

Designing website and AI-based Indonesian teaching materials integrated with arts and cultural values

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Received: May 31, 2026

Revised: July 14, 2026

Accepted: July 26, 2026

KEYWORDS	ABSTRACT
Artificial Intelligence Arts Culture Teaching materials Website	Developing Indonesian language teaching materials that address 21 st century demands has become a necessity. This study aims to design AI-integrated and web-based Indonesian teaching materials that are integrated with art and cultural values. It focuses on student interaction with AI as cultural interpreter and the embedding of cultural values within learning activities. This study implements ADDIE design. The primary novelty of this research lies in the formulation of a tripartite integration framework that simultaneously unifies three core components within a single learning product. The research subjects were 200 junior high school students. Data was collected through student needs assessment questionnaires, expert validation questionnaires, and learning achievement tests. The needs analysis revealed a high demand for interactive digital teaching materials among students, with the aspects of digital teaching materials (4,15) and learning technology (4,10) ranking as the highest priorities. Expert validation results indicated that material and media feasibility achieved scores of 90,8% and 88,4%, both categorized as "highly feasible." The N-Gain test results demonstrated that the experimental class attained an average score of 0,60 (moderate category), with 60% of students falling into the high category, whereas the control class only achieved 0,28 (low category). Pedagogical implication of these findings is the need of learning model which integrates technology and culture to create meaningful, contextual and responsive learning experience. Therefore, AI-integrated and web-based Indonesian teaching materials integrated with art and cultural values are declared highly feasible and effective for use at junior high school level. This study offers three significant contributions: (1) a theoretical contribution in form of the tripartite integration framework, (2) a practical contribution through a ready-to-implement teaching material product, and (3) a policy contribution as a reference for developing an Indonesian language curriculum that is adaptive to the digital era while simultaneously preserving local culture.

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Introduction

In the 21st century, significant changes in the development of teaching materials from conventional to digital approaches are crucial. This is driven by the students' need to master the 4C skills, namely critical thinking, creativity, collaboration, and communication (Tohani & Aulia, 2022). Teaching materials are interactive tools that encourage active student engagement (Lee, 2016). Therefore, teachers are expected to be capable of designing teaching materials that are adaptive to technological developments (Astuti et al., 2019). This becomes a crucial step in improving the learning quality in modern era. In practice, however, many teachers remain constrained by the use of static textbooks, resulting in student disengagement from learning environments that bear little resemblance to their daily digital experiences. This disconnect signals an urgent pedagogical concern: Indonesian language education is at risk of marginalization and irrelevance unless it can effectively reconcile prescribed curricular goals with the lived realities of contemporary learners.

This transformation is substantially driven by the policy shift from the 2013 Curriculum to the Merdeka Curriculum, which imposes a mandatory emphasis on character development and the incorporation of local cultural values throughout the teaching and learning process. Improving learning quality in modern era can be through curriculum changes, such as the transition from the 2013 Curriculum to the Merdeka Curriculum. The Merdeka Curriculum mandates the reinforcement of character education and local wisdom in the learning process. Local wisdom is a cultural heritage that contains values of wisdom, norms, and community identities that have to be preserved (Karomah & Masyuri, 2024). Local wisdom can be utilized as a contextual learning resource, helping students understand materials easily. Values of mutual cooperation, tolerance, and responsibility can be instilled through regionally based cultural learning (Dartini et al., 2025). In line with the Merdeka Curriculum, it emphasizes character strengthening and appreciation for local culture (Zainuddin, 2025). The integration of local wisdom in learning can enhance students' engagement and learning outcomes (Wangkamhan & Nachaisin, 2024). Therefore, the implementation of local wisdom in the learning process improves education quality and strengthens students' identity and sense of love for the national culture. However, a critical review of the existing literature reveals that previous studies have largely treated the three core components mandated by this curriculum reform separately. Research on digital teaching materials has primarily focused on technological aspects (Li et al., 2008; Gan et al., 2015). Studies on AI in education have emphasized efficiency and personalization (Kolluru et al., 2018; Fitria, 2021). Research on local wisdom has been predominantly directed toward character development and cultural preservation (Subiyantoro & Fadhilah, 2020; Chan, 2018).

Arts and cultural values such as *batik*, *wayang*, traditional Javanese songs, and traditional dance need to be integrated into teaching materials (Subiyantoro & Fadhilah, 2020). Furthermore, traditional music, folk games, and folktales can be utilized as engaging and meaningful learning media (Chan, 2018). Traditional crafts such as weaving, carving, and basketry can develop students' creativity and skills (Ho & Shih, 2023). Local languages and oral literature such as rhymed poems and legends can also be used to strengthen students' literacy skills while preserving local culture (Firdaus, 2025). Culture-based activities such as art performances or cultural projects can enhance students' active participation in learning. This integration aims to instill cultural identity while enriching students' learning experiences (Malarsih et al., 2025). This fragmented approach has created a significant research gap. Although the Merdeka Curriculum calls for holistic integration, no study has yet simultaneously synthesized these three elements into an integrated pedagogical framework for Indonesian language learning. Therefore, technology serves as a tool for interaction and exploration, while local culture provides meaningful and relevant content that anchors learning to students' life experiences. AI can accommodate these interactions by personalizing learning pathways, thereby creating a synergistic pedagogical cycle. This is supported by constructivist learning theory in which knowledge is actively constructed when students engage with authentic, contextual, and interactive experiences (Vygotsky in Astuti et al., 2024).

Therefore, this integration represents as fundamental transformation of the pedagogical landscape. However, arts and cultural values have not been fully integrated into Indonesian language teaching materials, so this can be great potential of Indonesian language as a strategy for instilling the noble values of arts and culture. According to Laili (2017), these values are important for strengthening students' identity and character. Existing teaching materials have not been able to connect language learning with daily cultural life (Miqawati et al., 2024). This condition indicates a gap between curriculum demands and real implementation (Agung et al., 2025). Indonesian language materials can integrate arts and cultural values because it can be inserted into literary texts, listening to folktales, writing poetry, or engaging in dialogue. It can be said that Indonesian teaching materials should become the main media for the integration of arts and cultural values because the nature of language itself is inseparable from the culture

of its speakers. Digital platforms such as websites provide a flexible and accessible infrastructure for delivering various multimedia content, ranging from interactive texts and videos to collaborative exercises (Vlasenko et al., 2023; Doering et al., 2009). On the other hand, arts and cultural values such as batik, traditional puppetry, traditional music, and folklore offer a rich repository of local wisdom, ethics, and identity that can transform language learning into a more meaningful and contextualized experience (Karomah & Masyuri, 2024; Zainuddin, 2025). However, this synergy remains largely untapped in Indonesian classrooms. Teachers often lack the resources or training to connect linguistic materials with students' cultural backgrounds, rendering lessons abstract and disconnected from their daily lives.

