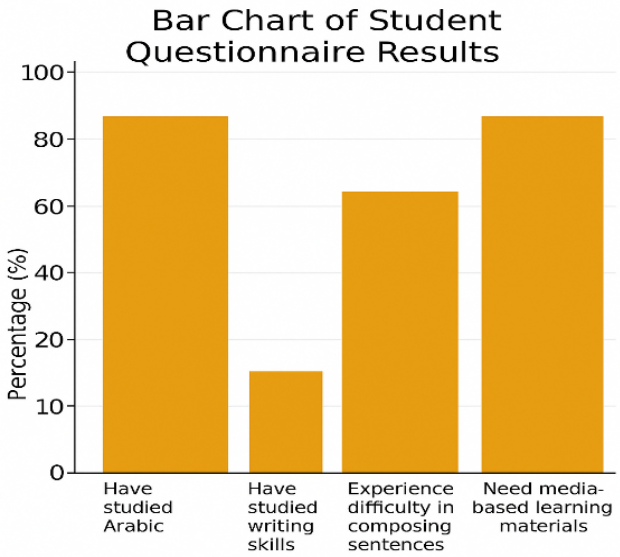

Figure 2. Student Needs Analysis

The chart indicates the percentage of students who have prior experience learning Arabic (100%), have received formal writing instruction (27.8%), can write sentences without a translator (16.7%), and feel the need for independent learning materials (94.4%).

In addition to the survey, interviews and classroom observations provided qualitative insights. Students in Class D were observed to have difficulty with fundamental aspects of Arabic sentence construction, particularly in identifying and using the core elements of both *jumlah ismiyyah* and *jumlah fi'liyyah*. For example, many students could not correctly distinguish the grammatical roles of words in simple sentences, leading to errors such as placing the object (*maf'ūl bih*) at the beginning of a sentence or mismatching verb conjugations with their subjects in gender and number. These findings align with reports in the literature that beginners from general-education backgrounds require more gradual and reinforced instruction to grasp basic sentence patterns. Overall, the needs assessment stage underscored an urgent need for structured, self-paced digital materials tailored to reinforce fundamental sentence-writing skills.

Design Stage Results

The design stage produced both the conceptual and technical framework for the Moodle-based Arabic sentence-writing learning materials. The content was developed based on the students' needs analysis and aligned with the Course Learning Outcomes (CLOs) of the *Kitabah Ibtida'i* course.

This stage resulted in the design of the material structure, presentation format, and selection of media to be used in the Moodle LMS. Based on the needs analysis, the materials were designed in two main formats, PDF modules and instructional videos, both developed within the same thematic framework to complement one another.

The material design includes five core topics: the structure of *mubtada'–khabar* in masculine and feminine forms (*mudzakkar and muannats*), *jumlah ismiyyah* in the form of *idhafah*, *jumlah fi'liyyah*, and *jumlah ismiyyah* with adverbial complements or *maf'ul bih*.

The design stage therefore produced a clear structure of learning materials, presentation formats, and the media components to be integrated into the Moodle LMS, ensuring that all elements function cohesively within the instructional framework.

Table 1. Design of Material Presentation in the Moodle LMS

Component	Design
Learning Structure	Topics 1–5 aligned with the module content
Learning Elements	Video → PDF Module → Exercises (Assignment) → Forum → Formative Quiz
Navigation	Simple interface, different icons for each type of media, step-by-step learning guide
Media Integration	Embedded instructional videos, PDF modules downloadable or viewable directly
Supporting Features	Completion tracking, automatic quiz feedback, Q&A forum
Output	A single digital classroom containing five learning topics with materials in the form of PDF modules, instructional videos, and discussion forums

The material design was developed using a sequential pattern, starting from the simplest structures to more complex ones, to ensure that students gain progressive understanding. At this stage, the learning flow was arranged, competencies were determined, storyboards were created, and Moodle features that support interactive learning such as page, quizzes, and feedback were selected. In addition, media components were designed in the form of PDF modules, instructional videos, and a digital classroom space. All components were developed based on principles of accessibility, visual consistency, and responsiveness to the needs of beginner-level students.

