



## Managing Digital Transformation in Cultural Education: The Development and Evaluation of KIRANTI Media for Phase D Learners

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### Abstract:

Integrating digital technology into language and cultural education creates opportunities to develop interactive learning media that can strengthen students' understanding of traditional literature and cultural heritage. However, the teaching of the Ramayana epic, particularly through wayang-based learning, requires learning media that are engaging, interactive, and relevant to students' digital learning experiences. This study describes the development of KIRANTI (Kidang Ramayana Interaktif) and examines its effectiveness as a digital learning medium for teaching the Ramayana epic and supporting students' cultural literacy. The study used a quantitative survey approach. Data were collected through questionnaires administered to Phase D students after using KIRANTI in wayang learning. The data were analyzed using descriptive statistics, including score calculation, percentages, and mean analysis, to determine the learning media's effectiveness. The findings show that KIRANTI obtained an effectiveness score of 93.8%, categorized as very effective. These findings imply that KIRANTI can serve as an interactive digital learning medium that supports students' understanding of the Ramayana epic while strengthening cultural literacy. Integrating it into language, literature, and cultural learning may offer a meaningful way to preserve cultural knowledge through digital education.

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## INTRODUCTION

Cultural diversity is a defining characteristic of Indonesian society and an important foundation for strengthening national identity across generations. Education has a strategic role in transmitting cultural knowledge because schools provide systematic spaces where students can encounter, understand, and appreciate cultural heritage. Wayang, as an Indonesian cultural heritage, is particularly relevant because its narratives contain moral values, philosophical meanings, and representations of social life that can support cultural literacy. Cultural literacy enables individuals to understand cultural differences, develop tolerance, and participate meaningfully in multicultural societies (Sudrajat & Sufiyana, 2024; Fikriyah, 2026; Muttaqien & Sain, 2026). In the digital era, however, cultural transmission increasingly interacts with technological change, making digital media important for connecting traditional cultural content with

contemporary learning practices. Digital technologies can broaden access to cultural knowledge and support heritage preservation through innovative forms of representation (Mendoza et al., 2023; Siliutina et al., 2024; Putri & Priantara, 2026). Therefore, integrating wayang narratives into digital learning is important for sustaining cultural knowledge while making cultural education more relevant to younger generations.

Digital learning media can be understood through multimedia learning principles, which emphasize integrating multiple forms of information to support meaningful learning experiences. In this context, digital media can combine written explanations, images, audio, video, animation, and interactive activities to present learning content more dynamically. Research on digital learning media indicates that such integration can accommodate students' learning-style preferences and create more flexible learning experiences (Nurmalisa et al., 2023; Naimah, 2026; Syafrudin et al., 2026). Digital media can also increase students' motivation and improve learning outcomes when appropriately integrated into instructional processes (Afifa & Astuti, 2024; Ulfa & Aldin, 2026). Interactive digital media also give students opportunities to engage actively with learning materials rather than merely receive information. Agustini et al. (2022) demonstrate that interactive flipbooks can create more engaging learning experiences, while Hamdani et al. (2022) highlight the potential of interactive multimedia to support higher-order learning. Thus, digital learning media provide a theoretical and practical basis for transforming cultural content into interactive educational experiences.

Despite this potential, cultural and literary learning still faces challenges in keeping students engaged with traditional cultural content. Conventional instruction may present wayang and epic narratives primarily through verbal explanations or static learning resources, limiting opportunities for students to interact with characters, storylines, cultural symbols, and embedded values. This challenge is particularly relevant when students increasingly encounter cultural information through digital environments. Systematic research shows that digital learning media can maximize learning opportunities when they are designed interactively and aligned with learners' needs (Salam et al., 2024; Anapah et al., 2026; Rahmayanti et al., 2026). However, technological adoption alone does not guarantee meaningful cultural learning because educational media must also preserve cultural meanings and provide opportunities for interpretation. Cultural literacy requires more than recognizing cultural artifacts; it involves understanding cultural values and developing attitudes that support multicultural interaction (Rizal et al., 2024; Evanita et al., 2026). Consequently, learning media for wayang should bridge digital engagement with cultural understanding rather than simply digitizing existing instructional materials.

