



Surface Fabrication as a Medium for Cultural Preservation: Fashion Inspiration the Crocodile Ritual *Nui Ulung Buayeh*

¹Nurul Iman Afifah, ¹Husna Saaidin*, ¹Prinses Saliang,

¹Hisyam Zakaria, ¹Wan Nadhra Ixora

¹Fakulti Seni Lukis & Seni Reka, Universiti Teknologi MARA, Malaysia

*Correspondence: husnasaaidin@uitm.edu.my

ABSTRACT

This study investigates the role of surface fabrication as a medium for cultural preservation, focusing on the mound-shaped crocodile symbolism of the Nui Ulung Buayeh ritual in Sabah. Using a qualitative, practice-led methodology that combined ethnographic observation, experimental textile fabrication, and thematic analysis, the research explored how ritual meanings can be translated into fabric manipulation techniques. There are five experimental samples were developed, employing appliqué, quilting, pleating, layering, and slashing to interpret symbolic elements of the ritual. The results demonstrate that fabric surfaces can effectively embody the ritual's key themes: the crocodile as guardian spirit, water as renewal, community interconnection, and performance as festivity. The findings highlight the potential of surface fabrication to function as both an innovative design practice and a living cultural archive. Policy recommendations include integrating intangible cultural heritage into design education, encouraging collaborations between designers and local communities, and supporting practice-led research within sustainable fashion frameworks. Such initiatives would ensure that endangered rituals like Nui Ulung Buayeh are preserved not only through documentation but also through creative and wearable reinterpretations. Future research should expand this work by developing full garment prototypes, engaging community custodians in participatory validation, and experimenting with digital technologies such as 3D simulation and AI-assisted design. This study concludes that surface fabrication provides a vital bridge between tradition and modernity, affirming fashion's role as a medium of cultural continuity and innovation.

Keywords: Cultural Preservation, Fashion Design, Intangible Cultural Heritage, Lundayeh People, Nui Ulung Buayeh, Practice-Led Research, Surface Fabrication

Article history

Received 10 October 2025

Revised 1 December 2025

Accepted 27 December 2025

JARDIN

The Journal of Art and Design Innovation

VOL. 1, No. 02, pp. 99-111

journal.iistr.org/index.php/JARDIN

DOI: [10.56741/IISTR.jardin.001429](https://doi.org/10.56741/IISTR.jardin.001429)



Published by Institut Kesenian Jakarta, and managed by IISTR.

© 2025 by the authors. Licensed to IISTR, Indonesia. This is an open access article distributed under the terms of the Creative Commons Attribution-ShareAlike 4.0 International License (CC BY-SA 4.0).

Introduction

The preservation of cultural heritage through contemporary design practices has gained significant scholarly attention, particularly in the context of fashion. This comprehensive review synthesizes literature on cultural preservation, and the role of rituals in identity formation, with a specific focus on how surface fabrication can serve as a medium for interpreting and sustaining intangible cultural heritage. The Crocodile Ritual *Nui Ulung Buayeh* of the Lundayeh people serves as a central case study for exploring these intersections, illustrating how fashion can bridge historical tradition and contemporary innovation while addressing pressing concerns of cultural sustainability and identity preservation in a globalized world.

The concept of surface fabrication encompassing techniques such as appliqué, quilting, pleating, and textile manipulation provides a particularly rich avenue for cultural storytelling. Unlike printed patterns or digital renderings, surface fabrication creates tactile, dimensional narratives that can embody the physical and spiritual essence of cultural practices. This literature review examines how these techniques, when informed by deep cultural understanding and sustainable practices, can transform fashion into a powerful medium for cultural preservation, specifically focusing on the endangered rituals of indigenous communities like the Lundayeh of Borneo.

Fashion, as both an expressive art form and a material practice, has long been entangled with cultural preservation. Designers frequently draw inspiration from heritage sources whether tangible objects or intangible traditions to ensure continuity and relevance of cultural practices in contemporary contexts. In this regard, fabric manipulation and surface fabrication techniques emerge as potent mediums to translate intangible narratives into tangible designs.

