

DEVELOPMENT OF INTERACTIVE LEARNING VIDEOS FOR SIGEH PENGUTEN DANCE: INTEGRATING EDUCATIONAL TECHNOLOGY AND CULTURAL PRESERVATION IN MULTICULTURAL EDUCATION

Nursya Fathin Nadiya^{1a*}, Dwi Yulianti^{2b}, Herpratiwi^{3c}, Fitri Daryanti^{4d}

^{1,2,3,4} Master of Educational Tecnology, University, Indonesia

^aE-mail: nfathinnadiya@gmail.com

(*) Corresponding Author

nfathinnadiya@gmail.com

ARTICLE HISTORY

Received : 20-05-2026

Revised : 07-06-2026

Accepted : 30-06-2026

KEYWORDS

cultural preservation;
educational technology;
interactive learning
video;
multicultural education;
Sigeh Penguten Dance;

ABSTRACT

The preservation of local cultural heritage in the digital era requires innovative learning media that not only enhance students' skills but also promote cultural understanding and multicultural awareness. Addressing this need, this study developed an interactive learning video for Sigeh Penguten Dance that integrates educational technology, cultural preservation, and multicultural education within a single learning platform. Learning Sigeh Penguten Dance at SMPN 38 Bandar Lampung faces several challenges, including students' difficulties in memorizing movement sequences, synchronizing movements with rhythm, and understanding the cultural values embedded in the dance. In addition, learning activities remain predominantly teacher-centered, limiting opportunities for independent learning. This study aimed to develop and evaluate the feasibility and effectiveness of the interactive learning video. The research employed a Research and Development (R&D) approach using the Borg and Gall model. The participants consisted of 20 students involved in dance extracurricular activities at SMPN 38 Bandar Lampung. Data were collected through observations, interviews, expert validation sheets, student response questionnaires, and dance performance tests assessing the aspects of wiraga, wirama, and wirasa. The results revealed that the developed media achieved an average validation score of 3.90, indicating a very feasible category. Student responses reached an average of 99.7%, reflecting highly positive perceptions of the media. Furthermore, the effectiveness test produced an N-Gain score of 0.95, categorized as high. These findings demonstrate that the interactive learning video effectively improves students' dance performance while supporting local cultural preservation and strengthening multicultural awareness through technology-based learning. Therefore, the developed media offers a practical and scalable innovation for arts education, contributing to the sustainable preservation and transmission of cultural heritage in contemporary educational settings.

This is an open access article under the CC-BY-SA license.



INTRODUCTION

The rapid advancement of digital technology has significantly transformed educational practices worldwide, encouraging educators to adopt innovative instructional approaches that enhance learning effectiveness, accessibility, and student engagement. The integration of technology into educational environments has become an essential component of twenty-first-century learning because it supports diverse learning styles and facilitates active knowledge construction (Mayer, 2020). Multimedia-based learning environments that combine text, images, audio, animation, and video have been shown to improve learners' cognitive processing and learning outcomes by engaging multiple sensory channels simultaneously (Fiorella and Mayer, 2018; Moreno and Mayer, 2022).

In arts education, particularly dance learning, technology-enhanced instructional media provide substantial opportunities to improve psychomotor skill acquisition. Dance learning requires students to observe movement patterns, understand rhythm synchronization, and repeatedly practice physical movements to achieve mastery. Conventional teaching approaches often depend heavily on direct teacher demonstrations, limiting students' opportunities for independent learning and repeated practice outside classroom settings. Consequently, digital learning media capable of supporting self-paced and repetitive learning have become increasingly important in contemporary dance education (Shadiev and Yang, 2020).

Among various forms of educational technology, interactive video-based learning has emerged as an effective medium for teaching practical and performance-based skills. Interactive learning videos enable learners to access instructional content repeatedly while simultaneously engaging with multimedia elements such as visual demonstrations, narration, textual explanations, and navigation controls. Previous studies have demonstrated that interactive videos improve learner motivation, participation, procedural understanding, and skill performance across various educational contexts. A systematic review conducted by Kay (2021) and Noetel *et al.* (2021) concluded that video-based instruction consistently enhances learning outcomes in higher education, while Zang *et al.* (2022) and Hong *et al.* (2022) found that interactive video technology significantly improves learner engagement and motor skill acquisition. In dance education specifically, video-based instruction facilitates repeated observation of movement sequences, enabling students to practice independently and develop greater confidence in performing dance movements (Risner and Anderson, 2021).

