

HERITAGE VOICES VIA EXPLORING DAYAK'S INSPIRATIONS IN CONTEMPORARY ART THROUGH THE USE OF ARTIFICIAL INTELLIGENCE IN GRAPHIC DESIGN

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Abstract. This research explores the integration of Dayak cultural elements into AI-generated fashion items via a collaborative design process with a focus group of a cohort of design students and verifies designs with four skilled Dayak artisans. Dayak people are the indigenous inhabitants of the Borneo Island. Traditional Dayak art is known for intricate wood carvings, beadwork and textiles; it features motifs inspired by nature, myths and spirituality. The project aims to connect traditional Dayak art with contemporary digital design, preserving cultural heritage while embracing technological advancements. The study is conducted in four phases: developing motifs from cultural identity icons, engaging students to create AI-assisted fashion products through a focus group, surveying students' experiences and verifying designs with Dayak artisans through interviews for in-depth insights. The findings impacted the design process, as artisans and students worked together to develop AI algorithms capable of identifying and integrating traditional Dayak themes and styles into digital fashion looks. Additionally, it examines the design process, elucidating the conversion of conventional creative methods into digital formats via artificial intelligence. The collaboration aims to maintain the genuineness of Dayak art while using AI skills to enhance creativity and innovation. The results indicate that AI has the potential to be a valuable instrument in preserving and enhancing traditional art forms, ensuring their significance in contemporary digital art settings. This study highlights the importance of cultural sensitivity and collaboration in combining indigenous art with advanced technology and serves as a blueprint for initiatives worldwide.

Keywords: Cultural elements, AI-generated fashion, Artificial Intelligence, graphic design, motif design.

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1. Introduction

The convergence of traditional art and modern technology has opened unprecedented opportunities for cultural preservation and creative innovation. Artificial intelligence (AI) has emerged as a transformative tool, enabling the development of generative systems capable of producing creative outputs that integrate human cultural knowledge with machine learning capabilities. Recent advancements in AI, such as generative adversarial networks (GANs) and deep learning models, have demonstrated potential in various creative fields, including art, design and fashion, by offering new approaches to traditional practices and creative ideation. These developments present a unique opportunity to explore how AI can be employed to preserve, enhance and innovate

within cultural art forms. Dayak art, a rich cultural heritage of the indigenous communities of Sarawak, Malaysia, is renowned for its intricate motifs and profound symbolic meanings. These motifs, representing elements of nature, spirituality and ancestry, have been traditionally employed in weaving, carving and other forms of artistic expression. However, like many traditional art forms, Dayak art faces challenges in preservation due to modernization and diminishing intergenerational transmission of cultural knowledge. To address these challenges, integrating AI into the creative process offers a promising avenue to preserve and innovate within this heritage, ensuring its relevance in contemporary design practices.

In recent years, the fashion industry has seen a paradigm shift toward sustainability and ethical design approaches (Kozlowski *et al.*, 2019). Jalil and Shaharuddin (2020) stated that fashion designers have emerged as catalysts for change and are tasked with integrating sustainable principles into their creative processes. The concept of sustainable fashion design is rooted in the need to mitigate the environmental and social impacts of the fashion industry (Jalil, 2022). The stable diffusion approach is consistent with using eco-friendly materials, waste reduction and product longevity, all incorporated into sustainable design principles (Chen *et al.*, 2019; Jalil, 2022). Simultaneously, generative deep learning models and AI are revolutionizing creative design disciplines. These models can process extensive datasets to produce innovative ideas, broadening the scope of creativity in design processes. However, adopting Generative Artificial Intelligence (GAI) in fashion raises ethical concerns, including biases in generated material and challenges related to copyright and ownership. Despite these issues, GAI presents a significant opportunity for design innovation, such as creating lifelike textures and unique designs (Yan *et al.*, 2022). This technological integration emphasizes the need for fashion professionals to adapt to and embrace new tools, blending creativity with technology.