Lundayeh is a minority community in the state of Sabah, Malaysia which located in the northern part of Borneo, particularly in Long Pasia. This ritual was also can be found in Sarawak was known as Lun Bawang, in Brunei known as Lun Bawang Murut and in Kalimantan, Indonesia as Dayak Lundayeh [1]. While state and regional classifications ascribe varying names, Lundayehs retain and share consistent linguistic and culture characteristics [2]. Despite variation in identity, the Lundayehs share a unified culture and belief system grounded in animism. A notable tradition practiced since time immemorial is the *nui ulung*, a ritual involving the carving of a crocodile image into the earth. This practice was historically accompanied by elaborate celebration and communal feasts, marking the

success of raiding parties that returns with an enemy's head from headhunting expeditions or warfare [3].

This community will be constructing a mounds shaped crocodiles as it was a symbol of strength and resilience which can survive in water and land. This symbolic representation of the crocodile was central to the Lundayeh's cultural identity, and the image of the crocodile would appear in various festivals [3]. In order to acknowledge the intangible ritual as an inspiration, this experimental of fabric manipulation was interpreted by the elements of a mounds shaped crocodile. *Nui Ulung Buayeh* in Sabah.

Literature Review

A. Fashion and Cultural Heritage

Scholars emphasize that cultural heritage, particularly intangible forms such as rituals, music, and craftsmanship, plays an essential role in shaping fashion narratives [4]. In many cases, fashion design becomes an instrument to "carry forward" traditions into modernity, balancing cultural authenticity with contemporary consumer sensibilities. For example, studies on the Italian fashion system reveal persistent struggles to preserve both tangible and intangible heritage, underscoring the complexity of musealizing fashion while respecting its living, evolving nature [5]. Similarly, research on Han embroidery shows how traditional motifs, once endangered, are being revitalized through incorporation into contemporary apparel, effectively transforming heritage into a living design language.

In Indonesia, the paradox of globalization is evident: global trends push for modernity while simultaneously creating spaces for local heritage recognition. Work on the sarong's elevation into gender-fluid fashion illustrates how designers adapt traditional garments into globalized contexts without erasing their cultural origin [6]. Such examples demonstrate how cultural preservation through fashion is both a creative and political act, positioning fashion as a mediator between tradition and modernity.

B. Fabric Manipulation and Surface Fabrication

Fabric manipulation is not new; it has been central to textile arts for centuries. However, its contemporary revival emphasizes novelty, sustainability, and heritage translation. According to Ahmed and Elsayed [4] techniques such as slashing, quilting, applique, and layering transform plain textiles into textured surfaces that embody narratives of playfulness, joy, and creativity in children's clothing. While their work focuses on aesthetics, it establishes a foundation for fabric manipulation as a generative tool for design inspiration.

Recent sustainable design literature deepens this perspective. Upcycling pedagogy emphasizes fabric manipulation as a vehicle for revaluation of waste materials, creating high-quality garments with embedded cultural and environmental significance [7]. Likewise, zero-waste fashion approaches, such as the Mobius Band structure, highlight the innovative potential of manipulating surfaces to reduce fabric waste while exploring cultural aesthetics of continuity and circularity [8].

Technology further extends these possibilities. AI-assisted garment design for ethnic fashion, as demonstrated in Miao women's apparel, integrates surface manipulation with computational modeling, balancing body shape customization, heritage patterns, and sustainable material use [9]. This fusion reveals surface fabrication as not only an aesthetic choice but also a methodological strategy for heritage preservation, identity reinforcement, and environmental responsibility.

C. Ritual Symbolism and Fashion Translation

Rituals provide profound symbolic material for designers. They encode values, cosmologies, and social bonds into performative acts, objects, and symbols. Scholars in fashion theory argue that the fold, drape, and pleat can embody motion, emotion, and ritualized subjectivities [10]. Similarly, surrealist and avant-garde fashion demonstrates how material manipulation can convey intangible urban and cultural narratives [11].