Beyond improving educational outcomes, educational technology also plays an important role in preserving cultural heritage. Globalization and modernization have accelerated cultural transformation processes that often reduce younger generations' interest in traditional arts and local cultural practices. UNESCO (2023) emphasizes that educational institutions play a strategic role in safeguarding intangible cultural heritage through innovative educational approaches that facilitate cultural transmission across generations. Digital technology offers opportunities not only to document and archive cultural expressions but also to disseminate and revitalize traditional cultural knowledge in ways that are relevant to contemporary learners. Emerging technologies have increasingly been recognized as effective tools for cultural heritage preservation, facilitating broader public access, cultural transmission, and educational engagement with local traditions (Ch'ng *et al.*, 2023; Economou and Meintani, 2021).

Indonesia is widely recognized for its cultural diversity, encompassing numerous ethnic traditions, languages, artistic performances, and local wisdom practices. One important cultural heritage from Lampung Province is the Sigeh Penguten Dance, a traditional welcoming dance performed to honor distinguished guests. The dance embodies cultural values such as hospitality, respect, harmony, and social cohesion, making it a significant representation of Lampung cultural identity (Putri and Nurcahyani, 2022). As an element of intangible cultural heritage, Sigeh Penguten Dance serves not only as an artistic performance but also as a medium for transmitting cultural values and preserving collective community identity.

However, preliminary observations conducted at SMPN 38 Bandar Lampung revealed several challenges in the implementation of Sigeh Penguten Dance learning activities. Students frequently experienced difficulties in memorizing movement sequences, synchronizing movements with accompanying rhythms, and expressing the emotional dimensions of the dance. Learning activities were predominantly conducted through teacher-centered demonstrations and repetitive practice sessions without sufficient technological support. As a result, students often

displayed low confidence and limited mastery of dance movements. Similar challenges have been reported in previous studies examining traditional dance learning in Indonesian educational settings, where limited instructional media hinder students' opportunities for independent learning and skill development (Pratama, *et. al.*, 2023).

Numerous studies have investigated the effectiveness of multimedia learning and video-based instruction in improving educational outcomes (Kay, 2021; Zang *et. al.*, 2022). Other studies have explored the role of digital technology in preserving traditional culture and supporting cultural education (Wahyuni *et. al.*, 2024). Ch'ng *et. al.* (2023) highlighted the growing role of digital technologies in safeguarding cultural heritage, while Economou and Meintani (2021) demonstrated the educational potential of mobile technologies for engaging learners with cultural content. Nevertheless, these studies primarily focused on heritage preservation and visitor engagement rather than integrating cultural preservation with instructional effectiveness in formal educational settings.. Nevertheless, existing studies generally focus on either instructional effectiveness or cultural preservation separately. Research integrating educational technology, traditional dance learning, cultural preservation, and multicultural education within a unified learning framework remains limited, particularly in the context of Sigeh Penguten Dance.

From the perspective of multicultural education, integrating local cultural heritage into digital learning environments can strengthen students' cultural identity while fostering appreciation for cultural diversity. Banks (2019) argues that multicultural education should provide learners with meaningful opportunities to understand, appreciate, and preserve diverse cultural traditions while preparing students for participation in increasingly diverse societies. Neito (2020) emphasizes that multicultural education should foster inclusivity, cultural responsiveness, and respect for cultural diversity through meaningful learning experiences.. Therefore, the integration of traditional cultural content into technology-enhanced learning media contributes not only to academic achievement but also to cultural awareness, intercultural understanding, and social cohesion.

Accordingly, this study addresses the identified research gap by developing an Android-based interactive learning video for Sigeh Penguten Dance that integrates educational technology, cultural preservation, and multicultural education values. The novelty of this study lies in the development of an interactive multimedia application that simultaneously functions as a learning medium, a cultural preservation instrument, and a multicultural educational tool. Unlike previous studies that primarily emphasize instructional effectiveness, this study examines how technology-enhanced learning can contribute to both improved dance performance and the preservation of local cultural heritage.