Development & Implementation Stage Results

a. Development

The development stage produced the final product based on the previously established design. The development process was divided into three main components:

1) PDF Module

The PDF module was developed as the main learning resource containing theoretical explanations, sentence examples, exercises, and summaries. Each unit of the module was designed with a consistent format to minimize the cognitive load on beginner students.

Figure 3. PDF Module Materials

2) Instruction Vidoes

The instructional videos were developed in alignment with the themes of each module unit, containing concise explanations, visualizations of sentence structures, and examples of usage in simple contexts. These videos serve as audio-visual reinforcement to facilitate students' understanding.

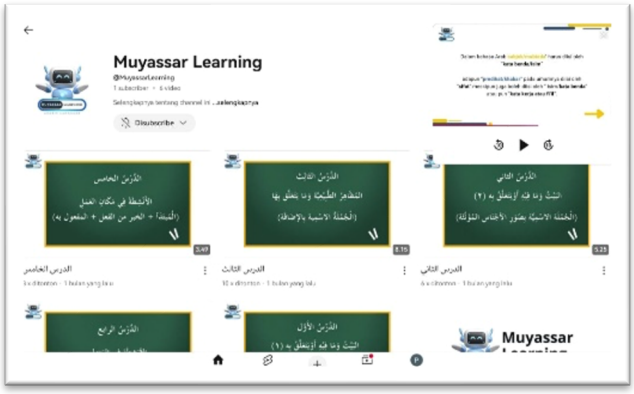

Figure 4. Instructional Video on YouTube

3) Integration into the Moodle LMS

The PDF modules and videos were then uploaded to the Moodle LMS and organized in the following format: a topic-based course structure (corresponding to the five material units), embedded links to the PDF modules and videos in each section, interactive exercises in the form of quizzes for self-evaluation, and a user guide to facilitate navigation within the LMS.

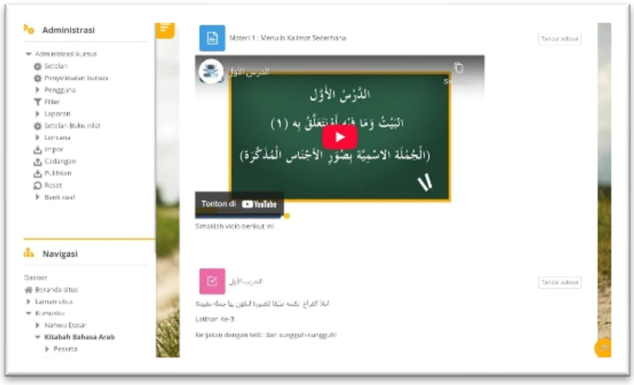

Figure 5. Display of the learning materials in the Moodle LMS

The interface design follows the principles of usability and user-centered design, featuring simple navigation, clear icons, and a linear learning flow.

b. Implementation

The implementation stage was carried out on a limited scale with 32 students. The implementation focused on testing usability rather than measuring effectiveness.

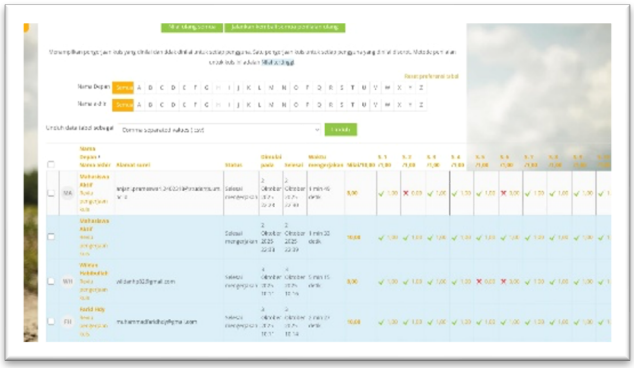

Figure 6. Implementation of LMS Moodle Usage

The implementation results showed that all students were able to access the modules, videos, and quizzes without technical difficulties. The user guide helped students understand the workflow, the learning materials were easy to navigate and comprehend, and the videos reinforced the concepts presented in the module. Students were also able to learn

independently through interactive exercises. This stage ensured that the product was ready to enter the expert validation process.

