



Optimizing Karawo Art-Based Digital Learning Media to Strengthen Local Cultural Identity

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Abstract

This study examines the optimization of digital learning media based on karawo art to strengthen local cultural identity. Karawo art, as an intangible cultural heritage rich in philosophical and aesthetic values, faces preservation challenges amidst the development of digitalization. The research uses a qualitative approach with a case study through in-depth interviews with 5 karawo artisans, 2 school principals, 5 arts and culture teachers, and 10 students in Gorontalo, as well as document analysis and field observations. The findings indicate that the use of digital technologies, such as online learning platforms, interactive media, and social media can motivate student learning compared to conventional methods. Thus, accelerating the process of knowledge transfer across generations and able to expand the reach of learning beyond the Gorontalo region. Digital integration also strengthens students' sense of cultural identity and enhances practical skills, despite challenges related to infrastructure readiness and limited digital competency among some teachers. The practical implications of this research emphasize the need for the development of a technology-based adaptive curriculum, ongoing teacher training, and the development of authentic digital content to ensure the survival and relevance of karawo art in the modern era. With these strategies, digitalization has the potential to become a humanistic instrument for preserving and actualizing karawo art for future generations.

Keywords:

Culture-Based Education, Karawo Art, Digitalization, Cultural Preservation, Gorontalo

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INTRODUCTION

Cultural heritage, in its various forms, is the foundation of a nation's identity and a reflection of the journey of human civilization. Traditional art, as one of the primary manifestations of cultural heritage, not only possesses aesthetic value but also embodies local wisdom, history, and philosophical values that shape the character of its supporting communities. In Indonesia, the extraordinary diversity of traditional arts is a priceless asset that must be preserved amidst the increasingly rapid flow of globalization and modernization. One traditional art form that possesses its own uniqueness and cultural richness is the karawo art form from Gorontalo. Several previous studies have highlighted the importance of preserving traditional arts through educational media. Sari & Santiana (2022) demonstrated that culture-based education can strengthen students' identities and enhance creativity. Prasetyo & Prasetyo's (2023) research emphasized that digitalization



can support the revitalization of traditional arts, but did not explore how humanist values are integrated into the learning process. However, studies on karawo art as part of culture-based education supported by digital technology are still very limited. Thus, there is a research gap in simultaneously connecting the dimensions of technology, culture, and a humanist approach, particularly in the Gorontalo context.

Karawo, a traditional Gorontalo embroidery art known since the 17th century, is not merely decorative but also rich in symbolic meaning. The unique technique of "slicing and perforating" the fabric fibers without breaking them, then replacing them with gold or silver thread, demonstrates the craftsmen's extraordinary skill and precision (Abdullah et al., 2021). This art represents the perseverance, patience, and cultural identity of the Gorontalo people. However, in the digital era, the regeneration of artisans is dwindling due to low interest from the younger generation and limited innovation in learning traditional arts. Therefore, this research not only offers practical contributions in the form of strategies for utilizing digital media for learning the art of karawo, but also theoretical contributions by enriching the discourse on culture-based education through the integration of a humanist approach within a digital framework. By highlighting gaps in previous research, this study is expected to broaden understanding of how cultural heritage can be preserved and actualized through education in the era of technological transformation.

Recognizing the urgency of preserving karawo art and the importance of culture-based education, and recognizing the enormous potential offered by the digital era, this research seeks to offer a solution through optimizing the use of digital technology. Technological transformation is not only a threat, but also a golden opportunity to revitalize karawo art. Through digital platforms, karawo art can be comprehensively documented, promoted more widely on the national and even international stage, and integrated into more interactive and engaging learning methods for millennials and Gen Z. Digitalization can open new access for students to learn karawo, from its history and production techniques to its philosophical meaning, without being hindered by geographical or time constraints. This humanistic approach in delivering digital materials is expected to touch the hearts of the younger generation, fostering a sense of empathy, appreciation, and pride in their own cultural heritage.

Based on the background that has been described, the problem formulation in this study is as follows: What are the forms and cultural values of Gorontalo karawo art that can be integrated into culture-based education?. How can the use of digital technology optimize the process of education based on Gorontalo karawo art culture?. What are the challenges and opportunities in integrating Gorontalo karawo art through culture-based education in the era of technological transformation, and how can a humanist approach strengthen the process?. Therefore, this study aims to identify and describe the forms and values of Gorontalo karawo cultural arts that are relevant for integration into culture-based education. It analyzes the potential and strategies for utilizing digital technology in optimizing Gorontalo karawo cultural arts education. It explains the challenges and opportunities faced in integrating Gorontalo karawo art through culture-based education in the era of technological transformation, and it explores the role of a humanist approach.