This paper investigates the integration of Dayak cultural elements into AI-generated artworks through a collaborative framework involving skilled artisans and design students. By leveraging AI technologies, this study aims to bridge the gap between traditional Dayak art and contemporary digital design, providing a platform for cultural preservation while fostering innovation in the fashion industry. This exploration highlights the potential of generative AI to create culturally sensitive and artistically rich designs, emphasizing the importance of collaboration between cultural custodians and technologists. In this study, we examine the use of AI to create fashion products that embody Dayak heritage while addressing the ethical, technical and cultural considerations inherent in such integrations. The findings aim to contribute to the discourse on sustainable and culturally grounded design practices, offering insights into the role of AI in transforming traditional art into modern creative expressions.

2. Literature Review

The development and implementation of computer systems capable of performing tasks that typically necessitate human intellect are called Artificial Intelligence (AI) technology (Chen *et al.*, 2019). Chen *et al.* (2019) stated that AI is often classified into five areas depending on various technological adoptions: machine learning, decision support systems, expert systems, optimization and image recognition and vision. Generative deep learning models, a kind of AI, have recently been extensively used in several design disciplines. Generative deep-learning models can acquire knowledge from

extensive datasets and produce novel ideas (Sohn & Kwon, 2020). These algorithms have shown a groundbreaking potential to enhance creative design processes by broadening or showcasing creativity. The application of AI in art and design has opened new avenues for creative expression and cultural preservation (Rachmad, 2024). AI algorithms, such as neural networks and machine learning, can analyze and replicate artistic styles, offering tools for artists and designers to explore new creative possibilities (McCormack *et al.*, 2020). Elgammal *et al.* (2017) demonstrated that AI could generate artworks indistinguishable from those created by human artists, highlighting the potential of AI in the creative industries. Several studies have explored the integration of AI with traditional cultural art forms. For instance, McCormack *et al.* (2020) investigated the use of AI in preserving Aboriginal art, emphasizing the importance of collaboration with indigenous communities. Similarly, Liu *et al.* (2019) explored AI-generated designs inspired by traditional Chinese motifs, demonstrating the potential for AI to enhance and preserve cultural heritage.

Dayak people of Sarawak, Malaysia, are indigenous groups known for their rich cultural heritage, including the Iban, Bidayuh and Orang Ulu, whose art and traditions inspire the development of fashion items through collaborative and technology-driven phases. Dayak art, originating from the Indigenous Dayak people of Borneo, is renowned for its intricate designs and deep symbolic meanings (Jalil *et al.*, 2024). Jalil *et al.* (2024) stated that Dayak motifs often represent natural elements, spiritual beliefs and ancestral heritage. These motifs are traditionally used in various art forms, including weaving, wood carving and body art (Noel, 2016). Preserving these traditional techniques and symbols is crucial for maintaining the cultural identity of the Dayak people (Jalil *et al.*, 2024). On the other hand, preserving traditional art forms faces numerous challenges, including eroding cultural knowledge and the influence of modernity. Sellato (2017) emphasizes the importance of intergenerational transmission of cultural understanding, which is increasingly threatened by globalization and urbanization.

Collaborative approaches involving traditional artisans and technology developers are essential for the successful integration of AI into cultural art. Hou and Kenderdine (2024) argue that genuine partnerships between cultural custodians and technologists can ensure cultural sensitivity and authenticity in AI-generated artworks. Such collaborations enable the incorporation of deep cultural knowledge into AI development, resulting in designs that respect and reflect traditional art forms (Hou & Kenderdine, 2024). Nevertheless, there has been a lack of focus on picture production and the impact of designer expertise levels on AI tool interpretations. This underscores the need for more investigation to improve the efficiency of human-AI cooperation in optimizing AI-generated images for graphic design (Rachmad, 2024). Rachmad (2024) stated that this method promotes a cooperative endeavor between design practitioners and computer scientists to create AI-powered graphic design tools customized to graphic designers' requirements. Furthermore, beyond generating written replies, there are also GAI algorithms that can produce visual pictures. Recently, the emergence of GAI technology has provided a chance to enhance design by creating lifelike textures applied to photos and generating innovative designs (Yan *et al.*, 2022). The image-generating GAI produces original and lifelike visuals using text or image inputs (Rachmad, 2024). These AI models leverage deep learning techniques and specifically utilize generative models, such as Generative Adversarial Networks (GANs), to produce new visual content (Sohn & Kwon, 2020). While artificial intelligence may not wholly understand the intuitive

features of human design, AI design tools may help human designers by collecting domain knowledge and customizing it to the usual design procedures.

