





 Research Article

AI Co-Creative Art Narrative and Emotional Mediation Research: A Computational Grounded Theory Analysis of “The Era of Prompts” Exhibition at Tainan Art Museum

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Abstract

Against the backdrop of rapid development in generative artificial intelligence technology, the definition, process, and evaluation standards of artistic creation are undergoing a profound transformation. This study takes “The Era of Prompts—A Challenge Letter from AI to Humanity” exhibition at Tainan Art Museum as the research field, employing mixed research methods to explore the multiple impacts and educational implications triggered by AI intervention in artistic creation. The research integrates exhibition ethnography, procedural scaffolding experimental design, and computational grounded theory analysis, conducting a three-stage learning journey experiment with 206 university students in southern Taiwan. The primary objective was to understand how university students perceive and engage with AI in the context of art creation, and to identify the core themes that emerge from their learning experiences. The main findings reveal five grounded themes of AI art learning: computational writing practice, emotional expression mediation, imperfection value reconstruction, collaborative relationship dynamics, and literacy requirement identification. These five themes interact spirally to form the theoretical model of “Adaptive Development of Art Learning in the AI Era.” The research concludes that art education in the AI era needs to construct new pedagogical paradigms that embrace technological innovation while maintaining human subjectivity, criticality, and emotional depth in creation. This study provides important references for theoretical construction and educational practice of AI art, offering a nuanced understanding of the human-AI creative partnership. The findings suggest that rather than viewing AI as a mere tool, it should be approached as a collaborator, a mediator of emotional expression, and a catalyst for re-evaluating the very nature of creativity. This research contributes to the fields of art education, human-computer interaction, and digital humanities by providing an empirically grounded framework for designing and evaluating AI-integrated learning environments.

Keywords: Artificial Intelligence Art, Grounded Themes, Computational Writing, Emotional Mediation, Adaptive Development

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1. INTRODUCTION

1.1. Research Background and Problem Statement

Contemporary art stands at an unprecedented technological turning point. From IBM’s “Deep Blue” victory in chess in 1997, symbolizing early AI capabilities based on rules and search algorithms; to AlphaGo’s breakthrough in Go in 2016, demonstrating the leap brought by deep learning and reinforcement learning; to the 2020s with generative AI models represented by GPT, DALL-E, Midjourney, and Sora, possessing cross-modal content generation capabilities that completely changed the landscape of

human-machine interaction. This series of technological milestones not only heralds the rise of machine intelligence but also profoundly reshapes the definition, process, and value system of artistic creation.



Figure 1. Main Entrance Wall of “The Era of Prompts—A Challenge Letter from AI to Humanity” Exhibition at Tainan Art Museum. The wall features the exhibition title in both Chinese and English, along with introductory text and visual elements that set the conceptual framework for the exhibition. *Source:* Hao-Chiang Koong Lin.

The rapid development of generative artificial intelligence technology has made “prompting” a new form of creation. Artists dialogue with AI systems through natural language instructions, transforming abstract creativity into concrete visual, auditory, or multimedia works. The emergence of this creative mode, as pointed out by Lin et al. (2025) in their research, makes writing itself transcend traditional linguistic expression functions, evolving into a computational multimodal practice. Prompts are no longer merely descriptive text but become algorithmic instructions that drive machine creation, carrying the creator’s intentions, aesthetic preferences, and cultural background.

However, the widespread application of AI technology in the artistic field has also raised a series of profound questions. When instructions replace brushes, when algorithms participate in conception, to whom does creative subjectivity belong? How do we define the respective contributions of human creativity and AI computational power? Furthermore, AI intervention not only changes the “how” of creation but also affects the “why” and “what” of creation. While pursuing AI generation efficiency and perfection, the inherent “imperfection” in human creation—those hesitations, flaws, accidents, and even failures—may become key to maintaining creative authenticity and personal style.

1.2. Research Significance and Value

Against this backdrop, “The Era of Prompts—A Challenge Letter from AI to Humanity” exhibition curated by Tainan Art Museum provides a valuable research field for academia. This exhibition not only brings together representative works of contemporary AI art but, more importantly, takes “prompting” as its core concept, precisely capturing the essential characteristics of current AI creation, and systematically presents the evolutionary trajectory of human-machine interaction modes through the curatorial structure of three stages: “collaboration,” “coexistence,” and “fusion.”

The academic value of this study is manifested at multiple levels. First, from the perspective of theoretical construction, this study provides an empirical foundation for understanding the essential characteristics of artistic creation in the AI era through an in-depth analysis of representative AI art exhibitions. Second, from the perspective of methodological innovation, this study integrates exhibition ethnography, procedural scaffolding experimental design, and computational grounded theory analysis, forming a mixed-method framework suitable for AI art research. Finally, from the perspective of practical application, this study provides specific theoretical guidance and practical suggestions for the transformation of art education in the AI era.



Figure 2. Exhibition Timeline Display Showing the Development of AI Technology from 2022-2024. The timeline includes key milestones such as ChatGPT, AIGC (AI-Generated Content), Stable Diffusion, Prompt Engineering, and other significant developments in AI art and technology, providing historical context for the exhibition's themes. *Source:* Hao-Chiang Koong Lin.

1.3. Research Framework and Chapter Organization

This study adopts mixed research methods, integrating qualitative and quantitative analysis to explore the complex phenomena of AI art from multiple dimensions. The research framework includes three interrelated levels: exhibition analysis, experimental design, and theoretical construction.

At the exhibition analysis level, researchers use exhibition ethnography methods to conduct in-depth observation and work analysis of the “Chanting World” exhibition. Through systematic field investigation, ten exhibition observation themes are identified, covering various aspects from creative process transparency to AI as a new media for multimodal weaving. This analysis not only reveals the diverse manifestations of contemporary AI art but also provides a theoretical foundation for subsequent experimental design.

At the experimental design level, researchers designed and implemented a learning experiment based on procedural scaffolding theory for 206 university students in southern Taiwan. The experiment guides students to deeply participate in AI art learning through a three-stage learning journey (pre-visit preparation, visit experience, reflection journal) and collects rich reflection data. This design embodies the importance of “creative AI literacy” cultivation emphasized by Tedre and Vartiainen (2023).

At the theoretical construction level, researchers use computational grounded theory to systematically analyze student reflection data, extracting grounded themes about AI art cognition and learning, and constructing corresponding theoretical models. The application of this analytical method, as pointed out by Nelson (2020), can effectively process large-scale text data and discover hidden patterns and associations.

The chapter organization of this paper is as follows: Chapter 2 reviews relevant literature and establishes theoretical foundation; Chapter 3 analyzes exhibition context and curatorial narrative; Chapter 4 deeply explores ten exhibition observation themes; Chapter 5 details experimental design and implementation process; Chapter 6 presents findings from computational grounded theory analysis; Chapter 7 discusses research implications and theoretical contributions; Chapter 8 summarizes research conclusions and proposes future prospects.

2. LITERATURE REVIEW AND THEORETICAL FOUNDATION

2.1. Theoretical Development of AI Art Creation

The combination of artificial intelligence and art is not a recent phenomenon; its theoretical roots can be traced back to cybernetics and systems theory thinking of the mid-20th century. However, the breakthrough of contemporary generative AI technology has brought qualitative leaps to this field. Current

AI art creation has transcended the simple tool usage level and entered deeper discussions of creative subjectivity.

From the perspective of the creative process, AI technology not only changes the generation method of artworks but, more importantly, redefines the role of creators and the nature of the creative process. This change is manifested at three levels: technological innovation at the tool level, thinking pattern transformation at the cognitive level, and creative ecosystem reconstruction at the social level.

AI systems excel in generating novel content but still have limitations in understanding and embodying deep cultural meanings. This limitation precisely provides irreplaceable value space for human creators, namely cultural interpretation, emotional expression, and ethical judgment.

2.2. Educational Application of Procedural Scaffolding Theory

Procedural scaffolding theory is rooted in Vygotsky's social constructivist learning theory, emphasizing that learning occurs within the learner's "zone of proximal development." Effective scaffolding design should provide appropriate support structures, enabling learners to gradually acquire the ability to independently complete complex tasks.