Meanwhile, this research is expected to provide the following benefits; theoretically contributing to the development of culture-based education theory, especially in the context of traditional arts and the use of digital technology. Enriching the treasure trove of knowledge regarding the preservation of cultural heritage through innovative educational approaches. Providing a strong theoretical foundation in understanding the relationship between culture, technology, and education in the digital era. As for practical benefits, in the form of input for local governments, cultural institutions, schools, and karawo craftsmen in designing strategies for the preservation and development of karawo art through education. Providing a model or guide for implementing the use of digital technology in effective and humanistic karawo art learning. Increasing awareness and appreciation of the younger generation towards Gorontalo karawo art, as well as strengthening their love for local culture.

This research focuses on Gorontalo's karawo art as the primary object of cultural-based education studies in the digital era. The primary focus is how digital technology can be implemented to support the learning and preservation of karawo art, as well as how humanistic aspects can be integrated. This research will be conducted in Gorontalo, involving relevant sources such as karawo artisans, arts and culture teachers, and students. The limitations of this research lie in the analysis of digitalization strategies and their impact on karawo art cultural education, as well as the exploration of its humanistic approach, without directly developing a digital platform.

METHODS

This study uses a qualitative approach with an in-depth case study design. The qualitative approach was chosen because the purpose of this study is to deeply understand the phenomenon of optimizing Gorontalo karawo art culture-based education in the digitalization era, as well as exploring the meaning and perceptions of the participants in a humanistic manner. The case study was chosen to provide a rich and holistic picture of how the integration of digital technology in karawo art learning takes place in a real context in Gorontalo.

Research Approach

The approach used is qualitative, which focuses on an in-depth understanding of individual experiences, perceptions, and meanings in specific social and cultural contexts (Creswell & Poth, 2018). This approach allows for a rich exploration of the complexities of the relationships between traditional arts, culture-based education, and digital technology, as well as their humanist impacts.

Research Design

The research design used is a single case study. Case studies allow researchers to investigate phenomena in depth in real-life contexts, where the boundaries between phenomena and contexts are unclear (Yin, 2018). In this study, the "case" studied is the process and impact of efforts to optimize Gorontalo karawo art culture-based education through the use of digital technology.

Location and Time of Research

This research was conducted in Gorontalo Province, Indonesia, focusing on areas with strong traditions in karawo art and relevant educational institutions. The selection of this location was based on the existence of living karawo art and educational practices there. The research implementation time is estimated to be 3 months, covering the preparation stage, data collection, data analysis, and report writing.

Subjects/Research Informants

Research informants were selected purposively (purposive sampling) to obtain relevant and in-depth information. Informant criteria include:

Table 1. Informant criteria

No	Informant	Amount	Criteria Standards
1	Senior Karawo	3-5 people	Individuals who have in-depth knowledge of history, techniques, motifs
2	Cultural Figures	1-2 people	An individual who has in-depth knowledge of the history, techniques, motifs, and philosophical values of Karawo art.
3	Arts and Culture Teacher/ Indonesian Language Teacher	3-5 people	Teachers involved in implementing culture-based education in schools, especially those teaching local arts or history.
4	High School Students (SMA/SMK)	5 SMA 5 SMK	Students who have or are currently taking arts and culture lessons that integrate Karawo, both traditionally and digitally.
5	Representative of the Department of Culture/Tourism	1-2 people	The party responsible for the preservation and promotion of culture in Gorontalo

Data Collection Techniques

Data were collected through several methods to ensure the validity and depth of information:

Table 2. Data Collection Techniques

No	Techniques	Work Steps	Information
1	In-depth Interview	Exploring information regarding informants' understanding of Karawo art, culture-based education practices, their experiences with digital technology in art learning, and their views on challenges and opportunities.	Questions will be designed to encourage descriptive and reflective answers, capturing the human dimensions of their experiences..
2	Participant Observation	Observing directly how interactions between teachers, students, Karawo	Researchers will conduct direct observations of the Karawo art learning process in schools (if