Previous studies have demonstrated the educational potential of digital media, but their emphases remain diverse. Nurmalisa et al. (2023) synthesized the use of digital learning media to support students' learning-style preferences, while Iskandar et al. (2023) examined the educational use of PowerPoint and YouTube. Agustini et al. (2022) developed an interactive flipbook to improve students' learning experiences, and Hamdani et al. (2022) developed Android-based interactive multimedia to support critical thinking. Similarly, Ramlah et al. (2022) showed that interactive puzzle media can create enjoyable learning experiences. In contrast, Alyusfitri et al. (2024) examined the relationship between student responses and learning outcomes through interactive multimedia-based e-modules. These studies establish that interactivity can strengthen engagement and learning experiences. Nevertheless, most studies focus on general

academic content or broad digital-learning applications rather than integrating interactive media with Indonesian wayang narratives and the Ramayana epic. This gap highlights the need for culturally grounded digital media designed specifically for literary and cultural learning.

Research on cultural literacy further underscores the importance of integrating cultural content into educational practice. Dafit et al. (2024) demonstrated that ethnopedagogy-based thematic modules can improve students' understanding and cultural literacy, while Kale et al. (2023) emphasized the importance of cultural literacy in education involving diverse cultural backgrounds. Dukes et al. (2023) highlighted culturally responsive literacy instruction as an important approach for connecting literacy practices with learners' cultural contexts. At the same time, digital technologies have increasingly been recognized as instruments for cultural heritage preservation and dissemination (Mendoza et al., 2023; Lian & Xie, 2024). Ajani et al. (2024) specifically emphasized the potential of digital media technologies to revitalize indigenous knowledge and languages. However, research has paid limited attention to the intersection of interactive digital learning, wayang-based literary education, and cultural literacy. Existing research therefore leaves a contextual and pedagogical gap concerning how traditional epic narratives can be transformed into interactive learning experiences while retaining their cultural significance. Addressing this gap is important for connecting cultural preservation with contemporary educational practice.

The state of the art in this study is KIRANTI (*Kidang Ramayana Interaktif*), an interactive digital learning medium that presents the Ramayana epic in Javanese and supports cultural learning. KIRANTI integrates narrative content, visual representations, learning videos, and educational games into a single digital learning environment. Rather than treating wayang merely as cultural material to be introduced, the medium positions the Ramayana narrative as an interactive learning resource through which students can engage with characters, events, values, and cultural meanings. The development also connects cultural literacy with digital learning by giving students opportunities to encounter cultural knowledge in a format consistent with contemporary digital experiences. This approach matters because cultural preservation requires not only maintaining heritage content but also developing transmission forms that remain accessible and meaningful to younger generations. Therefore, KIRANTI connects traditional cultural heritage, interactive digital pedagogy, Javanese literary learning, and cultural literacy within one instructional medium.

This study addresses the research problem of how KIRANTI can be used as an interactive digital learning medium to teach the Ramayana epic and support cultural literacy among Phase D students. The study argues that a culturally grounded digital medium can provide a more meaningful learning experience when traditional literary content is presented in interactive, accessible formats. KIRANTI is therefore positioned not simply as a technological product, but as a pedagogical medium that connects digital learning with cultural knowledge. The study examines its effectiveness through students' responses to determine how well the medium supports learning about the Ramayana epic and cultural literacy. The expected contribution is both practical and conceptual. Practically, KIRANTI offers an alternative medium for learning Javanese language and culture. Conceptually, the study shows how interactive digital media can connect cultural heritage education with contemporary learning practices. The findings are expected to provide evidence for developing culturally responsive digital learning media that support cultural continuity among younger generations.

## RESEARCH METHODS

This study employed a quantitative descriptive survey design to obtain empirical evidence on students' perceptions of KIRANTI (*Kidang Ramayana Interaktif*), a digital learning medium used for the Ramayana Epic in Phase D. A survey design was selected because it enables measurement of respondents' perceptions through standardized questionnaire data and supports descriptive representations of educational phenomena (Kusumo et al., 2022). The design was appropriate for examining usability, engagement, and cultural-literacy relevance of technology-mediated learning without manipulating instructional conditions. Recent studies indicate that interactive and culturally contextualized digital media can support students' literacy development, engagement, and learning experiences (Asmayawati et al., 2024; Zulqadri & Nurgiyantoro, 2023). From an educational-management perspective, KIRANTI was treated as an instructional resource whose use should align with learning objectives and be managed within classroom practice.

