

PROCEEDINGS ARTICLE

## Limitations and Possibilities of Technological Tools in Artistic Creation

Zhan Li<sup>1</sup>

<sup>1</sup>*Beijing Institute of Fashion Technology, Beijing, 100029, China;*

\*Corresponding author. Email: 420497085@qq.com

### Abstract

In the present work, the potential of technologies as artistic tool and their impacts on artistic creation are examined. Specifically, the evolution of artistic tools is reviewed first, with a focus on how the limitations of tools have stimulated the imagination and emotional expression of artists. Subsequently, it analyzes how technology has transformed the role of artistic tools, from Duchamp's ready-made art to the application of digital technology, virtual reality, and artificial intelligence, and has provided unprecedented possibilities for artistic creation. However, this change also brings challenges, such as the possibility that artists may overlook the deeper potential of tools in their pursuit of new tools and effects. Per the research findings, recommendations are proposed that artists should consciously utilize technological tools as a medium for expressing ideas and emotions rather than merely using them as a means for visual effects, and only in this way can technologies be better integrated with art to provide more possibilities for future artistic creation.

**Keywords:** Technology; Artistic Creation; Restrictive; Possibility

### 1. INTRODUCTION

Technology provides a tool for humans to pursue higher efficiency by liberating them from basic living needs and thus giving them the leisure to discover the beauty of life. In today's world, technology penetrates every aspect of human life. Just as Duchamp used ready-made products as artistic tools, technology has gained increasing popularity among artists in their artistic creations. As the combination of technology and artistic creation gains broader attention, more and more artworks generated this way begin their debuts in major art museums and exhibition halls. At present, most studies on this combination are from the perspective of art design, and their main objective is to enhance the aesthetic effect and lifestyle atmosphere of technological products. The integration of technological tools into artistic creation has increasingly become an important way for contemporary culture to be reflected, bringing new possibilities for both technological and artistic issues.

### 2. THE ROLE OF TOOLS IN ARTISTIC CREATION

A quick glimpse of the primitive cave paintings and other early works will reveal that the painting tools initially used by people include plants or minerals, natural or briefly processed, such as black obtained by burning wood or brownish red obtained by grinding iron ore. With the increase in social practice experience, people's requirements for tools grow higher as well. Artists gradually discover the expressive characteristics of specific tools in creative practice, and by strengthening this characteristic, they finally create tools such as Eastern ink painting and Western oil painting that carry profound cultural connotations. Though painting tools have been constantly evolving in ancient times, this evolution shows a clear direction, which enables later generations to discover the development logic in view of lessons from history.

There is no denying that tools have their limits no matter how advanced they develop or evolve: the brownish-red color of iron ore lacks luster; the strokes of oil painting lack variation; the color of ink wash is monotonous. These limits, rather than diminish the artist's desire to express themselves, unleash more of their imagination. Therefore, the artist had to cast a subjective eye when appreciating the artworks before them: the brownish-red color was the color of the buffalo, and those black lines represented the human form. The subjective appreciation is arbitrary, but this bold move demonstrates one of the earliest human behaviors to escape from the natural world and has become another ability humans have beyond animals besides rational thinking, namely emotion.

The relationship between the limitations of tools and the expression of emotions is ambiguous. Artists' emotional expression is not arbitrary, but an expansion of emotions in a personalized way conforming to the characteristics of tools. Emotional expression in artistic creation, so to speak, is achieved through the use of tools. Excellent artists such as Van Gogh, despite their love of the colors of Japanese "ukiyo-e" paintings, would not use oil paintings for simulation. Instead, they would translate the language of these prints into the language of oil paintings to give a new visual effect. Similarly, Pollock mixed materials such as sand and sawdust into oil painting materials for artistic creation, in hopes of using unconventional materials to go beyond the linguistic boundaries of oil painting materials.

Therefore, in artistic creation, tools not only provide the material basis for the expression of thoughts and emotions, but also come as a key driver of the development and innovation of artistic forms. "The diverse forms of artistic expression are the result of the continuous advancement of science" [1]. Though inevitably confined by the characteristics of tools during artistic creation, artists often "translate" what they see and feel, integrating their perspectives and emotions into their works to give birth to novel forms of art with unique charm. The relationship between the limitations of tools and the artists' emotional expression is also interactive: artists respect and enhance the characteristics of tools in a personalized way to give expression to their emotions, and hence, the expression of emotions is realized by exploring the possibilities of tools.

### **3. THE ROLE TRANSFORMATION BROUGHT BY TECHNOLOGY TO CREATIVE TOOLS**

In traditional painting, the evolution of tools reflects the accumulation of social practice experience and the deepening of artistic expression techniques. Tools give expression not only to the artist's artistic inspirations but their emotions and creativity, driving the continuous development and innovation of art. The introduction of new technologies to artwork production, however, has brought about a range of shifts in the role that tools play in artistic creation.

