A Study on the Differences in AI-Generated Illustrations Across Different Professional Backgrounds

Wang Ruixue* , Jaehyung Byun** , Jonghwan Seo**

Abstract

This study uses the Classic of Mountains and Seas as its subject matter to explore the differences between art design, literature, and computer science students when using Midjourney to generate illustrations. Through multidimensional scaling analysis and questionnaire surveys, the results show that illustrations generated by students from different majors form unique clustering regions in two-dimensional space, reflecting significant professional differences. Art design places greater emphasis on color and stylistic innovation, literature focuses more on narrative and cultural symbols, while computer science leans toward structural and logical expression. Although AI demonstrates strong potential in creativity and visual style, it still has limitations in accurately interpreting cultural symbols and mythological imagery. This study provides insights into the application of AI in artistic creation and highlights its potential and challenges in a multidisciplinary context.

Keywords : AI illustration | Midjourney | Different professional backgrounds | multidimensional scaling

I. INTRODUCTION

The rapid advancement of generative AI technology, particularly the widespread adoption of image-generation tools like Midjourney, DALL · E, and Stable Diffusion, is profoundly transforming artistic creation. These tools possess powerful text-to-image conversion capabilities, enabling creators to effortlessly generate images with complex compositions and aesthetic features. This advancement not only expands artistic expression but also shifts image creation from the exclusive domain of professional artists to a more accessible mass phenomenon, marking a new phase in the transition from specialized to popular image creation. Generative AI has also demonstrated significant application value in education,

cultural dissemination, and the digital creative industries, offering new possibilities for arts education and interdisciplinary collaboration.

Using the Classic of Mountains and Seas as a unified source material, the phoenix—a figure rich in symbolism and cultural recognition—was selected as the creative theme. By comparing the creative performance of students from art design, literature, and computer science disciplines in AI illustration generation, this study aims to systematically explore how academic backgrounds influence

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creative behavior, stylistic expression, and aesthetic preferences.

This research fills a gap in understanding creator variability within generative AI, while also providing theoretical insights for art education, interdisciplinary collaboration, and visual communication. The findings offer practical guidance for optimizing human–machine collaboration mechanisms and refining AI system design, holding significant academic and practical value—particularly in applications involving traditional cultural themes and cross–disciplinary creation.

II. Literature Review

With the rapid advancement of generative AI technology, AI–generated art illustrations have become essential tools in digital creation. Prompt–based image generation models such as Midjourney, DALL · E, and Stable Diffusion can swiftly transform textual descriptions into high–quality visual works. These tools not only provide creators with more diverse means of expression but also lower the barrier to entry for professional skills, enabling non–professional users to participate in creation. This has expanded both the audience and forms of artistic creation.

Existing research indicates that the style and creative process of AI–generated artworks are influenced not only by model algorithms but also significantly constrained by user characteristics and cognitive structures. For instance, a user's disciplinary background, creative experience, and aesthetic preferences can all impact the visual effects and cultural expressions of generated works. This suggests that analyzing AI–generated art requires more than examining technical performance and output alone; it necessitates consideration of the creator's knowledge framework and operational strategies.

Existing research generally emphasizes the important role of user characteristics in AI–generated art. Meron [1] proposes that the professional logic and cultural judgment mechanisms of creators should be integrated into the system to achieve human–machine symbiosis. Bakumenko [2] reveals differences in acceptance and emotional responses among different age groups, reflecting the influence of technological familiarity and cultural experience. Lyu et al. [3] found that art professionals are more proactive in prompting and generating strategies, but the final visual effects show limited differences; Southworth et al. [4] pointed out that disciplinary backgrounds lead to structural cognitive differences, which should be bridged through interdisciplinary education; Sozen [5] proposed a process model of “user cognitive structure prompt input—generation feedback,” illustrating the interaction paths designers take when using AI tools.