3	Document Analysis	<p>art, and technology occur, and capturing aspects that may not be revealed through interviews.</p> <p>Collection and analysis of documents related to Karawo art, such as books, journal articles, cultural service reports, digital publications (websites, blogs, social media about Karawo), and learning materials used in schools.</p>	<p>possible), the activities of the Karawo craftsmen community, or the use of digital platforms in learning.</p> <p>This document analysis will provide historical and factual context that supports the findings from the interviews and observations.</p>
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Data Analysis Techniques

The qualitative data obtained will be analyzed using thematic analysis (Braun & Clarke, 2006). The analysis process will include: Transcription: Transcribing all interview recordings and observation notes. Data Familiarization: Repeatedly reading transcripts and notes to gain a comprehensive understanding. Coding: Identifying relevant data segments and providing codes or labels. Theme Formation: Grouping similar codes into potential themes that reflect important patterns or meanings in the data. Theme Review: Reviewing and refining the themes that have been formed, and identifying the main themes that answer the problem formulation. Theme Definition and Naming: Providing a clear definition for each theme and choosing a descriptive name. Interpretation and Reporting: Interpreting the themes in the context of the research and presenting them in a coherent narrative, supported by data quotes from informants.

Data Validity and Reliability

To ensure the validity and reliability of the findings, several strategies will be applied: Source Triangulation: Comparing data obtained from various types of informants (craftsmen, teachers, students, government officials) to see consistency or differences in views. Method Triangulation: Using various data collection techniques (interviews, observations, document studies) to obtain a more comprehensive and complementary picture. Member Checking: Presenting initial findings or interpretations to informants for feedback and confirmation, ensuring that the researcher's interpretations are in accordance with their understanding. Audit Trail: Documenting the entire research process, from data collection to analysis, to allow for independent audit of the findings.

RESULTS & DISCUSSION

Result

This section presents the findings of research on optimizing education based on Gorontalo Karawo arts culture in the digitalization era, and discusses them in depth by linking them to relevant theories and exploring their humanist dimensions.

1. Description of Gorontalo Karawo Art and Its Cultural Value

Gorontalo karawo art is a cultural heritage rich in aesthetic values, skills, and the philosophy of life of the Gorontalo people. Based on interviews with senior craftsmen, karawo is not just a handicraft, but an artistic expression that requires high dedication and precision. In line with Waty (2024,87-88) that this technique requires high precision and patience, making each karawo embroidery product a form of individual expression from the craftsman. The unique manufacturing process, namely by slicing the basic material of the fabric fiber without breaking it to be used as a medium for embroidery resembling cross-stitch material, reflects the values of perseverance and deep patience. According to Karsum Dunda, a craftsman and karawo activist from Gorontalo Regency, explained, "Making karawo requires a calm heart and steady hands. Just a little mistake, all the work for days can be ruined. Embroidery is not only a matter of skill, but also a spiritual exercise." (Interview, October 15, 2024). This value is in line with the concept of "craftsmanship" which emphasizes mastery of skills through repeated practice and dedication (Smith et al., 2020).

According to Lahinta (2024:2), according to the elders, karawo is an acronym for the word Alawo (A-La-Wo or Ayita-Lantheya-Wo'ala). The meaning of the three words is ayita is a connection or a weave, lantheya means soft or gentle or something that softens each other, while wo'ala means something that is unraveled or sparse which is made in a clear and calm state. The three acronyms are inherent and implied in the process of making karawo which can also be the value behind the culture of the karawo art tradition.

Karawo motifs, as identified from document studies and interviews, have strong symbolic meanings. The "Bunga Tatudi" (Cana flower) motif, for example, is often associated with a princess who always maintains purity and radiates beauty, while the "Bitila" motif of breadfruit leaves symbolizes fertility and prosperity which is often used as an ornament. According to Niode, a cultural figure, "Karawo and every variety of motifs have a story, there is a meaning. In the past, these motifs were used to mark social status, important moments in life" (Interview, February 12, 2025). This shows that karawo functions as an important visual communication medium in the social order of Gorontalo society, communicating collective values and beliefs.

In a humanistic way, karawo teaches about the importance of appreciating the process and beauty in imperfect perfection (human imperfection). The complexity and long processing time make each karawo piece a work of art of high value, not only in terms of material but also in terms of the effort and sincerity poured out. This is in line with the humanistic view that upholds human dignity and the values contained in every creative work.

