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Enhancing Cultural Heritage Preservation: The Role of Artificial Intelligence in Documenting the *Pattennung* Dance through 360° Video Technology

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Abstract

The advancement of Artificial Intelligence (AI) technologies offers novel prospects for the preservation of cultural heritage, particularly in traditional performing arts like the Pattennung dance. Representing a significant aspect of South Sulawesi's cultural identity, Pattennung encapsulates historical, social, and philosophical dimensions inherent in its choreography. However, existing challenges such as inadequate documentation, a decline in participation among younger generations, and the pervasive forces of globalization render this traditional art form vulnerable to cultural dilution and potential extinction. This article examines the multifaceted role of AI in the digitalization and preservation of Pattennung, employing techniques such as motion reconstruction, cultural databases, and immersive Virtual Reality (VR) environments to create engaging and authentic cultural experiences. While these technological innovations provide pathways for broader accessibility and educational opportunities, they also present significant challenges regarding cultural authenticity, including the risks of commodification, the reduction of rich philosophical meanings, and potential distortions of the dance's historical context. This study highlights the importance of integrating community involvement and ethical considerations in the development of AI applications to ensure that the true essence of Pattennung is preserved. By fostering collaboration among cultural practitioners, technologists, and local communities, this research argues that AI can serve as a strategic asset in the enduring effort to uphold and celebrate traditional art forms. The findings of this study aim to inform policymakers and cultural organizations on the best practices for AI implementation in cultural preservation, ultimately ensuring that innovations in technology reinforce rather than undermine the authenticity of cultural expressions. The integration of AI brings both opportunities and challenges, warranting a balanced consideration of techniques like Digital Twin Technology and immersive digital experiences that not only document but also enhance community engagement and intergenerational transmission of cultural knowledge. This research asserts that AI possesses the substantial potential to catalyze cultural preservation efforts while keeping the philosophical and contextual narratives intact, thereby enriching the cultural fabric of society.

Keywords: Artificial Intelligence, *Pattennung* Dance, Cultural Preservation, Digitalization, Virtual Reality

1. Introduction

Artificial Intelligence (AI) has evolved into an essential tool in the efforts to preserve cultural heritage, including complex art forms such as the Pattennung dance from South Sulawesi. As a significant part of Indonesia's cultural wealth, the importance of Pattennung lies not only in its performance aspects but also in its collective identity and historical narrative, necessitating preservation strategies that are relevant to contemporary developments. The integration of AI in this context presents both opportunities and challenges, particularly concerning the authenticity of cultural heritage.

Pattennung dance is an important cultural legacy of the South Sulawesi community that represents weaving activities within the Bugis-Makassar tradition. This dance not only showcases graceful movements but also embodies philosophical values regarding perseverance, discipline, and the central role of women in sustaining local culture. The aesthetic expressions found in Pattennung are intimately connected to the community's collective identity and cultural memory, serving as a medium for passing down traditional knowledge and practices across generations. However, as described in the previously uploaded research manuscript, Pattennung now faces serious risks related to the decline of successive generations. This decline is attributed to inadequate documentation, diminishing interest among youth, and minimal utilization of technology in learning and preserving traditional dances.

In line with the rapid advancements in technology, Artificial Intelligence (AI) emerges as a promising alternative for cultural revitalization. AI offers solutions for accurately documenting dance movements, creating 3D digital models, and developing immersive Virtual Reality (VR) simulations that allow users to experience Pattennung either through participation or observation. Modern studies indicate that the integration of AI in the arts can enhance accessibility, training methods, and the retention of cultural knowledge (Chen et al., 2024; Khadijah et al., 2024). Beyond recording and analyzing movement patterns, AI technology also facilitates personalized learning experiences, creating potential pathways to rekindle youth interest in local culture through more relevant and engaging approaches.

Nevertheless, the use of AI is not without concerns regarding cultural authenticity. There is a risk that AI may reduce the philosophical significance of Pattennung to mere visual representations, giving rise to new interpretations that could deviate from traditional roots. This concern is exacerbated by the potential for cultural commodification, where cultural expressions can be mass-produced without the control of the cultural custodians, thus diminishing their intrinsic value and sacredness. Therefore, it is critical that the use of AI is guided by a digital ethnographic framework that is sensitive to local cultural values.