This has resulted in Indonesian teaching materials frequently ineffective to engage students or instill a sense of pride in their own culture. Existing digital teaching materials tend to be text-heavy and monotonous (Huang et al., 2011; McGrath, 2016). Furthermore, the integration of local culture is limited to decorative motifs rather than being embedded as the core of learning activities (Fitrawati et al., 2023). On the other hand, Indonesian teaching materials need to be designed to keep pace with the demands of digital era in which students grow up as digital natives who are familiar with technology, instant access to information, and digital learning styles. Therefore, it is necessary to design Indonesian teaching materials that not only integrate arts and cultural values but are also packaged in a digital format that is interactive, engaging, and relevant to students' digital daily lives. A critical review of recent research confirms that this gap is consistent across various contexts. For instance, Jayadi et al. (2024) successfully integrated arts into instruction but did not utilize digital tools or AI; studies on AI (Hasibuan et al., 2023) focused on efficiency while neglecting cultural content; and research on local wisdom in education (Miqawati et al., 2024) rarely considered the potential of AI or web-based platforms. This fragmented evidence underscores the absence of a comprehensive model that addresses all three dimensions simultaneously. This represents more than a curricular design challenge. It is a profound pedagogical oversight that fails to recognize the inextricable bond between language and the culture of its speakers. To disregard this connection is to risk student disengagement and the gradual erosion of cultural identity in the face of accelerating globalization.

In digital era, technology plays an important role in education. Technologies such as websites and artificial intelligence (AI) have transformed the way teachers teach and students learn. Websites provide unlimited access to various learning resources, ranging from interactive materials to instructional videos. According to Vlasenko et al. (2023), websites have become a flexible and accessible platform for presenting teaching materials interactively. Through websites, materials can be presented in various forms such as text, images, audio, and video (Li et al., 2008). This enables students to learn both independently and collaboratively (Gan et al., 2015). Therefore, the use of websites can enhance the effectiveness and appeal of learning. The explicit novelty of this study is in its concurrent integration of three disparate domains, (1) digital teaching materials, (2) AI-based pedagogical applications, and (3) arts and cultural values into a unified and coherent framework specifically designed for Indonesian language learning at junior high school level.

Artificial Intelligence (AI) is capable of providing personalized learning experiences, such as virtual assistants that are ready to help students anytime and anywhere. According to Kolluru et al. (2018), AI can adjust materials to the needs, abilities, and learning styles of students. This technology can also provide automatic and real-time feedback (Fitria, 2021). However, the utilization of AI in Indonesian teaching material is still limited (Hasibuan et al., 2023). Therefore, innovation in integrating AI into teaching materials is needed to make learning more optimal. Therefore, this study aims to address these challenges by designing, developing, and evaluating web- and AI-based Indonesian teaching materials that are deeply integrated with arts and cultural values. This study is grounded in the pedagogical premise that authentic, technology-mediated, and culturally grounded learning experiences are the most effective for developing students' language proficiency and cultural identity.

In fact, the quality of digital Indonesian teaching materials needs improvement. Many available teaching materials tend to be textual and less interactive (Huang et al., 2011). This causes students to be less interested and less motivated in the learning process (Fitrawati et al., 2023). Furthermore, these teaching materials focus more solely on linguistic aspects (McGrath, 2016). As a result, learning becomes less contextual and less meaningful for students. This study is of critical importance as it focuses on the design of web- and AI-based Indonesian language teaching materials integrated with arts and cultural values. The urgency of this research is grounded in three pressing issues. First, no existing Indonesian language teaching materials simultaneously integrate these three components, resulting in a gap between the demands of the digital era and the need for cultural preservation. Second, the younger generation grows up as digital natives who are more familiar with technology, rendering conventional teaching materials no longer optimal in attracting interest and enhancing student engagement. Third, without adaptive teaching material design, local arts and cultural values are at risk of being eroded and abandoned by students.

Therefore, this research is imperative to design instructional materials that are responsive to the digital era while simultaneously preserving arts and culture through Indonesian language education.

Previous studies have examined the development of digital teaching materials in language learning. In addition, there are also studies discussing the utilization of AI in education. A study has addressed the integration of arts and culture in learning (Jayadi et al., 2024). However, these three aspects are generally examined separately. Research on digital teaching materials focuses more on learning technology, while AI emphasizes learning efficiency and personalization (Khatimah, 2025). Moreover, research on arts and culture tends to be directed toward strengthening students' character and identity (Woo & Choi, 2021). This indicates that there is still a research gap that needs to be addressed.

Explicitly, the research gap found is the absence of studies that integrate all three aspects simultaneously, namely: (1) the development of digital teaching materials, (2) the utilization of artificial intelligence (AI), and (3) the integration of arts and cultural values into Indonesian language teaching material. Research on digital teaching materials remains focused on learning technology aspects without deeply addressing arts and cultural content. Research on AI in education emphasizes efficiency and learning personalization rather than the preservation of cultural values. In addition, research on the integration of arts and culture tends to be directed toward strengthening students' character and identity without optimally utilizing the potential of AI and digital platforms. It can be said that there is no study which has designed website and AI-based Indonesian teaching materials integrated with arts and cultural values. This gap constitutes the main focus of this study. In fact, such integration has the potential to produce more innovative teaching materials that are relevant to the future (Tondeur et al., 2017). The combination of these components is expected to improve overall learning quality (Vonti et al., 2025).

The novelty of this study lies in the simultaneous integration of three components that have previously been examined separately, namely: (1) the development of digital teaching materials, (2) the utilization of AI, and (3) the integration of arts and cultural values into Indonesian teaching material. First, this study offers a tripartite integration framework (website, AI, and arts and culture) that has never been formulated in previous research. Previous research on digital teaching materials has focused on technology. AI research has focused on efficiency and personalization, while arts and culture research has focused on character strengthening. This study is the first to combine all three simultaneously in the context of Indonesian language learning. Second, this study produces a prototype of Indonesian teaching materials that are not only website and AI-based but also specifically integrated with local arts and cultural values. No similar product has integrated these three elements. Existing products generally focus on only one or two aspects. Third, this study does not treat arts and culture as mere complements, but rather as a core component equal to the technology and AI components. This differs from previous research which tends to position arts and culture as an additional component. Fourth, this study specifically designs teaching materials for Indonesian language subjects at the junior high school level which are integrated with arts and cultural values. Previous research has been general in nature without specifically addressing local wisdom.

This study is important to be conducted because it is focused on designing website and AI-based Indonesian teaching materials integrated with arts and cultural values. The urgency of this study lies in three pressing issues. First, there is no existing Indonesian teaching material that simultaneously integrates these three components, resulting in a gap between the demands of digital era and the need for cultural preservation. Second, the young generation grows up as digital natives who are more familiar with technology, so conventional teaching materials are no longer optimal in attracting their interest and increasing their engagement in Indonesian language learning. Third, without adaptive design of teaching materials, local arts and cultural values have a risk to be eroded and abandoned by students. Therefore, this study needs to be conducted to design teaching materials that are responsive to the digital era while simultaneously preserving arts and culture through Indonesian language education.

Method

This study was part of development research which implemented the ADDIE design. This ADDIE design was previously implemented by Susanti et al. (2025) in developing web-based teaching materials. The ADDIE design was chosen because it provided a systematic, adaptive, and relevant development framework suited to the characteristics of digital learning innovation based on websites and AI. In this context, ADDIE was considered appropriate because it had an organized structure that was oriented toward user needs. The ADDIE stages began with the analysis stage. It is important to note that this study involved 200 junior high school students as research subjects in both the analysis and implementation stages. In the analysis stage, all 200 students served as respondents to identify initial needs related to writing instruction. Subsequently, in the implementation stage, the same subjects were retained to test the effectiveness of the developed product. For the purpose of experimental testing, these 200 students were divided into two

groups: an experimental class (100 students) that utilized the developed product, and a control class (100 students) that did not utilize it. Therefore, the research subjects remained consistent across all stages, with differences only lying in the function and research design implementation according to the objectives of each stage.