Research into generative deep-learning artificial intelligence in creative fashion creation has recently increased (Lee, 2022). The fashion business requires its workers to have flexibility and a desire to investigate and experiment with new technologies, particularly Artificial Intelligence (AI) and more significantly, Generative Artificial Intelligence (GAI); this sector combines creativity with technology. Nevertheless, the emergence of GAI in the fashion industry raises ethical problems, such as potential biases in the created material and challenges with copyright and ownership rights (Lee, 2022). Recent advancements, including tools like Attribute-GAN and DreamPose, have automated tasks such as pairing garments and visualizing clothing in motion (Chen *et al.*, 2019). Technological advancements such as Attribute-GAN and DreamPose have played a crucial role in automating the creation of matching pairs of apparel and converting still photographs into films that showcase garments in motion (Chen *et al.*, 2019). Rachmad (2024) investigates the influence of AI-assisted and AI-based design tools on graphic design, particularly emphasizing website customization, image restoration, branding, logo design and style transfer. In addition, Chen *et al.* (2019) asserted that stable diffusion represents a strategic and methodical approach to integrating sustainable practices into the design process when applied to fashion. Emphasizing stability and durability as fundamental elements of sustainable fashion, the notion speaks to thoughts offered by Bauckhage (2011). Using steady diffusion techniques, designers want to produce lasting goods, lowering environmental effects and helping move rapid fashion away (Fletcher, 2013).

The objective of AI within the fashion industry is to develop a personalized approach that adds value to the business model (Wu & Li, 2024). Subsequently, AI has revolutionized the fashion industry by transforming various aspects across the entire fashion ecosystem, from manufacturing to distribution (Lee, 2022), retail (Marteli *et al.*, 2021), social media and marketing (Liang *et al.*, 2020), design (Lee, 2022) and product development (Rathore, 2023). Within the fashion sector, artificial intelligence aims to create a customized strategy that adds value to the corporate model (Rathore, 2023). Artificial intelligence technology is an excellent tool for fashion designers to help them create fresh and creative designs (Yan *et al.*, 2022). When new technologies are adopted into a given field, the first focus is on including them in already-established practices (Parsons & Campbell, 2004), such as using artificial intelligence to analyze significant volumes of data, including fashion trends, consumer preferences and historical styles, to generate design suggestions. This method helps designers to simplify their creative process and make informed judgments based on facts (Verganti *et al.*, 2020). Furthermore, applying AI-forecasted fashion trends will affect the sourcing of materials and the number of products produced, thus reducing overstock or overgeneration (Candeloro, 2020) and so offering a more affordable, sustainable fashion supply chain.

Fashion majors may participate in AI projects via two primary pathways. Fashion students' involvement in creating artificial intelligence technology and generating a data set for supervised learning (Rathore, 2023). Chen *et al.* (2019) stated that the first second is teaching AI-utilizing abilities as material for idea development and education. Though these roadways have enabled students to meet the working ideas of artificial intelligence technology, it is challenging for them to apply AI technology inside the whole clothes design process when their involvement is limited to data collecting and classification of fashion image datasets. This paper investigates the integration of Dayak cultural elements

into AI-generated fashion items. Through a collaborative process involving four skilled artisans and a group of design students, the project aims to bridge traditional Dayak art with contemporary digital design, preserving cultural heritage while embracing technological advancements.

3. Methodology

The research adopted a mixed-method approach. This technique employs qualitative and quantitative research methodologies to thoroughly investigate the incorporation of Dayak cultural components into AI-generated fashion products. The study is divided into four phases.

Phase One: Develop the initial motifs from the cultural identity icons and artisan's artworks (objective one) by conducting interview sessions and analyzing Dayak's cultural significance and motifs/patterns in the artisan's artwork.

Phase Two: Involving students to be inspired by developed motifs and use AI tools to create fashion products through conducting a focus group to gather diverse perspectives and interactions among participants (objective two).