The research was conducted at MTs Al Asror Semarang, Central Java, Indonesia. The site was selected purposively because Grade VII students had received the Ramayana Epic material through KIRANTI, making it directly relevant to the study. The target population comprised Grade VII students in Phase D who had completed learning activities using KIRANTI. Researchers purposively selected participants based on enrollment in Grade VII and prior exposure to the KIRANTI-supported Ramayana lesson. This approach ensured respondents could evaluate the media based on learning experience rather than hypothetical familiarity. This contextual selection aligns with recent studies emphasizing culturally relevant digital materials and contextual learning environments in developing students' cultural literacy (Regi et al., 2025; Asmayawati et al., 2024). The school context also enabled consideration of instructional planning, implementation, and monitoring as educational-management dimensions.

Data were collected through a structured questionnaire developed from indicators of digital learning media quality and cultural literacy. The instrument covered media appearance, ease of use, quality of Ramayana content presentation, interactivity, learning motivation, and students' understanding and cultural literacy, drawing on the media-assessment aspects reported by Priyambodo et al. (2012). Questionnaire construction followed principles of construct operationalization, clear item formulation, respondent comprehension, and attention to validity and reliability. Each statement used a five-point Likert scale: Strongly Agree, Agree, Neutral, Disagree, and Strongly Disagree. Recent educational survey research also supports structured rating scales for measuring perceptions and technology-related learning variables among students and teachers (Bintoro et al., 2024; Suryadi et al., 2025). The instrument therefore captured user-oriented media characteristics and perceived instructional value within digital learning management.

Data were analyzed using descriptive statistics by calculating item scores, total scores, means, and percentages for each indicator. Percentages were interpreted using predetermined categories of very good, good, fair, poor, and very poor to describe KIRANTI utilization overall. This approach was appropriate because the study aimed to summarize patterns of student response rather than test causal relationships. Descriptive analysis is commonly used in educational survey research to portray levels of digital literacy, technology use, and learning perceptions (Kusumo et al., 2022; Suryadi et al., 2025). Interpretation also considered the educational-management function of digital media, particularly its alignment with instructional planning, implementation, monitoring, and improvement. This management-oriented interpretation is consistent

with research showing that successful digitalization requires coordinated resources, implementation processes, review, and institutional improvement (Purnomo et al., 2024; Riinawati, 2024).

## RESULTS AND DISCUSSION

### Results

#### Development of the KIRANTI Digital Learning Media

The development of KIRANTI (*Kidang Ramayana Interaktif*) followed a systematic sequence: needs analysis, material planning, design planning, media development, and trial implementation. The development process aimed to produce a digital learning medium for teaching the Ramayana epic through an integrated combination of textual content, visual illustrations, animated videos, and educational games. Each stage generated specific components that were subsequently incorporated into the final version of KIRANTI.

#### Needs Analysis

The needs analysis identified student characteristics, learning content, and instructional conditions relevant to Javanese language learning. The analysis indicated that wayang learning relied primarily on teacher explanations and textbooks. Under these conditions, students struggled to follow the storyline and identify the cultural values embedded in the Ramayana epic. The needs analysis therefore identified a need for learning media that could present the material in more varied and interactive formats. The characteristics of Phase D students also informed the media format. Accordingly, KIRANTI was designed to incorporate textual explanations, illustrations, animated videos, and educational games within an integrated digital learning environment.

#### Material Planning

The material was organized around the learning outcomes and learning objectives for Javanese language instruction in Phase D, with the Ramayana epic as the main content. The material covered the main elements of the story, including characters, plot, and storyline, as well as character and cultural values represented through the narrative. The selected values included honesty, responsibility, courage, loyalty, and sacrifice. The material was presented in concise, clear language with supporting illustrations.