The analysis stage was conducted to identify the needs of Indonesian language learning in the digital era, particularly those related to the development of website and AI-based teaching materials. The analysis focused on students' needs, learning characteristics, competencies to be achieved, and the need to integrate arts and cultural values into teaching materials. Furthermore, this stage also included an analysis of technological needs, both in terms of website use, integration of AI features, and user readiness to utilize digital learning. The analysis results served as the basis for determining the direction of developing teaching materials that were contextual, interactive, and relevant to the learning needs in 21st century. This stage involved 200 junior high school students. Data was collected using questionnaire. The aspects of questionnaire could be viewed in Table 1.

Table 1. Aspects of Student' Needs Questionnaire

<i>No</i>	<i>Aspect</i>	<i>Indicators</i>	<i>Number of Items</i>
1	Arts	Dance, music, fine arts, theater, performing arts	5
2	Culture	Local culture, traditions, local wisdom, traditional games, traditional cuisine	5
3	Literature	Folk poetry, fables, fantasy stories, short stories, inspirational stories, fiction & non-fiction book literacy	6
4	Language Skills	Writing descriptive texts, observation reports, procedures, expositions, explanations, discussions, speeches, news, letters, advertisements/slogans/posters, fantasy stories, fables, short stories, inspirational stories	14
5	Learning Technology	Use of gadgets, learning applications, artificial intelligence (AI), learning videos, interactive games	5
6	Digital Teaching Materials	Display, material completeness, examples, practice questions, online/offline access	5
Total			40

The questionnaire in table 1 was administered using a Likert scale (5-1), and the results from the participants were calculated using the Ideal Mean ($M_i = 3$) and Ideal Standard Deviation ($SD_i = 0.67$). It could be said that the categories of students' needs could be determined with the following ranges: a score of ≥ 4.0 was classified as Very High, a score of 3.34–3.99 as High, a score of 2.67–3.33 as Moderate, a score of 2.0–2.66 as Low, and a score of < 2.0 as Very Low.

The design stage was directed toward the comprehensive planning of learning system and the structure of digital teaching materials. At this stage, the website display design, learning navigation flow, integration of AI features, and the design of Indonesian teaching materials integrated with arts and cultural values were developed. The design also included the development of learning activities, user interaction strategies, and design of learning evaluations integrated into the digital system. This stage aimed to produce a product design that was visually appealing and supporting the effectiveness of students' learning experiences. At this stage, data was collected using a needs checklist. Before being deployed in the main study, the questionnaire of student needs was tested for validity and reliability. Content validity was assessed through evaluation by two experts (a lecturer in learning evaluation and a lecturer in Indonesian language studies) using Aiken's V index. The content validity results indicated that all statement items obtained Aiken's V values ranging from 0,78 to 0,92, which exceeded the minimum threshold of 0,70, thus confirming their validity. Reliability testing was conducted through a limited trial involving 30 students who were not part of the main research sample. The obtained Cronbach's Alpha coefficient was 0,87, surpassing the minimum acceptable value of 0,70, thereby establishing the instrument's reliability. As a result, the student needs questionnaire was deemed appropriate and valid for use in data collection.

In addition to involving students, the analysis stage also involved 5 Indonesian language teachers from junior high schools who were purposively selected from different schools. The involvement of teachers aimed to obtain practical perspectives regarding (1) which cultural materials were most relevant to integrate into Indonesian language learning, (2) technical constraints frequently encountered in utilizing

technology, and (3) which AI features were most needed to support the teaching process. Data from teachers were collected through semi-structured interviews lasting 30–45 minutes per teacher. The interview results from teachers were used to verify and enrich the student questionnaire data, ensuring that the needs analysis was not only based on student perceptions but also considered the readiness and needs of teachers as the primary implementers in the classroom.

The development stage was the process of realizing the design into a website and AI-based teaching material product. At this stage, the development of learning content, integration of AI features, preparation of supporting media, and development of interactive elements within the website were carried out. Arts and cultural values were integrated into the teaching materials as the main component of it. In order to guarantee that the integration between the website, AI features, and cultural values functioned as a unified system, integrative design criteria were developed as follows. First, content integration criteria stipulated that every Indonesian language learning material must contain at least one arts or cultural element (e.g., reading texts with wayang themes, writing description exercises about batik, or listening to folklore). Second, technology integration criteria required that AI features (virtual assistants, automated feedback provision, and material recommendations) be directly connected to cultural content for instance, AI providing culturally-based literary text recommendations tailored to students' proficiency levels. Third, pedagogical integration criteria mandated that each learning activity simultaneously encompass three components: language learning objectives, cultural appreciation, and the utilization of interactive technology. These design criteria served as the reference for developing flowcharts, storyboards, and AI usage scenarios, ensuring that integration was not merely additive but rather constituted the foundational architecture of the learning system.

The process of selecting cultural values to be integrated into the teaching materials was conducted through several systematic steps. First, identification of cultural values was carried out through a literature review of local wisdom relevant to the context of junior high school students. Second, consultation with arts and culture teachers was conducted to validate the authenticity and appropriateness of the cultural values within the educational context. Third, a focus group discussion was held with 5 Indonesian language teachers from junior high schools to discuss which cultural values were most feasible for integration into learning materials. This process resulted in the selection of 10 main cultural values to be integrated, namely: (1) batik and its philosophy, (2) traditional puppetry and moral values, (3) Javanese traditional songs and aesthetic values, (4) traditional dance and the value of mutual cooperation, (5) traditional ceremonies and religious values, (6) traditional games and sportsmanship values, (7) traditional cuisine and local wisdom values, (8) folklore and moral values, (9) woodcarving art and the value of perseverance, and (10) oral traditions and the value of togetherness. These ten cultural values were then transformed into structured learning activities. For example, the value of batik was integrated into writing descriptive texts by having students describe the motifs and philosophy of batik; the value of traditional puppetry was integrated into retelling activities by having students recount its stories; and the value of Javanese traditional song was integrated into poetry materials by having students analyze the diction and meaning of it. The developed product then underwent an expert assessment process. The first assessment was conducted to ensure content appropriateness in which two material experts were involved. This assessment used a questionnaire as the data collection technique. The questionnaire instrument could be viewed in Table 2.

Table 2. Aspects of Material Expert Questionnaire

<i>No</i>	<i>Aspects</i>	<i>Indicators</i>	<i>Number of Items</i>
1	Arts	Dance, music, fine arts, theater, traditional performing arts	5
2	Culture	Local culture, traditions, traditional ceremonies, local wisdom, traditional games, traditional cuisine	5
3	Literature	Folk poetry, fables, fantasy stories, short stories, inspirational stories, fiction & non-fiction book literacy	6
4	Language Skills 1	Writing descriptive texts, observation reports, procedure texts, exposition texts, explanation texts, discussions, persuasive speeches	7
5	Language Skills 2	Writing news texts, letters (personal & official), advertisements/slogans/posters	3
6	Language Skills 3	Writing report texts, fantasy stories, fables, short stories, inspirational stories, fiction & non-fiction book literacy	6

7	General Assessment	Feasibility of teaching materials; support for literature in the curriculum; integration of arts, culture, and literature	3
Total			35

The second assessment involved two media experts to ensure the quality of display and the functionality of technology used. This assessment used a questionnaire as data collection technique. The questionnaire instrument could be viewed in Table 3.