In the context of AI art education, the importance of procedural scaffolding is particularly prominent. When facing emerging technologies, learners often need multi-level support, including conceptual understanding, procedural operation, and strategic thinking. This multi-level support design concept provides important theoretical guidance for the experimental design of this study.

Effective scaffolding design can promote learners' ability to transform and integrate between different modalities. This finding has important significance for AI art education, as AI creation often involves coordinated use of multiple modalities such as text, images, and audio.

2.3. Methodological Innovation of Computational Grounded Theory

Computational grounded theory is an important development of traditional grounded theory in the digital age, combining the depth analysis of qualitative research with the scale advantages of computational methods. Nelson (2020) proposed in his pioneering research that computational grounded theory can process large-scale text data while maintaining sensitivity to the deep meaning of data.

Computational grounded theory is particularly suitable for analyzing complex interaction patterns in human-machine co-creation processes. This method can effectively identify thematic patterns and conceptual associations hidden in large amounts of text data, providing a solid empirical foundation for theoretical construction.

Lin et al. (2025) further expanded the application scope of computational grounded theory in their research on AI-assisted programming education. They proposed a hybrid analysis framework integrating AI teaching agents and machine learning, maintaining the depth of qualitative research while improving analysis efficiency and reliability. This research particularly focuses on the impact of AI teaching agents on students' self-efficacy, programming ability, and learning engagement, providing an important empirical foundation for AI-assisted education research.

2.4. Grounded Analysis Based on AI-Assisted Education: Methodological Innovation and Empirical Findings

Based on the pioneering research of Lin et al. (2025), this study further develops AI-based grounded analysis methods, which is an innovative analysis framework combining AI teaching agents with traditional grounded theory. This method is particularly suitable for understanding learning effects and cognitive changes in AI-assisted education, providing new methodological perspectives for AI art education research.

2.4.1. Methodological Innovation: Grounded Analysis of AI-Assisted Education

2.4.1.1. Multimodal Data Integration for Educational Understanding

Modern AI-assisted education research needs to process large-scale data from multiple sources, including interaction records from learning platforms, student reflection journals, dialogue records of teaching agents, etc. This multi-source data integration analysis can provide more comprehensive learning understanding perspectives, transcending the limitations of traditional single data sources.

This study borrows this method, combining students' exhibition visit experiences, reflection journals, peer discussions, and other data sources to form a hybrid analysis framework suitable for AI art education research. The innovation of this method lies in that it not only focuses on learning outcomes but also emphasizes cognitive changes and emotional experiences during the learning process.

2.4.1.2. Dual Verification of Topic Modeling and Content Analysis

Using Latent Dirichlet Allocation (LDA) topic modeling technology, research can automatically identify potential topic structures in large-scale text data. This technology can automatically identify potential topic structures in text without predefined labels or categories, which is highly consistent with the inductive principles of grounded theory.

This study applies this technology to the analysis of student reflection journals, identifying key concept groups through topic modeling, then conducting in-depth interpretation through manual content analysis, forming an analysis system combining quantitative and qualitative approaches. Researchers achieve transformation from machine learning results to humanistic understanding through steps such as adjusting topic numbers, labeling topic names, and grouping keywords.

2.4.1.3. Context-Sensitive Analysis of Cross-Platform Data

The contextual characteristics of different data sources have important impacts on analysis results. The interactive characteristics of learning platforms, community-oriented knowledge sharing mechanisms, and diverse user backgrounds provide researchers with rich educational cognitive data.

Similarly, student reflection journals in this study, as deep records of personal learning experiences, provide another important data context. This cross-platform comparative analysis enriches the theoretical depth of research, enabling us to understand the complex phenomena of AI art education from both individual learning experience and collective social cognition levels.

2.4.2. Empirical Findings: Association Patterns Between AI Educational Technology and Art Learning

2.4.2.1. Evolution Trajectory of Learner Focus Topics

AI-assisted education research shows that learners' attention to new technologies presents obvious topic evolution patterns. From basic technical operation attention, gradually expanding to creativity cultivation, problem-solving ability, and interdisciplinary application. This study finds that students' focus points in AI art learning present similar evolution trajectories: from initial technical operation attention (such as prompt syntax, parameter settings), developing to mid-term creative process understanding (such as human-machine collaboration modes, creative generation mechanisms), and finally ascending to deep philosophical speculation (such as creative subjectivity, redefinition of artistic essence).

2.4.2.2. Diversified Characteristics of Learner Perspectives

Learners from different backgrounds show differentiated characteristics in understanding AI technology. Students in this study, as direct participants in AI art education, demonstrate more complex perspective structures: they are both technology learners and art creators, as well as witnesses to educational transformation. This multiple identity makes their reflections have unique depth and breadth, providing rich perspectives for understanding the multiple aspects of AI art education.

2.4.2.3. Social Cognitive Mechanisms of Educational Innovation

Learners' positive experiences and deep reflections on AI educational technology not only affect their personal learning trajectories but also influence broader social cognition through peer networks and social media sharing. This "learner voice" dissemination effect provides an important social foundation for the promotion of AI art education.

2.4.3. Theoretical Construction: Integrated Model of Technology Assistance and Individual Learning

2.4.3.1. Interaction Mechanisms Between Collective Intelligence and Individual Cognition

This study proposes an integrated theoretical model of technology assistance and individual learning. In this model, individual AI art learning experiences contribute to collective knowledge bases through reflection journals, peer discussions, and social media sharing; meanwhile, collective intelligence influences individual learning cognition and attitude formation through learning platform interactions, experience sharing, and opinion debates.

2.4.3.2. Social Construction Characteristics of Cross-Cultural Learning Patterns

Cultural factors in AI art learning are not only manifested at the individual level in values and aesthetic preferences but, more importantly, at the social level in collective cognitive construction processes. Taiwanese students' understanding of AI art is deeply influenced by the "harmonious coexistence" concept in Confucian culture, making them more inclined to view AI as collaborative partners rather than competitors, emphasizing balance and harmony in human-machine relationships.

2.4.3.3. Predictive Model for Social Acceptance of Educational Innovation

This study constructs a predictive model for social acceptance of educational innovation. The model contains three core elements: technology accessibility (learners' understanding and exposure to new technologies), value consistency (compatibility between new educational methods and existing values), and effect visibility (observability and communicability of educational outcomes). This model not only helps understand the promotion mechanisms of AI art education but also provides a theoretical reference for the socialization of other emerging educational technologies.

In the context of this study, we borrowed this methodological innovation and applied it to the analysis of learning reflections in AI art education. Through AI-assisted analysis of 206 student reflection journals, we can not only process larger-scale text data but also identify subtle patterns and associations that traditional manual coding might miss. The application of this methodology enables us to maintain the inductive characteristics of grounded theory while significantly enhancing the depth and breadth of analysis.

3. EXHIBITION CONTEXT AND CURATORIAL NARRATIVE: TRIPLE VARIATIONS FROM COLLABORATION, COEXISTENCE TO FUSION

3.1. Temporal Coordinates: Historical Echoes and Contemporary Pulse of AI Art

The curatorial concept of "The Era of Prompts" exhibition embodies a profound understanding of the AI technology development context. Curator Professor He-Lin Luo (2025) keenly captured the key moment of AI technology evolution, placing the exhibition within a grand narrative from symbolic computation to generative intelligence. Luo (2025) points out in the curatorial discourse that the exhibition's timeline design clearly presents the development trajectory of AI technology: from early rule-based expert systems, to the rise of machine learning, to the breakthrough of deep learning, and finally to the explosion of generative AI.

The exhibition's curatorial discourse clearly distinguishes the evolution of AI's role in artistic creation. In the early stages, AI was more viewed as a novel tool or medium, with artists using algorithms to generate random or rule-based patterns and sounds. As machine learning capabilities strengthened, AI

began to imitate specific styles and even participate in the creative decision-making process. In the generative AI era, AI can almost independently complete transformations from text to images, sounds, and videos, making “human-machine collaboration” a real and universal creative mode.