Therefore, the objectives of this study were to: (1) develop an interactive learning video for Sigeh Penguten Dance, (2) evaluate its feasibility through expert validation, (3) analyze students' responses toward the developed media, and (4) examine its effectiveness in improving students' dance performance.

METHOD

This study employed a Research and Development (R&D) approach using the Borg and Gall development model (Borg and Gall, 2003). The model was selected because it provides a systematic framework for developing, validating, and evaluating educational products before their implementation in real learning environments. Through this approach, the developed learning media could be continuously refined based on expert feedback and field-testing results to ensure its feasibility and effectiveness.

The study was conducted at SMP Negeri 38 Bandar Lampung, Indonesia. The participants consisted of twenty students from Grades VII and VIII who actively participated in dance extracurricular activities. A purposive sampling technique was employed because these students were directly involved in learning Sigeh Penguten Dance and represented the intended users of the developed learning media.

The development process followed several stages, beginning with a needs analysis, followed by product design, product development, expert validation, product revision, field testing, and final product revision. During the needs analysis stage, observations and interviews were conducted with teachers and students to identify learning difficulties and instructional media requirements. The findings revealed that students frequently experienced difficulties in memorizing dance movement sequences, synchronizing movements with musical

accompaniment, and practicing independently due to the limited availability of learning resources. Based on these findings, learning materials were designed to include the historical background of Sigh Penguten Dance, its cultural values, costume descriptions, movement tutorials, and practical exercises. The application was subsequently developed using Adobe Animate to produce an Android-based interactive learning video.

Data were collected using observation sheets, interview guidelines, expert validation sheets, student response questionnaires, and dance performance assessment rubrics. Observation sheets and interview guidelines were used to obtain information regarding learning conditions and students' needs. Expert validation sheets were designed to evaluate the appropriateness of content, instructional quality, visual appearance, navigation, interactivity, and technical functionality of the developed media. Student response questionnaires were administered to examine students' perceptions regarding the attractiveness, usability, and usefulness of the application in supporting dance learning.

To assess students' dance performance, a rubric based on three fundamental dimensions commonly used in Indonesian dance education was employed, namely wiraga, wirama, and wirasa. The wiraga dimension measured the accuracy of movement execution, including body posture, movement coordination, sequence accuracy, and conformity to the standard techniques of Sigh Penguten Dance. The wirama dimension evaluated students' ability to synchronize their movements with the accompanying music, maintain tempo consistency, and demonstrate rhythmic precision throughout the performance. Meanwhile, the wirasa dimension assessed students' expressive abilities, including confidence, emotional expression, appreciation of the dance's cultural meaning, and the ability to convey the aesthetic character of the performance. These indicators enabled the assessment process to capture not only technical mastery but also artistic and cultural understanding of the dance.

All validation instruments were assessed using a four-point Likert scale ranging from 1 (poor) to 4 (excellent). The dance performance assessment was conducted based on predetermined criteria for each indicator, allowing a more objective evaluation of students' learning outcomes.

Data were analyzed using descriptive statistical techniques to determine the feasibility of the developed product and students' responses toward its implementation. Mean scores obtained from expert validation were categorized according to predetermined feasibility criteria. The effectiveness of the interactive learning video was measured using the normalized gain (N-Gain) score proposed by [18]:

The resulting N-Gain values were interpreted using three categories: high ($g \geq 0.70$), medium ($0.30 \leq g < 0.70$), and low ($g < 0.30$). The effectiveness of the developed media was determined based on improvements in students' dance performance scores across the dimensions of wiraga, wirama, and wirasa after utilizing the interactive learning video.

RESULT AND DISCUSSION

Need Analysis

The preliminary needs analysis revealed several challenges in the implementation of dance learning activities. Students reported difficulties in memorizing movement sequences, understanding movement transitions, and synchronizing movements with accompanying music. Teachers also indicated that learning activities relied heavily on direct demonstrations, limiting students' opportunities for independent practice outside school hours.