2. Implementation of Culture-Based Education in Karawo Art Learning

Culture-based education of karawo art in Gorontalo still faces various implementation models, ranging from traditional to those that are starting to penetrate digital. In schools, karawo learning is often carried out through direct demonstrations by teachers or guest craftsmen, as well as practicing making simple motifs. Mrs. Serlin, a Craft teacher at one of SMPN 7 in Gorontalo, stated, "We try to introduce karawo to students so that they know the richness of their regional

culture. However, limited tools, materials, and time make it difficult for us to teach this complicated hand embroidery technique in depth." (Interview, February 21, 2025). This indicates a gap between the potential of karawo art and the capacity for implementation in the formal school curriculum.

Students' perceptions of karawo culture-based education vary. While most students expressed interest in the beauty of karawo, many found it difficult to practice due to the complexity of the handmade technique. An 11th-grade student at SMKN 4 in Gorontalo commented, "Karawo is beautiful to look at, but it's difficult to make myself. I'd prefer a video tutorial I could repeat." (Interview, January 25, 2025). This was confirmed by the fact that 10 students expressed their desire for a student-friendly digital media platform to help them better understand this traditional art. This statement is highly relevant to constructivism theory (Vygotsky, 1978), which emphasizes learning through active experience and interaction. Students need methods that allow them to learn at their own pace and review material they find difficult.

In a broader context, some artisan communities are also actively transferring knowledge to the younger generation through informal training. However, the reach of this training is often limited to local communities. This limitation is crucial considering the importance of artisan regeneration so that karawo art does not become extinct.

3. Utilization of Digital Technology in Optimizing Karawo Culture-Based Education

Research shows that digital technology has great potential to optimize education based on Karawo art culture. Various digital platforms have begun to be utilized, although not yet massively and integrated.

a. Online Learning Platforms and Interactive Media:

Platforms like YouTube, Instagram, and dedicated Karawo websites have become the primary means for students and the general public to access information. Video tutorials detailing the Karawo-making process, from tool preparation to embroidery techniques, are highly sought after. However, these tutorials are generally intended for artisans with a basic knowledge of the craft. Ahmad, the student mentioned earlier, stated that he learned a great deal about Karawo motifs from YouTube videos, which he can replay as many times as needed. "I can pause, watch the needle slowly go in, and then try it myself at home using regular thread," he said (Interview, October 25, 2023). This aligns with the principle of connectivism (Siemens, 2005), which emphasizes learning through a network of information that can be accessed anytime.

b. Impact of Digital Technology on Learning Interest:

The majority of 10 students interviewed (80%) showed increased interest in learning when Karawo material was presented through engaging digital media. Two students were less interested due to difficulty understanding the Karawo process, as the material presented was presented by craftsmen with basic knowledge. Therefore, it is necessary to consider the appropriateness of the content for the introductory stage of basic techniques. However, the use of high-quality images, demonstration videos, and interactive narratives made the learning feel more lively

and relevant to them. Ms. Anita admitted, "When we use short videos about the history of Karawo in class, the students' response is much more enthusiastic than just a lecture." (Interview, October 20, 2023). This shows that digital technology can be an effective bridge to connect cultural heritage with the younger generation growing up in the digital age.

c. Effectiveness of Digital Learning in Transferring Cultural Values:

Humanistically, good digital learning not only transfers technical skills, but also the values contained therein. Documentary videos featuring inspiring stories of karawo artisans, interviews with cultural figures who tell the philosophical meaning behind the motifs, and virtual tours of karawo galleries can foster students' appreciation and empathy for the art. According to Windi, one of the young karawo activists, said, "We are trying and are trying to create a digital platform that not only displays karawo products, but also the stories behind them, so that the younger generation understands that this is not just embroidered cloth, but there is struggle and soul in it." (Interview, October 28, 2024). This shows an awareness of the importance of the humanist dimension in the digitalization of culture.

d. Challenges and Opportunities for Digitalization of Karawo Art in Education

1a. Challenges:

Despite its great potential, the integration of digitalization in Karawo culture-based education faces several challenges. First, the digital divide is still a major issue. Not all students or schools in Gorontalo have stable internet access and adequate devices. "In our area, the internet network is still difficult. Even if there is, the quota is expensive," said a student from a coastal area. (Interview, October 2, 2024). Second, the digital readiness of teachers and craftsmen still needs to be improved. Many are not yet accustomed to using technology for educational purposes. Third, an adaptive curriculum is not yet fully available. There needs to be an adjustment to the school curriculum so that digital materials about karawo can be integrated systematically. Fourth, the issue of copyright and originality of karawo motifs needs to be considered so that there is no digital exploitation that is detrimental to local craftsmen.