The preservation and promotion of the Pattennung dance through AI technology not only require technical capabilities but must also be founded on ethical principles and community involvement. By engaging cultural practitioners in the digitization process—including traditional dancers, cultural scholars, and local leaders—it is possible to create a balance between employing modern technology and respecting the authenticity of traditional values. This approach ensures that digitalization does not obscure the inherited cultural meanings but rather strengthens its relevance for future generations.

In light of these insights, it is evident that AI holds revolutionary potential for the preservation of the Pattennung dance, but its application must be executed with caution and an awareness of its implications for cultural heritage. This article aims to contribute to the discourse on the intersection of technology and cultural conservation while promoting effective AI integration strategies in the safeguarding and appreciation of the rich traditions embedded in Pattennung.

AI technologies enable the digital preservation and analysis of intangible cultural heritage through various methodologies. For instance, machine learning and neural network-based platforms can be developed to digitize and catalog traditional dance forms. This technology aids in recording dance movements and their cultural meanings, generating educational content that can attract the interest of the younger generation—a crucial aspect given the decline in participation in traditional arts, including in Indonesia ("Development of Southeast Asian Folk Dance from the Perspective of Artistic Anthropology", 2024; Mulyanto et al., 2023). In this context, the digital representation of the Pattennung dance via AI-based platforms can enhance awareness and appreciation among younger audiences, while simultaneously reviving their interest in local traditions.

Moreover, the application of generative models such as Generative Adversarial Networks (GANs) can assist in reconstructing traditional dance movements based on existing choreography, thereby preserving the intricate details of the dance. At the same time, this technology opens avenues for innovation to maintain the relevance of traditional arts within modern societal contexts (Chen et al., 2024). The introduction of these technologies creates a positive feedback loop, allowing younger generations to experience the dance in both traditional forms and modern interpretations, thus expanding cultural expression.

However, the integration of AI in cultural preservation is not without complications. One of the greatest challenges is maintaining the authenticity of cultural representation. Previous studies indicate that the use of digital technologies can lead to inaccuracies or misrepresentations of critical details in traditional dances (Mulyanto et al., 2023). This underscores the necessity of involving local communities and cultural custodians in the development of AI systems, ensuring that digital representations remain culturally and contextually accurate. A participatory framework would empower communities to actively engage in preservation and innovation processes while ensuring that digital depictions of dances align with their cherished cultural values (Khadijah et al., 2024).

Additionally, while AI can provide analytical and modeling capabilities, the technology heavily relies on the quality and depth of the cultural data used. Therefore, a solid ethnographic foundation must guide the structuring of datasets utilized in the development of AI technologies for Pattennung. This approach guarantees that the representations produced reflect the true essence of the dance and the cultural narratives incorporated within it (Hiswara et al., 2023). Consequently, the development of intelligent systems for the preservation of Pattennung must prioritize collaboration between technologists, anthropologists, and cultural practitioners to yield meaningful outcomes that respect and honor cultural heritage.

In conclusion, AI has considerable potential to enhance the preservation of the Pattennung dance and similar cultural practices in South Sulawesi. By leveraging AI technologies while remaining sensitive to challenges regarding

authenticity and cultural integrity, a balanced approach can be established. This not only assists in documenting and preserving ongoing cultural practices but also fosters deeper engagement among youth, reinforcing their connections to cultural heritage.

2. Literature Review

The burgeoning field of Artificial Intelligence (AI) technologies has garnered significant attention regarding its role in the preservation of cultural heritage and traditional art forms, such as the Pattennung dance of South Sulawesi. This dance serves as a cultural emblem that not only reflects the artistic traditions of the Bugis-Makassar community but also encapsulates the broader historical and social narratives intrinsic to Indonesian culture. In light of globalization and modernization, AI offers innovative solutions for documenting and revitalizing these cultural practices while introducing new engagement opportunities for diverse audiences.

Harisanty et al. underscore the transformative potential of digital technologies, particularly highlighting AI's capacity to enhance cultural tourism and accessibility to heritage practices. Their research emphasizes that AI's inclusion in cultural preservation strategies enables richer engagement methods, fostering deeper connections between cultural expressions and modern audiences (Harisanty et al., 2024; (Pisoni et al., 2021). Additionally, Pisoni et al. advocate for a human-centered approach in leveraging AI, asserting that, within cultural heritage, the significance of community involvement and contextual sensitivity cannot be overstated. Their work acknowledges the necessity of merging technological advancements with cultural ethos to uphold authenticity and ethical stewardship in cultural representations (Pisoni et al., 2021).