Expert Validation Results

To ensure the feasibility and suitability of the developed product, the researcher submitted it to experts for validation. The validation process was carried out by two experts: (1) an expert in Arabic language content, and (2) an expert in media and instructional design. The feasibility assessment of the product by these experts was analyzed using a Likert scale.

1) Results of the Content Expert Validation

The percentage of validation results was calculated based on the assessment of the Arabic language content expert and its alignment with educational material feasibility standards. The content validation in this study was carried out by an Arabic language education lecturer from Universitas Negeri Malang. The results show that the product obtained a score of 77, categorized as "good/feasible", with several notes and suggested revisions.

Table 2. Results of the Material Validation

Score	Number of Responses	Response × Score	Percentage Index
5	0	0	77/100 × 100% = **77%**
4	17	68	Interpretation Result: Good / Feasible
3	3	9	Based on Interval: Good / Feasible
2	0	0	
1	0	0	
Total	**20**	**77**	

2) Results of the Media Expert Validation

The percentage of the validation results was calculated based on the media and design assessment. The media validation in this study was conducted by an instructional media and design lecturer, a lecturer in the Department of Arabic Language Education at Universitas Negeri Malang. The results showed that the product obtained a score of 90.67, categorized as "excellent/highly feasible."

Table 3. Media Validation Results

Score	Number of Responses	Response × Score	Percentage Index
5	9	45	68/75 × 100% = **90.67%**
4	5	20	Interpretation Result: Excellent / Highly Feasible
3	1	3	Based on Interval: Excellent / Highly Feasible
2	0	0	
1	0	0	
Total	**15**	**68**	

Discussion

The findings of this study indicate that the development of Arabic sentence-writing materials based on the Moodle LMS using the Hannafin & Peck model successfully produced a feasible learning product that aligns with the needs of beginner students, particularly those from non–Madrasah Aliyah backgrounds. These results reinforce that the Hannafin & Peck model, which is user-oriented and iterative in nature, is effective for developing digital materials in language learning (Hannafin & Peck, 1988). Recent studies also demonstrate that the Hannafin & Peck model comprising the stages of needs analysis, design, development, and implementation with continuous evaluation consistently produces digital learning media that are valid, feasible, and effective in improving language learning outcomes (Dinata et al., 2023; Nazliati et al., 2024). The main advantage of this model lies in its user-centered orientation and iterative process, which allows for continuous revisions at each stage. As a result, the final product is truly aligned with the learners' needs and characteristics (Dahmayanti et al., 2024; Nugraha et al., 2024).

The content expert validation conducted by Dr. Laily Maziyah, S.Pd., M.Pd. obtained a score of 77%, categorized as good/appropriate. However, several important revision notes were provided, indicating that linguistic accuracy is a fundamental aspect of learning Arabic sentence structure. One of the revisions concerns the writing of hamzah mutawassiṭah and hamzah mutaṭṭarifah. Errors in placing the hamzah can affect meaning and increase the cognitive load on learners, as highlighted in modern studies on Arabic orthography (Muliansyah & Baroroh, 2020). Selain itu, ketidaklengkapan harakat pada beberapa contoh kalimat dianggap problematis bagi mahasiswa non-MA yang belum memiliki kemampuan fonologis dan i'rab dasar. These findings support the theory of linguistic scaffolding, which emphasizes the importance of providing gradual linguistic support to help learners understand language structures more easily and systematically which emphasizes that beginning learners require explicit visual–phonological support to reduce cognitive load and facilitate the decoding of Arabic text (Ikawati, 2020; Zainuddin et al., 2016).