Table 3. Aspects of Media Expert Questionnaire

<i>No</i>	<i>Aspect</i>	<i>Indicators</i>	<i>Number of Items</i>
1	Visual Display	Color selection, font type and size, layout, proportion of visual elements, quality of images/illustrations/infographics, design consistency	6
2	Typography and Readability	Text readability against background, use of spacing, font variation, cross-device readability	4
3	Navigation and Ease of Use	Ease of menu access, clarity of instructions, ease of navigation, button response speed, availability of help button	5
4	Interactive Content Quality	Quality of text material presentation, quality of images/illustrations, quality of simple animations, interactive features, infographics	5
5	Website Technical Quality	Loading speed, device compatibility (responsiveness), browser compatibility, website stability, data security	5
6	Artificial Intelligence (AI) Integration	Ease of access to AI features, AI response speed, AI answer accuracy, writing task feedback, personalized learning recommendations	5
7	Completeness of Website Features and Components	Interactive table of contents/menu, user instructions, search feature, practice questions/quizzes feature, material download feature	5
8	Accessibility and Ease of Distribution	Ease of URL access, support for slow networks, ease of link sharing, offline mode (material download)	4
9	Appeal and Learning Motivation	Attractive interface design, gamification elements, increased learning interest, maintaining student focus, arts and cultural elements	5
10	Integration Support for Arts, Culture, and Literature	Suitability of icons/illustrations, suitability of theme with Indonesian culture, selection of traditional motifs/ornaments	3
11	General Assessment	Website feasibility, ease of operation, accuracy of AI feature integration	3
Total			50

Both questionnaires for material and media experts were assessed using a Likert scale of 1 to 5, with the following categories: 1 (very poor), 2 (poor), 3 (moderate), 4 (good), and 5 (very good). The feasibility criteria were determined based on the percentage of scores obtained, namely: highly feasible (81%–100%), feasible (61%–80%), moderately feasible (41%–60%), less feasible (21%–40%), and not feasible (<21%) (Sugiyono, 2017).

The questionnaires for material and media expert validation were also tested for validity and reliability. Content validity testing was conducted through assessment by two experts in the field of educational measurement and evaluation. The content validity results using Aiken's V indicated that all statement items obtained values ranging from 0,76 to 0,94, which exceeded the minimum threshold of 0,70, thus confirming their validity. Reliability testing of the expert questionnaire instruments was conducted by calculating the inter-rater reliability coefficient between the assessments of two material experts and two media experts using Cohen's Kappa. The calculated Cohen's Kappa value for the material expert

questionnaire was 0,82, while for the media expert questionnaire it was 0,79. Both values were above 0,70, thereby establishing the reliability of the expert questionnaire instruments.

After the product was revised based on feedback from material and media experts, the product was pilot-tested with 5 Indonesian language teachers from junior high schools to obtain practical assessments. The teachers were asked to try all features of the website and AI themselves, then provide feedback regarding (1) ease of use from the teacher's perspective, (2) the suitability of cultural content with classroom teaching needs, (3) the usefulness of AI features in reducing teachers' administrative burden (e.g., automated assessment features), and (4) recommendations for improvement before the product was implemented on a larger scale. The feedback from teachers was used for the final revision of the product.

The implementation stage was conducted by implementing a quasi-experimental design through product trials in Indonesian language learning in the experimental class. The implementation aimed to determine product usability, user responses, the effectiveness of using the website and AI in the learning process, and the acceptability of arts and cultural content in learning. At this stage, 200 students were directly involved in using the teaching materials. Empirical data on learning experiences, interactivity levels, and ease of use of the system were obtained.

The evaluation stage was carried out continuously to assess the quality and effectiveness of the developed product. The evaluation covered aspects of material content, instructional design, website display, AI functions, and the impact of using teaching materials on Indonesian learning process. The evaluation results were used as a basis for product refinement to make it more adaptive, interactive, and aligned with user needs. Therefore, the evaluation process served as the final stage of development and a mechanism for overall product quality enhancement.

Results and Discussion

Based on the results of needs analysis from 200 participants, the average score for each item is obtained. The average scores for each item indicate varying tendencies in students' needs. The detailed distribution of it can be viewed in Figure 1.

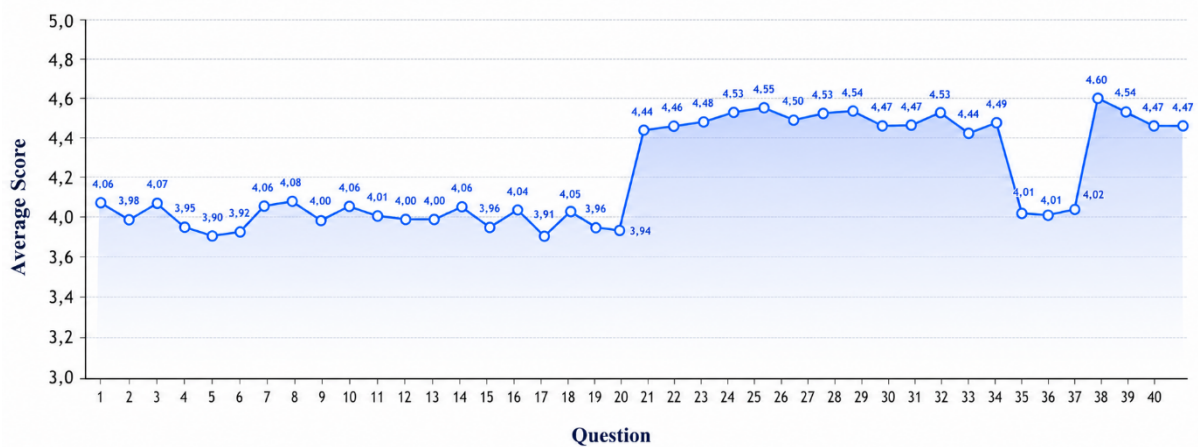


Fig. 1. Distribution of average scores for each item

Based on the scores for each item, the data is grouped into several assessment aspects. This grouping is carried out to facilitate the analysis process for each measured aspect. The detailed scores for each aspect can be viewed in Table 4.

Table 4. Scores of Students' Needs for Teaching Materials

Priority	Aspect	Score	Category
1	Digital Teaching Materials	4,15	Very High
2	Learning Technology	4,10	Very High
3	Language Skills	3,99	High
4	Literature	3,95	High
5	Arts	3,92	High
6	Culture	3,88	High

In table 4, the overall score is 3.99. This score falls into the High category. This indicates that junior high school students have a high need for website and AI-based Indonesian teaching materials integrated with arts and cultural values. The aspects of Digital Teaching Materials and Learning Technology are the highest priorities, falling into the Very High category, particularly regarding indicators such as learning videos, interactive games, AI virtual assistants, and attractive displays. The aspects of Language Skills, Literature, Arts, and Culture fall into the High category in which the aspects of traditional games, traditional music, and traditional cuisine need to be interesting. Therefore, the designed teaching materials should prioritize technological interactivity, visually appealing displays, concrete examples of local culture, and AI integration as virtual assistant to meet students' needs.