Figure 1. Material Display in the KIRANTI Media

The material presentation was organized to maintain the essential content of the Ramayana epic while providing visual support for students' comprehension. This structure formed the basis for integrating the material into the subsequent design and development stages.

## Design Planning

The design stage focused on developing KIRANTI's interface and navigation structure. The interface incorporated visual elements associated with Javanese culture, including wayang character illustrations, coordinated visual elements, and recognizable navigation icons. The main interface consisted of four principal menus: learning outcomes and learning objectives, Ramayana epic materials, learning videos, and educational games.



Figure 2. Main Menu of the KIRANTI Media

The learning video component presented the Ramayana storyline through narration, animated illustrations, and audio. The educational game was designed as an interactive activity to assess students' understanding of the material. The game provided immediate feedback after students selected an answer, showing whether their responses matched the answer key.



Figure 3. Wayang Animation Video Display

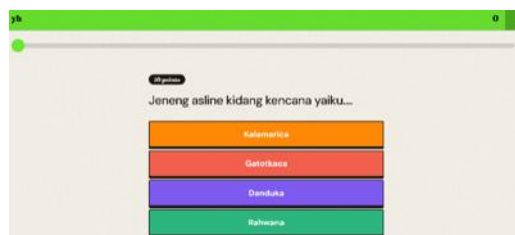


Figure 4. Quiz Game Display



Figure 5. Quiz Feedback Display

## Media Development

The development stage integrated the planned materials and design components into the KIRANTI digital learning medium. The completed media contained the Ramayana learning materials, animated learning videos, and educational games. These components were connected within a sequential learning structure. The video component presented the storyline through narration, moving illustrations, and audio, while the educational game provided an interactive activity with immediate feedback. The resulting media version was then used by students in the survey-based evaluation.

### Students' Responses to the KIRANTI Digital Learning Media

The effectiveness-related responses were collected through a questionnaire administered after students used KIRANTI to learn the Ramayana epic. The study assessed seven indicators: media attractiveness, ease of use, material comprehensibility, video usefulness, enjoyment of the educational game, learning motivation, and cultural literacy. Table 1 presents the descriptive results.

**Table 1. Students' Questionnaire Results**

| No.            | Indicator                                      | Percentage   | Category         |
|----------------|------------------------------------------------|--------------|------------------|
| 1              | Attractive media appearance                    | 94.4%        | Very Good        |
| 2              | Ease of media use                              | 93.6%        | Very Good        |
| 3              | Ease of understanding the material             | 92.8%        | Very Good        |
| 4              | Video supports material understanding          | 93.6%        | Very Good        |
| 5              | Educational game makes learning more enjoyable | 96.0%        | Very Good        |
| 6              | Media increases learning motivation            | 93.6%        | Very Good        |
| 7              | Media supports cultural literacy               | 92.8%        | Very Good        |
| <b>Average</b> |                                                | <b>93.8%</b> | <b>Very Good</b> |

The overall questionnaire score was 93.8%, which was classified as very good according to the predetermined interpretation criteria. The indicator scores ranged from 92.8% to 96.0%. The educational game indicator recorded the highest percentage at 96.0%. The media appearance indicator followed with 94.4%, while ease of use, video support for material understanding, and learning motivation each obtained 93.6%. Material comprehensibility and cultural literacy each obtained 92.8%. Thus, all seven assessed indicators were classified within the very good category.

### Relevance of KIRANTI for Ramayana Learning

The questionnaire results provide a descriptive profile of students' responses to using KIRANTI in Ramayana learning. Across the seven assessed indicators, the percentages were consistently high, ranging from 92.8% to 96.0%. The results indicate that students reported positive responses across the media appearance, usability, material presentation, video component, educational game, learning motivation, and cultural literacy indicators.

The media incorporated four principal learning components: learning outcomes and objectives, Ramayana learning materials, animated videos, and educational games. These components were presented within a single digital learning environment. The questionnaire results showed that the educational game was the highest-rated component, with a score of 96.0%. At the same time, the material comprehensibility and cultural literacy indicators received the lowest scores, both at 92.8%. The findings provide a descriptive representation of students' responses to the different components of the KIRANTI media.