The content expert also recommended aligning the themes across the PDF module, the instructional videos, and the five learning units. Inconsistency in themes was considered to potentially disrupt the cognitive and pedagogical flow of learning. Thematic alignment and consistency among objectives, content, and assessment are essential for supporting learning effectiveness. Instructional alignment has been shown to improve cognitive flow, motivation, and student learning outcomes (Hristov et al., 2023). Another revision involved the tarkīb waṣfī and the marking of ma'rifat elements. This indicates that consistency in the use of terminology and syntactic structures is essential for developing relational understanding in Arabic grammar, as explained (Yasri & Yoyo, 2022). Thus, the revisions provided by the content expert were not merely technical, but conceptual in nature and grounded in principles of Arabic linguistic theory.

Meanwhile, the media expert validation conducted by Moh. Fery Fauzi, S.Pd., M.Pd.I obtained a score of 90.67% with a "highly feasible" category, indicating that the interface design and media integration in the LMS Moodle met the required aspects of usability, navigation, and visual consistency. This finding is in line with studies that Rabiman et al. (2020) and Simanullang and Rajagukguk (2020) which affirm that Moodle supports the design of learning pathways that are structured, adaptive, and suitable for beginner learners. The integration of PDF modules as core content, videos as visual–auditory reinforcement, and quizzes as interactive exercises strengthens the effectiveness of multimedia-based learning. This is consistent with Mayer's multimedia learning theory and Paivio's dual coding theory, both of which emphasize that combining verbal and visual representations significantly enhances retention and conceptual understanding (Liu et al., 2020).

The usability quality of this product also reflects the application of user-centered design principles, such as consistent color schemes, intuitive icons, and simple navigation. This is essential because non-MA students often face dual challenges: difficulties in Arabic language learning and adapting to digital learning technologies. The initial implementation findings involving 32 students show that simple navigation and a sequential material format helped students learn independently. This supports Zimmerman's theory of self-regulated learning, which emphasizes that a clear structure facilitates students' ability to regulate their learning strategies (Cerón et al., 2024; Lan & Zhou, 2025).

The integration of the PDF content, instructional videos, and LMS Moodle features demonstrates the success of the design and development & implementation stages within the Hannafin & Peck model. The alignment of these three elements creates a complementary multimodal learning experience that is relevant to the needs of beginner learners and consistent with modern instructional principles. The implementation findings further show that the step-by-step material designed based on the initial needs analysis effectively supports students in understanding the basic patterns of Arabic sentence structure, particularly the elements of mubtadaʾ–khabar, basic jumlah fiʿliyyah, and simple iʿrab patterns.

Overall, this study provides a significant contribution to the development of kitābah al-jumal (sentence-writing) materials for beginner learners. The product developed is not only

empirically feasible based on material and media validation but also conceptually strong, as it is grounded in theories of language learning, instructional design, and educational technology. In addition to filling the research gap regarding the development of Moodle-based sentence-writing materials using the Hannafin & Peck model in the Indonesian context, this study also opens opportunities for further research at the effectiveness-testing stage through experimental or quasi-experimental designs, allowing the product to be implemented on a wider scale.

CONCLUSION

This study produced Arabic sentence-writing learning materials based on the Moodle LMS that are feasible and aligned with the needs of beginning learners, particularly those from non–Madrasah Aliyah backgrounds. The development process followed the Hannafin & Peck model, which includes the stages of analysis, design, development & implementation, and was limited to expert validation.

The material expert validation resulted in a score of 77%, categorized as good/appropriate, accompanied by several important revisions related to linguistic accuracy, including the writing of hamzah, completeness of diacritics, thematic alignment, and consistency of grammatical terminology. Meanwhile, the media expert validation obtained a score of 90.67%, categorized as very appropriate, indicating that the interface design, navigation, and media integration within Moodle met usability principles and suited the characteristics of beginning learners.

The limited implementation involving 32 students demonstrated that the developed materials were easy to understand, systematic, and effective in helping students build foundational understanding of Arabic sentence structure. Thus, the product has the potential to serve as a pedagogical solution to address competency gaps among novice learners who lack prior exposure to Arabic language instruction.

In addition to providing practical benefits for improving instructional quality, this study also offers theoretical contributions to the development of LMS-based instructional design for Arabic language learning. It further opens opportunities for future research focusing on effective testing through classroom-based experimental studies.

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