Phase Three: A survey with students about their experiences through distributing a questionnaire (objective two).

Phase Four: Verification designs with the artisan through conducting interview sessions and one-on-one conversations designed to explore in-depth insights (objective three).

The primary objective was to develop AI algorithms to identify and integrate traditional Dayak themes and styles into digital fashion designs. Effective methodologies for collaboration include co-design sessions and iterative feedback loops to cover the second objective. Development of motifs and patterns influenced by artisans' cultural artworks, then have students use these motifs as references, incorporating AI elements to create contemporary designs suitable for fashion. After creation, all designs are verified by the artisans, which was the last objective of this study. These methodologies facilitate continuous dialogue between artisans and technologists, ensuring that the resulting AI tools are aligned with cultural values and artistic practices. These interviews focused on their perspectives, experiences and expertise in traditional Dayak art. The interviews were designed to capture the nuanced understanding and rich narrative of Dayak's cultural elements.

After conducting some experiments to develop the initial cultural motifs with inspiration from Dayak's art and handicrafts and interview sessions with Dayak's artisan (Jalil *et al.*, 2024), a session was organized where students collaboratively developed AI-generated graphic and fashion designs. Hence, each group of students included six people who were asked to use the developed motif (designed by the first author) using AI generator websites to create a graphical design. It should be noted that before this session, students were asked to attend a workshop entitled "Generative AI for Creatives." Henceforth, they had some basic and essential information before attending this focus group session. Afterward, students were asked to complete a questionnaire after developing the graphical motifs. Indeed, a questionnaire survey among students was done to collect data on the performance and accuracy of AI algorithms developed to identify and integrate Dayak themes and styles into digital fashion designs. After the session ended, student satisfaction with using AI was investigated through questions with possible responses based on a 5-point Likert scale (1=strongly disagree, 2=disagree,

3=neutral, 4=agree, 5=strongly agree). Afterward, in-depth interviews were conducted to gather detailed information on the artisans' perspectives, experiences and expertise in traditional Dayak art, especially verifying the AI designs. It collected feedback from artisans on the quality and authenticity of AI-generated designs. The interviews were performed individually using a face-to-face meeting platform to guarantee tailored interaction and efficient data gathering. Each session lasted around one hour and was recorded in audio format. Analyzed were the transcriptions of these recordings.

4. Results and Discussion

4.1. Phase One: Develop the initial motifs from the cultural identity icons and artisan suggestion

As shown in Table 1, interviewing 4 Dayak artisans showed the similarity between them in patterns; all have strong beliefs when using living creatures' patterns. Creating these motifs and patterns is a process that can only be undertaken by specific individuals. These patterns adorn clothing and paintings with distinct social contexts: Orang Ulu are reserved for individuals of higher status, Iban patterns symbolize warriors in 'Pua Kumbu' and Bidayuh patterns reflect strong spiritual connections. Each artisan believes that the living creatures' pattern has spiritual connections. The social stratification based on the uses of items known as aristocracy highlights differences influenced by social, economic and political factors, categorized into classes such as 'Maren', 'Hipui' and 'Panin'. Moreover, tattoos featuring living creatures' motifs are also significant within Dayak cultures, requiring specific individuals for their application to ensure spiritual appropriateness and strength. Artisan 1 attributes these patterns as being influenced by animals such as dogs or water dragons, connecting them with spiritual significance and symbolizing social status. In contrast, Iban artisans incorporate straight patterns with shorter tendrils and stop in certain parts, reflecting their historical headhunting, as noted by Artisan 4. Bidayuh is characterized by simplicity compared to Iban and Orang Ulu, as Artisan 2 and 3 described, drawing inspiration from plant motifs, where spirals symbolize longevity. Contemporary developed motifs inspired by Dayak culture are shown in Figure 1.



Figure 1. Contemporary developed motifs by the first author inspired by Dayak culture

The description of each motif is explained left to right as follows.

1. Circular Symmetrical Motif: This intricate motif showcases a circular design with a symmetrical arrangement. It embodies the unity and harmony found in nature, a central theme in Dayak culture, especially the Orang Ulu Identity. The swirling patterns and interwoven lines suggest the interconnectedness of all life forms, reflecting traditional beliefs and aesthetics.