Zhang Zhiding and Zhang Zhenwei [6] emphasized that AI has nearly matched human creativity in terms of style and composition, but remains limited in accurately expressing emotions and cultural symbols. Kay [7] found that individuals with different professional backgrounds exhibit significant cognitive differences in graphic creation, and prompt generation outcomes depend not only on algorithms but also on users' experience

and strategies. Chen et al. [8] further point out that AI has gradually integrated into creative workflows, and understanding how users from different disciplinary backgrounds interact with AI holds significant implications for art education and technological development.

Overall, these studies provide theoretical foundations for this research to explore how professional background differences manifest in AI illustration generation, and offer insights for optimizing AI tools in cultural expression, cognitive alignment, and educational applications in the future. Existing research on AI-generated art predominantly focuses on dichotomous distinctions between art and non-art, or experts and non-experts, lacking systematic analysis of differences in prompt expression, visual style, and cultural symbol construction among users with diverse disciplinary backgrounds. Furthermore, most studies remain confined to technical performance and user satisfaction metrics, neglecting in-depth exploration of users' cognitive structures and cultural preferences. Particularly in creative contexts involving traditional cultural elements like the Classic of Mountains and Seas, virtually no research has examined the relationship between disciplinary background and generated outcomes.

Therefore, building upon existing theoretical foundations, this study will systematically compare the creative characteristics of users from diverse disciplinary backgrounds. By integrating multidimensional analysis with expert evaluation methods, it will explore the interaction between disciplinary context and creative strategies, with a particular focus on the generation of traditional cultural imagery. This approach not only addresses gaps in current research and deepens our understanding of how disciplinary knowledge structures influence AI-driven creation but also offers practical value and innovative significance for the integration of AI and cultural arts.

In summary, this study will not only provide new perspectives for the collaboration of different professional backgrounds and reveal the intersection of art, literature and computer science in AI-assisted creation, but also show the multiple possible paths for the integration of technology and humanities. This will help promote the in-depth application of AI in cultural and artistic creation and education, and provide theoretical support and practical reference for the future positioning of AI in the social and cultural fields.

III. Research methodology

This study was conducted under the guidance of a clear framework and phased objectives, maintaining systematicity and rigor from data collation and sample construction to result analysis, ensuring the standardization and reliability of the research process.

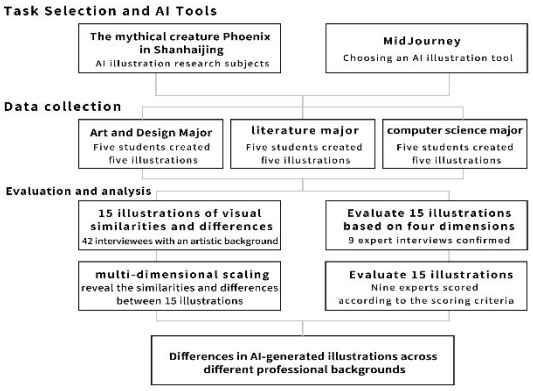


Fig. 1. Research Methodology Process

3.1 Tasks and Generation Tools

This study aims to analyze illustrations generated by 15 students majoring in art design, literature, and computer science, each using Midjourney to create illustrations based on the mythical creature described in the Classic of Mountains and Seas: “Beyond the East Sea, there is a bird resembling a chicken, adorned with five colors and patterns, known as the phoenix.” To better understand this creative task, the phoenix was chosen as the subject due to its significant symbolic meaning and widespread cultural recognition in Chinese mythology. Its distinct “five-colored plumage” provides direction for AI-driven creation, aligning with mainstream aesthetics, facilitating dissemination, and proving suitable for cultural products, animation, and gaming. Through modern technology, traditional culture is revitalized, and mythological tales are reenergized.

Among numerous AI image generation tools, Midjourney is widely recognized for creating highly stylized works with outstanding visual effects. Midjourney emphasizes artistic expression and is well-suited for concept art and fantasy themes[9]. Shanxi Liao[10] investigated the tool's application in image creation, discovering its proficiency in generating surreal and imaginative visuals—qualities that align perfectly with the mythical and fantastical elements of the Classic of Mountains and Seas. Midjourney not only provides a new technical pathway for digital art creation but also opens up fresh possibilities for reinterpreting traditional mythological imagery through contemporary expression.