1b. Opportunities:

On the other hand, the opportunities offered by digitalization are very broad. Wider reach allows karawo art to be known to audiences outside Gorontalo, even globally, through social media platforms, tourism websites, and e-commerce. Innovation in learning methods can continue to be developed, for example through the use of gamification, virtual reality for karawo-making simulations, or collaborative platforms between students and craftsmen. The creation of new learning resources that are standardized and easily accessible is very possible. Collaborative learning is a learning process that allows students to encourage and work together (Niswa et al, 2025). Global collaboration is also open, where karawo artists can learn new techniques or collaborate with artists from other countries through digital spaces.

Discussion

The findings of this study strongly confirm and enrich the theoretical understanding that has been outlined. The Theory of Cultural Preservation (Cameron & Kenderdine, 2007) is proven to be relevant in the context of karawo art, where digitalization appears as a crucial adaptation strategy. More than just a promotional tool, digital platforms function as "living archives" that allow karawo art to be accessed, studied, and appreciated by a wider audience, beyond geographical and time constraints. The use of detailed video tutorials and authentic stories of artisans on social media expands the reach and public awareness of this art, in line with the principles of the Diffusion of Innovation Theory (Rogers, 2003). Innovation in the delivery of digital content has been shown to accelerate the spread of knowledge and appreciation of karawo.

The integration of technology in learning karawo art is greatly assisted by the principles of Constructivism Theory (Vygotsky, 1978). Students are no longer passive recipients of information, but rather active builders of their knowledge. Through interactive video tutorials, the ability to repeat materials, and online discussion forums, students can independently construct their understanding of the complex techniques of making karawo, the meaning of motifs, and the cultural values contained therein. Local wisdom is knowledge and practices developed by the community in managing natural resources and the surrounding environment (Asadzadeh et al., 2017). Therefore, social balance will form an environment of potential craftsmen. Thus, each student is expected to be inspired and love their culture. This personalized learning experience, as indicated by Ahmad who felt helped by watching videos repeatedly, is very important in modern pedagogy.

This is also reinforced by the Connectivism Theory (Siemens, 2005), where karawo art becomes a node in a vast digital knowledge network. Students can connect with sources of information from various craftsmen, teachers, and even cultural institutions, forming a rich and connected understanding. From a humanist perspective, this study highlights that digital technology, when used with awareness and good intentions, can actually strengthen the human dimension in preserving culture. The stories of karawo craftsmen shared through digital platforms, about their struggles, dedication, and pride in their work are able to touch the audience emotionally. This creates a bond of empathy between the younger generation and the heirs of traditional art.

Local wisdom can be a solution to overcome environmental problems and create social balance (Albantani & Madkur, 2018). For example, a video showing the wrinkled but agile hands of a senior craftsman making karawo embroidery is often more memorable and inspiring than just a photo of the finished product. This narrative highlights the values of human dignity, perseverance, and living heritage.

Furthermore, digitalization can be a means to empower the craftsmen themselves. With digital platforms, they can promote their work directly, reach a wider market, and potentially earn a better income. This is not only about preserving art, but also about economic and social sustainability for the karawo craftsman community. According to Risjon from the Cooperatives, UMKM and Trade Service, emphasizing the importance of this: "We want this technological era to help our craftsmen so that karawo art is more developed, diverse, and interesting so

that it can support their lives." Delivered at the 'Capacity Building' activity of technology transfer of karawo motif designs on October 1, 2024.



Figure 1. Capacity Building Activities 1 October 2024 (Source: Author's Reproduction, 2025)

The challenges faced, such as the digital divide, lack of digital literacy, and the potential loss of authenticity, further emphasize the importance of a human-centered approach in implementing technology. Technology should be seen as a tool, not a substitute for human interaction and deep cultural understanding. Adaptive curricula that integrate technology should be designed with local context, student needs, and teacher capacity in mind. Efforts to document not only the physical motifs, but also the "soul" and "story" behind each karawo work through digital media, will ensure that this heritage remains alive and meaningful for future generations. This is the essence of the "optimization" sought: how technology can strengthen, not erode, the human and cultural values contained in karawo art. There are efforts to attract and motivate students to learn karawo by making motifs using modern digital technology that were previously made manually.