2. Abstract Central Focus Motif: This motif features a more abstract and dynamic composition. It centers around a bold, central shape with radiating elements. The design

evokes Dayak art's energetic and spirited nature, with its sharp angles and flowing curves representing the natural world and the spiritual realm.

3. Heart-Shaped Symmetrical Motif: This motif is characterized by a heart-like shape with balanced, symmetrical details. The design emphasizes love, compassion and community values, integral aspects of Dayak culture. The intricate patterns within the motif highlight the detailed craftsmanship and deep symbolic meanings typical of Dayak artistry.

4. Spiralling Quadrant Motif: This motif, comprised of four interconnected spirals, represents the cyclical nature of life and the importance of balance and continuity. Each quadrant mirrors the others, creating a cohesive and harmonious design that reflects Dayak's appreciation for equilibrium and natural cycles.

5. Dual Mask-Like Motif: This design features a central form resembling dual masks or faces, symbolizing duality and the balance between opposing forces. The motif represents guardian spirits or ancestors, a common theme in Dayak culture, where masks are used in rituals and ceremonies to connect with the spiritual world.

6. V-Shaped Ornate Motif: The V-shaped motif is adorned with elaborate patterns and detailed elements, suggesting legality and importance. This design could indicate leadership or a significant cultural symbol within the Dayak community. The intricate linework and symmetrical arrangement emphasize the meticulous craftsmanship and cultural significance of such motifs.

Table 1. Interviewing code and analyzing the Dayak's cultural significance

Theme	Code	Summary of Findings
Cultural Significance	Orang Ulu Patterns	Orang Ulu patterns use natural colors and patterns of living creatures; specific patterns symbolize status and prestige. Leaders like Penghulu and Tua Kampung manage the distribution of authentic beads. Distinctive hairstyles (short bangs, long tails) are cultural identifiers.
	Bidayuh Patterns	Bidayuh motifs are significant, often originating from dreams. Some motifs are reserved for those demonstrating strength and resilience. Distinctive traditional hats and beadwork reflect unique cultural identities.
	Dayak Social Hierarchy	Dayak tribes have a social hierarchy within longhouses (e.g., Maren, Hipui, Panin) with roles inherited from parents. During the Gawai festival, 'Kumang' and 'Kelian' represent the queen and king.
Motifs and Patterns	Iban Cultural Practices	The Iban are known for the Pua Kumbu, a ceremonial robe requiring spiritual dreams for weaving. It symbolizes cultural identity and spiritual connections.
	Dayak Motifs	Dayak patterns are continuous, repeated and curved and motifs like 'Asuk' (dog) and water dragons symbolize spiritual companionship.

4.2. Phase Two: Involving students to be inspired by developed motifs and use AI tools to create digital artworks and fashion items

The study originated with an AI-based first graphic design, which was then applied to clothing design within the industry-university fashion design class and the student's evaluation of the class was analyzed. This project introduced students to new technology, providing a situation of uncertainty or pondering how the future may unfold and how to interpret the present. Hence, 36 design technology students in year three were given 2 hours to create a graphical design using Artificial Intelligence and assigned to six groups. As shown in Figure 2 (left), the design inspiration for this piece originates from a

traditionally decorated baby carrier (ba') adorned with intricate seed bead panels and glass beads. These motifs embody the cultural and artistic heritage of the Dayak community, symbolizing protection and care. The essence of the baby carrier's beadwork was abstracted into a central graphic motif, capturing its elaborate and symmetrical patterns. This motif was then transformed into various intricate designs, each emphasizing different aspects of the original artwork's complexity and symmetry. These refined designs were further enhanced with vibrant, modern color schemes, creating a striking contrast that highlights the traditional patterns while presenting them in a contemporary light. The final graphical designs evoke a sense of cultural preservation and innovation, blending the historical significance of the motifs with artistic expression.