3.2 Analysis Method I: MDS

To more intuitively reveal the similarities and differences among the 15 illustrations, this study employed multidimensional scaling (MDS) for analysis. MDS is a classic multivariate statistical method that maps the similarities or distances between samples in high-dimensional data to a low-dimensional space, visually presenting the differences and potential cluster structures among samples in the form of spatial distribution[11]. This method is a general technique used to understand and display the structure of multivariate data. It has been widely applied in the field of behavioral science and has deepened our understanding of complex psychological phenomena. MDS has been used to evaluate cognitive development theories, study children's interracial relationships, determine consumer preferences, and assess the dimensional structure and content validity of tests and questionnaires[12].

3.3 Analysis Method 2: Expert Evaluation

We invited nine experts in the fields of art and design and conducted nine semi-structured interviews with them individually. These experts possess

extensive artistic practice and educational experience, making them qualified to professionally evaluate AI-generated illustrations. The group comprised 6 women (67%) and 3 men (33%), with the following age distribution: 3 individuals (33%) were aged 20–30, 5 individuals (55%) were aged 30–40, and 1 individual (12%) was aged 40–50. The team includes two university professors, three associate professors, two lecturers, and two senior designers. The interview process comprised three steps: First, open-ended questions guided experts to share their experiences and criteria in illustration creation and evaluation. Second, their responses were thematically categorized and compared to identify core dimensions repeatedly emphasized during evaluation. Finally, through multiple rounds of discussion and cross-validation, an evaluation framework with high consensus among experts was established. This systematic process ultimately yielded four key factors for assessing illustration works, providing a theoretical and practical foundation for subsequent research.

(1)Color features;(2) Composition features;(3) Content features;(4) Style features.

Nine experts conducted a systematic evaluation of the works based on four key characteristics of the illustrations: color characteristics, compositional characteristics, content characteristics, and stylistic characteristics. They analyzed specific dimensions within each characteristic — color harmony and emotional expressiveness, compositional balance and visual guidance, content consistency and thematic clarity, and stylistic uniqueness and originality—and assigned quantitative scores accordingly.

Through these evaluation results, we further compared and analyzed differences in AI-generated illustrations across various professional backgrounds. This process not only revealed variations in disciplinary knowledge structures regarding prompt language, aesthetic preferences, and cultural imagery construction but also provided systematic evidence for deepening our understanding of the relationship between AI creation and disciplinary contexts.

Ⅳ. Experiments and results

4.1 Data collection: AI illustration generation

In order to systematically explore the differences in creative behavior, stylistic expression, and aesthetic preferences among individuals with different professional backgrounds in the process of AI-generated illustration, this study employed purposive sampling to consciously select undergraduate students from three disciplines—art design, computer technology, and literature—at a comprehensive university in China as experimental subjects. Five undergraduate students were recruited from each discipline, for a total of 15 participants across the three groups, forming a representative small sample structure.

In the experiment, the use of prompts was standardized to a certain extent. Before formal creation, students received guidance on prompts, including their length, level of detail, and descriptive approach.

Necessary explanations were also provided regarding the creation theme, the phoenix, to ensure students fully understood the task requirements. This ensured comparability of operations across different subject groups. However, during the actual creative process, students retained a degree of freedom to adjust the phrasing of prompts based on their own creativity and interpretation, striking a balance between standardized requirements and personalized expression. Each group was limited to a maximum of fifteen minutes for their creation.

The literature major group mastered Midjourney's operational methods and prompt writing techniques through preliminary training before the experiment. During the formal creation process, they demonstrated a distinct narrative orientation and focus on cultural imagery. On average, students independently completed illustration generation and submitted their work within 13 minutes.