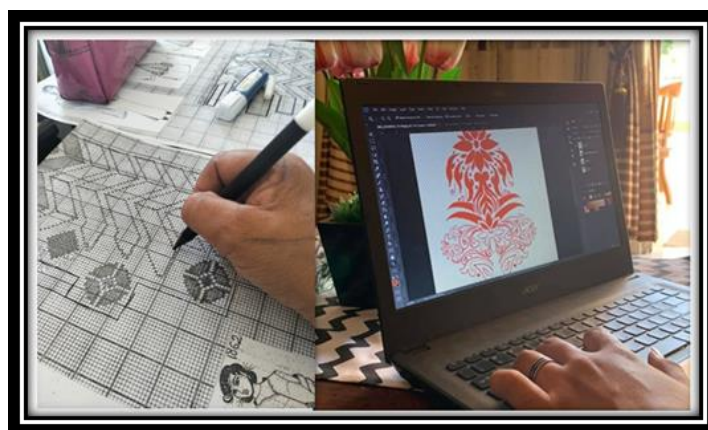


Figure 2. Making Karawo Motif Manually and Using Modern Design Technology (Source: Author's Reproduction, 2025)

CONCLUSION

This research conceptually concludes that Gorontalo's karawo art, as a manifestation of intangible cultural heritage rich in the values of perseverance, patience, precision, and local identity, has extraordinary potential to be optimized in the realm of culture-based education in the era of technological transformation. Key findings suggest that the integration of digital technologies such as interactive video tutorial platforms, social media for humanist narratives, and the potential of educational applications can fundamentally change the landscape of karawo art learning. Answering the research question, we assert that digital technology is not just a tool, but a catalyst that allows students to internalize the meaning of karawo culture and skills in a deeper, more personal, and meaningful way, in line with the principles of constructivism that emphasizes active knowledge building and connectivism that recognizes distributed learning networks.

The humanistic aspect of Karawo art, embodied in the stories of struggle and dedication of its artisans, is reinforced through authentic digital content, fostering empathy, appreciation, and pride in local identity in the younger generation, while simultaneously empowering cultural preservers economically. However, we also identified that the success of this optimization depends heavily on addressing crucial challenges such as the digital divide, the ongoing need for improved digital literacy, and the need for an adaptive curriculum.

Therefore, we recommend a holistic and collaborative, human-centered approach: local governments and relevant institutions should prioritize the development of inclusive digital infrastructure and equitable digital literacy programs; educational institutions should proactively integrate karawo digital materials rich in humanistic narratives into their curricula and train teachers; and artisan communities should be encouraged to actively contribute to this digital ecosystem. With the right strategy, karawo art can transform from a mere legacy of the past into a dynamic force shaping cultural identity and sustainability in the future.

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REFERENCES

- Abdullah, A., Hamzah, M. Y., & Arif, A. N. (2021). *Nilai Filosofis dan Makna Simbolis dalam Seni Sulaman Karawo Gorontalo*. Jurnal Antropologi Budaya, 15(2), 112-125.
- Albantani, A. M., & Madkur, A. (2018). Think Globally, Act Locally: The Strategy of Incorporating Local Wisdom in Foreign Language Teaching in Indonesia. *International Journal of Applied Linguistics and English Literature*, 7(2), 1-8. <https://doi.org/10.7575/aiac.ijalel.v.7n.2p>.
- Asadzadeh, A., Kötter, T., Salehi, P., & Birkmann, J. (2017). Operationalizing a concept: The systematic review of composite indicator building for measuring community