This finding supports previous research reporting that instructional videos improve learner participation, autonomy, and confidence in acquiring practical skills. Fiorella and Mayer (2018) demonstrated that instructional videos are most effective when designed according to multimedia learning principles, while Noetel et al. (2021) reported that video-based learning consistently improves academic performance and learner engagement across educational contexts.

Product Development

The developed product was an Android-based interactive learning application created using Adobe Animate. The application integrated various multimedia components, including instructional videos, narration, text explanations, images, traditional music accompaniment, and interactive navigation features.

The learning materials included:

- Introduction to Sigeh Penguten Dance.
- Historical background and cultural significance.
- Traditional costumes and accessories.
- Step-by-step movement tutorials.
- Guided practice sessions.
- Evaluation activities.

Feasibility Evaluation

The feasibility of the developed media was assessed by material experts and media experts.

Table 1. Expert Validation Results

Validator	Mean Score	Category
Material Expert	3.88	Very feasible
Media Expert	3.92	Very feasible
Average	3.90	Very feasible

(Source: Processed Research Data, 2026)

The average validation score of 3.90 indicates that the developed media met pedagogical, technical, and cultural content standards.

The effectiveness of the developed media can be explained through Mayer's Cognitive Theory of Multimedia Learning, which posits that learners achieve better learning outcomes when information is presented through integrated verbal and visual channels [1]. The combination of movement demonstrations, narration, textual explanations, music accompaniment, and interactive navigation enabled students to process information more efficiently and facilitated meaningful learning experiences. By presenting information through multiple complementary modalities, the application supported learners in constructing mental representations of dance movements while reducing unnecessary cognitive load. Consequently, students were able to develop procedural knowledge and movement accuracy more effectively than through conventional instruction alone.

Student Responses

Student responses were collected after the implementation of the interactive learning media.

Table 2. Student Response Results

Aspect	Percentage (%)
Attractiveness	100
Ease of Use	99
Usefulness	100
Learning Motivation	100
Average	99.7

(Source: Processed Research Data, 2026)

Students demonstrated highly positive responses toward the developed media. The average percentage score reached 99.7%, indicating that students perceived the media as attractive, useful, easy to use, and beneficial for independent learning.

The highly positive student responses toward the developed media indicate that the success of the application was influenced not only by its technological features but also by the relevance of its cultural content. Students were not merely interacting with digital media; they were engaging with cultural knowledge that was closely connected to their local identity and social environment. This finding suggests that the integration of cultural heritage into digital learning environments can increase students' sense of ownership and personal relevance toward the learning material. According to constructivist learning perspectives, learners tend to be more motivated when educational content is meaningful and connected to their lived experiences. Therefore, the strong acceptance of the application may reflect the successful combination of technological interactivity and culturally relevant content.

Effectiveness Testing

The N-Gain score of 0.95 indicates a substantial improvement in students' dance performance following the implementation of the interactive learning video.

The findings demonstrate that the developed interactive learning video effectively improved students' dance performance. The average N-Gain score of 0.95 indicates a substantial improvement in students' mastery of dance movements after utilizing the developed media. This result confirms that multimedia-based learning environments can effectively support psychomotor skill acquisition through repeated observation and practice opportunities.

The substantial improvement in students' dance performance is also consistent with the findings of (Borg and Gall, 2003) who reported that interactive video technology significantly enhances motor skill learning by enabling learners to repeatedly observe, analyze, and practice complex movement patterns. This mechanism is particularly relevant in dance education, where psychomotor skill acquisition requires continuous visual modeling and practice.

The effectiveness of the developed media can be explained through Mayer's Cognitive Theory of Multimedia Learning, which posits that learners achieve better learning outcomes when information is presented through integrated verbal and visual channels (Mayer, 2020). The combination of movement demonstrations, narration, textual explanations, music accompaniment, and interactive navigation enabled students to process information more efficiently and facilitated meaningful learning experiences. The multimedia elements reduced cognitive overload while supporting the development of procedural knowledge necessary for dance performance.

The highly positive student responses (99.7%) indicate strong acceptance of technology-enhanced learning environments among contemporary learners. Students perceived the media as attractive, useful, and easy to use, suggesting that interactive video-based learning can increase learning motivation and engagement. This finding supports previous research reporting that instructional videos improve learner participation, autonomy, and confidence in acquiring practical skills (Kay, 2021; Zhang *et al.*, 2022).