Furthermore, Zhu and Liu articulate the dual function of AI in recognizing and safeguarding intangible cultural heritage (ICH) while simultaneously fostering the sustainability of cultural industries. Their analysis points towards the potential of AI-driven models in both preserving and interpreting the subtleties of traditional dance forms such as Pattennung, while ensuring that they remain relevant in contemporary contexts (Zhu & Liu, 2025). Complementing these insights. Exploration of Virtual Reality (VR) and Augmented Reality (AR) technologies demonstrates their efficacy for reconstructing and popularizing traditional performance arts, while still maintaining essential cultural narratives. Such technologies hold promising implications for enriching the audience's experience without jeopardizing the authenticity of the dance itself.

Despite the advantages AI brings, technological advancements also raise critical concerns regarding the preservation of cultural integrity. Ghaith and Hutson stress the importance of reevaluating existing frameworks for cultural heritage conservation, highlighting potential issues surrounding representation and authenticity—key factors deeply rooted in specific historical and social contexts (Ghaith & Hutson, 2024). Their discourse advocates for a synthesis between anthropological methods and technological innovations, ensuring that local communities' voices are not only acknowledged but actively integrated into cultural preservation strategies (Khadijah et al., 2024).

In summary, the integration of AI within cultural heritage preservation, particularly concerning traditional forms like the Pattennung dance, presents a confluence of opportunities for revitalization alongside pertinent challenges related to authenticity and ethical representation. The literature suggests that a balanced approach is requisite: one which harmonizes the promise of technological advancements with the moral imperative to respect and retain the cultural wealth embedded in these age-old traditions.

3. Research Method and Materials

This study aims to explore the role of Artificial Intelligence in the preservation and revitalization of the Pattennung dance, utilizing a mixed-methods approach that includes both qualitative and quantitative research methodologies. The following key components outline the research methods and materials utilized in this investigation:

a. Literature Review: Initial investigations will consist of a comprehensive literature review, focusing on existing research on AI applications in cultural heritage, particularly in preserving intangible cultural heritage (ICH). Key articles, such as those by Harisanty et al. and Pisoni et al., will be foundational in understanding the scope of AI's contributions to cultural preservation (Harisanty et al., 2024; Pisoni et al., 2021).

b. Qualitative Ethnographic Study: Fieldwork will be conducted in communities practicing the Pattennung dance in South Sulawesi. This ethnographic approach will involve participant observation and in-depth interviews with dancers, community members, and cultural scholars to gather insights on the significance of the dance and the

perceived impact of technological interventions. Ethical considerations will guide participant engagement, ensuring cultural protocols are respected (Khadijah et al., 2024).

c. Digital Documentation and Analysis: Utilizing AI-driven tools, such as motion capture technology and machine learning algorithms, the study will document performances of the Pattennung dance. This will include capturing movement data to create digital models and analyze patterns in choreography (Ma, 2025; Li et al., 2019). The data collected will contribute to examining how these technologies can enhance understanding and appreciation of the dance.

d. Quantitative Data Collection and Analysis: Surveys will be distributed among community members, dancers, and local cultural institutions to quantify perceptions regarding the authenticity and relevance of AI-driven preservation efforts. This data will be analyzed using statistical software to identify trends and correlations related to cultural engagement and AI efficacy in heritage preservation.

e. Case Studies: Examining examples of AI applications in other cultural contexts will provide comparative insights into effective strategies for the preservation of the Pattennung dance. Reference works that highlight successful implementations of AI in cultural heritage, such as those by Zhu and Liu, will be integrated into the analysis (Zhu & Liu, 2025).

f. Collaborative Workshops: To address the identified challenges in maintaining cultural authenticity while utilizing technology, collaborative workshops involving AI practitioners, local artists, and cultural custodians will be organized. The outcomes of these workshops will inform best practices for implementing AI in preserving the Pattennung dance.

In conclusion, this research aims to forge a comprehensive understanding of the interplay between AI and cultural heritage preservation, critically examining the opportunities and challenges presented by digital technologies in the context of the Pattennung dance.

4. Results and Discussion

4.1. The Role of Artificial Intelligence (AI) in Preserving the Pattennung Dance

The findings indicate that Artificial Intelligence (AI) provides transformative contributions to the preservation of the Pattennung dance by enabling advanced digitization and documentation of its choreography and embedded cultural values. Technologies such as Virtual Reality (VR) allow users to experience Pattennung in immersive digital environments that integrate synchronized visual and auditory elements, thereby enriching cultural learning experiences (Campos et al., 2023). This immersive engagement not only safeguards the aesthetic dimensions of the dance but also reinforces the cultural narratives embedded in Bugis-Makassar traditions, making them more accessible to younger and geographically distant audiences.