Figure 2. Creation of graphical designs using Artificial Intelligence by students



Figure 3. Graphical mini fashion collection using Artificial Intelligence

As shown in Figure 2 (right), the inspiration for this design stems from the traditional beaded sunhat adorned with spiritual dragons and *aso'* motifs, integral to Dayak culture. The intricate beading patterns of the sunhat capture the rich cultural heritage and spiritual significance of the Dayak community. Graphic designs were developed by extracting and abstracting these motifs, showcasing the transformation from traditional artistry to contemporary visual interpretation. The central motif was further manipulated to create various symmetrical designs, emphasizing the fluidity and adaptability of the traditional elements. These graphical designs were then applied to modern, vibrant illustrations, maintaining the essence of the original motifs while presenting them in a fresh, dynamic context. This approach preserves the cultural significance and reimagines it, making it accessible and appealing to a broader audience. Subsequently, the researcher applied the six AI-generated graphical motifs to fashion clothing designs using CLO3D software and contemporary outfits, as shown in Figure 3.

4.3. Phase Three: A survey with students about their experiences using AI

To assess and quantify the students' perspective after they completed the AI-generated online training, researchers conducted a survey using a questionnaire form. The poll had 15 questions, with responses on a 7-point Likert-type scale ranging from strongly disagree to agree strongly. Question 15 of the questionnaire form used by Catal et al. (2020) was not included in this investigation. The statistical findings from the survey are shown in Table 2. As shown in Table 2, many students (19 out of 36) have used GAI technologies at least sometimes, indicating moderate familiarity. The experience level is also distributed, with more students identifying as beginners or intermediate, suggesting room for growth and learning. Students generally believe GAI can enhance their creative and academic abilities, with the highest agreement for improving the ability to create digital images and writing skills (mean = 4.83). There is strong agreement that GAI technologies can save time and provide unique insights and perspectives, highlighting their perceived utility in academic tasks (mean = 4.77).

Regarding concerning wit using AI and creativity, while some students express concern that GAI might undermine educational values or limit peer interaction, the majority do not strongly agree with these statements. This indicates a balanced view where the benefits of GAI are recognized, but potential drawbacks are also acknowledged. Most students (28 out of 36) agree or strongly agree that using GAI technologies is essential for producing quality outputs in their careers (mean = 4.40). Even more (30 out of 36) emphasize the need for responsible use of GAI, indicating awareness of ethical considerations. Student evaluation of the AI-based design process within the course was rated at 4.75 out of 5 (94.8%), indicating a highly positive assessment. The review confirmed that the instructional methods, effective communication and interactions between faculty and students were appropriate. However, it also highlighted the need for more precise evaluation standards.

The program offered a novel approach to garment design using AI-based Creative Systems Technology, which deviates from established methodologies. This method exposed students to innovative problem-solving strategies, allowing them to recognize design requirements efficiently. Furthermore, students expanded their understanding and expertise in digital fashion design, improving their ability to think critically and creatively using innovative technologies. The garment design process with AI includes creating supervised learning datasets in the issue definition and research stage, then employing trained AI models in the creative exploration stage to generate product

prototypes using a data-driven and efficient method. Consequently, students acquired artificial intelligence (AI) knowledge using supervised learning methods in the fashion sector.

Table 2. Statistical results of the questionnaire analysis

	Question	Mean	SD	Alpha Cronbach
	I believe generative AI technologies can improve my			0.78
1	ability to create digital images	4.83	0.24	0.76
2	ability to write a proper idea for having a color palette	4.34	0.59	0.78
3	problem-solving to idea generation for the creation of a design	4.15	0.89	0.71
4	ability to derive meaningful information from data	4.40	0.69	0.71
	I believe image-based generative AI technologies			0.81
5	can help me save time	4.77	0.45	0.77
6	can provide me with unique insights that I may not have thought of myself	4.32	0.59	0.72
7	can provide me with unique perspectives that I may not have thought of myself	4.11	0.78	0.92
8	can provide me with immediate personalized feedback for my assignments	4.78	0.70	0.74
9	can provide me with immediate suggestions for my assignments	4.57	0.68	0.73
10	is an excellent tool as it is available 24/7	4.88	0.20	0.77
	Using image-based generative AI technologies			0.71
11	to complete assignments undermines the value of a university education	4.75	0.33	0.78
12	will limit my opportunities to interact with peers while completing coursework	4.23	0.59	0.71
13	will hinder my development of teamwork skills	4.02	0.89	0.73
14	will hinder my development of problem-solving skills	4.13	0.67	0.75
15	will hinder my development of leadership skills	4.25	0.81	0.71