Designers translating rituals into fashion often use visual metaphors and surface treatments to capture key symbols. For example, Tang Dynasty costume reconstruction through digital simulation used proportions, folds, and layering to revive ancient ritual wear [12]. In another case, Chu cultural embroidery was analysed for its embellishment value, demonstrating how surface textures capture symbolic heritage meanings [13].

Yet, ritual translation is not merely symbolic. It engages the body as a performative surface, aligning with studies on wearable musical garments where touch and sound interfaces transform fabric into ritualistic, interactive artifacts [14]. Thus, surface fabrication can serve as a powerful metaphorical and performative language for ritual-based design.

D. Southeast Asian Context and the Crocodile Ritual

Southeast Asia's rich cultural diversity provides fertile ground for fashion-heritage integration. Indonesian and Malaysian traditions in particular feature rituals connected to animals, water, and community, aligning closely with surface fabrication's potential for symbolic materialization. The *Nui Ulung Buayeh* ritual was centering the crocodile (*buayeh*) as a guardian and spiritual figure, embodies themes of strength, renewal, and communal

participation. These resonate with textile design techniques: applique can symbolize protective motifs, quilting can embody layered communal identities, and pleating can represent water's fluidity.

While Southeast Asian heritage has been studied in terms of batik, songket, and sarong adaptation [15], specific ritual-based preservation through fabric manipulation remains absent. No scholarly work has systematically examined how surface fabrication can embed crocodile ritual symbolism into fashion. This absence underscores the need for targeted frameworks that preserve lesser-known, endangered rituals by translating them into visible, wearable surfaces.

E. Surface Fabrication as Cultural Preservation Framework

Synthesizing across literature, three key insights emerge:

1. **Material Narrative:** Surface fabrication techniques inherently embody narrative potential. Layering, slashing, and applique can become material metaphors for ritual stories.
2. **Sustainability and Heritage:** Fabric manipulation not only reduces waste but also sustains intangible heritage by giving it new form.
3. **Performance and Identity:** Ritual-inspired surfaces can be embodied in fashion performance, reinforcing identity while adapting to modern contexts.

A framework for cultural preservation via surface fabrication would involve mapping ritual symbols (crocodile, water, community, performance) onto manipulation techniques (applique, quilting, pleating, layering) to generate designs that are both aesthetic and archival.

F. Critical Gaps

Despite rich work in related fields, the literature reveals several gaps:

1. **Underrepresentation of Ritual-based Fashion:** While embroidery, sarong, and historic costumes are studied, rituals like *Nui Ulung Buayeh* remain neglected.
2. **Limited Integration of Fabric Manipulation and Ritual Studies:** Existing studies on manipulation emphasize sustainability or pedagogy, not ritual preservation.
3. **Lack of Southeast Asian Comparative Frameworks:** Regional studies rarely compare ritual-inspired design strategies across cultures.

The reviewed scholarship demonstrates the growing recognition of fashion as a tool for cultural preservation. Fabric manipulation emerges as a particularly rich avenue for translating intangible traditions into tangible surfaces. However, the crocodile ritual *Nui Ulung Buayeh* has not been examined through this lens, leaving a gap in both scholarship

and practice. By addressing this gap, the present research proposes a methodological framework to use surface fabrication as a medium of cultural preservation, ensuring that ritual symbolism continues to live on through fashion.

Research Methodology

This study adopted a qualitative, practice-led methodology guided by a cyclical model of cultural narrative exploration. The model integrates ethnographic observation, experimental textile fabrication, thematic analysis, and interpretation of ritual symbolism (see Fig. 1). The iterative cycle reflects the dynamic relationship between cultural practices and material experimentation, ensuring that design outcomes remain both culturally grounded and creatively innovative.