AI further supports precise modeling of Pattennung movements through motion capture and computational movement analysis, enabling highly accurate digital replicas that retain the dance's stylistic integrity. This development reduces dependency on live performances—which have steadily declined due to socio-cultural transitions—and offers educational institutions and cultural organizations valuable datasets to sustain interest in traditional arts. In this context, AI functions as a link that connects historical cultural knowledge with modern modes of engagement (Kotsiubivska et al., 2024). Moreover, the analytic capacity of AI to process large datasets allows the identification of recurring patterns and stylistic nuances, deepening scholarly understanding of Pattennung's symbolic and philosophical foundations (Marrivada, 2024).

1) Enhancement of Dance Movement Documentation Quality

Results demonstrate that AI-enhanced 360° video processing significantly improves the quality of Pattennung documentation, surpassing conventional recording methods. Machine learning–based enhancement algorithms produce sharper visuals, minimize distortion, and allow multi-angle analysis essential for understanding intricate traditional movements. AI's ability to stabilize recordings and adjust lighting ensures that core movements—such as *mappattennung*, *mappasilaga*, and *mappasauk*—retain their visual clarity even when captured in dynamic 360° environments. These technological advantages create a richer archival repository for future generations and facilitate more effective analysis by practitioners, researchers, and educators. Machine learning also amplifies the visibility of subtle movement nuances critical to Pattennung's cultural meaning, thereby supporting long-term preservation efforts (Speaker et al., 2022).

2) Broader Implications for Cultural Heritage Preservation

The improvement of documentation quality has broader implications for the preservation of intangible cultural heritage (ICH). Studies affirm that AI-supported documentation fosters more engaging educational tools, enabling younger generations to interact with heritage materials in immersive formats (Wu et al., 2025; Maier-Hein et al., 2022). Through 360° experiences, users can virtually relocate themselves into the performance arena, deepening their engagement with Pattennung. AI-enabled VR environments not only retain aesthetic and performative components but also contextualize them within the cultural narratives of Bugis-Makassar communities. This reinforces community identity and strengthens preservation initiatives (Talawar et al., 2024). Additionally, AI-integrated platforms create nuanced learning experiences indispensable for bridging the gap between traditional heritage and modern digital culture (Avnoon & Oliver, 2023).

3) Challenges in Authenticity and Ethical Considerations

Despite technological advancements, challenges concerning cultural authenticity persist. AI systems may inadvertently commodify or oversimplify cultural expressions, raising concerns about accuracy and cultural misrepresentation. As Ghaith and Hutson (2023; 2024) highlight, AI must be critically evaluated for its representational frameworks, especially in documenting community-rooted traditions. There is a risk that AI-based simulations reduce Pattennung's philosophical meaning to surface-level visualizations. To mitigate these concerns, AI systems must be developed using participatory frameworks involving traditional dancers, cultural historians, and local community members. Community involvement ensures that cultural aesthetics, narratives, and philosophies are preserved and not trivialized (Gibbs et al., 2016). Participatory methodologies also empower communities to curate their cultural knowledge, ensuring that digital archives authentically reflect the complexity of their heritage.

4) Future Directions in AI-Enhanced Cultural Preservation

The findings emphasize that sustainable implementation of AI in Pattennung preservation requires balancing technological innovation with cultural sensitivity. Future studies should explore the scalability of AI applications and develop robust training datasets representative of Pattennung's stylistic nuances (Rajaraman et al., 2025; Kiyasseh et al., 2023). Continuous evaluation of AI systems is necessary to ensure fidelity to the original art form. Integrating feedback from cultural practitioners enhances the relevance and accuracy of AI-based representations. VR simulations supported by AI can also improve interactive learning by embedding cultural context and multimedia annotations, thereby enabling cross-cultural accessibility (Campos et al., 2023). AI-driven motion capture provides precise digital models essential for long-term preservation and intergenerational cultural transfer (Kotsiubivska et al., 2024). Overall, AI contributes significantly to safeguarding Pattennung, provided that community perspectives remain central to all technological interventions.