These shifts can be traced back to the modern art movement in the early 20th century. In 1917, French artist Marcel Duchamp named an ordinary urinal "Fountain" and placed it in an exhibition hall, which challenged the definition of traditional art and marked the beginning of the use of ready-made products for artistic creation. Duchamp's innovation shattered the norm that artistic creation must rely on traditional tools such as brushes and pigments and paved the way for the diversification of artistic creation tools. Inspired by Duchamp, artists began to explore the use of various ready-made products in their daily lives for artwork creation, from everyday objects to discarded materials, from sound and light to behavior and concepts. Tools for artistic creation became all-encompassing.

The emergence of ready-made art contributed to the diversification of artistic tools, leading to a shift in the role of tools in artistic creation. When artists use behavior or installation to create an art piece, the aesthetic significance they consider goes beyond the mere spatial and compositional relationships between elements. For example, in Yves Klein's performance artwork "Jumping into the Void," his leap into the air is a fleeting event, but the artist founded a newspaper to cover this leap. Newspapers are usually used to report important news events, which are the realistic carriers of certain historical moments. Therefore, this newspaper endows events that leap into the void with solidity. However, the newspaper founded by Klein only existed for one day, which resulted in the event ultimately returning to nothingness. By overlapping reality with virtuality, the artist incorporated an abstract structure of "instant eternal instant" into his work, filling in the concrete elements of the work

in such rich layers, finally forming a memorable beauty. This event suggests that new artists are starting to consider the more comprehensive relationship between tools and art creation like a director.

Nonetheless, the change in the role of tools in art creation has gone far beyond this. The advancement of emerging technologies, such as digital technology, virtual reality, and artificial intelligence, provides artists with more creative tools and means, offering infinite possibilities for artistic creation. With these advanced technological means at hand, artists create unprecedented visual and sensory experiences, exploring new fields and forms of art. However, artists can be overwhelmed by the diversification of technological products. Contemporary technological and artistic tools cannot be seen solely as ready-made products; they have become tools capable of independently completing works. For example, the popular painting software "Procreate" and sculpture software "Zbrush" have their own unique modeling language and aesthetic characteristics. Although these software packages are designed to simulate real-life painting and sculpture, their colors, strokes, and scratches emit a distinct air of digital art. In addition, digital art tools such as TouchDesigner and OpenBrush have completely created another independent art form with unique artistic effects, and if we wish to gain such effects, we must use relevant tools. As Cao Liping stated in her article "3D Printing and Lacquer Art Between Art and Technology", using new technological means, "artists have broken through traditional creative limitations and opened up new ways of artistic expression"[2].

The effect of each tool is specific, and the creative inspiration and emotional expression of artists are often diverse and complex. Although technological tools have brought rich possibilities for creation, they have also to some extent constrained the purity of artistic creation. For example, traditional painting tools such as brushes and pigments have formed unique artistic language and emotional communication methods through long-term use. Painters express their inner emotions through the weight of strokes and the intensity of colors. However, in the field of digital painting, although painting software is powerful and can simulate various traditional brushstrokes and even create unprecedented visual effects, artists need to familiarize themselves with the software's operating logic and adapt to its preset color modes, stroke parameters, etc. before using it. During this process, the emotional coherence of artistic creation may be disrupted. When artists want to express a delicate and hazy emotion, traditional painting can easily achieve it through natural blending of pigments, while in digital painting software, it may take a lot of time to debug parameters such as brush transparency and flow rate in order to barely approach the ideal effect. Moreover, with the rapid development of technology, various emerging art tools continue to emerge. In addition to common painting and sculpture software, there are also Processing that can generate dynamic images and Arduino that can implement interactive art. Every new tool has its unique technical principles and forms of expression. If artists want to master multiple tools to enrich their creative methods, they need to invest a lot of time and energy in learning. For artists who are accustomed to focusing on a few traditional creative tools for a long time, this is undoubtedly a heavy burden. At the same time, due to the extremely fast pace of tool updates, new versions or completely new tools have emerged just after becoming familiar with the characteristics of a tool, further exacerbating artists' anxiety in tool selection and use. In this situation, the emotional expression that artistic creation should focus on is often disrupted by the use and updating of tools, which undermines the core position of artistic creation.

This has caused a series of problems: If one wishes to achieve a certain effect, one has to learn the specific tool that gives that wished effect, and as the technological tools grow, one may get exhausted on their way of endless learning.; or if one wishes to explore possibilities within the limitations of a specific tool for a particular effect, the quick update and iteration of the related software will also make it challenging for one to adapt. In such interactions, tools have already taken the lead over artists, making them dominant while the artists their vassals to showcase various tool effects.