Furthermore, the integration of cultural values within the multimedia application contributed to a more holistic learning experience. In addition to learning movement techniques, students were introduced to the historical background, symbolic meanings, traditional costumes, and cultural values embedded in Sigeh Penguten Dance. This combination of skill development and cultural understanding may explain why students perceived the application as highly useful and engaging. Rather than viewing dance solely as a performance activity, students were encouraged to understand its broader cultural significance, thereby fostering deeper learning and stronger emotional engagement with the material.

From a cultural preservation perspective, the developed media serves as an effective instrument for safeguarding local cultural heritage. The digitalization of traditional dance content transforms cultural knowledge into accessible learning resources that can be repeatedly utilized by younger generations. As emphasized by UNESCO (2023), digital educational resources play a strategic role in preserving intangible cultural heritage because they facilitate the transmission of cultural knowledge beyond conventional face-to-face settings. The present study demonstrates that educational technology can move beyond documentation functions and become an active medium for cultural revitalization through learning.

The findings also highlight the contribution of educational technology to multicultural education. Exposure to local cultural values through interactive digital media enabled students to strengthen their cultural identity while simultaneously developing appreciation for Indonesia's cultural diversity. This outcome supports Banks' perspective (Banks, 2019) that multicultural education should provide meaningful learning experiences that encourage learners to recognize, respect, and preserve cultural diversity. In this context, technology functioned not only as a learning tool but also as a bridge connecting students with cultural values that are increasingly challenged by globalization and cultural homogenization (Fikri, 2025).

The present findings also support the concept of digital dance pedagogy proposed by Hake (1999), who argued that technology-mediated dance instruction can extend learning opportunities beyond classroom settings and facilitate more flexible, student-centered learning experiences. The developed application enabled students to access instructional materials independently, thereby supporting continuous learning and practice.

Compared with previous studies that primarily examined multimedia learning from the perspective of instructional effectiveness (Pratiwi, 2024), this study offers a broader contribution by demonstrating that educational technology can simultaneously fulfill pedagogical, cultural, and multicultural functions. The findings indicate that the success of technology-enhanced learning is not determined solely by the sophistication of the technology itself but also by the extent to which learning content reflects learners' cultural contexts and identities. Therefore, the developed interactive learning video represents an innovative model that integrates educational technology, cultural preservation, and multicultural education within a single learning framework.

CONCLUSION

This study developed and evaluated an Android-based interactive learning video for Sigeh Penguten Dance using the Borg and Gall development model. The findings demonstrate that the developed media is feasible for use in dance learning and effectively supports students in mastering dance movements through interactive and self-paced learning experiences. More importantly, the study shows that technology-enhanced learning can function not only as a pedagogical tool but also as a medium for cultural transmission and preservation.

By integrating instructional content with the cultural values embedded in Sigeh Penguten Dance, the application provides students with opportunities to develop psychomotor skills while simultaneously strengthening cultural literacy, cultural identity, and appreciation of local heritage. These findings highlight the potential of digital learning media to bridge educational innovation and cultural sustainability, particularly in the context of traditional arts education.

The study contributes to the fields of educational technology and multicultural education by demonstrating that culturally responsive digital learning environments can support both learning achievement and cultural awareness. The integration of technology, traditional arts, and multicultural values offers an alternative model for preserving local cultural heritage within contemporary educational settings.

From a practical perspective, schools are encouraged to adopt and integrate interactive cultural learning applications into arts education programs to support independent learning and strengthen students' engagement with local culture. Educational authorities and local governments may also consider supporting the wider dissemination and adaptation of similar applications as part of cultural preservation and digital learning initiatives. Future research should involve larger and more diverse samples, explore different cultural contexts, and employ longitudinal approaches to examine the long-term impact of technology-based cultural learning on students' cultural identity, intercultural competence, and appreciation of cultural diversity.