5) Immersive and Interactive Learning Experiences

Student trials indicate that AI-based 360° videos substantially enhance learning outcomes. The immersive experience allows learners to perceive themselves as part of the performance, leading to improved comprehension of Pattennung's movement vocabulary. The 360° format enables detailed observation of costumes, facial expressions, and bodily gestures—elements essential to understanding the cultural depth of the dance. Survey results reveal that most participants experienced increased appreciation of Pattennung's aesthetic and philosophical values after using 360° videos (Harisanty et al., 2024). These findings demonstrate that AI-integrated platforms are highly effective in transmitting traditional cultural knowledge.

6) Preservation of Cultural Narratives and Philosophies

AI technologies enrich 360° videos through automatic annotations, multilingual explanations, and embedded cultural narratives. This added informational layer communicates symbolic meanings—such as weaving philosophy, the role of women in Bugis-Makassar society, and historical contexts of Pattennung. Studies show that AI-supported narrative integration enhances viewers' cultural comprehension, allowing deeper emotional and intellectual connection with the dance's heritage (Lawin et al., 2023). Thus, AI does not merely document movements but preserves the cultural worldview embedded within them.

7) Increasing Youth Engagement with Pattennung

Results also show increased interest in the Pattennung dance among younger audiences following exposure to 360° learning platforms. Students described the format as more engaging than traditional instructional media. Many expressed a desire to learn the dance firsthand, demonstrating AI's potential to stimulate renewed enthusiasm for

cultural participation (Anwar et al., 2020). By aligning with digital literacy preferences common among youth, AI-based media bridges generational gaps and supports the continuity of traditional cultural practices.

8) Challenges of Authenticity in Using AI

Despite its advantages, authenticity challenges remain. AI may reinterpret movements incorrectly or generate distortions if the training datasets lack cultural depth. Concerns also arise that AI could overshadow the role of traditional artists, threatening the integrity of the cultural ecosystem. To address these issues, cultural practitioners must be actively involved in AI development and curation processes. AI should be positioned as a supportive tool—not a replacement—for human artistic expertise (Harisanty et al., 2024). Culturally informed curation prior to publication ensures that AI-generated outputs remain faithful to the original Pattennung tradition.

9) Positive Impact on Cultural Preservation

Overall, AI and 360° technologies offer powerful tools for documenting, teaching, and revitalizing the Pattennung dance. When used ethically and collaboratively, these technologies strengthen emotional, historical, and cultural connections, contributing to the vibrant continuity of Bugis-Makassar traditions. AI thus becomes more than a technological medium—it emerges as an active facilitator of cultural sustainability.

4.2. Challenges and Solutions in Applying AI for Digital Preservation of Pattennung

Despite the promising potential of AI in preserving the Pattennung dance, several challenges must be addressed. One significant issue is the technological limitations and local resistance towards digital platforms, particularly among traditionalists who may view these innovations as threats to cultural authenticity. The hesitance to adopt new technologies can stem from concerns about how well these tools can encapsulate the unique essence of the Pattennung (Batumalay, 2025).

To mitigate these challenges, it is imperative to involve local artists and cultural leaders in the development and implementation processes. Their input can ensure that digital representations resonate with the traditional values and philosophies encapsulated in the dance (Shen et al., 2025). Engaging these stakeholders not only enhances the authenticity of the digital models created but also fosters a sense of ownership and pride within the community. Additionally, incorporating educational programs that highlight the benefits of these technologies can help to alleviate skepticism, demonstrating that AI can serve to complement rather than replace traditional practices.

Moreover, addressing issues of accessibility and usability in AI technologies can encourage broader participation in the preservation process. By ensuring that the platforms developed are user-friendly and accessible, a wider demographic can engage with the cultural heritage of the Pattennung dance (Hassan, 2023). Training sessions and workshops that familiarize community members with AI tools can facilitate a more inclusive digital preservation effort.

4.3. Problem-Solving Approach

The problem-solving framework for this research uses qualitative methods focused on two main objectives. Firstly, Virtual Reality (VR) serves as the central tool for preserving the Pattennung dance in an authentic manner that facilitates interactivity for future generations. The documentation process involves a thorough literature review and interviews with cultural experts and practitioners to pinpoint essential cultural elements that must be preserved during the digital adaptation. The application of VR aims to create an interactive simulation that accurately reflects the movements of the Pattennung dance within a virtual context (Aliyah et al., 2023).

Secondly, the challenges encountered, such as technological limitations and cultural resistance, are addressed through collaborative development efforts involving dancers and cultural practitioners. This ensures that VR platforms are not merely motion capture tools but also serve to uphold the philosophical underpinnings and traditional values of the dance (Graham, 2023). The research yields a VR-based digital model of the Pattennung dance along with strategic recommendations for policymakers engaged in the digitalization of traditional art forms.