The results of needs analysis serve as the direct basis for designing product features. The relationship between student needs and the developed features can be explained as follows. First, students' need for learning videos (the indicator with the highest score in the Learning Technology aspect) is addressed by providing learning videos integrated into the website, which included subject explanation videos, cultural videos (e.g., videos on batik making, traditional dance performances), and tutorial videos on how to use AI features. Second, the need for an AI virtual assistant (score 4,3) is addressed by integrating an AI chatbot that can be accessed at any time to help students understand the material, provide additional explanations about cultural values, and answer student questions in real-time. Third, the need for interactive games (score 4,2) is addressed by developing culture-based quizzes and games, such as "Guess the Batik Motif" and "Arrange the Folktale," which tested students' understanding of the material while simultaneously introducing cultural values. Fourth, the need for an attractive display (score 4,0) is addressed by designing an interface that uses batik motifs as visual elements, a color palette inspired by traditional Indonesian colors, and a user-friendly layout. Therefore, every product feature is developed directly to respond to specific identified needs, rather than merely adding technological features indiscriminately. Findings from need analysis serve as the basis for designing classroom learning scenarios. The students' high need for an AI virtual assistant (4,3) does not imply that AI will replace the teacher's role; rather, it will collaborate with the teacher through the designed scenarios. These scenarios ensure that AI functioned as a supporting tool, not a substitute, and that the teacher remained the primary facilitator in the learning process.

After analysing students' needs, the Indonesian teaching materials enter the design stage. In the design stage, the website and AI-based Indonesian teaching materials integrated with arts and cultural values are designed based on the results of students' needs analysis. The design is carried out by organizing the material structure, determining learning outcomes, and integrating arts and cultural elements into each Indonesian learning topic. The designed materials included literary texts, language skills, and local cultural content packaged interactively. The material design can be viewed in Figure 2.

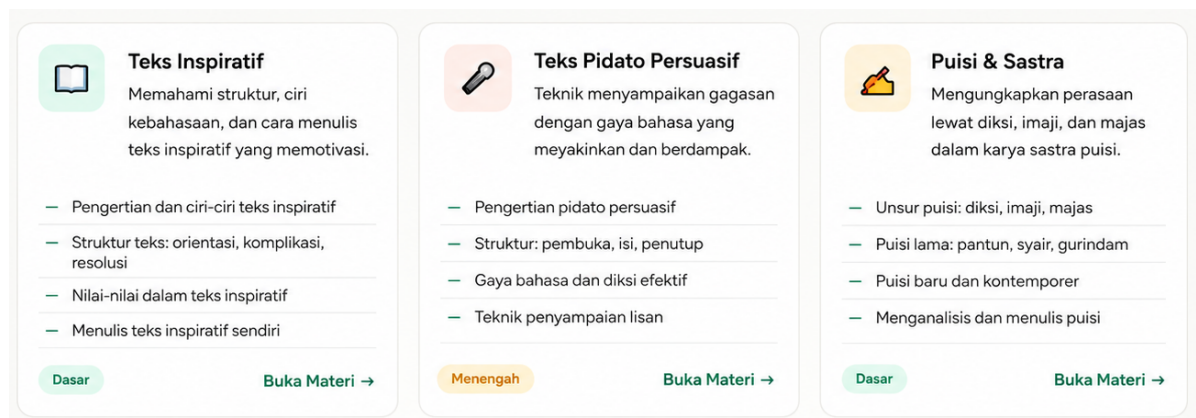


Fig. 2. Material Design in Website-based Indonesian Teaching Materials

In this stage, the website interface is designed to be user-friendly, attractive, and appropriate to user characteristics. The researchers develop flowcharts, storyboards, menu navigation, and scenarios for using AI to support learning, such as material recommendation features, writing assistance, automatic feedback, AI-based information search, and automated assessment of student performance. The teaching material design is equipped with multimedia components including images, videos, arts and cultural illustrations, interactive practice questions, and learning evaluations that can be accessed both online and offline. The interface design of website can be viewed in the Figure 3.



Fig. 3. Interface Design of Website-based Indonesian Teaching Materials

To provide a clearer illustration of how this teaching material is used in learning practice, a concrete learning scenario is presented below. Take, for example, a lesson on Writing Descriptive Texts with the theme of Batik. A student accesses the website and selects the material "Writing Descriptive Texts" with a batik theme. The student reads a descriptive text about the philosophy of the Batik Obor Sewu motif, which is presented with visual illustrations. After that, the student is asked to write a descriptive text about their favorite batik motif. As the student writes, the AI feature provides real-time suggestions for grammar improvement, sentence structure, and diction choices. After completing their writing, the student submits it and receives automated feedback that covers linguistic aspects (grammar, spelling, structure) and cultural aspects (depth of understanding of batik philosophy). The teacher can view the students' writing results and provide additional reinforcement in the classroom. This scenario demonstrates that student interaction with the platform occurs dynamically from accessing cultural texts, receiving contextual AI feedback, to engaging in activities that simultaneously combine language skills and cultural appreciation.

The result of design stage is initial prototype of website-based teaching materials that integrated arts, cultural values, and AI technology in Indonesian language learning. This prototype is designed as interactive learning media that focuses on the mastery of language skills and strengthening the appreciation of arts and local culture as part of student character formation. The integration of arts values is realized through the use of visual illustrations, literary works, and aesthetic elements that support engaging learning experience. Cultural values are presented through learning materials, texts, and activities that contain local wisdom, traditions, and Indonesian cultural identity. In addition, AI technology is utilized to support adaptive learning, such as providing automatic feedback, recommending materials based on student abilities, and offering interactive features that can increase student engagement and learning motivation.

The role of AI in this teaching material is not limited to adaptive learning functions alone, but is specifically designed to support students' understanding of arts and cultural values through the following mechanisms. First, AI functions as a cultural interpreter that provides contextual explanations of cultural values emerging in the text. For example, when students read a text about traditional puppetry, they can seek additional information about the philosophy of wayang characters, the moral values embedded within, and their relevance to modern life. Second, AI functions as a cultural guide in creative writing activities. When students write culture-based stories, AI can provide suggestions on cultural elements that could be incorporated, such as dialogue reflecting Javanese politeness values or setting descriptions depicting traditional atmospheres. Thus, AI does not merely serve as a technological tool but becomes a pedagogical partner that helps students internalize cultural values through meaningful interaction.

The cultural values in this teaching material do not merely function as thematic content that is inserted into the lessons, but rather as a pedagogical resource that actively shapes the learning process. Below is a concrete example of how cultural values are integrated into learning activities. This can be illustrated as follows. In culture-based learning, batik is not only utilized as content that is merely inserted into the learning materials, for instance through descriptive texts about batik that students read. Moreover, batik is integrated as a pedagogical resource that becomes part of the entire learning process. Students observe various batik motifs, analyze the philosophical meanings contained within them, and then write descriptive texts that reflect their understanding of these cultural values. Furthermore, students present their writing in front of the class to receive feedback from the teacher and peers. In this process, artificial intelligence (AI) is utilized to provide feedback on the quality of the writing and facilitate students to develop critical thinking skills, cultural literacy, and writing skills in a more comprehensive manner.

This prototype is served as the basis for development stage and being assessed by experts. The assessment results from two material experts can be viewed in Figure 4.