REFERENCES

- Borg, W. R., & Gall, M. D. (2003). *Educational research: An introduction* (7th ed.). Allyn & Bacon.
- Ch'ng, E., Cai, S., & Thwaites, H. (2023). Digital heritage and cultural preservation: Emerging technologies and educational opportunities. *Heritage Science*, 11(1), 1–17. <https://doi.org/10.1186/s40494-023-00879>
- Economou, M., & Meintani, E. (2021). Promising beginnings? Evaluating museum mobile phone apps for engaging visitors with cultural heritage. *Museum Management and Curatorship*, 36(4), 382–404. <https://doi.org/10.1080/09647775.2020.1803110>
- Fikri, M. A. (2025). Sejarah dan peran Tari Sigeh Penguten sebagai tradisi dan identitas kebudayaan Lampung. *Jurnal Selaksa Makna*, 1(1). <https://doi.org/10.23960/selaksamakna.v1i1.296>
- Fiorella, L., & Mayer, R. E. (2018). What works and doesn't work with instructional video. *Computers in Human Behavior*, 89, 465–470. <https://doi.org/10.1016/j.chb.2018.07.015>
- Hake, R. R. (1999). *Analyzing change/gain scores*. Indiana University.
- Hong, J. C., Hwang, M. Y., Tai, K. H., & Kuo, Y. C. (2022). Applying interactive video technology to enhance motor skill learning and learner engagement. *Educational Technology Research and Development*, 70(4), 1785–1805. <https://doi.org/10.1007/s11423-022-10114-6>
- Kay, R. H. (2021). Exploring the use of video podcasts in education: A comprehensive review of the literature.

- Computers in Human Behavior Reports*, 4, 100123. <https://doi.org/10.1016/j.chb.2012.01.011>
- Mayer, R. E. (2021). *Multimedia learning* (3rd ed.). Cambridge University Press.
- Mayer, R. E. (2017). Using multimedia for e-learning. *Journal of Computer Assisted Learning*, 33(5), 403–423. <https://doi.org/10.1111/jcal.12197>
- Moreno, R., & Mayer, R. E. (2022). Interactive multimodal learning environments. *Educational Psychology Review*, 34(2), 567–589. <https://doi.org/10.1007/s10648-007-9047-2>
- Nongko, P. A., Salma, S., Said, H., Usman, U., & Rohmiati. (2025). Cultural sustainability through digital learning: Integrating technology in Lulo dance education. *Journal of Leadership, Management and Policy in Education*, 3(1). <https://doi.org/10.51454/jlmpedu.v3i1.1350> [16] Banks, J. A. (2019). *An introduction to multicultural education* (6th ed.). Pearson.
- Nieto, S. (2020). Re-imagining multicultural education: New visions, new possibilities. Multicultural Shadiev, R., & Yang, M. (2020). Review of studies on technology-enhanced language and arts learning. *Education and Information Technologies*, 25(6), 5895–5923. <https://doi.org/10.3390/su12020524>
- Noetel, M., Griffith, S., Delaney, O., Sanders, T., Parker, P., Del Pozo Cruz, B., & Lonsdale, C. (2021). Video improves learning in higher education: A systematic review. *Review of Educational Research*, 91(2), 204–236. <https://doi.org/10.3102/0034654321990713>
- Pratama, A., Yuliana, D., & Fitriani, R. (2023). Digital learning innovation in Indonesian traditional dance education. *Journal of Arts Education Research*, 15(2), 145–158.
- Pratiwi, S. W., Yetti, E., & Rakhman, R. T. (2024). Needs analysis and design of an interactive learning video on Indonesian traditional dance for senior high school students. *Imaji: Jurnal Seni dan Pendidikan Seni*, <https://doi.org/10.21831/imaji.v23i2.90029>
- Risner, D., & Anderson, M. (2021). Digital dance pedagogy: Opportunities and challenges in online dance education. *Research in Dance Education*, 22(3), 311–327. <https://doi.org/10.1080/14647893.2020.1798398>
- UNESCO. (2023). *Operational principles for safeguarding intangible cultural heritage through education*. Paris: UNESCO.
- Zhang, D., Zhou, L., Briggs, R. O., & Nunamaker, J. F. (2022). Instructional video in e-learning: Assessing learner engagement and learning outcomes. *Computers & Education*, 189, 104590. <https://doi.org/10.1016/j.im.2005.01.004>