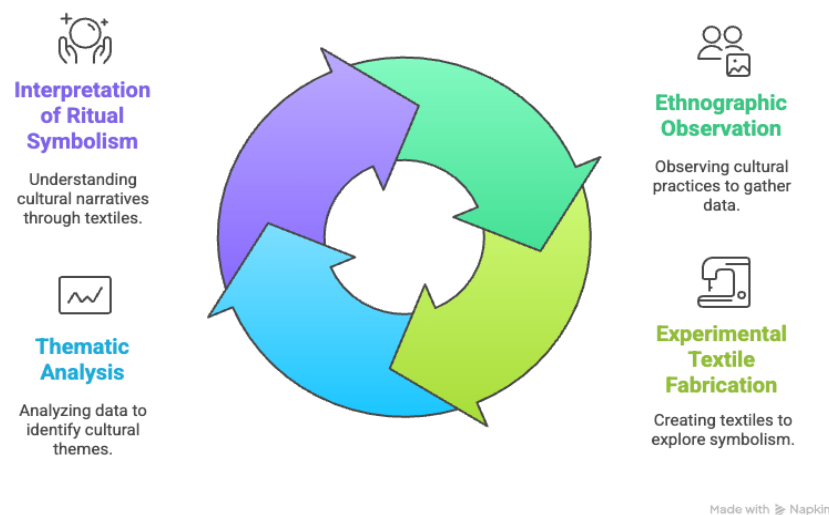


Fig. 1. Cycle of Culture Narrative Exploration

A. Ethnographic Observation

The research began with ethnographic observation of the *Nui Ulung Buayeh* ritual, focusing on its performative, symbolic, and material dimensions. Observation encompassed both direct fieldwork (where possible) and secondary sources such as photographs, videos, and ethnographic accounts. This method allowed for a sensory and contextual understanding of the ritual, capturing not only visual motifs (crocodile, water, community) but also embodied practices, gestures, and communal participation.

B. Experimental Textile Fabrication

Insights from observation were then translated into material form through experimental textile fabrication. Drawing from fabric manipulation techniques [4], the study employed appliqué, reverse appliqué, quilting, pleating, and layering to create fabric samples inspired

by ritual symbols. For example, crocodile scales were explored through textured quilting, while water's fluidity was represented through pleating and draping. These experiments were documented with sketches, photographs, and reflective notes, making the textile samples themselves a form of practice-based research data [16].

C. Thematic Analysis

All collected data takes field notes, archival materials, and experimental samples were subjected to thematic analysis [17]. This involved coding and clustering observations into cultural themes (guardian spirit, renewal, community, festivity). These themes were then cross mapped with textile outcomes, establishing a systematic framework of translation from ritual symbolism to fabric manipulation.

D. Interpretation of Ritual Symbolism

The final stage of the cycle was the interpretation of ritual symbolism through textiles. This stage moved beyond technical outcomes to reflect on how surface fabrication can function as a medium of cultural preservation. By interpreting fabric samples as narrative carriers, the study articulated how design outcomes could embody and communicate the ritual meanings of *Nui Ulung Buayeh*. Reflexive journaling [18] was integral here, acknowledging the researcher's positionality as both designer and interpreter.

Result and discussion

This section presents the outcomes of experimental fabric manipulations inspired by the mound-shaped crocodile symbolism in the *Nui Ulung Buayeh* ritual (Sabah). Each sample was developed to capture ritual elements through surface fabrication, interpreted via texture, layering, and structural manipulation.

A. Interwoven Grids with Circular Overlays

The first sample (Fig. 2) employed woven ribbon strips with folded circular intersections. The resulting surface produced a geometric, architectural effect, balancing rigidity with rhythmic repetition.

- **Result:** The interwoven grid produced raised intersections resembling stylized scales.
- **Interpretation:** This structure symbolizes community interconnection, reflecting how the ritual unites participants through collective performance. The repeated intersections can also be seen as a metaphor for the continuity of ancestral knowledge.