Table 1. The Literature Major Experiment

Illustration	Prompt
	a mythical golden rooster-like phoenix standing on a sacred mountain peak, feathers flowing like silk with emerald and crimson tones, surrounded by ancient Chinese landscape painting with misty rivers and distant temples, soft ink wash atmosphere, symbol of divine order and poetic wisdom, classic Chinese mythology style.
	In the distant East Sea , a poetic mythical bird like a phoenix, with soft pink, orange, and blue feathers, standing quietly on a cliff above the misty sea, glowing in gentle light, surrounded by a dreamy and ancient landscape, symbol of rebirth and mystery, fantasy literature style.
	A majestic phoenix perched on the edge of an ancient mountain peak, its brightly colored feathers blending perfectly with the misty clouds overhead. The majestic phoenix shimmers with brilliant colors in the sunlight, exuding power and beauty. In the background of this divine bird are rugged cliffs and ethereal skies, as well as the boundless sea.
	A colorful phoenix perches on the edge of an ancient mountain, its iridescent feathers shimmering in the sunlight as it gracefully takes flight against a backdrop of misty mountains and cascading waterfalls. This is a digital painting in the style of Chinese fantasy art, featuring an ethereal landscape with a focus on bright colors, a warm color palette, and a high level of detail. The technique used is digital airbrushing, creating a pastel-like effect with a golden age illustration aesthetic.
	A phoenix, with red and orange feathers, stands atop the mountains in ancient China. It has long tail feathers like fireflies, fiery eyes, and wings spread out to fill half of its body, surrounded by blue water waves under the bright sunlight. The illustration style is a colorful cartoon, a full-body portrait, with brushstrokes. The color scheme is flat, in the style of Chinese ink painting, with watercolor effects, resulting in a cute and adorable appearance. The artwork features an oil painting texture, light colors, and a warm atmosphere.

Computer science students complete tasks through concise and logically clear instructions, focusing more on image structure and semantic control while engaging less with cultural narratives and stylistic exploration. Ultimately, they completed their creative works in just 7 minutes on average.

Table 2. Computer Science Major Experiments

Illustration	Prompt

	A large red and orange bird with open wings, standing in front of the sun, looks like a phoenix, with mountains and the sea in the background, in vibrant colors.
	A phoenix composed of minimal geometric shapes and five colors stands on an angular polygonal cliff overlooking an ocean and mountains composed of layered vector waves and grids, with clean lines and vibrant tones in the style of modern computer graphics.
	a realistic phoenix standing by the seaside with mountains in the background, detailed feathers, natural colors, clear and sharp image.
	A colorful phoenix with red, green, and yellow feathers is flying over the sea. The background is mountains and blue sky. Its wings are clearly outlined, its tail feathers are spread out, and its scales sparkle in the light.
	A beautiful phoenix with red, blue and yellow feathers perched on the edge of cliffs overlooking an ocean in Hawaii. The background is cloudy and foggy.

Students majoring in art and design leveraged their professional expertise in their creative work, achieving personalized expressions by adjusting prompts and parameters. The average 12-minute creation process reflects their spirit of exploration and aesthetic pursuit.

Table3. Art Design Major Experiments

Illustration	Prompt
	A majestic phoenix with vibrant, multicolored feathers perched on an icy cliffside at night. The background is dark and starry sky, creating a magical atmosphere. The design incorporates bright orange, reds, yellows, greens, blues, purples, silver accents, intricate patterns of the plumage, sparkling effects, fantasy style. Digital art by Alena Aenami, featured in Artstation, perfect for T-shirt printing. It has clear outlines, no shadows, and has high resolution.
	A beautiful phoenix with rainbow feathers, standing on the edge of an ancient fantasy mountain range overlooking the ocean, painted in soft pastel colors, in the style of James Jean and Craig Mullins.
	Generate a vibrant and dynamic illustration of a phoenix with smooth, abstract strokes and vibrant colors including red, yellow, blue, green, and white, bursting with energy and movement, in a modern digital art style, with high contrast against a dark background, and with expressive, smooth compositions with a painterly quality and focus on artistic design.
	A colorful phoenix with long feathers, standing on the snow in front of an ancient Chinese village, illustrated in the style of James Jean and Atey Ghailan. The colors include reds, oranges, yellows, greens, and a white background, and the design is full-body. It has detailed textures and is in vector format. There is a mountain range behind it. In its mouth, there should be waves, symbolizing wisdom or power.