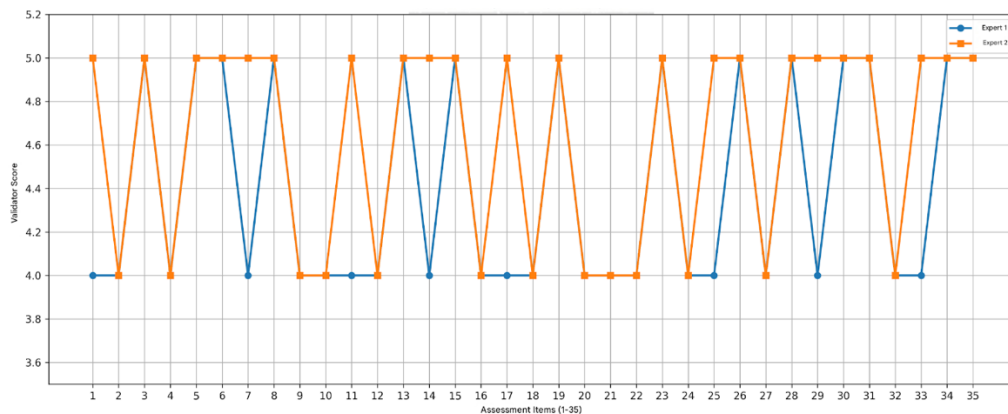


Fig. 4. Graph of Relationship between Scores of Material Expert 1 and Material Expert 2

Based on the assessments from two material experts, all assessment aspects receive Very Good category. The arts, culture, and literature aspects obtain average score of 4.5. In the aspect of language skills 1, the average score is 4.35; language skills 2 obtains 4.5; and language skills 3 obtains 4.6. Moreover, the general assessment aspect obtains the highest average score of 4.85. Overall, the average assessment score from both experts is 4.54, falling into Very Good category. Furthermore, the feasibility percentage calculation shows that expert 1 provides a feasibility score of 88.2%, while expert 2 gives a score of 93.4%. Both results belong to the Very Feasible category. The average feasibility percentage from both experts is 90.8%, it can be concluded that the developed teaching materials are very feasible to be implemented in Indonesian language learning. In addition, the first material expert suggests that more varied text examples are needed, while the second material expert suggests adding a glossary to each chapter.

Assessment results from two media experts can be viewed in Figure 5.

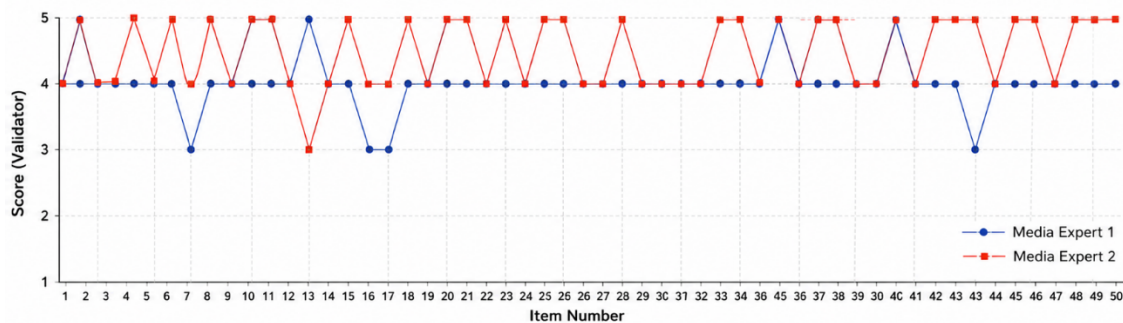


Fig. 5. Graph of Relationship between Scores of Media Expert 1 and Media Expert 2

In figure 5, all assessment aspects obtain Very Good category. The aspect of visual display obtains average score of 4.50. Aspect of typography and readability obtains average score of 4.25. Aspect of navigation and ease of use obtains average score of 4.20. Aspect of interactive content quality obtains average score of 4.30. Aspect of website technical quality obtains average score of 4.40. Aspect of AI integration obtains average score of 4.40. Aspect of completeness of website features and components obtains average score of 4.50. Aspect of accessibility and ease of distribution obtains average score of 4.25. Aspect of appeal and learning motivation obtains average score of 4.60. Aspect of integration support for arts, culture, and literature obtains average score of 4.84. Aspect of general assessment obtains average score of 4.50. Overall, the average assessment score from both experts is 4.44, falling into the Very Good category. Furthermore, the feasibility percentage calculation shows that expert 1 provides a total score of 215 out of a maximum score of 250 (86.0%), while expert 2 provides a total score of 227 out of 250 (90.8%). Both results are in the Very Feasible category. The average feasibility percentage from both experts is 88.4%, it can be concluded that the developed website and AI-based Indonesian teaching materials are very feasible to be implemented in Indonesian language learning. The first media expert suggests improving slow networks and providing more detailed user instructions. The second media expert suggests improving typography on several pages and adding more image elements. Based on the assessments and suggestions

from the four experts, the teaching materials have to be revised. The results of this revision are implemented in the experimental class.

The implementation stage involves two classes, namely the experimental class and the control class. Both classes are provided a pretest before the treatment is administered. The experimental class with 200 students is taught using website and AI-based Indonesian teaching materials integrated with arts and cultural values. The control class with 80 students is taught using teaching materials available on the internet. At the end of the session, both classes are provided a posttest. The comparison of pretest and posttest scores in both classes can be viewed in Table 5.

Table 5. Scores in Experimental Class and Control Class

<i>Class</i>	<i>N</i>	<i>Pretest (Mean)</i>	<i>Posttest (Mean)</i>	<i>Gain</i>
Experimental	200	62,4	85,2	22,8
Control	80	61,8	72,5	10,7

Based on results of prerequisite test, all research data meet the parametric statistical assumptions. In the normality test using Kolmogorov-Smirnov, the significance values for experimental class are 0.082 for the pretest and 0.095 for the posttest, while the control group obtains significance values of 0.078 for pretest and 0.088 for posttest. All of these significance values are greater than the significance level of 0.05, indicating that the data is normally distributed. Furthermore, the results of homogeneity of variance test using Levene's Test show significance values of 0.265 for pretest and 0.172 for posttest. Both of them are also greater than 0.05. Therefore, the variances between experimental and control classes are declared homogeneous. In addition, the results of equivalence test using Independent Sample t-test show a significance value. This can be viewed in Table 6.

Table 6. Equivalence Test (Independent Sample t-test)

<i>Variable</i>	<i>t</i>	<i>df</i>	<i>Sig. (2-tailed)</i>	<i>Description</i>
Pretest	1,234	278	0,218	Not significantly different

Because the significance value is greater than 0.05, there is no significant difference between the initial abilities of experimental class and control class. This indicates that both classes are in equivalent condition before the treatment is given. It can be said that they are suitable in testing learning effectiveness.

Based on results of effectiveness test using Independent Sample t-test with the hypothesis H_0 stating that there is no significant difference in posttest scores between experimental and control classes, and H_1 stating that there is a significant difference in posttest scores between the experimental and control classes, the results obtained are presented in Table 7.

Table 7. Posttest Difference Test (Independent Sample t-test)

<i>Variable</i>	<i>t</i>	<i>df</i>	<i>Sig. (2-tailed)</i>	<i>Mean Difference</i>
Posttest	12,456	278	0,000	12,7

In table 7, t-value of 12.456 is obtained with $df = 278$ and a significance value (Sig. 2-tailed) of 0.000. This value is smaller than significance level of 0.05. Therefore, H_0 is rejected and H_1 is accepted. Furthermore, the mean difference value of 12.7 indicates a difference in the average posttest scores between experimental class and control class. It can be concluded that there is significant difference in learning outcomes between two classes after the treatment is given. These results indicate that the use of website and AI-based Indonesian teaching materials integrated with arts and cultural values is effective in improving students' learning outcomes compared to the use of teaching materials available on the internet.

The results of improvement test using Paired Sample t-test show that experimental class experiences a significant improvement between pretest and posttest scores. This can be viewed in Table 8.