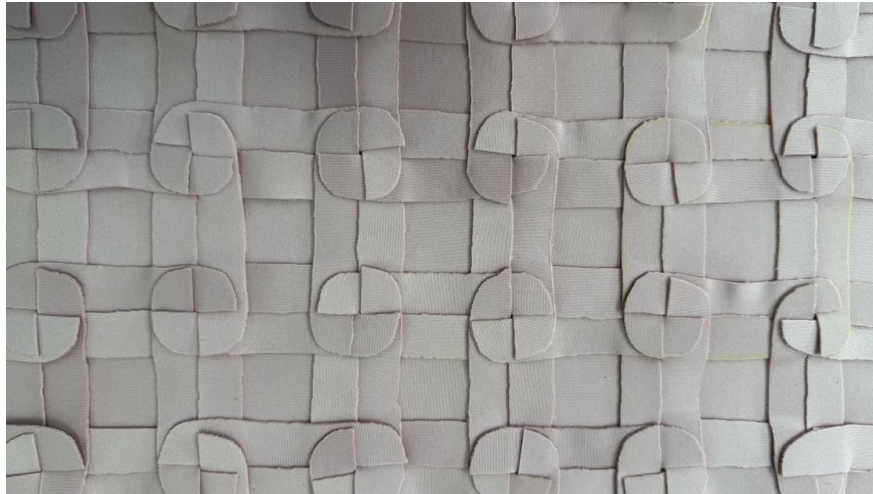


Fig. 2. Interwoven grid fabric manipulation with circular overlays, symbolizing unity and ritual order.

B. Crocodile-Embossed Leather Patches

The second sample (Fig. 3) applied appliqué techniques using faux crocodile leather cut into irregular patches of various sizes. These patches were stitched onto a neutral base fabric, creating a tactile, mosaic-like surface.

- **Result:** The sample visually and texturally mimicked the crocodile's skin, with scales arranged in organic formations.
- **Interpretation:** This outcome reflects the protective symbolism of the crocodile, embodying its role as a guardian spirit in the *Nui Ulung Buayeh*. The overlapping textures highlight endurance and strength, central to the ritual's meaning.



Fig. 3. Crocodile-embossed leather patches appliquéd on fabric, representing protective scales.

C. Three-Dimensional Quilted Scales

In the third sample (Fig. 4), raised quilting was used to create padded, mound-like forms with crocodile-textured surfaces.

- **Result:** The quilted mounds produced a three-dimensional, topographical surface resembling the raised ridges of a crocodile's back.
- **Interpretation:** The mound-like quality directly references the ritual landscape of Nui Ulung Buayeh, where crocodile mounds signify ancestral and ecological presence. This design symbolizes groundedness, resilience, and spiritual guardianship.



Fig. 4. Quilted three-dimensional crocodile-textured mounds evoking ritual mound symbolism.

D. Textured Pockets with Circular Inserts

The fourth sample (Fig. 5) combined framed scale-like shapes with layered circular appliqués. The use of contrasting materials created depth and variety within each “scale.”

- **Result:** Dense, clustered textures emerged, producing a rhythmic surface reminiscent of seeds or clusters of eggs.
- **Interpretation:** This form symbolizes fertility and cyclical renewal, echoing the ritual's association with water as a life-giving force. The repetition of circular motifs reinforces the ritual's cyclical dimension



Fig. 5. Circular inserts within framed “scales,” symbolizing fertility and renewal

E. Slashed Transparent Layering

The final sample (Figure 6) employed a sheer overlay with vertical slashes, revealing darker underlayers. Stitching secured the layers while allowing organic openings to form.

- **Result:** The layered slashes produced irregular textures resembling scars or natural crocodile hide.
- **Interpretation:** This design reflects liminality and transformation, key themes of the ritual. The crocodile, as a creature of both land and water, embodies transition and duality, here materialized through layered transparency and disruption.



Fig. 6. Slashed transparent layering revealing underlayers, symbolizing liminality and transformation.