#### **4. ARTISTIC STRATEGIES FOR EFFECTIVELY UTILIZING TECHNOLOGICAL TOOLS**

The exploration of the possibilities of limited tools by artists resembles excavating the possibilities of the subject, and it is how the value of the subject can be displayed. The diversification of tools focuses only on the visual effects that stand out from those enabled by existing tools, making it

difficult for artists to explore more possibilities for one specific tool. As artists constantly seek new tools and effects, they may find it hard to tap into their creativity from just one tool. The pursuit of visual effects then gradually degenerates into the pursuit of visual stimulation, just as people addicted to short videos find it increasingly difficult to finish a movie. The possibility of the subject is thus replaced by the diversity of the object.

The alienation of human beings by tools is a long-standing topic, and artistic creation is regarded by philosophers such as Guy de Poe and Marcuse as the ultimate solution to this problem. The alienation of artists by art tools can only be solved by the artist's consciousness. The increase in the variety of tools is inevitable amidst the wave of technological progress, and technological progress is an irresistible path determined by human nature, and to curb the development of tools is contrary to reason. Therefore, we must focus our attention on the artist's grasp of tools.

As science and technology advance at a hair-raising speed, the integration of science and technology with art has become a hot topic. Scientists and artists are exploring more ways of technology-art integration to enable new visual experiences. "The 14th National Art Exhibition for the first time integrated experimental art, digital art, and animation in one exhibition area, presenting the latest achievements in this field over the past five years" [3]. In fact, such integration does not necessarily bring efficiency to technology; instead, artists' pursuit of technological tools is determined by the inherent laws of artistic creation. Fundamentally, the higher efficiency enabled by technology is precisely to enable humans to have time to care about beauty. Efficiency is just the means, while it is beauty that comes as our ultimate goal.

As new technologies keep emerging, an increasing collection of new visual effects of artworks come into being. However, lots of artworks nowadays merely incorporate technological elements like sound, light, and electricity to satisfy the superficial desire for novel visual stimuli. These works are far from demonstrating cutting-edge technologies and have no profound aesthetic implications. When one, a scientist or an artist, wants to combine science and art, one must understand the laws of artistic creation. In fact, artistic creation is a personalized expression, and this personalization needs to be rooted in an individual's life experience. Scientists need to discover ways to express their attitudes through their research, shifting from the pursuit of the practicality of tools to the pursuit of the expressiveness of the subject's feelings. In the case of artists, they need to consciously maintain their position as the dominating part during art creation, treating special effects as expressive elements in their works rather than the ultimate goal. Therefore, when facing the issue of the combination of technology and art, we should not "blindly pursue the leading role of technology while neglecting the spiritual core of art. At the same time, we can utilize the avant-garde nature of art to endow technology with new concepts and imagination"[4].

In conclusion, technological art is still within the domain of "contemporary art" [5]. These constantly updated technological tools should not merely be regarded as materials to enrich the artistic effects of artworks, nor should they merely be seen as ways to showcase advanced technologies. Instead, we should incorporate them as an ordinary element when expressing specific ideas. Only in this way can technological tools truly participate in the artistic creation.

## 5. CONCLUSION

From Duchamp's ready-made products to the application of modern technology, the tools for artistic creation have become more diverse and personalized. Artists constantly explore new fields and forms of art through the creative use of these tools, driving innovation and development of art. The advancement of technology has greatly enriched artists' creative tools and methods, from digital technology to virtual reality to artificial intelligence. These emerging technologies not only provide unprecedented diversity for artistic creation, but also change the role of tools. In this transformation, technology provides opportunities and challenges for artistic creation, which requires in the artists not only technical literacy and innovative thinking, but also aesthetic and creative abilities to avoid misunderstandings, thereby enabling true technology-art integration and creating new and infectious works of art. Against the backdrop of technology-art integration, artists need to maintain their proactive position in art creation and inject new vitality and creativity into the development of art.

**REFERENCES**

1. Yu, H. P.; Ma, D. Similarities, Differences, Blending and Advancement: A Preliminary Exploration of the Relationship between Ancient Chinese Art and Science from the Perspective of Cultural Relics. *Literary Review* **2024**, 12, 197–201.
2. Cao, L. P. 3D Printing and Lacquer Art Wandering between Art and Technology. In *Proceedings of the 9th Oriental Design Forum and the Inauguration Conference of the Shanghai Representative Office of the International Design Science Society (USA)*; (pp. 1–6); September 2023.
3. Li, Z. Technology as a New Tool and Medium of Art—A Review of Experimental Art, Digital Art and Animation in the 14th National Art Exhibition. *Art Observation* **2024**, 11, 33–35.
4. Li, Y. F.; Xue, L. Research on the Development of the Art and Technology Direction in Fine Arts Colleges from the Perspective of New Liberal Arts. *Art Observation* **2024**, 8, 125–128.
5. Yang, G. Y. The Historical Construction and Practical Path of the Legitimacy of Sci-tech Art. *Art Studies* **2025**, 2, 76–85.