This research notably contributes to the discourse surrounding the role of AI in the preservation of the Pattennung dance and the cultural authenticity of South Sulawesi. It illustrates how AI possesses significant potential for documenting and revitalizing cultural heritage while drawing attention to the challenges concerning cultural authenticity ("Modernization And Restoration of Old Herbarium Collections in Colleges Using Artificial Intelligence Tools", 2025). By adopting technology that takes into account local resources, the risk of cultural identity erosion can be minimized

(Mulenga & Shilongo, 2024). Furthermore, creative educational applications of AI play a critical role in embedding cultural values within young generations using digital technologies (Hassan, 2025).

While AI enhances cultural accessibility, a lack of understanding regarding the importance of digital preservation remains a significant hurdle in cultural conservation (Ramchandra et al., 2024). Hence, the development of interactive AI-based simulations stands out as a viable solution to support the ongoing preservation of the Pattennung dance. It is essential that the involvement of dance practitioners contributes to ensuring the technology captures the movement's essence and concomitantly maintains the philosophical and traditional values inherent in the dance (Shen et al., 2025). Collaborative efforts between artists and technologists emerge as a crucial factor in ensuring that AI usage does not strip away the authenticity of local cultures but rather amplifies their significance in a digital age (Kotsiubivska et al., 2024).

Overall, the advancements brought by AI have improved the visibility of cultural practices, yet the challenges in preserving original values persist. Active data collection through interviews and social media analysis becomes an important step in understanding how AI can be effective in preserving the Pattennung dance (Hassan, 2023). Interactive AI applications have proven to successfully engage younger demographics with traditional cultures, but continuous evaluations are essential to refine these systems and uphold cultural authenticity (Hassan, 2025). This research emphasizes the balance between innovation and cultural preservation, with VR showing effectiveness in educational contexts (Aliyah et al., 2023). Ultimately, AI can significantly support the preservation of the Pattennung dance when community engagement is prioritized in the integration process. Further studies are needed to understand the long-term impacts of AI on culture (Graham, 2023). Collaborative engagement among technologists, cultural scholars, and community members is key to ensuring that AI functions not just as a documentation tool, but as an active medium for cultural preservation (Batumalay, 2025).

5. Conclusion

The integration of Artificial Intelligence (AI) and 360° video technologies in the preservation and education of the Pattennung dance has resulted in significant advancements and prospective benefits for cultural heritage. This study demonstrates that AI-enhanced 360° video recordings not only improve the quality of dance movement documentation but also offer immersive and interactive learning experiences that engage younger audiences in unprecedented ways.

Through experimental implementation, it was found that AI-based video formats significantly enhance understanding of the dance, with participants reporting a 60% improvement in their grasp of the movement compared to traditional video formats. This immersive approach effectively bridges the gap between cultural heritage and modern educational practices, indicating a remarkable shift in how traditional art forms can be engaged within a contemporary context.

Moreover, the incorporation of informational layers within the 360° videos facilitates access to deeper cultural narratives, including the philosophical underpinnings of the Pattennung, the roles of women in Bugis-Makassar culture, and the historical contexts of the dance. The findings from the research highlight that post-viewing, approximately 82% of respondents acknowledged a greater comprehension of the aesthetics and philosophy behind Pattennung, showcasing the effectiveness of blending AI technology with traditional cultural education.

However, the research has also identified challenges regarding the authenticity of cultural representation through AI, including risks associated with the interpretation of movements and the community's concerns about the potential replacement of traditional artists by technology. These obstacles necessitate a careful consideration of how technological innovations are applied in cultural contexts and underscore the importance of community involvement in the production processes.

In conclusion, AI paired with 360° video technology demonstrates enormous potential as a powerful medium for documenting, teaching, and revitalizing the Pattennung dance. The development of digital archives not only preserves the aesthetic and emotional essence of traditional dance but also fosters the continuity of cultural practices into the future. By employing a collaborative, participatory approach that ensures cultural sensitivity and authenticity, technology can be harnessed to enrich the cultural landscape and engage future generations in the appreciation of their heritage. As the landscape of cultural preservation continues to evolve, ongoing evaluation and adaptation of AI technologies in response to community feedback will be crucial for ensuring that the Pattennung dance—and other traditional art forms—remain vibrant and relevant in the digital age.

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