F. Comparative Interpretation

Together, these five fabric explorations demonstrate the material translation of ritual symbolism into surface fabrication:

- **Guardian Role:** Quilted mounds & crocodile leather patches.
- **Fertility & Renewal:** Circular appliqués and clustered forms.
- **Community Unity:** Interwoven grids with intersections.
- **Transformation & Liminality:** Slashed layering with hidden underlayers.

These outcomes position fabric manipulation as more than decoration; it is a semiotic practice that archives intangible heritage within tactile and wearable forms.

Conclusion and Recommendation

This study set out to explore the potential of surface fabrication as a medium for cultural preservation, specifically by interpreting the mound-shaped crocodile symbolism from the *Nui Ulung Buayeh* ritual in Sabah through experimental fabric manipulations. The findings demonstrate that fabric manipulation is more than an aesthetic exercise; it is a symbolic and cultural practice capable of translating intangible narratives into material form. Through techniques such as appliqué, quilting, layering, pleating, and slashing, the crocodile's protective scales, the renewal of water, the communal spirit of the ritual, and the performative dimensions of festivity effectively materialized into textile surfaces. These experiments confirm that fabric surfaces can serve as a living archive, carrying forward endangered ritual meanings into contemporary fashion contexts.

From a policy perspective, the research highlights the importance of integrating intangible cultural heritage into design education, community engagement, and sustainable fashion policies. Local governments and cultural heritage institutions could encourage partnerships between designers, artisans, and community custodians to ensure that rituals such as *Nui Ulung Buayeh* are not only documented but also dynamically reimaged through creative industries. Funding schemes and policy frameworks that support practice-led research in fashion design can help bridge cultural preservation with economic development, positioning heritage-inspired textiles as both cultural assets and creative commodities. Additionally, embedding cultural preservation within sustainable fashion initiatives would align heritage safeguarding with global priorities on sustainability and identity.

Looking ahead, future research could build on these findings in several directions. Firstly, there is scope to scale the experimental samples into full garment prototypes, allowing for a richer understanding of how ritual-inspired surfaces perform in motion and interact with the body in real contexts. Secondly, community validation is essential: engaging directly with cultural custodians and practitioners in Sabah would not only affirm the symbolic accuracy of the textile interpretations but also foster co-creation that respects

local voices. Thirdly, the integration of digital technologies such as 3D simulation, digital embroidery, or AI-assisted design offers opportunities to expand the reach of ritual-inspired textiles into global fashion markets while preserving cultural authenticity. Finally, comparative studies across Southeast Asia could examine how other ritual symbols may be adapted through surface fabrication, positioning this method as a regional model for cultural preservation through fashion.

In conclusion, this research affirms that surface fabrication is both an innovative design methodology and a cultural preservation strategy. By materializing the symbolic elements of the *Nui Ulung Buayeh* ritual into tactile surfaces, it demonstrates how fashion can serve as a mediator between tradition and modernity. The study calls upon policymakers, educators, and researchers to recognize the cultural and economic potential of ritual-inspired design, and to ensure that the heritage embedded in rituals is sustained not only through documentation but also through creative, wearable, and future-facing expressions.

Conflict of Interest

The authors declare no conflict of interest.