A majestic phoenix beyond the Eastern Sea, resembling a colorful rooster with harmonious five-colored feathers in vibrant red, blue, green, yellow, and white, illustrated with clean lines and smooth gradients, modern contemporary digital art style, elegant and balanced composition with clear focal point, detailed feather textures, minimal background suggesting misty sea and mountains with soft abstract shapes, vibrant yet cohesive color palette, sleek and polished illustration emphasizing form and color harmony, in the style of Art Nouveau and minimalism, with subtle influences of surrealism and graphic illustration.

4.2 Evaluation and analysis1: multidimensional scaling

This study employed a hybrid data collection method combining online and offline approaches to ensure the comprehensiveness and representativeness of the data. The experimental materials consisted of 15 illustrations created by participants with diverse professional backgrounds, with the works randomly numbered from 1 to 15. To conduct an in-depth analysis of the visual and stylistic similarities among the illustrations, the study design paired the 15 illustrations in two-by-two combinations, forming 105 independent paired groups. Participants were required to assess the similarity of all paired combinations using a Likert five-point scale, with scores ranging from 1 to 5, where 1 represents “very similar” and 5 represents “completely dissimilar.” This scale aims to objectively measure participants' perceptions of visual similarity among the illustration groups, thereby revealing the distribution of similarity among illustrations created in different professional contexts. This method effectively ensures the reliability of the data and the accuracy of the analysis, providing a solid foundation for subsequent statistical analysis and conclusion-drawing.

Fig. 2. Sample survey questionnaire

To ensure the professionalism and reliability of the illustration evaluation results, this study strictly controlled the selection of evaluation subjects and the data collection process during the experiment. A total of 42 participants with an art-related background were recruited to participate in the illustration similarity scoring task. These evaluators had received formal education or professional training in fields such as art design, art education, or visual culture, and possessed strong artistic appreciation skills and a solid foundation in image judgment. They were capable of making stable and discerning subjective evaluations across dimensions such as style, composition, color, and cultural expression.

The questionnaire designed by this research institute primarily focuses on the task of evaluating the similarity of paired illustrations, aiming to examine respondents' intuitive experiences and evaluation criteria in visual perception and artistic judgment. The questionnaire was distributed through both online and offline channels to ensure sample diversity and comprehensive data collection. In the online section, 25 valid responses were

obtained via the questionnaire system. Respondents primarily included undergraduate and graduate students majoring in art, art teachers, and freelance creators. These individuals possess high artistic literacy and visual analysis capabilities, enabling them to provide relatively professional feedback for the study. For the offline portion, 17 paper questionnaires were collected. Respondents were primarily students enrolled in master's-level art courses and members of campus art clubs, who possess experience and interest in illustration creation through their daily studies and practice.

During the data stage, the research team screened 42 questionnaires based on predefined validity criteria, ultimately confirming that 40 questionnaires met the analysis requirements. Based on these valid questionnaire data, this study collected a total of 600 valid paired scoring records. Due to the large volume of data, this study only presents the data table of one respondent as the data foundation for multidimensional scaling analysis. These scoring records will assist researchers in conducting an in-depth analysis of the cognitive differences among respondents with different professional backgrounds when assessing the perceived similarity of AI-generated illustrations, providing a reliable foundation for subsequent data processing and analysis. Subsequent analyses were conducted using IBM SPSS Statistics 27.0 software for data coding, similarity matrix construction, and dimensionality reduction modeling to explore the perceived stylistic structures between different illustrations and the visual clustering characteristics among professional creators.

The model employed in this study converged after nine iterations. According to the Kruskal stress value criterion, the final stress value was 0.21650, falling between 0 and 1. The stress value reflects the degree of inconsistency between the observed similarity matrix and the reconstructed distances in the low-dimensional space within the multidimensional scaling (MDS) model. Lower values indicate better model fit to the original similarity structure and stronger explanatory power. The stress value in this study is slightly above the ideal standard for "excellent fit" (Stress < 0.1) but remains within an acceptable range, suggesting the model effectively reproduces participants' perceived structure of illustration styles to a certain extent.