Table 8. Results of Improvement Test (Paired Sample t-test)

<i>Class</i>	<i>Pair</i>	<i>Mean Difference</i>	<i>t</i>	<i>df</i>	<i>Sig. (2-tailed)</i>	<i>Description</i>
Eksperimen	Posttest - Pretest	22,8	28,456	199	0,000	Significant
Kontrol	Posttest - Pretest	10,7	8,234	79	0,052	Not Significant

In table 8, the mean difference value for experimental class is 22.8 with t-value of 28.456 at $df = 199$ and significance value of 0.000 (< 0.05), indicating that the improvement is statistically significant. On the

other hand, control class obtains a mean difference of 10.7 with t-value of 8.234 at $df = 79$ and significance value of 0.052 (> 0.05), indicating that the improvement is not statistically significant. These data show that the improvement in learning outcomes in the experimental class is higher and more consistent than control class.

Furthermore, the N-Gain test results show that the effectiveness of improving learning outcomes in experimental class is in the moderate category, with an average N-Gain score of 0.60. A total of 120 students (60%) are in high category, 75 students (37.5%) are in moderate category, and only 5 students (2.5%) are in low category. In addition, control class obtains an average N-Gain score of 0.28, in which no student is in high category (0%), 20 students (25%) are in moderate category, and 60 students (75%) are in low category. This can be viewed more clearly in Figure 6.

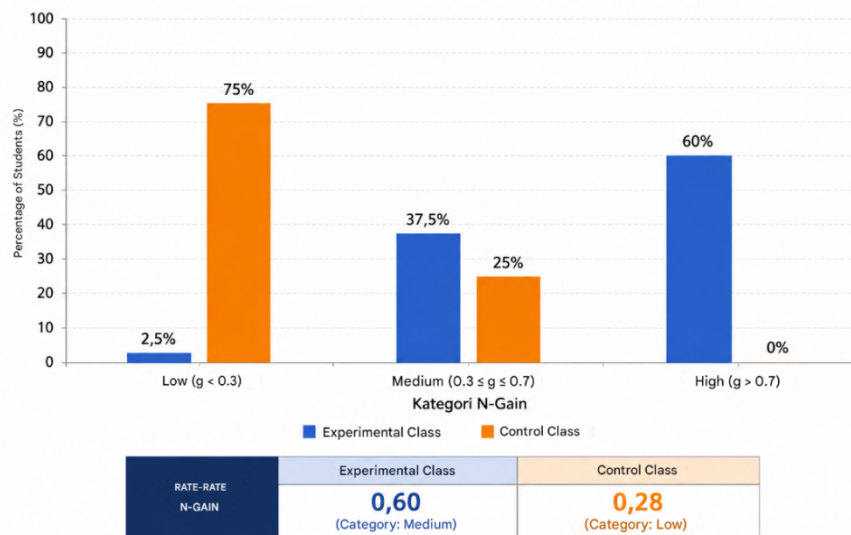


Fig. 6. Distribution of N-Gain Scores in Experimental and Control Classes

In figure 6, the results indicate that website and AI-based Indonesian teaching materials integrated with arts and cultural values are able to provide better improvement in learning outcomes compared to the use of teaching materials available on the internet.

To strengthen the evidence regarding the interaction between technology, AI, and culture, a more in-depth analysis of how these three elements interact in the learning process and contribute to improved learning outcomes is presented below. Analysis of student writing results show that 72% of students in the experimental class were able to explain the cultural philosophy in their descriptive texts, compared to only 18% of students in the control class. In their writings about batik, experimental class students describe the motifs, its colors, and explain the philosophical meanings, such as the "Obor Sewu Motif." Meanwhile, control class students tend to describe batik physically without addressing the philosophical aspects. This difference indicates that the integration of culture as a pedagogical resource significantly enhances the depth of student understanding. Furthermore, qualitative data from AI feedback reveals that this feature corrects linguistic aspects and provides cultural enrichment and feedback. This type of feedback encourages students to deepen their cultural understanding. Both interaction evidences demonstrate that technology, AI, and culture do not function separately but rather mutually reinforce one another in creating a holistic and meaningful learning experience.

The teacher's role in the implementation of this teaching material is not replaced by AI, but rather transformed into a more strategic one. Based on classroom observations and interviews with teachers, the teacher acts as a facilitator of discussion and reflection. After students have independently used the website, the teacher leads class discussions to explore student understanding, correct misconceptions, and connect the material to everyday life contexts. The teacher also leads reflection on the cultural values that have been learned, deepening the understanding that has been built through interaction with AI. Therefore, the teacher's role shifts from being a transmitter of information to a learning facilitator supported by AI data and analysis. The collaboration between teachers and AI creates a more effective learning ecosystem, in which teachers can focus on aspects that require a human touch, such as in-depth discussions, value reinforcement, and personalized guidance.

To provide more concrete evidence of how culture functions as a pedagogical resource, an analysis of student work samples demonstrating deep cultural integration is presented below. The analysis of student

writing reveals a marked difference between the experimental and control classes, particularly in the depth of understanding of cultural philosophy. Students in the experimental class describe the physical characteristics of batik, interpret its philosophical meanings, and connect them to life values. For example, a student writes, "The Kawung batik symbolizes purity of heart. Its perfectly round shape teaches us to always introspect and perfect ourselves. In daily life, we must strive to become better individuals." On the other hand, students in the control class tend to produce factual descriptions focused on visual aspects without revealing deeper cultural meanings. For instance, a student writes, "Kawung batik has round patterns like kawung fruit. Its colors are brown and white." These findings indicate that learning that integrates cultural values as a pedagogical resource is able to encourage students to develop a deeper, more reflective, and more contextual understanding of the cultural meanings being studied. This data shows that students in the experimental class are able to identify cultural elements (as students in the control class did), analyze philosophy, connect it to life values, and express cultural understanding creatively through their writing. Culture in the experimental class functioned as a pedagogical resource that encourages critical thinking, creativity, and value internalization.

In the final stage, evaluation is conducted to assess the quality of the developed product and to identify the shortcomings of teaching materials before they are used more widely. The evaluation in this study includes formative evaluation and summative evaluation. Formative evaluation is conducted at each stage of development through needs analysis, material expert validation, media expert validation, prototype revision, and teaching material trials. Summative evaluation is conducted after the learning implementation to examine the results of using teaching materials in experimental and control classes.

In formative evaluation, material experts provide several suggestions regarding the content of teaching materials, such as the need to add more varied text examples and provide a glossary in each chapter to help students better understand certain terms. In addition, media experts suggest improving access support for slow internet networks, improving typography on several pages, and adding visual elements to make the website display more attractive. Based on these suggestions, the researchers revise the display, material structure, and supporting features on teaching materials before implementing it in learning process.

Summative evaluation is conducted after the teaching materials are implemented in experimental class. The evaluation results show an improvement in students' learning outcomes in experimental class compared to control class. Furthermore, the N-Gain test results reveal that the majority of students in experimental class are in moderate to high improvement categories. During the implementation process, students also demonstrate more active engagement when using interactive features and AI assistance on the website.

Based on the established indicators of successful integration, the evaluation of integrated system shows the following results. Content integration is successful, as 85% of students are able to identify and explain the cultural values contained in each learning material, as evidenced by their written work and quiz responses. Technology integration is successful in which 89% of students reported that AI helps them understand the cultural material better (based on questionnaire responses). Pedagogical integration is successful, as there is a significant improvement in student learning outcomes encompassing linguistic aspects (an increase of 22,8 points) and cultural appreciation aspects (75% of students in the experimental class demonstrate deep cultural understanding compared to 15% in the control class). These indicators demonstrate that the integration is functioned effectively. It serves as the foundational architecture of learning system.