References

- [1] K. Ganesan and S. A. Rahman, "Lockdowns and food security: Embodying native wisdom in rice production among the indigenous Lundayeh in Sabah," in *Social and Political Deglobalisation: Covid-19, Conflict, and Uncertainties in Malaysia*, Singapore: Springer Nature Singapore, 2024, pp. 187–206.
- [2] R. E. Prastyo, D. Wisadirana, A. I. Rozuli, and M. L. Hakim, "Introducing village culture as the main strategy in achieving successful village SDGs," *HABITAT*, vol. 36, no. 1, pp. 46–58, 2025.
- [3] R. Y. Ganang, J. W. K. Ling, and K. Ganesan, "Representation of Buayeh in the quality of life of the Lundayeh people," *Malaysian Journal of Social Sciences and Humanities (MJSSH)*, vol. 3, no. 2, pp. 169–184, 2018.
- [4] O. K. Ahmed and N. A. Elsayed, "Fabric manipulation as a fashion inspiration source for children clothes," *International Design Journal*, vol. 9, no. 4, pp. 79–91, 2019.
- [5] F. Caponigri, "Fashion's brand heritage, cultural heritage, and the piracy paradox," *Cardozo Arts & Ent. LJ*, vol. 39, p. 557, 2021.
- [6] D. M. W. Githapradana, "The application of paradox aesthetic concepts and values in the design of contemporary Urbanomad androgynous sarongs through a visual metaphor approach," in *Proc. Int. Conf. on Sustainability in Creative Industries*, Cham: Springer Nature Switzerland, Nov. 2022, pp. 239–248.
- [7] A. Burns, "Upcycling classics—sustainable design development through fabric manipulation techniques in fashion design education," *International Journal of Art & Design Education*, vol. 43, no. 2, pp. 272–288, 2024.
- [8] Z. Li, D. Cumming, F. Kane, and S. Prescott, "Use of the Mobius Band structure to challenge 2D flat origins in zero-waste pattern-making for fashion," *International Journal of Fashion Design, Technology and Education*, pp. 1–14, 2025.

- [9] Q. Yu, X. Tao, and J. Wang, "Sustainable design on intangible cultural heritage: Miao embroidery pattern generation and application based on diffusion models," *Sustainability*, vol. 17, no. 17, p. 7657, 2025, doi: 10.3390/su17177657.
- [10] M. Wang, R. Murphy, and I. Christie, "Bringing sustainable practices, fashion shows, and sociological insights together to reinvigorate sustainable fashion education," *Sustainability*, vol. 17, no. 2, p. 631, 2025, doi: 10.3390/su17020631.
- [11] J. Sweeney-Risko, "Elsa Schiaparelli, The New Woman, and surrealist politics," *Interdisciplinary Literary Studies*, vol. 17, no. 3, pp. 309–329, 2015.
- [12] C.-X. Zhong and H.-G. Ye, "The application of Han embroidery art in modern fashion design," in *Proc. 3rd Annual Int. Conf. on Social Science and Contemporary Humanity Development*, Sep. 2017, pp. 487–490, Atlantis Press, doi: 10.2991/sschd-17.2017.93.
- [13] X. Zhong and D. Chudasri, "A review of traditional embroidery from China in relation to knowledge management and design," in *2019 Joint Int. Conf. on Digital Arts, Media and Technology with ECTI Northern Section Conf. on Electrical, Electronics, Computer and Telecommunications Engineering (ECTI DAMT-NCON)*, Jan. 2019, pp. 276–281, IEEE.
- [14] J. Birringer and M. Danjoux, "Wearable technology for the performing arts," in *Smart Clothes and Wearable Technology*, Woodhead Publishing, 2023, pp. 529–571.
- [15] S. Rismantojo, V. Sirivesmas, E. Joneurairatana, and W. A. Natalia, "Transforming the Batik Tiga Negeri (Three-Countries Batik) in pleats to represent Indonesia, Malaysia, and Thailand's batik heritage by applying the ATUMICS method," *Archives of Design Research*, vol. 37, no. 4, pp. 65–96, 2024.
- [16] L. Candy and E. Edmonds, "Practice-based research in the creative arts: Foundations and futures from the frontline," *Leonardo*, vol. 51, no. 1, pp. 63–69, 2018, doi: 10.1162/LEON_a_01471.
- [17] V. Braun and V. Clarke, "Using thematic analysis in psychology," *Qualitative Research in Psychology*, vol. 3, no. 2, pp. 77–101, 2006, doi: 10.1191/1478088706qp063oa.
- [18] D. A. Schön, *The Reflective Practitioner: How Professionals Think in Action*. Basic Books, 1983.