The stress value has certain limitations: First, it is influenced by sample size and the number of variables; small samples or high-dimensional variables may lead to elevated stress values. Second, a high stress value does not necessarily render the model unusable but suggests caution in interpreting the results. Additionally, the stress value does not comprehensively reflect the model's fit across all individual levels. Therefore, when interpreting MDS results, the RSQ value should be considered alongside the stress value to comprehensively assess the model's validity and reliability. The RSQ value of 0.73677 exceeds the minimum acceptable threshold of 0.60, indicating that the model possesses explanatory power and reliability in reproducing the original

similarity structure. Overall, the MDS model demonstrates relatively robust fit metrics and reasonably reflects the distance structure in participants' perceptions of illustration styles.

Table4: The multidimensional scaling analysis

iteration	stress	improvement
1	.30302	
2	.28324	.01978
3	.27608	.00716
4	.27278	.00330
5	.27067	.00221
…	…	…
9	.26544	.00098

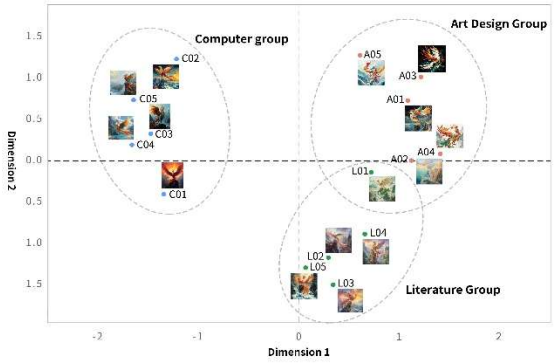


Fig. 3. multidimensional scaling results chart

From the results of the multidimensional scaling analysis, it can be observed that the illustrations generated by Midjourney across different disciplines exhibit a clustered distribution pattern in the two-dimensional perceptual space. Illustrations created by students from the same discipline show consistency and concentration within the space, while those from different disciplines exhibit distinct differences. Specifically, four out of the five illustrations created by computer science students are clustered in the upper-left quadrant of the graph, indicating a strong internal consistency in visual style within this group of works; the illustrations created by literature students are concentrated in the lower region of the graph, forming a localized cluster ; while the illustrations created by art design students are primarily distributed in the right-side region of the graph, with the A02 sample slightly deviating from the center as an isolated case, but the overall pattern still constitutes a clustered structure.

The figure shows that a few samples exhibit cross-group proximity. Sample A02 from the art design group is located in the lower right quadrant of the graph, close to the center of the perceptual space, and its distance from some illustrations in the literature group is significantly reduced. This proximity suggests that A02 may incorporate the mild color tones or narrative compositional elements commonly found in literary works in its visual style, failing to fully reflect the typical characteristics of art design expression. Similarly, the L01 sample deviates from the main cluster area of the literature group and shifts toward the central area of the art design group, indicating that it may incorporate mixed characteristics of art design style in terms of image language or color processing.

Although there are instances of cross-disciplinary style fusion in individual samples, from the perspective of overall spatial structure, the three groups of illustrations still maintain clear category boundaries within the two-dimensional perceptual space. This result further validates the consistent influence of professional background on the cognitive and aesthetic preferences in illustration creation. Based on this two-dimensional

model, it can be inferred that students from different disciplinary fields exhibit clear structural differences in their expressive pathways and visual preferences when utilizing AI tools for illustration creation, reflecting the profound impact of knowledge structure and training background on AI-assisted creation outcomes.

4.3 Evaluation and analysis2: Expert Evaluation

To further evaluate 15 representative works, we invited nine industry experts to score them. A line chart was plotted based on the average scores to compare performance differences across evaluation dimensions among three categories of creators with distinct professional backgrounds. The illustration assessment covered four aspects: Color Characteristics (richness, harmony, layering, and visual impact), Composition Characteristics (element layout, balance, spatial sense, and stability), Content Consistency (thematic clarity and task alignment), and Style Characteristics (innovation, consistency, and personalization). Scoring employed an inverted scale: works demonstrating excellence and alignment received lower scores, while those deviating from the theme, lacking coordination, or exhibiting insufficient expressiveness received higher scores to highlight distinctions.