Based on these evaluation results, the developed teaching materials still require improvement in several technical aspects, particularly optimizing website access on certain networks and developing more varied multimedia content. However, the evaluation results indicate that teaching materials have met learning needs and can be used as an alternative for Indonesian learning materials at junior high school level. Therefore, these teaching materials can be recommended as effective learning innovation to improve language skills and foster appreciation for arts and culture among junior high school students in digital era.

In other words, the evaluation of website and AI-based Indonesian teaching materials integrated with arts and cultural values have three main conclusions. First, these teaching materials are declared to be very feasible based on material expert and media expert validation. Second, these teaching materials are effective in improving students' learning outcomes. Third, these teaching materials are superior to conventional teaching materials, with a higher improvement in learning outcomes.

Based on results of this study, the discussion focuses on the main findings, which include: (1) students' needs for website and AI-based Indonesian teaching materials integrated with arts and culture values, (2) the feasibility of the teaching materials based on material expert and media expert validation, (3) the effectiveness of the teaching materials in improving students' learning outcomes, and (4) the advantages of

website and AI-based teaching materials compared to teaching materials available on the internet. These four findings will be discussed as follows.

First, students' needs for interactive digital teaching materials integrated with technology reflect the changing characteristics of today's generation who are familiar with digital devices. The need for learning videos, interactive games, AI virtual assistants, and attractive displays indicates that students are no longer satisfied with textual and static teaching materials. In line with Chisunum & Nwadiokwu (2024) who state that digital teaching materials can enhance student engagement through a combination of text, audio, video, animation, and interactive evaluations. Silverajah & Govindaraj (2017) also confirm that flexible access to materials according to students' needs and learning paces can increase student learning independence. Meanwhile, the need for the integration of arts and culture indicates that students have an awareness of the importance of local cultural values in learning. Kosimov (2025) reinforces that the preservation of national culture can be strengthened through learning that presents aesthetic, moral, social, and historical values in a sustainable manner.

Second, the feasibility of the teaching materials which is assessed as very feasible by both material and media experts, indicates that the developed product has met quality standards both in terms of content and technical aspects. The very feasible assessment in the aspects of arts, culture, and literature indicates that local values have been well integrated into the learning materials. This finding is supported by Ottu et al. (2024) who state that the integration of cultural elements into teaching materials has been proven to enhance students' understanding of local wisdom through literature, folktales, poetry, and other cultural expressions. Fitriadi et al. (2024) argue that strengthening arts and cultural values helps develop critical thinking skills while instilling a sense of pride in Indonesian cultural identity. The very feasible assessment in the aspects of integration support for arts and culture, appeal, visual display, and feature completeness indicates that the developed website is designed by considering good instructional design principles. Fisher & Baird (2006) state that educational websites can improve learning efficiency by providing materials, exercises, evaluations, and discussion forums within a single digital system. Fitria (2025) also adds that the development of website-based Indonesian teaching materials enables the integration of multimedia such as literary videos, poetry reading audio, cultural images, and interactive exercises.

Third, the effectiveness of website and AI-based teaching materials in improving student learning outcomes demonstrates that these teaching materials are superior to teaching materials available on the internet. The significant improvement in experimental class proves that the treatment in form of using website and AI-based teaching materials had a real positive impact. This finding aligns with Li (2023), who states that AI can help organize materials based on students' abilities, needs, and learning styles in a more targeted manner. Hasani (2025) confirms that Indonesian language learning can be strengthened through the use of AI for text analysis, language correction, automatic question generation, and recommendations for arts and cultural materials. Furthermore, Kovalchuk et al. (2025) state that students' learning experiences become more interactive through educational chatbots, intelligent evaluation systems, and website-based material personalization. Therefore, the combination of website as a distribution platform and AI as a learning personalization feature creates an effective synergy in improving student learning outcomes.

Fourth, the advantages of website and AI-based teaching materials compared to teaching materials available on the internet are in their ability to present materials in a more interactive, varied, and adaptive manner. The majority of students in experimental class are in moderate to high improvement categories, while students in control class are predominantly in low category. This indicates that digital teaching materials with AI integration are able to address the challenges of learning in digital era, which requires flexibility, personalization, and active student engagement. Doering et al. (2009) state that digital teaching materials make it easier for teachers to update learning content in accordance with curriculum developments, social conditions, and the needs of modern education. Trissetianto et al. (2026) also argue that interaction between teachers and students can be strengthened through communication features, direct feedback, and collaborative learning. Another advantage of these teaching materials is their ability to integrate arts and cultural values contextually, so students' language skills are improved and they give more appreciation of cultural heritage. The design of digital-based Indonesian teaching materials with AI integration and arts and cultural content is a strategic way in creating innovative learning that is relevant to technological developments.

It can be said that results of this study confirm that the integration of arts, cultural values, and AI technology in website-based teaching materials represents an educational innovation relevant to the needs of digital era. These findings reinforce the theory that the design of digital-based Indonesian teaching materials is a strategic way in creating innovative learning that is responsive to the development of educational technology. These teaching materials are recommended as an alternative for Indonesian

language learning at junior high school level to improve students' language skills and foster their appreciation of arts and culture.

Conclusion

This study successfully developed website and AI-based Indonesian language teaching materials integrated with arts and cultural values that were validated as highly feasible by material and media experts, proven effective in significantly improving junior high school students' learning outcomes, and superior to existing online teaching materials, as reflected in the experimental class's moderate N-Gain with most students achieving high improvement. The integration of websites, AI, arts, and culture creates interactive, flexible, personalized, contextual, and meaningful learning, supports students' independent learning, reduces dependence on direct teacher guidance, strengthens language skills, and fosters appreciation of cultural heritage, character, and national identity. The study contributes theoretically through a tripartite integration framework of websites, AI, and arts and culture; practically through the production of concrete teaching materials; and at the policy level by providing a reference for developing Indonesian language curricula responsive to the digital era. Although limited by its implementation scope, AI feature development, and lack of long-term testing, the findings empirically confirm that the synergy between technology and culture is a strategic approach to creating innovative, humanistic, and future-responsive Indonesian language learning. Further research should test these teaching materials on a larger scale, over a longer period, across different educational levels and contexts, and with more adaptive and personalized AI features.

Declarations

- Author contribution** : Zuhad is responsible for the design and development of website system and the integration of AI technology into the digital teaching materials. Carrine Irawan Kumalasari plays a role in analyzing user needs, developing research instruments, and collecting data. Cahyo Hasanudin acts as the corresponding author, coordinating all stages of the research, from design, development, and implementation to the writing of the article manuscript. Aji Krisna Bayu contributes to calculating the instrument validation results, quantitative and qualitative data analysis, and writing the initial draft of the manuscript. Liga Alhaqi Audi Putra Nusantara is involved in reviewing international literature, compiling the literature review, and final editing of the manuscript to align with international publication standards. All authors have approved the final version of this manuscript and take full responsibility for the entire content of it.
- Funding statement** : This research has fully funded by the Ministry of Higher Education, Science, and Technology (Kemdiktisaintek), Republic of Indonesia, through the scheme of *Penelitian Dosen Pemula* in 2026.
- Conflict of interest** : All authors declare that they have no competing interests.
- Ethics Approval** : Information on Ethics Approval and informed consent statements are required for all articles published in BAHASTRA since 2025.
- Additional information** : No additional information is available for this paper.

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