This historicized presentation not only helps audiences understand the technological background of current AI art phenomena but also provides important temporal positioning for academic research. As revealed by the exhibition, we are currently at a critical juncture transitioning from the “AI prompting era” to the “AI fusion era,” and this temporal characteristic provides important clues for understanding the evolution of human-machine relationships.

3.2. Structural Design: A Three-Act Drama of AI Development

The exhibition cleverly divides the process of AI intervention in artistic creation into three stages: “collaboration,” “coexistence,” and “fusion,” using these as the spatial layout and narrative mainline of the exhibition. These three stages are not strictly linear progressions but represent three typical states of human-machine interaction modes, providing audiences with an analytical framework for understanding the complexity of AI art.

Act I: Collaboration

Luo (2025) positions the collaboration area in the curatorial design as an experience display space for traditional field creators’ first contact and attempts at co-creation with AI. This area features diverse exhibition forms, including video records of artists’ personal testimonies, creative process documentation, and preliminary AI-assisted works. Core issues revolve around “trust” and “communication”: How do creators overcome unfamiliarity with AI technology? How do they learn effective “prompt engineering” to guide AI? How does AI-generated content combine with creators’ original styles and intentions?

The exploration at this stage embodies the trade-offs and negotiations between creators in utilizing AI potential and maintaining their own creative subjectivity. Observations reveal that creators generally experience psychological transformation processes from skepticism to acceptance, from passive use to active integration. The recording of this transformation process provides valuable empirical material for understanding the psychological mechanisms of human-machine collaboration.

Act II: Coexistence

The coexistence area displays how AI is integrated as a powerful productivity tool into existing creative workflows. The exhibition focuses on presenting work comparisons before and after AI intervention, highlighting AI’s high-efficiency capabilities in visual generation, sound design, motion capture, and other aspects. At this stage, creators’ roles often transform from direct content producers to more macro “directors,” “planners,” or “curators,” responsible for setting goals, screening materials, and integrating resources.

This role transformation embodies a “distributed collaboration” framework, where the creative process becomes a continuous cycle of negotiation, debugging, and editing between humans and AI. However, efficiency improvements are accompanied by concerns about originality and style uniqueness. The work comparisons in the exhibition clearly demonstrate this trade-off relationship between “efficiency” and “texture.”

Act III: Fusion

Luo (2025) designs the fusion area as a space dominated by new media artists more familiar with programming languages and interdisciplinary teams, exploring deeper integration of human-machine relationships. In this curatorial concept, AI is no longer merely a tool or assistant but becomes an organic component of the creative system, even playing a “third-party” role between creators and audiences. Works are mostly interactive installations, generative art, or data-driven performances, emphasizing real-time, participatory, and evolutionary characteristics.

Core issues turn to “symbiosis,” “translation,” and “control”: How are human intentions translated into algorithmic logic? How do we balance AI autonomy with human control? How does audience participation influence work generation and evolution? The exploration at this stage touches the frontier of human-machine relationships, presenting a complex intelligence loop jointly constituted by data, algorithms, human intentions, and audience feedback.

3.3. Visual Codes and Spatial Metaphors

Luo (2025) incorporates deep metaphorical meanings into the exhibition’s visual design and spatial layout. The exhibition space is dominated by deep dark tones, dotted with flowing blue lights and digital projections, creating a spatial experience that is both technological and mysterious. The “eye” symbol running through the exhibition space becomes a strong visual code, carrying multiple interpretive possibilities.

This “eye” can be interpreted as the omnipresent “data eye” of AI systems, constantly observing, learning, and imitating; it can also be seen as the “rational eye” of human creators examining, reflecting on, and questioning AI; it can be understood as the “viewing eye” of audiences facing AI art, intertwining curiosity, confusion, and amazement. This multi-interpretive design precisely echoes the complexity of “viewing” and “being viewed,” “creating” and “being created” relationships in contemporary AI art.

Luo (2025) constructs a field that guides audiences to philosophical contemplation through the exhibition space itself. The transparent installation design allows audiences to directly observe the operating mechanisms of works, which not only enhances the educational value of works but also embodies the exhibition’s consistent pursuit of the “transparency” theme. From creative process transparency to exhibition installation transparency to human-machine relationship transparency, the exhibition practices the concept of “demystification” at multiple levels.

4. IN-DEPTH EXHIBITION ANALYSIS: DISCUSSION OF TEN OBSERVATION THEMES

Based on in-depth observation and systematic analysis of “The Era of Prompts” exhibition, this study identifies ten exhibition observation themes. These themes not only reflect the diverse manifestations of contemporary AI art but also reveal the deep mechanisms and complex dynamics in human-machine collaboration processes. The following will analyze the specific manifestations and theoretical implications of these themes one by one.

4.1. Recording Dialogue: The Transparency Revolution of Creative Processes

In traditional artistic creation, the creative process is often viewed as the artist’s private domain, with the outside world only able to infer creative trajectories through final works. However, in “The Era of Prompts” exhibition, we observed a revolution in creative process transparency. Since large language models automatically record all dialogue histories, many artists began displaying these records as important components of their works.

A digital artist in the exhibition displayed her complete dialogue records with AI lasting several hours. From initial vague ideas to gradually concrete descriptions, to final precise instructions, every dialogue modification and every prompt adjustment is like a fossil of creative thinking, recording the artist’s thought trajectory. This recording method transforms the creative process from a black-box operation to transparent, traceable processes.

More impressively, many artists not only preserved text records but also filmed complete creative process side-recording videos. These videos completely record every action of creators in front of computers, every pause in thinking, every exclamation or sigh. This transparent creative recording, as pointed out by Lin et al. (2023), not only provides audiences with windows to understand AI creative mechanisms but also provides valuable case resources for art education.

Transparent creative records also provide unprecedented materials for art history research. Future art historians will be able to study the development trajectory of AI art in the early 21st century with

unprecedented precision, analyze different artists' creative strategies, and track the impact of technological development on creative practice. These records will become important documents of digital age art history.



Figure 3. AI Art Creation Workstation Setup Within the Exhibition Space. The installation includes a computer terminal where visitors can experience the process of creating AI art through prompt engineering, with a large screen displaying generated cityscape imagery and surrounding text showing the prompts used in the creation process. *Source:* Hao-Chiang Koong Lin.

4.2. Inspiration of Chanting: Prompts as Artistic Language of the New Era

The “chanting” concept proposed by Luo (2025) precisely captures the core mechanism of current AI creation. In the context of AI art, prompts undertake functions similar to ancient incantations—they are the medium for human-AI communication, the bridge for transforming abstract ideas into concrete creation. The prompt display wall specially set up by Luo (2025) in the exhibition, from simple descriptions to complex technical instructions, these texts themselves possess a poetic beauty.

As an emerging language form, prompts have unique linguistic characteristics. Observations reveal that effective prompts need to find a balance between specificity and openness. Overly specific descriptions may limit AI’s creative space, while overly vague instructions may lead to unpredictable results. Mastering this balance, as pointed out by Lin et al. (2025) in their research, requires creators to have a deep understanding of AI capabilities and limitations.

The interactive area in the exhibition allows audiences to personally experience the prompt creation process. Observations reveal that even using the same prompts, AI-generated results have subtle differences, and this randomness adds unexpected surprises to creation. This phenomenon reveals the dialectical relationship between “determinism” and “randomness” in AI creation, providing important clues for understanding the essential characteristics of AI creation.

Although most AI models are primarily trained on English, the exhibition also displays some prompt experiments using Chinese, Japanese, and other languages. These experiments reveal the subtle relationship between language and creative style, also reflecting implicit cultural biases and limitations in AI models. Prompts in different languages may lead to different visual styles, reflecting uneven cultural distribution in training data.

4.3. Two-Dimensional Culture: Digital Reflection of Contemporary Youth Aesthetics

The two-dimensional special area of the exhibition displays numerous works using composite media, cleverly combining traditional anime elements with AI generation technology. These works not only reflect the life experiences and aesthetic tastes of contemporary young generations but also demonstrate diverse and vibrant creative energy. Observations reveal that young artists are not satisfied with purely digital creation; they hope to bring virtual elements into the real world, creating touchable and interactive artistic experiences.