### Students' Responses Related to Cultural Literacy

The cultural literacy indicator scored 92.8%, placing it in the very good category. This result reflects students' questionnaire responses on KIRANTI's contribution to their cultural literacy during Ramayana learning. The indicator was assessed alongside other dimensions of the digital learning medium and produced the same percentage as the material comprehensibility indicator.

KIRANTI presented the Ramayana epic through textual materials, illustrations, animated videos, and interactive evaluation activities. The media therefore combined literary content with visual and interactive components within the same learning environment. The questionnaire results for cultural literacy indicate a positive student response to this component of the media.

Overall, the descriptive findings show that KIRANTI received an average score of 93.8%, categorized as very good, across the seven assessed indicators. The results demonstrate consistently high response percentages for all measured aspects, with the educational game receiving the highest score (96.0%) and material comprehensibility and cultural literacy receiving the lowest scores (92.8%). These findings constitute the empirical results of the student questionnaire regarding the use of KIRANTI as a digital learning medium for the Ramayana epic.

## Discussion

The findings indicate that KIRANTI received an overall response score of 93.8%, categorized as very good, across media appearance, usability, material comprehension, video support, educational games, learning motivation, and cultural literacy. This result is consistent with Nurmalisa et al. (2023), who emphasized that digital learning media can accommodate students' learning preferences through varied modes of information presentation. Similarly, Salam et al. (2024) reported that appropriately designed digital media can maximize learning opportunities by providing accessible and engaging learning experiences. The present finding extends these observations to Javanese language learning, particularly the teaching of the Ramayana epic. Unlike studies examining digital media primarily as general instructional technology, KIRANTI integrates digital interaction with culturally specific literary content. Thus, the high student response suggests that digital learning can not only improve learning experiences but also facilitate engagement with culturally embedded educational content.

The educational game obtained the highest response score of 96.0%, indicating that this component received particularly positive student responses. This finding corresponds with Ramlah et al. (2022), who demonstrated the relevance of interactive puzzle media for creating enjoyable learning experiences. It also supports Agustini et al. (2022), whose interactive flipbook demonstrated the potential of interactive digital formats to strengthen students' learning experiences. However, KIRANTI differs from these media because its interactive activity is embedded within a cultural-literary learning environment rather than focusing primarily on general academic content. The game connects directly to the Ramayana materials and provides immediate feedback after students respond. This finding shows how an interactive assessment feature can integrate cultural narratives within a single learning medium. This integration is a key characteristic of KIRANTI compared with more general-purpose interactive learning media.

The 93.6% response rate for the video component aligns with the broader literature emphasizing multimedia integration in digital learning. Iskandar et al. (2023) identified PowerPoint and YouTube as widely used digital learning resources that support varied instructional presentations. Similarly, Hamdani et al. (2022) found that interactive multimedia can provide richer learning experiences by integrating multiple digital elements. KIRANTI extends this approach by combining animated video with textual Ramayana content and interactive activities rather than presenting video as an independent instructional resource. The finding therefore suggests that video's value within KIRANTI is tied to its role as one component of an integrated learning environment.

This differs from approaches that treat digital video as the primary medium. The contribution is integrating audiovisual representation with cultural narrative, allowing the Ramayana storyline to be presented in a format aligned with contemporary digital learning practices.

The 92.8% score for cultural literacy provides an important finding because it demonstrates a positive student response to the cultural dimension of KIRANTI. This result is consistent with Dafit et al. (2024), who showed that ethnopedagogical learning materials can support students' cultural literacy and understanding. It also aligns with Rizal et al. (2024), who emphasized the importance of developing cultural literacy through educational experiences. Nevertheless, this study differs from those studies by using an interactive digital medium centered on a specific traditional epic. KIRANTI does not separate cultural content from language and literary learning; instead, the Ramayana narrative serves as both learning content and a cultural resource. The contribution therefore lies in demonstrating a practical intersection between digital pedagogy and cultural literacy. Although the cultural literacy score was the joint-lowest among the indicators, it remained in the very-good category, suggesting that students still received cultural content positively in the digital format.