This improved their abilities as aspiring designers who can effectively work together with AI. Furthermore, through industry-university partnerships, AI technology was used to investigate the vast product databases of the affiliated firm. Students assumed the role of fashion designers for several businesses inside the classroom. Using AI technology, they studied the product needs of specific companies and devised their designs, resulting in a more efficient and market-driven garment design process. The artists provided vital knowledge on Dayak art's symbolic interpretations, traditional methodologies and cultural importance. Their accounts highlighted the need to safeguard cultural genuineness while adjusting to modern platforms. The interviews revealed a profound bond between the artists and their cultural legacy, emphasizing their unwavering commitment to preserving conventional artistic expressions.

4.4. Phase Four: Verification of AI-generated designs with the Indigenous artisan

While each artisan emphasized different aspects of cultural preservation and adaptation to modern technology, they underlined the importance of embracing technology while preserving authenticity and engaging younger generations in traditional culture once AI-generated graphics from students were shown to them. As technology advances, all artisans recognize technology's role in preserving the cultural heritage in different aspects. With the concern of declining participation among younger generations, Artisans 1 and 2 are adapting traditional practices into contemporary tastes

in cultural preservation. While adapting technology, it must maintain authenticity, as stated by Artisans 2 and 3, while reaching broader audiences and preserving traditions. Artisan 1 said, “I am impressed by how the AI has captured the intricate details of our traditional motifs, especially the spiritual dragons and *patterns*. *The transformation from our beaded sunhat to these digital designs is respectful and innovative. Seeing our heritage explored in new ways through modern technology*”. Artisans 1 and 4 acknowledge the negative impact of overpowering technology into commercial availability on traditional craftsmanship and cultural identity. At the same time, all artisans explain adapting to modern technology and Artisans 2,3 and 4 consent to the importance of balancing technology development with cultural tradition and practices.

Artisan 3 stated that “*the incorporation of AI in creating these motifs is fascinating. The designs retain the essence of our traditional art while bringing a fresh, contemporary look. It shows how technology can help preserve and evolve our cultural expressions, making them relevant to today's generation*”. I1 mentions his son's use of technology to produce contemporary music with traditional elements and the importance of digital recordings of *sape* techniques to preserve knowledge. I2 integrates traditional art with digital tools, stressing the need for cultural and historical context in art. She stated that “*the AI-generated motifs are quite intriguing. They have managed to keep the spirit and aesthetics of our art intact. I especially like how the motifs have been adapted into vibrant, modern forms. This approach can help our traditional designs reach a broader audience, especially in the fashion industry*”. I3 embraces scanning and digital tools for efficiency, encourages mastering traditional skills alongside digital tools and emphasizes preserving cultural identity in art while supporting the use of technology to protect cultural heritage. I4 acknowledges technology's role in stimulating creativity, recognizes the balance between technology's benefits and the need for authentic traditional art and supports using technology educationally while warning against losing creativity.

Artisan 4 stated, “*Seeing our traditional motifs transformed by AI is exciting and thought-provoking. The designs connect to our cultural roots while exploring new artistic boundaries. This fusion of tradition and technology could open new possibilities for our art forms, ensuring future generations appreciate them*”. In conclusion, they agreed that modern technology preserves cultural heritage through digital recording of traditional music and adaptation of instruments like the *sape*. However, traditional practices are declining among youth and traditional colors and patterns are being integrated with modern designs, ensuring careful motif selection to respect copyright. Integrating Dayak cultural elements into AI-generated fashion products represents a novel approach to cultural preservation. By involving Dayak artisans in the design process, the project ensures that the traditional motifs and techniques are accurately described and preserved. This approach aligns with the findings of previous studies, emphasizing the importance of cultural sensitivity and collaboration. AI has the potential to enhance creative possibilities by offering new tools for artists and designers. Developing AI algorithms capable of replicating Dayak motifs allows for exploring innovative design solutions while maintaining cultural authenticity. This dual focus on preservation and innovation can ensure the continued relevance of traditional art forms in contemporary digital art settings.