Figure 4. Exhibition Display Showing AI-generated Artworks in “The Era of Prompts” Exhibition at Tainan Art Museum. The installation features multiple large-scale digital prints showcasing various AI-generated visual styles, from abstract patterns to naturalistic imagery, demonstrating the diversity of AI artistic expression. *Source:* Hao-Chiang Koong Lin.

A young artist’s work is particularly eye-catching, using AI technology to reinterpret classic anime characters, placing these characters in modern urban contexts. Characters originally existing in fantasy worlds suddenly appear in real street scenes, producing a surreal visual impact. This creative approach embodies an important characteristic of two-dimensional culture: virtual-real fusion.

The use of composite media reflects an important trend in digital age artistic creation: the fusion of physical and digital. An observed work prints AI-generated anime-style character images on transparent acrylic boards, then combines them with LED light strips and mirror materials, creating a three-dimensional installation viewable from different angles. When audiences move, the characters’ expressions and postures seem to change, producing dynamic visual effects.

However, the use of two-dimensional culture in AI art also raises some thought-provoking questions. When AI can easily imitate and generate anime-style works, where are the boundaries of originality and cultural appropriation? An artist in the exhibition candidly discusses this issue in her creative statement, reflecting contemporary artists’ cultural sensitivity and ethical awareness.

4.4. Eve Clone: AI Reinterpretation of Cross-Era Artistic Practice

Dean Pey-Chwen Lin’s “Eve Clone” series occupies a special position in the exhibition. The history of this series can be traced back decades, from initial physical light sculpture installations to prophetically entering the metaverse’s twin world, and now having new interpretations in the AI era. This cross-era artistic practice demonstrates an ideal relationship between artists and technology: neither blindly worshipping technology nor rejecting it, but viewing technology as an expressive tool.

The name “Eve Clone” itself is full of profound symbolic meaning. Eve, as the ancestor of humanity, represents the origin of life and the archetype of femininity, while cloning symbolizes technology’s replication and reconstruction of life. This contrast and tension have different manifestations in different technological eras, but their core concerns remain consistent: In an era of rapid technological development, what challenges and opportunities do human essence and identity recognition face?

Amazingly, Dean Lin began exploring identity construction issues in virtual worlds when the metaverse concept was not yet popular. Her works prophetically depicted a parallel world composed of digital twins, and this exploration of virtual identity appears highly prescient today.

Now, with the support of generative AI technology, the “Eve Clone” series has new manifestations. In the latest works observed, AI generated countless “Eve” variants, each with unique characteristics while carrying the same cultural symbols and symbolic meanings. This diversity and richness are difficult to achieve with traditional creative techniques, and these AI-generated Eve images are not static but constantly evolving.

4.5. AI Collaboration: Deep Exploration of Creative Boundaries and Ethics

The collaboration special area of the exhibition presents the most thought-provoking question: When AI participates in creation, who is the real creator? Many exhibits are the result of collaboration between artists and AI, forcing audiences to rethink the essence of creation and the definition of creators. Observations reveal that the dynamics of human-machine collaboration are more complex than expected; it is not a simple tool-use relationship, nor a pure master-servant relationship, but a more subtle interaction mode.

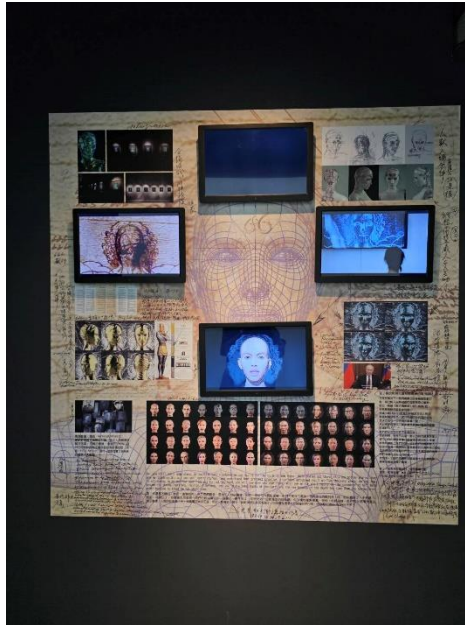


Figure 5. Interactive Digital Art Installation Featuring Multiple Screens Displaying AI-generated Portraits and Facial Analysis. The work explores themes of identity, recognition, and human representation in the age of artificial intelligence, with various screens showing different stages of AI processing and generation. *Source:* Hao-Chiang Koong Lin.

A particularly striking work displays the collaboration process between a painter and AI. The painter first draws a basic composition on canvas, then scans it into the AI system, which generates multiple variations based on the painter's style and intentions. The painter then selects favorite elements and recombines them into their own painting. This process repeats until the final work is completed.

In this collaboration, what are the respective contributions of humans and AI? Humans provide initial creativity and final judgment, while AI provides rich variations and technical support. But this division of labor is not absolute; sometimes AI's "unexpected" generation inspires new human ideas, while human adjustments also influence AI's subsequent generation. This mutual influence and inspiration constitute a completely new creative mode.

As AI's role in creation becomes increasingly important, a series of ethical issues also emerges. Many works in the exhibition explore these issues: Where are the boundaries of AI participation in creation? How do we ensure the rights of human creators? How do we handle copyright issues of AI-generated content? How do we avoid bias and discrimination in AI creation? A participating artist candidly discusses these issues in her creative statement, reflecting contemporary artists' ethical sensitivity.

Observations also reveal that many artists begin to develop emotional connections with AI. They give names to their commonly used AI models, describe feelings of "dialogue" with AI, and even express appreciation or disappointment with AI's "creativity." This phenomenon reflects deep changes in human-technology relationships. As pointed out by Lin et al. (2025) in their research, when AI becomes a creative partner rather than merely a tool, human-machine relationships become more complex and rich.

4.6. No Code Coding: Democratization of Artistic Creation Thresholds

The technical display area of the exhibition witnesses a revolution regarding creative thresholds. In the past, generative art often required deep programming backgrounds, and this technical threshold excluded many artists with creativity but lacking programming skills. However, through “No Code Coding” methods, many artists without programming backgrounds can now easily engage in multiple generative creations.

Observations reveal that most No Code tools displayed in the exhibition adopt visual programming methods. Artists can construct creative logic through graphical interfaces, like building blocks to combine different functional modules. This approach not only lowers learning thresholds but also makes the creative process more intuitive and interesting. This visual programming method can help people without technical backgrounds understand and apply computational logic.

Another important feature of No Code tools is supporting multiple generative creations. Artists can quickly generate multiple different work variants based on the same creative logic by adjusting parameters or modifying partial modules. The exhibition has a special display area showing 100 different versions of works created by an artist based on the same No Code template. Although these works are based on the same creative logic, each has unique visual effects.

The popularization of No Code Coding has profound impacts on the entire artistic creation ecosystem. It not only allows more artists to participate in digital creation but also spawns new creative communities and collaboration modes. The exhibition displays an online community composed of No Code creators, with members from different backgrounds, forming a vibrant creative ecosystem through sharing creative templates, exchanging technical insights, and collaborating on projects.

4.7. Transparent Installations: Innovative Experiments in Exhibition Forms

In “The Era of Prompts” exhibition, what impresses most is not only the works themselves but also the exhibition’s arrangement methods. The curatorial team not only made the creative process transparent but also applied transparency treatment to the exhibition installations themselves. Some works even completely expose their operating mechanisms to audiences, allowing them to directly see the technical construction behind the works.



Figure 6. Minimalist Interactive Art Installation Featuring Transparent Screens and a White Cubic Structure. The piece explores themes of transparency and visibility in AI processes, allowing viewers to observe the technological mechanisms behind AI art creation. *Source:* Hao-Chiang Koong Lin.

This transparent installation method embodies a completely new exhibition concept. Traditional exhibitions often hide technical details, allowing audiences to focus on the aesthetic effects of works. But in the context of AI art, technology itself is an important component of works, and hiding technology would actually weaken the integrity of works. Transparent installation design allows audiences to simultaneously appreciate both the aesthetic and technical values of works.