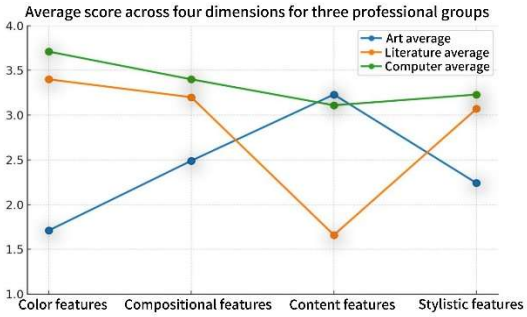


Fig. 4. Average score across four dimensions for three professional groups

The illustration works of art and design students exhibit distinct characteristics in this experiment: their use of color is prominent, creative, and visually impactful, earning recognition from experts; compositions demonstrate artistic merit and overall balance, though they occasionally lack rigor, reflecting the tension between free creativity and traditional norms; thematic consistency is relatively weak, indicating lower alignment with the subject matter, yet aligning with their emphasis on innovation and individual expression; Stylistically, the works excel in individuality and innovation, fully demonstrating a pursuit of expressive power and distinctive artistic voice.

The illustrations produced by computer science students demonstrate overall balanced and stable performance, with scores across all four dimensions falling within the mid-range. While color usage is rational, it lacks sufficient variation. Compositions exhibit neat alignment with content yet fall short in creative tension. Stylistic expression maintains consistency but lacks distinctive personal traits, resulting in outputs that lean toward standardization and technicality.

Illustrations created by literature majors often feature conservative color choices and lack visual impact, revealing

shortcomings in their visual arts training. However, they demonstrate strong narrative coherence, with highly unified themes and clear storytelling logic, highlighting the strengths of a literary background in narrative structure and cultural expression. Stylistically, these works tend to be bland and uninspired, lacking both cohesion and individuality, indicating relative weakness in artistic style development.

V. Discussion

Research findings reveal significant differences in how students from diverse academic backgrounds utilize Midjourney to generate illustrations: within the two-dimensional perceptual space, works from different disciplines exhibit clustered distributions. Art and design students emphasize stylistic innovation and visual impact, literature students focus on narrative logic and the representation of cultural symbols, while computer science students prioritize structural clarity and technical precision. Expert evaluations further validated these distinctions: art and design students tended toward creative and personalized expression, literature students emphasized content coherence and cultural accuracy, while computer science students demonstrated overall stability but relatively limited creativity and individuality. These findings indicate that disciplinary background plays a crucial role in AI illustration creation.

It should be noted that this study has certain limitations. Due to the small sample size of participants in each discipline group (only five students per group) the generalizability of the findings is constrained. Although prompt guidance was provided during the experiment, participants may have varied in their ability to use prompts and their proficiency with AI tools, which could have influenced the generated results to some extent. Furthermore, algorithmic biases and technical limitations inherent to AI tools may also influence the stylistic outcomes and generation quality of the works. Thus, caution is warranted when interpreting these findings.

Nevertheless, these discoveries offer significant insights for the future development of AI illustration. Research indicates that AI should strike a balance between creative expression and cultural accuracy, while providing personalized support tailored to the distinctive characteristics of different disciplines. Simultaneously, the fusion of interdisciplinary styles demonstrates novel creative possibilities. Future research could explore more refined human-machine collaboration models, integrating multidisciplinary knowledge from fields such as art, literature, computer science, anthropology, psychology, and design. This approach aims to enhance AI's creative efficiency, cultural comprehension, and aesthetic expressiveness, ultimately fostering intelligent creative partners that embody both innovation and cultural depth.

VI. Conclusion

Students from different academic backgrounds exhibit significant differences in AI-assisted illustration

generation. Research findings reveal distinct preferences in creative approaches among creators with varying disciplinary backgrounds: Art and design majors emphasize composition and style, leveraging their visual training and creative techniques to produce works with stronger aesthetic appeal and visual impact; literature majors prioritize narrative and cultural symbols, focusing on conveying content and cultural stories, though they demonstrate relative weakness in visual presentation and stylistic development; computer science students lean toward rational and structured expression, possessing strong technical and logical advantages that enable model optimization, yet they exhibit deficiencies in artistic expression and cultural comprehension.