Overall, this study presents a creative experiential strategy to include students in their education actively. Using GAI tools for a graphical apparel design development project helped students better appreciate the technologies' practical relevance. By integrating participants' unique knowledge and experiences, the project represents the

development of a dynamic, collaborative learning environment that promotes active knowledge production. Through this study, students' dissatisfaction with the present degree of publicly accessible GAI tools was shown. As the literature on artificial intelligence literacy emphasizes, students have a great need to become masters in the generation of high-quality GAI output utilizing exact programming instructions. Students realized the need to create explicit questions to get the intended results as the photographs generated throughout the project fell short of expectations. Students developed their talents by directly seeing how their inputs affected the outputs produced by the tools. They understood the professional-level abilities needed for the next application in the fashion business.

This emphasizes how crucial it is for teachers to help students acquire the ability to provide successful prompts with high-quality outputs, preparing them for future professions. The influence of artificial intelligence developments on rapid engineering for fashion should be the main emphasis of future studies. This involves looking at how teachers may help students create customized prompts by educating them about artificial intelligence, letting them experiment with AI tools, giving feedback, demonstrating real-world examples, supporting teamwork, debating ethics and keeping current on developments. Apart from what students gained from the project, the findings of this study show teachers that students value the time-saving feature of utilizing this technology and the instantaneous feedback it may provide on learning results. This emphasizes the need for further investigation on how teachers may motivate student involvement with these instruments and use their features to improve curricula development.

5. Conclusion

This paper serves as a blueprint for similar initiatives worldwide, highlighting the need for innovative approaches to cultural preservation in the digital age. The collaborative efforts of artisans and design students resulted in a harmonious blend of traditional Dayak art and contemporary digital design. This project underscores the importance of cultural sensitivity and collaboration, offering a blueprint for integrating indigenous art with advanced technology. As AI continues to evolve, it holds promise for preserving and enhancing cultural heritage, ensuring its significance in contemporary digital art settings. Undergraduate fashion education is a foundational platform to equip students with practical skills to transition into the dynamic and competitive apparel industry workforce. Experiential learning methodologies, a common practice in fashion education, offer students invaluable opportunities to immerse themselves in real-world scenarios, facilitating the development of a comprehensive set of abilities and competencies crucial for success in the fashion industry. These hands-on experiences extend beyond traditional classroom settings, allowing students to actively engage in tasks, projects or activities that closely resemble the multifaceted challenges and demands they will face in their future careers. In order to thrive within the contemporary fashion industry, students must be creative and understand the technologies currently reshaping the landscape. AI and GAI technologies are revolutionizing every facet of the industry, underscoring the necessity for students to not only effectively adopt and use this technology but also critically evaluate its outputs and comprehend the ethical implications that may arise from its use.

Researchers and designers should adopt a hybrid approach that integrates modern technology with traditional methods to document and share cultural practices effectively. Digital tools like recordings and virtual reality can capture and simulate traditional techniques while preserving the core skills and cultural contexts essential to these practices. Engaging younger generations is key to preserving cultural heritage. Developing interactive digital platforms, such as educational apps and online workshops, can make traditional art and music more accessible and appealing to younger audiences. Social media can also play a role in highlighting the cultural narratives behind traditional motifs, increasing awareness and appreciation. While innovating traditional designs to suit contemporary tastes, it is essential to maintain the original meanings and values of these motifs. Innovations should enhance cultural essence rather than dilute it, ensuring that the traditional significance is preserved even as new elements are introduced. Utilizing digital technology to document and archive traditional practices is another vital suggestion. Creating comprehensive archives through video tutorials, digital libraries of patterns and virtual museums will serve as valuable educational tools and help preserve cultural knowledge for future generations. Lastly, involving the community in the digitization and adaptation processes ensures that cultural heritage is represented accurately and respectfully. This involvement supports the community in retaining ownership of its cultural expressions and contributes to preserving its heritage.

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