Observations reveal that transparent installation design greatly enhances the interactivity and interest of exhibitions. When audiences can see how their behaviors are captured by sensors, how they are processed by algorithms, and how they are finally transformed into visual or auditory effects, their understanding of works becomes deeper, and their participation becomes more active. Many audiences stay for long periods in front of these transparent installations, not only appreciating the effects of works but also studying their working principles.

4.8. AI Development Timeline: Witnessing Important Milestones in Art History

Luo (2025) uses the long axis of AI evolution as the main line, clearly presenting the current position in the “AI prompting era” and about to enter the “AI fusion era” historical positioning. This timeline design not only helps audiences understand the development context of AI technology but also makes them aware that they are witnessing an important historical moment.

From the proposal of the Turing Test in the 1950s, to the revival of neural networks in the 1990s, to the breakthrough of deep learning in the 2010s, and finally to the explosion of generative AI in the 2020s, each stage has corresponding artworks and creative practices. This historicized presentation allows audiences to understand the significance and value of current AI art in a broader temporal and spatial background.

Luo (2025) demonstrates strong curatorial ambition, positioning this exhibition as an important milestone in AI art development. This positioning is not exaggerated but based on an accurate judgment of the current technological development stage. Observations reveal that the exhibition is indeed at a critical turning point—AI technology is mature enough to become an important tool for artistic creation; meanwhile, society’s acceptance of AI is rapidly increasing, creating conditions for the popularization of AI art.

4.9. Cross-Domain Creation: New Possibilities for Technology-Art Fusion

In the past, visual artists often had to collaborate with engineers or sound artists due to technical limitations to complete cross-media works. Now, AI technology allows artists to wear multiple hats, crossing different fields and demonstrating unprecedented creative freedom. The exhibition observes many artists who originally specialized in certain fields, now able to create comprehensive works covering visual, auditory, and even interactive experiences.



Figure 7. Large-Scale Display of AI-generated Digital Artwork Featuring Vibrant Colors and Abstract Forms. The piece demonstrates the aesthetic capabilities of AI in creating complex visual compositions that blend organic and geometric elements. *Source:* Hao-Chiang Koong Lin.

A traditional painter uses AI technology to compose music for their paintings, a musician creates visualized musical works, and a poet transforms text into dynamic visual poetry. This multi-role creative mode embodies the profound impact of AI technology on the creative ecosystem.

The development of AI technology is dissolving boundaries between different artistic fields. When text can generate images, images can transform into music, and music can drive animation, traditional artistic classification systems face redefinition challenges. This boundary dissolution brings new possibilities for artistic creation and poses new requirements for art education.

4.10. AI as New Media: Multimodal Innovation Weaving Art

Viewing AI as a new artistic medium, like oil paint, marble, or photographic film. But the uniqueness of AI as a medium lies in its being not only passive material but also an active, creative partner. It has learning capabilities, generative abilities, and even some degree of “creativity.”



Figure 8. Interactive Installation Displaying AI-generated Urban Landscapes and Architectural Imagery. The work features colorful building facades and includes Chinese text elements, exploring the intersection of AI technology with local cultural contexts and urban environments. *Source:* Hao-Chiang Koong Lin.

The exhibition observes young artists’ curiosity, excitement, and innovation toward AI as a new medium. They are not satisfied with simply using AI to generate content but explore how to weave AI’s multimodal generation capabilities into rich and diverse cross-media creations. AI’s multimodal capabilities provide unprecedented possibilities for artistic creation. Artists can freely transform between text, images, audio, and video, creating complex and rich sensory experiences.

An impressive work demonstrates this weaving charm. The artist starts with a poem, uses AI to transform poetry into images, then transforms images into music, and finally transforms music into dynamic visual effects. The entire process forms a complete sensory cycle, with each medium retaining certain qualities of the original poem while adding new layers and meanings.

5. EXPERIMENTAL DESIGN: GUIDING AI ART EXPLORATION JOURNEY WITH PROCEDURAL SCAFFOLDING

Facing the new landscape of AI art revealed by “The Era of Prompts,” how to guide learners, especially university students about to enter society, to effectively understand, participate in, and critically reflect on this transformation has become an urgent task for art education. Therefore, this study designed an experimental program aimed at promoting deep learning and reflection, targeting 206 students from different universities and interdisciplinary backgrounds in southern Taiwan. The core method is applying the “procedural scaffolding” theory throughout the entire exhibition learning process.

5.1. Theoretical Foundation: Why Do We Need Scaffolding?

Procedural scaffolding theory is rooted in Vygotsky’s social constructivism, emphasizing that learning occurs within the learner’s “zone of proximal development”—the task area that learners can achieve with assistance from experienced others but cannot complete independently. In the emerging and rapidly changing field of AI art, the necessity of scaffolding is particularly prominent. Students not only

need to master new technical tools and understand abstract artistic concepts, but also need to establish critical thinking frameworks to address ethical, social, and philosophical challenges brought by AI.

This experimental design integrates four types of scaffolding to provide comprehensive learning support:

Conceptual Scaffolding: Provides background knowledge, key terms, and theoretical models, such as AI development history, different AI art types, and human-machine collaboration modes, helping students establish foundational frameworks for understanding.

Metacognitive Scaffolding: Designs reflective questions, learning journals, and peer dialogue sessions, guiding students to monitor, evaluate, and regulate their own learning processes and cognitive changes, becoming aware of their attitudes, assumptions, and emotional responses to AI art.

Procedural Scaffolding: Provides clear task steps, operation guides, and tool usage suggestions, such as how to write effective prompts and how to analyze work, reducing cognitive load so students can focus on higher-level thinking.

Strategic Scaffolding: Provides analytical frameworks, comparison matrices, and problem-solving strategies, such as how to evaluate the quality of AI-generated content and how to address algorithmic bias, helping students develop deep inquiry and critical evaluation abilities.

This multi-level scaffolding integration aims to create a learning environment with structural support that can stimulate autonomous exploration, echoing Jocius's (2018) emphasis on the need to provide support across multiple dimensions, including conceptual, technical, and collaborative aspects, when studying multimodal creation.

5.2. Three-Stage Learning Journey: From Preparation, Experience to Reflection

The experimental design carefully divides students' learning process into three coherent stages, each equipped with detailed procedural scaffolding learning sheets guiding students to gradually deepen.

Stage 1: Preparing for Departure—Pre-visit Preparation (1 week)

This stage aims to prepare knowledge and psychological readiness for exhibition visits. Learning sheet content includes:

AI Art Time Capsule: Understanding AI art development context through reading a brief history and marking milestones, recognizing that current AI enthusiasm did not emerge from nowhere. This segment uses conceptual scaffolding to help students establish a historical perspective and theoretical foundation.

Prompt Chanting First Experience: Attempting to write prompts for different types of AI (text, image, music), comparing similarities and differences, thinking about effective prompt elements. This helps cultivate "creative AI literacy" emphasized by Tedre and Vartiainen (2023), combining procedural and strategic scaffolding.

Exhibition Strategy Decoding: Reading exhibition introductions, understanding curatorial structure (collaboration, coexistence, fusion), pre-selecting interesting artists or works, and setting personalized visit goals. This segment integrates conceptual and metacognitive scaffolding, helping students establish learning objectives and expectations.

Stage 2: Immersive Experience—Visit Experience (1 day)

This stage emphasizes on-site observation, interactive experience, and social learning. Learning sheets guide students to:

Exhibition Focus Catcher: Conduct structured recording for representative works in three exhibition areas (work, artist, description, AI role, personal observation), and record interactive installation experiences and reflections. This segment mainly uses procedural and metacognitive scaffolding, ensuring systematic and in-depth observation.

Thought Collision Sparks: Conduct group discussions, share personal observations, record different viewpoints, and jointly extract views on AI art contributions and challenges. This collaborative learning mode emphasizes the role of peer interaction in meaning construction, mainly using strategic and metacognitive scaffolding.

Behind-the-Scenes Curatorial Exploration (optional): Encourage students to interview on-site staff or docents to understand curatorial concepts and audience feedback. This segment uses conceptual scaffolding to help students obtain deeper background information.