- disaster resilience. *International Journal of Disaster Risk Reduction*, 25, 147–162. <https://doi.org/10.1016/j.ijdrr.2017.09.015>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101.
- Cameron, F., & Kenderdine, S. (2007). *Rethinking cultural heritage: An introduction*. Dalam F. Cameron & S. Kenderdine (Eds.), *Rethinking cultural heritage: From practice to theory* (pp. 1-11). Taylor & Francis.
- Chen, X., Wang, Y., & Li, Z. (2021). Augmented reality in cultural heritage education: A systematic review. *Journal of Educational Technology & Society*, 24(3), 45-60.
- Creswell, J. W., & Poth, C. N. (2018). *Qualitative inquiry and research design: Choosing among five approaches* (4th ed.). Sage Publications.
- Djafar, K. (2019). *Sejarah Perkembangan Seni Sulaman Karawo di Gorontalo*. *Jurnal Sejarah Lokal*, 5(1), 30-45.
- García, M., & Weiss, L. (2019). The role of culture in student learning: A meta-analysis. *Review of Educational Research*, 89(4), 509-546.
- Lahinta et al. (2024). *Gorontalo Punya Cerita*. Malang: CV. Bukuin Publishing.
- Mohamad I, Parta, Sudana, Waty et al. (2024). *Rupa Is Me: Kumpulan Tulisan Seni Rupa dan Budaya*. Denpasar: Komunitas Budaya Gurat Indonesia.
- Natsir, S., & Rahman, R. (2021). *Makna Simbolis Motif-Motif Karawo Gorontalo dalam Kehidupan Sosial Masyarakat*. *Jurnal Kajian Budaya*, 10(2), 180-195.
- Niswa, K., Srikandi, C. N., & Zuliana. (2025). The Application of Collaboration System-Based Learning in Overcoming Syntactic Interference in the Abstracts of Teacher Professional Program Students. *JTP -Jurnal Teknologi Pendidikan*, 27(1), 17–24. <https://doi.org/10.21009/jtp.v27i1.54499>
- Prasetyo, B., & Prasetyo, E. W. (2023). Tantangan Digitalisasi dalam Pelestarian Warisan Budaya Tak Benda di Indonesia. *Jurnal Kebudayaan Nusantara*, 7(1), 88-102.
- Ritzer, G., & Jurgenson, N. (2019). *Digitalization*. Dalam G. Ritzer (Ed.), *The Blackwell Encyclopedia of Sociology* (pp. 1-2). Wiley-Blackwell.
- Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). Free Press.
- Selwyn, N. (2019). *Should universities develop an 'ethics of digital teaching'?*. *Teaching in Higher Education*, 24(4), 449-461.
- Siemens, G. (2005). Connectivism: A learning theory for the digital age. *International Journal of Instructional Technology & Distance Learning*, 2(1), 3-10.
- Sari, N. P., & Santiana, S. (2022). Peningkatan Minat Baca Siswa Melalui Integrasi Cerita Rakyat Lokal dalam Pembelajaran Bahasa Indonesia. *Jurnal Pendidikan Bahasa dan Sastra Indonesia*, 18(1), 55-68.
- Smith, J., Jones, R., & Davis, L. (2020). The enduring value of traditional crafts in the modern world. *Journal of Cultural Preservation Studies*, 8(3), 210-225.
- Tompkins, E. (2020). *Culturally responsive teaching and the brain: Promoting authentic engagement for culturally and linguistically diverse students*. Corwin.
- UNESCO. (2003). *Convention for the Safeguarding of the Intangible Cultural Heritage*. UNESCO.
- Utama, B. P., & Susila, A. (2023). Pemanfaatan Aplikasi Edukatif untuk Pengenalan Alat Musik Gamelan bagi Siswa Sekolah Dasar. *Jurnal Teknologi Pendidikan*, 15(2), 110-125.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.
- Wang, L., Zhang, Q., & Li, Y. (2022). The effectiveness of multimedia e-learning platforms in teaching traditional arts and history. *International Journal of Waty, M. (2019). Airbrush Karawo Batik Design, Journal of Social Science Studies. ISSN 2329-9, Vol. 6, No.1*

- Wahyudyanti, L Retno. (2024). Menyulam Tradisi. Yogyakarta: CV. ANDI OFFSET
Emerging Technologies in Learning, 17(5), 180-195.
- Waty, M. (2019). Airbrush Karawo Batik Design, Journal of Social Science Studies. ISSN 2329-9, Vol. 6, No.1
- Waty M. (2017). Karawo Design Concept Of Airbrush Batik, Prosiding Seminar Internasional Conference on Culture, Art, and Humanities.
- Yin, R. K. (2018). *Case study research and applications: Design and methods* (6th ed.). Sage Publications.
- Zhang, H., & Liu, Y. (2021). Social media as a tool for promoting cultural heritage: Opportunities and challenges. *International Journal of Cultural Policy*, 27(3), 315-330.