A few cross-group samples (A02 and L01) reveal key characteristics of interdisciplinary creativity between literature and art design majors: they demonstrate stylistic fusion capabilities—drawing on visual or narrative elements from another discipline to form new expressions while grounded in their own field; they exhibit cognitive flexibility—integrating literary narrative logic with visual expression from art design across disciplinary boundaries during the creative process; While such interdisciplinary creation enhances richness and diversity, it may also dilute disciplinary specificity, suggesting that interdisciplinary training must balance preserving disciplinary identity with fostering innovative integration.

AI demonstrates remarkable potential in color application and stylistic innovation, yet remains limited in interpreting cultural symbols and deep contextual meanings. This deficiency is particularly evident when depicting traditional themes like the Classic of Mountains and Seas, where AI-generated content often lacks detailed and accurate cultural interpretation.

This study not only reveals the strengths and limitations of AI illustration across disciplinary contexts but also provides insights for future AI applications in artistic creation and cultural heritage preservation. Findings suggest integrating multidisciplinary knowledge systems to enhance cultural imagery construction and personalized creative guidance, thereby fostering deep collaboration and innovative development between AI and human creators.

REFERENCES

[1]Meron Y. Graphic design and artificial intelligence: Interdisciplinary challenges for designers in the search for research collaboration[J]. 2022.

[2]Bakumenko S. AI Generated vs. Traditional: Investigating Age Group Differences in the Perception of Art[J]. 2024.

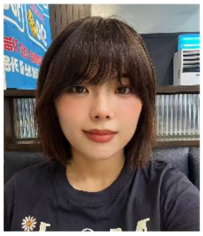
[3]Lyu Y, Wang X, Lin R, et al., "Communication in human–AI co-creation: Perceptual analysis of paintings generated by text-to-image system," *Applied Sciences*, 12(22): 11312, 2022.

[4]Southworth J, Migliaccio K, Glover J, et al. Developing a model for AI Across the curriculum: Transforming the higher education landscape via innovation in AI literacy[J]. *Computers and Education: Artificial Intelligence*,4: 100127, 2023.

[5]Sözen T. AI Tools in Design: Unveiling Their Impact on Design Thinking and Process Integration[D]. *Middle East Technical University* (Turkey), 2024.

[6]Zhang Z, Zhang Z. AI Drawing: an Exploration of Image Artistic Creation—Taking the Practice of "Tongyi Wanxiang" AI Drawing System as an Example[C]//2024 International Conference on Humanities, Arts, Education and Social Development (HAESD 2024). *Atlantis Press*, pp. 96—106 , 2024.
[7]Kay S. The figural problem solving and problem finding of professional and semiprofessional artists and nonartists[J]. *Creativity Research Journal*, vol. 4, no. 3, pp. 233—252 , 1991.
[8]Chen J F, Chu Y S, Lin P H. Innovative Frontiers in Visual Arts: AI's Role in Interdisciplinary Collaboration[C]//International Conference on Kansei Engineering & Emotion Research. *Singapore: Springer Nature Singapore*, 2024: pp. 374—388.
[9]Jie P, Shan X. Comparative analysis of AI painting using [Midjourney] and [Stable ffusion]—a case study on character drawing[J]. *The International Journal of Advanced Culture Technology*, pp. 403—408 , 2023.
[10]Liao S, Ji X. A study on the application of generative artificial intelligence technology in image design[C]//2nd International Conference on Intelligent Design and Innovative Technology (ICIDIT 2023). *Atlantis Press*, pp. 338—350, 2023.
[11]Kruskal, Joseph B., and Myron Wish. Multidimensional scaling. No. 11. Sage, 1978.
[12]Davison M L, Sireci S G. Multidimensional scaling[M]//Handbook of applied multivariate statistics and mathematical modeling. *Academic Press*, pp. 323—352, 2000.

Authors



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