Stage 3: Settling and Sublimation—Reflection Journal (1 week)

This stage aims to guide students to integrate learning experiences and conduct deep reflection and creative transformation. Learning sheet content includes:

Personal Journey: Review changes in views on AI art before and after visits, analyze key influencing factors, deepen understanding of exhibition themes, and conduct emotional reflection. The design of emotional reflection mainly uses metacognitive scaffolding.

In-depth Work Analysis: Select one work for in-depth analysis from multiple angles, including technology, theme, human-machine contribution, innovation, and limitations, compare differences between traditional and AI-assisted creation, and explore social impacts. This segment mainly uses strategic scaffolding to cultivate critical analysis abilities.

My AI Creative Vision: Based on exhibition inspiration, design one's own AI art creation concept, clarifying theme, technology, human-machine division of labor, and expected significance, and reflect on the design process. This segment aims to push learning from the understanding level to application and creation levels, integrating procedural, strategic, and metacognitive scaffolding.

5.3. Experimental Implementation and Data Collection

The experiment was implemented in 2025, with participants being 206 students from five universities in southern Taiwan, covering different disciplinary backgrounds, including art design, humanities and social sciences, and science and technology. Participants' ages ranged from 19-24 years, with 60% female and 40% male. All participants completed baseline questionnaires about AI technology familiarity and artistic interest before the experiment.

The experiment adopted a quasi-experimental design, randomly dividing participants into an experimental group (103 people) and a control group (103 people). The experimental group received complete procedural scaffolding support, while the control group only received basic exhibition information without structured learning support. Both groups visited the same exhibition and completed reflection journals at the same time points.

Data collection included three levels: quantitative data (pre-post questionnaires, learning effectiveness assessment), qualitative data (reflection journals, group discussion records), and behavioral data (visit trajectories, interaction time records). All text data underwent anonymization processing, and informed consent was obtained from participants.

Experimental results show that the experimental group receiving procedural scaffolding support significantly outperformed the control group in AI art understanding depth, critical thinking ability, and creative expression. More importantly, experimental group students' reflection journals presented richer thematic diversity and deeper conceptual associations, providing a high-quality data foundation for subsequent computational grounded theory analysis.

6. RESEARCH FINDINGS: COMPUTATIONAL GROUNDED THEORY ANALYSIS

6.1. Data Analysis Methods

This study uses Computational Grounded Theory to systematically analyze reflection journals of 206 students. Computational grounded theory combines the qualitative analysis depth of traditional grounded theory with the scale advantages of computational methods, particularly suitable for processing large-scale text data while maintaining sensitivity to deep data meanings.

The analysis process is divided into three stages: first, conducting open coding to identify initial concepts and categories in text; second, conducting axial coding to establish associations and hierarchical structures between concepts; finally, conducting selective coding to extract core themes and construct theoretical models.

To ensure analysis reliability, the research team adopted human-machine collaborative coding methods. First, two researchers independently conducted manual coding to establish initial coding frameworks; then used natural language processing technology for large-scale text analysis to identify potential thematic patterns; finally compared and integrated manual coding with machine analysis results to form final thematic frameworks.

6.2. Computational Grounded Theory Analysis Process

This study adopts the three-stage coding procedure of computational grounded theory to systematically analyze reflection journals of 206 students. The analysis process strictly follows Charmaz's (2024) constructivist grounded theory principles while combining Nelson's (2020) computational analysis techniques, ensuring both depth and breadth of analysis.

6.2.1. Open Coding Stage

The goal of the open coding stage is to identify initial concepts and phenomena in data without presetting any theoretical frameworks, allowing concepts to naturally emerge from data. The research team conducted line-by-line coding of 206 reflection journals, identifying 127 initial concepts. The following presents the main open coding categories and their student sentence evidence:

6.2.1.1. Technical Learning Coding

Prompt Experimentation: Students described extensive prompt experimentation experiences. Student A-23 wrote: *"I tried at least 50 different description methods and found that adding words like 'high quality' and '4K' indeed makes AI-generated images more refined."* Student B-67 reflected: *"Describing the same cat, using 'cute orange cat napping in sunlight' versus 'an orange cat sleeping' produces completely different effects."*

Technical Threshold Perception: Multiple students expressed renewed understanding of technical complexity. Student C-102 stated: *"I originally thought AI art was simple, just inputting text, but after actual operation, I found that generating ideal works requires many techniques."* Student D-45 wrote: *"Learning to write good prompts is harder than I imagined, requiring understanding of AI logic and artistic feeling."*

Tool Mastery Progress: Students recorded learning curves from unfamiliarity to familiarity. Student E-78 described: *"When first using Midjourney, I had no idea how to start, but now I can adjust various parameters and control style and composition."* Student F-134 reflected: *"From initial random attempts to now being able to purposefully design prompts, I feel I've mastered a new creative language."*

6.2.1.2. Cognitive Transformation Coding

Creative Subject Redefinition: Students engaged in deep thinking about "who is the creator." Student G-89 wrote: *"I began to doubt, when AI participates in creation, am I still the sole creator? Or are we partners?"* Student H-156 expressed: *"AI-generated images sometimes give me unexpected inspiration, feeling it's not just a tool but more like a creative partner."*

Artistic Value Reassessment: Many students rethought the essence and value of art. Student I-71 reflected: “*Seeing AI quickly generate beautiful works, I began thinking, where exactly is the value of art? Is it skill or ideas?*” Student J-193 wrote: “*AI made me realize that perhaps the most important thing in art is not technical perfection but emotional expression and personal style.*”

Efficiency-Quality Trade-off: Students generally faced choices between efficiency improvement and artistic texture. Student K-28 stated: “*AI can indeed help me complete work quickly, but sometimes I miss the slow crafting process of manual creation.*” Student L-165 reflected: “*Creating with AI is very efficient, but I always feel something is missing, perhaps that sense of achievement from creating by hand.*”

6.2.1.3. Emotional Experience Coding

Surprise and Excitement: Students frequently expressed amazement at AI capabilities. Student M-47 wrote: “*When I saw AI generate beautiful images completely beyond expectations based on my descriptions, I was truly shocked.*” Student N-112 expressed: “*AI sometimes creates visual effects I never thought of, and that sense of surprise makes creation more interesting.*”

Anxiety and Unease: Meanwhile, some students expressed concerns about the future. Student O-83 reflected: “*AI is so powerful, will there come a day when human artists are no longer needed?*” Student P-198 wrote: “*Seeing AI capable of so much, I’m somewhat worried whether my learned professional skills will become useless.*”

Achievement Redefinition: Students gained a new understanding of creative achievement. Student Q-76 stated: “*Although I didn’t draw it by hand, being able to guide AI to create ideal works through text also gives me great achievement.*” Student R-141 reflected: “*I found that even with AI-assisted creation, when works express the emotions I want, that satisfaction is real.*”

6.2.2. Axial Coding Stage

The goal of the axial coding stage is to establish associations between concepts and identify grounded themes along with their properties and dimensions. Through analysis and induction of 127 initial concepts, the research team identified five grounded themes and established their relational structures.