The findings also support the argument that digital technology can contribute to cultural heritage preservation when cultural content is adapted to contemporary learning formats. Mendoza et al. (2023) identified digital technologies as important tools for preserving cultural heritage, while Siliutina et al. (2024) highlighted both opportunities and challenges in digital cultural preservation. Ajani et al. (2024) similarly emphasized digital media's potential to revitalize indigenous knowledge and languages. KIRANTI contributes to this body of research by translating the Ramayana epic into an interactive educational format rather than presenting cultural preservation as a separate archival activity. Its novelty lies in connecting cultural heritage preservation directly with classroom learning. This approach positions digitalization as a way to transmit cultural knowledge through educational practice. The finding is particularly relevant because the media retains the cultural narrative while changing its mode of presentation, thereby connecting traditional content with students' contemporary digital learning environment.

The overall consistency of the seven indicators, ranging from 92.8% to 96.0%, also corresponds with research emphasizing the value of interactive digital media for student engagement. Afifa and Astuti (2024) reported positive effects of digital learning media on motivation and learning outcomes, while Alyusfitri et al. (2024) found that students' responses to interactive multimedia were related to learning outcomes. However, the present study should be interpreted differently because its descriptive survey design does not establish causal effects or statistically test relationships between media use and learning outcomes. The contribution is therefore empirical rather than causal: it documents students' responses to a culturally specific digital learning medium. This distinction strengthens the interpretation of the findings because the 93.8% result is treated as evidence of positive student perception rather than proof that KIRANTI improved motivation, comprehension, or cultural literacy. The study consequently provides a basis for subsequent experimental or comparative research.

The principal contribution and novelty of this study lie in integrating Ramayana-based cultural content, Javanese language learning, audiovisual presentation, educational games, and cultural literacy within one interactive digital medium. Previous studies have established the value of digital learning media (Nurmalisa et al., 2023; Salam et al., 2024), interactive multimedia (Hamdani et al., 2022; Agustini et al., 2022), and

culturally oriented learning (Dafit et al., 2024; Ajani et al., 2024), but these strands have generally been examined separately. KIRANTI brings these dimensions together in a specific pedagogical context. The 93.8% overall response and consistently very-good ratings indicate that students responded positively to this integrated format. Thus, the study contributes a culturally grounded model of digital learning in which technological innovation is used alongside, rather than in place of, cultural content. Further research can examine its effectiveness through experimental designs, learning-outcome comparisons, and longer-term assessments of cultural literacy.

## CONCLUSION

The most important finding of this study is that KIRANTI (*Kidang Ramayana Interaktif*) achieved an overall student response of 93.8%, showing that integrating text, illustrations, animation, video, and interactive quizzes was highly acceptable for learning the Ramayana epic. This finding shows that culturally grounded digital learning media can transform traditional literary content into a more engaging and accessible learning experience without disconnecting it from its cultural foundations. This study's scholarly contribution is showing how interactive digital pedagogy can integrate with culturally specific literary content to strengthen the connection between Javanese language learning, digital learning experiences, and cultural literacy. The research implications are both theoretical and practical: theoretically, the findings extend discussions of digital pedagogy by emphasizing cultural contextualization as an important dimension of interactive learning media; practically, KIRANTI provides teachers with an alternative medium for presenting Ramayana materials in ways that align with contemporary students' learning preferences while preserving local cultural content. Nevertheless, this study is limited by its descriptive survey design, single educational setting, and reliance on students' self-reported responses, which prevent causal conclusions regarding improvements in learning achievement, motivation, or cultural literacy. Future research should therefore employ experimental, quasi-experimental, comparative, or longitudinal designs involving more diverse schools and participants to evaluate KIRANTI's effects on learning outcomes, motivation, engagement, and cultural literacy, while also refining its interactive features and assessing its applicability across different learning contexts.

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## CONFLICT OF INTEREST

All authors declare that there are no relationships or interests that could potentially influence the independence and objectivity of this article.

## USE OF ARTIFICIAL INTELLIGENCE (AI)-ASSISTED TECHNOLOGY

During the writing process, the authors used AI-based tools (Open AI Chat GPT) to assist with language editing and improve the manuscript's readability. AI was not used to replace the analysis, interpretation of data, or formulation of the research conclusions.

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