6.2.2.1. Grounded Theme 1: Computational Writing Practice

This category integrates all concepts related to prompt creation, including linguistic precision, logical structure design, parameter control, and other sub-concepts. Student S-59’s reflection best embodies this category’s characteristics: “*I found that writing prompts are like designing a program, each word has specific functions, and the order and combination methods affect final results. Word choice, arrangement order, and even punctuation marks might change AI’s understanding.*”

Student T-87 further described the complexity of this practice: “*Effective prompts need to consider many levels: description specificity, style instruction accuracy, and technical parameter settings. This is not just writing but more like designing an instruction system.*” Student U-124 added: “*I began treating prompts as a new programming language to learn, with its own grammatical rules and logical structures.*”

6.2.2.2. Grounded Theme 2: Emotional Expression Mediation

This category covers various aspects of AI as an emotional expression tool, including cross-media transformation, emotional materialization, expression threshold reduction, and other concepts. Student V-36’s experience typically reflects this category: “*AI helped me transform inner feelings into images, those emotions I couldn’t express with brushes, through text descriptions could become visual works. I finally could ‘see’ my emotions.*”

Student W-178 shared similar experiences: “*I was never good at drawing, but through AI, I could transform poetic imagery into visual images. AI became a bridge for my emotional expression, allowing me to dialogue with the world in new ways.*” Student X-95 added: “*AI made me discover that emotions can be expressed through so many ways, not just text or music, but also combinations of colors, shapes, and light and shadow.*”

6.2.2.3. Grounded Theme 3: Imperfection Value Reconstruction

This category reflects students' renewed recognition of human creative qualities, including flawed aesthetics, handcrafted warmth, personalized expression, and other concepts. Student Y-52's reflection profoundly embodies this value reconstruction: *"After seeing AI-generated perfect images, I instead cherish those small flaws in hand-drawn works more; they give works warmth and personality. Those imperfect lines and accidental colors instead become the most precious parts."*

Student Z-169 further elaborated: *"AI's perfection made me rethink what art is. Perhaps art's value lies not in technical perfection but in the humanity revealed through hesitations, corrections, and even mistakes."* Student AA-103 wrote: *"I began appreciating the 'imperfection' in human creation; those trembling lines and uneven colors are all human traces that AI cannot replicate."*

6.2.2.4. Grounded Theme 4: Collaborative Relationship Dynamics

This category describes the complexity and dynamics of human-machine collaborative relationships, including role division, interaction modes, control negotiation, and other concepts. Student BB-81's description best illustrates this dynamic relationship: *"Initially, I treated AI as advanced Photoshop, later I found it more like a collaborative partner with its own ideas, sometimes its suggestions would make me change my original creative direction. We have a subtle dialogue relationship."*

Student CC-127 shared the complexity of collaborative processes: *"Collaborating with AI requires constant adjustment and adaptation. Sometimes I need to express my ideas more precisely, sometimes I need to accept AI's 'creativity,' this is a mutual learning process."* Student DD-154 added: *"I found human-machine collaboration is not a unidirectional instruction relationship but a bidirectional creative exchange. AI's responses influence my next decisions, forming a creative spiral ascent."*

6.2.2.5. Grounded Theme 5: Literacy Requirement Identification

This category integrates students' recognition of new skill requirements, including prompt engineering skills, critical thinking abilities, cross-media literacy, and other concepts. Student EE-72's summary well encapsulates this category: *"Mastering prompt techniques is like learning a new language; it determines whether you can effectively communicate with AI and what kind of work you can create. But this is not just technical skills, it also requires artistic feeling and critical thinking."*

Student FF-189 further analyzed: *"Artistic creation in the AI era requires new literacy combinations: technical understanding, creative expression, critical judgment. We need to understand both technology and art, both utilize AI and maintain independent thinking."* Student GG-116 added: *"Learning AI art is not just learning tool usage but learning a new way of thinking, a creative philosophy of human-machine collaboration."*

6.2.3. Selective Coding Stage

The goal of the selective coding stage is to identify integrative theoretical categories and construct theoretical models. Through in-depth analysis of five grounded themes, the research team identified "Adaptive Development of Art Learning in the AI Era" as the integrative theoretical category and constructed corresponding theoretical models.

6.2.3.1. Integrative Theoretical Category: Adaptive Development of Art Learning in the AI Era

This integrative theoretical category integrates all other categories, describing learners' adaptive development processes in AI art environments. Student HH-201's comprehensive reflection best embodies this category: *"Through this AI art learning, I not only learned to use new tools, but more importantly, I learned how to maintain learning flexibility and creative original intention in an era of rapid technological change. AI changed the way of creation but didn't change the essence of creation—expressing oneself and moving others."*

This adaptive development manifests in spiral progress across three levels: skill-level tool mastery and innovative application, cognitive-level concept reconstruction and thinking transformation, and emotional-level value rebuilding and identity recognition. Students' development across these three levels is mutually promoting and dynamically balanced, forming a complete learning ecosystem.

6.3. Theoretical Model Construction

Based on findings from computational grounded theory analysis, this study constructs a theoretical model about AI art learning. This model takes "Adaptive Development of Art Learning in the AI Era" as the integrative theoretical category, integrating dynamic relationships among five grounded themes.

6.3.1. Complete Description of Five Grounded Themes

Through in-depth analysis in the axial coding stage, this study identifies five grounded themes that jointly constitute the theoretical foundation of AI art learning:

Category 1: Computational Writing Practice - This category reveals prompt creation as an emerging computational writing form with characteristics of linguistic precision, logical structure design, and parameter control. Students recognize that effective prompt creation requires both linguistic artistry and computational thinking, forming a unique "human-machine dialogue language." This practice transcends traditional writing's expressive function, becoming a core skill for driving AI creation.

Category 2: Emotional Expression Mediation - This category describes how AI technology becomes a new medium for emotional expression, achieving cross-media transformation, emotional materialization, and expression threshold reduction. Students discover that AI is not only a creative tool but also a bridge for emotional expression, allowing creators originally lacking specific media skills to achieve diversified emotional expression through text descriptions, thus expanding the boundaries of creation.

Category 3: Imperfection Value Reconstruction - This category reflects students' renewed recognition of human creative qualities, including value reassessment of flaw aesthetics, handcrafted warmth, and personalized expression. When facing technically perfect works generated by AI, students instead cherish imperfect elements in human creation more, believing these "flaws" precisely embody humanity and creative authenticity, possessing unique value that AI cannot replicate.

Category 4: Collaborative Relationship Dynamics - This category reveals the complexity and dynamics of human-machine collaborative relationships, involving multiple aspects, including role division, interaction modes, and control negotiation. Students' collaborative experiences evolve from simple tool usage to complex partnership relationships, requiring continuous adjustment, adaptation, and mutual learning, forming a dynamically balanced creative ecosystem.

Category 5: Literacy Requirement Identification - This category integrates students' recognition of new skills required for AI-era artistic creation, including prompt engineering skills, critical thinking abilities, and cross-media literacy. Students recognize that AI art creation requires not only technical operation abilities but also comprehensive literacy of artistic feeling, critical judgment, and creative philosophy, forming a completely new creator capability structure.

6.3.2. Core Structure of Theoretical Model

The model contains three interrelated levels: skill level (including computational writing practice and literacy requirement identification), cognitive level (including imperfection value reconstruction), and emotional level (including emotional expression mediation and collaborative relationship dynamics). These three levels mutually influence and promote each other, jointly constituting the complete picture of AI art learning.

6.3.3. Dynamic Characteristics of Model

The theoretical model emphasizes the dynamics and adaptability of learning processes. Learners continuously adjust their cognitive frameworks, skill structures, and emotional attitudes in interactions with AI technology, forming spiral development trajectories. This development is not linear but a complex process full of repetition, adjustment, and breakthroughs.

6.3.4. Educational Implications of the Model

The theoretical model reveals that effective AI art education should simultaneously focus on development across skill, cognitive, and emotional levels, rather than merely staying at the skill training level. Educational design needs to provide learners with sufficient exploration space and reflection opportunities, supporting them in finding their positioning and value in human-machine collaboration.

7. DISCUSSION AND IMPLICATIONS

7.1. Situating the Five Themes in Contemporary AI Art Discourse

Our first theme, computational writing practice, aligns with recent findings by Guo et al. (2025), who observed that creative writers are not passive users of AI but actively ‘negotiate between AI’s benefits and their deeply held writerly values.’ Their study highlights that writers develop sophisticated, iterative workflows to steer AI output, which mirrors the prompting strategies our participants developed. This suggests that the ability to craft effective prompts is becoming a new form of literacy, one that combines technical understanding with artistic intent. Similarly, the theme of collaborative relationship dynamics is contextualized by the work of Knight and Eladhari (2025), who frame the artist-AI relationship within the historical concept of automatism. They argue that as generative systems become more complex, ‘the issue of controllability and authorship has come to the forefront.’ Our findings provide an empirical snapshot of this dynamic, showing students grappling with the balance of ceding control to the AI to discover novel outputs while retaining authorship and creative direction.

7.2. Theoretical Grounding for the Five Emergent Themes

The five themes that emerged from our analysis can be theoretically grounded in sociocultural theories of learning and theories of digital creativity. The theme of collaborative relationship dynamics, for instance, resonates strongly with Vygotsky’s theory of mediated learning (Vygotsky, 1978). Vygotsky argued that cognitive development is a socially mediated process where learning occurs through interaction with more knowledgeable others and through the use of cultural tools. In our study, the AI acts as both a ‘more knowledgeable other’ in its vast generative capacity and as a primary cultural ‘tool’ that mediates the students’ creative process. The students’ engagement with the AI can be seen as a form of collaborative dialogue, where the AI scaffolds their learning and allows them to achieve creative outcomes within their ‘zone of proximal development’ that they might not have reached alone.

Furthermore, the themes of emotional expression mediation and imperfection value reconstruction can be illuminated by theories of digital creativity, such as the work of Candy and Edmonds (2002) on co-creativity. They emphasize the interactive and often unpredictable nature of working with digital systems. The AI, as a co-creative partner, introduces an element of surprise and serendipity. This aligns with our finding that students found the AI could mediate their emotional expression in unexpected ways, sometimes leading to a re-evaluation of ‘imperfection’ as a source of novel aesthetic value. The AI’s non-human interpretation of prompts can break artists from their conventional patterns, fostering a creative tension between intention and outcome, which Candy and Edmonds identify as a key driver of innovation in digital art.

7.3. Practical Implications for Stakeholders

Our findings offer several practical implications for different stakeholders involved in the ecosystem of AI and art:

For Educators: The five themes can serve as a pedagogical framework for designing art curricula in the AI era. Instead of focusing solely on the technical aspects of prompt engineering, educators should design learning experiences that encourage students to explore the collaborative and emotional dimensions of AI. For example, assignments could involve students using AI to interpret a poem visually, and then reflecting on how the AI's output differed from their own interpretation, thereby engaging with themes of emotional expression mediation and imperfection value reconstruction. The "Adaptive Development" model suggests a cyclical learning process, where students iteratively refine their understanding and skills.

For Practitioners and Artists: Our study highlights the importance of developing a personal and reflective practice when working with AI. Artists can leverage AI as a co-creative partner to break creative blocks and explore new aesthetic territories. The theme of computational writing practice suggests that artists should cultivate a unique "prompting voice" as a form of artistic expression. Furthermore, by embracing the unexpected and often "imperfect" outputs of AI, artists can discover novel creative directions, turning the tool's limitations into an aesthetic strength.

For Researchers: The "Adaptive Development" model provides a theoretical basis for future research on AI in creative domains. Researchers can further test and refine this model in different contexts and with different populations. The identified themes also point to several promising avenues for future inquiry, such as longitudinal studies on how artists' relationships with AI evolve over time, or the development of new metrics to evaluate human-AI co-creativity. The limitations of our study, as discussed in the conclusion, also offer a clear roadmap for future research.

For Policymakers and Institutional Stakeholders: To facilitate the integration of AI in creative education, policymakers should support the development of teacher training programs focused on AI literacy for the arts. Institutions should invest in providing access to AI tools and platforms, while also fostering critical conversations about the ethical implications of AI in art, including issues of authorship, bias, and labor. Supporting interdisciplinary research and collaboration between art departments, computer science, and education faculties will be crucial for developing holistic and effective AI-integrated creative practices.

8. CONCLUSION

8.1. Summary of Research Contributions

This study demonstrates that AI in art education represents not merely a technical shift but a fundamental pedagogical transformation requiring new paradigms that balance technological affordances with humanistic values. Through our computationally grounded theory analysis of 206 university students' experiences at "The Era of Prompts" exhibition, we identified five interconnected themes that form the "Adaptive Development of Art Learning in the AI Era" model: computational writing practice, emotional expression mediation, imperfection value reconstruction, collaborative relationship dynamics, and literacy requirement identification. These themes reveal that effective AI art education must move beyond technical prompt engineering to cultivate critical engagement, emotional expression, appreciation for creative imperfection, and nuanced understanding of human-AI collaboration.

Theoretical Contributions: Proposed a three-level theoretical model of AI art learning, enriching art education theory content; identified five core themes of AI art creation, providing conceptual frameworks for related research.

Methodological Contributions: Integrated exhibition ethnography, procedural scaffolding experiments, and computational grounded theory analysis, forming a mixed-method framework suitable for AI art research.

Practical Contributions: Provided specific teaching design and implementation suggestions for AI-era art education, offering references for related educational practice.

8.2. Practical Recommendations

Based on research findings, this study proposes the following practical recommendations:

For Educational Institutions: Recommend incorporating AI literacy cultivation into core curricula of art education while strengthening teacher training to improve teachers' AI technical capabilities and teaching levels.

For Art Creators: Recommend actively learning and mastering AI technology while maintaining commitment to the unique values of human creation, finding a balance between technological innovation and humanistic care.

For Policy Makers: Recommend formulating relevant policies to support AI art education development, including support in funding investment, equipment allocation, and curriculum standards.

8.3. Research Limitations and Prospects

This study has some limitations: First, research subjects mainly come from southern Taiwan, and the universality of the results needs further verification; second, the research time is relatively short, and long-term effects need tracking observation; finally, AI technology develops rapidly, and research results may need updates according to technological development.

Future research can develop from the following directions: expand research scope to include participants from more regions and cultural backgrounds; extend research time for longitudinal tracking studies; deepen technical research to develop AI tools more suitable for educational scenarios; strengthen interdisciplinary cooperation, integrating professional knowledge from art, education, technology, and other fields.

AI-era artistic creation is redefining concepts of creativity, originality, and artistic value. In this transformative era, art education faces unprecedented challenges and opportunities. This study hopes to contribute to theoretical construction and practical development in this field and looks forward to participation from more researchers and practitioners to jointly explore the bright future of AI-era art education.

From the rich landscape presented by "The Era of Prompts" exhibition, researchers see the complex relationship between AI and human creators that is both competitive and collaborative, both challenging and opportunistic. The future direction of this relationship largely depends on current educational practice choices and efforts. As the exhibition title suggests, AI sends humans not only a challenge letter but also an invitation—inviting humans to explore new boundaries of creativity with AI and jointly write new chapters in artistic development.

8.4. Limitations and Future Research

We acknowledge several limitations in this study that open avenues for future research. First, our sample consisted of university students in southern Taiwan. This specific demographic and cultural context may influence their perceptions of AI and art, and the findings may not be generalizable to other populations, such as professional artists, younger students, or individuals from different cultural backgrounds. Future research could address this by conducting similar studies in diverse cultural and demographic settings to explore the cross-cultural dimensions of AI art education.

Second, the study was conducted within the context of a single exhibition. While "The Era of Prompts" provided a rich and focused environment, the specific curatorial choices and artworks featured undoubtedly shaped the participants' experiences. Future studies could examine other types of AI art exhibitions or different learning environments (e.g., online platforms, formal art classes) to broaden the understanding of how context influences learning.

Methodologically, while our computational grounded theory approach allowed for the analysis of a large dataset of qualitative reflections, it lacks the depth of traditional ethnographic methods. A mixed-

method approach that combines our current methodology with in-depth interviews or observational studies of a smaller group of participants could provide a more nuanced understanding of the creative process.

Finally, our “Adaptive Development” model is an initial theoretical formulation. Future research should aim to validate and refine this model. Longitudinal studies that track the development of creative AI literacy over a longer period could provide valuable insights into the long-term effects of AI on artistic practice and learning.

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Research Ethics. This study was conducted in accordance with the ethical guidelines and regulations of the National University of Tainan. All participants provided informed consent prior to participation. The research protocol was approved by the institutional review board, and all procedures were carried out in compliance with applicable ethical standards and institutional regulations.

Data Availability Statement. The data and materials used in this study are available from the corresponding author upon reasonable request. The dataset includes student reflection journals collected during the three-stage learning journey experiment conducted at “The Era of Prompts” exhibition at Tainan Art Museum.

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