Retraction

Retracted: The Application and Teaching of Digital Technology in Printmaking

Security and Communication Networks

This article has been retracted by Hindawi, as publisher, following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of systematic manipulation of the publication and peer-review process. We cannot, therefore, vouch for the reliability or integrity of this article.

Please note that this notice is intended solely to alert readers that the peer-review process of this article has been compromised.

Wiley and Hindawi regret that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

References

[1] H. Zhang and H. Zheng, "The Application and Teaching of Digital Technology in Printmaking," *Security and Communication Networks*, vol. 2022, Article ID 3271860, 7 pages, 2022.

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Research Article

The Application and Teaching of Digital Technology in Printmaking

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Along with the popularization of digital technology, artists began to use digital technology as a technological means to make more attempts in the creation of print art, thereby breaking through the formal constraints. The diversity of information technology inspires artists' creative inspiration and makes the development of art move in a more varied and diversified direction. The new vision brought by digital technology, digital printmaking, comprehensive printmaking, and digital technology in the creation of comprehensive printmaking and its positive influence on the future development of printmaking provide favorable conditions for the development of diversified art. This paper takes the application of digital technology in the creation of comprehensive prints as a research point and separately expounds the development and application background of digital computer technology and the development history of traditional prints, thereby extending to the modern combination of these two techniques and then transitioning to today's synthesis print. Based on the background of modernity and history, this article analyzes the classical language forms and characteristics of traditional printmaking to comprehensive printmaking from the theory and practice. And based on the techniques of software plate-making technology, it has been expanded to a series of specific measures such as materials and mechanisms. The research in this paper shows that artists can use digital prints to create high-impact works of art with higher quality and more artistic content.

1. Introduction

Comprehensive printmaking has made further breakthroughs on the basis of the previous four craftsmanship, breaking the limitations of traditional layouts. Comprehensive printmaking makes printmaking technology more refined and realizes a collection of four major types of prints. The development of digital technology has improved the technical level of printmaking [1–3]. Computer technology can convert all visual things into binary numbers and unify sounds and texts into binary codes. Art forms based on computer technology are also unified because of the high intelligence of computers, thus realizing the complementarity of art forms. The rapid development of digital technology has created new opportunities for the development of print art. A typical example is that screen prints use digital technology to perform color separation and division

operations [4]. Woodcut prints and other materials are taken from the internet. However, the combination of these art forms is only embodied before plate making. Based on the discussion of digital technology, this article attempts to discuss the combination of printmaking technology, as well as the connection between the two and the probability of printmaking extension under the combination of digital technology. All these provide a feasible way for the development of printmaking in the digital age.

In the era of modern digital technology, traditional printmaking technology has developed to a certain extent. Printmaking based on computer technology [5, 6] has various forms, and the art form is more realistic than the previous printmaking technology. At the same time, the open source of information on the internet provides print authors and artists with more material and creative inspiration. The development of digital technology has also

brought an impact on traditional printmaking, and many people think that this goes against the original intention of printmaking. Computer reproduction of prints greatly reduces the difficulty of prints. This article analyzes this problem, and its main purpose is to give readers a new understanding of printmaking based on digital technology and also to distinguish digital printmaking from traditional printmaking technology, so as to achieve the purpose of compatibility between the two and then eliminate readers' doubts about unique digital prints.

The development of digital art in the West started from the Industrial Revolution, replacing manual individualized production with large-scale industrial production. Among them, the use of machines to promote social progress became a symbol of the times. Therefore, the Industrial Revolution is also called the machine age. With the promotion of social impetus, the design of mechanical equipment and the outline of graphics have gradually shifted from the traditional manual form to the media of computer equipment for editing. Digital art is produced from this form of design. In the West, traditional printmaking has a long history, and printmakers' experimentation and pioneering of printmaking are earlier than those of Chinese printmakers. The formation of digital print art was born out of the continuous exploration of Western artists. Photographic art is a catalyst for the emergence of Western modernism, and it has aggravated the decline of figurative art and realism. The increasing growth of photography technology has promoted the technological development of modern art and contributed to the advancement of visual art. Through the mutual application and combination of digital photography technology and electronic computer technology, Western artists have essentially changed the expressive nature of photography art. It can be said that the emergence of Western digital print art came out of the history of digital art development, and it is a unique branch. It is the perfect crystallization of artists' continuous exploration and technological development.

There is no consensus on the form and concept of digital printmaking abroad, but opinions on digital printmaking works have appeared in some international printmaking exhibitions in China, which undoubtedly gave this unique art form an encouragement to a certain extent [7]. Moreover, many foreign artists who specialize in digital printmaking have achieved high artistic achievements [8, 9]. According to data, many art academies have opened relevant courses to explore the techniques of digital printmaking. Digital printmaking is an emerging thing. Although related works have appeared in printmaking exhibitions, it has not yet been fully formed and developed, and there is no in-depth study and comprehensive understanding of it. Therefore, the research of digital technology in printmaking has great research value.

This paper explores how to use digital products such as computers, digital cameras, and inkjet printers to draw prints, as shown in Figure 1, which focuses on how to use computer-aided plate making to complete comprehensive printmaking in the process of using digital products and image processing technology. Specifically, it includes using a

FIGURE 1: Digital output device.

pressure-sensitive pen to draw the draft, processing the resolution of the output picture, using the picture cut function to achieve the effect of splicing the draft, and finally the output. This article fully explains how to use digital technology in the process of creating comprehensive prints. As far as the preparation stage of the drawing is concerned, it clarifies how to draw the drawing using a pressure-sensitive pen and proposes a countermeasure against the data output obstacles that often occur in this process. Regarding the print output link, besides explaining how to print out the self-provided inkjet printer, it also explains how to set the printer parameters to deal with the large error of the computer screen brightness and the actual color of the image, so as to achieve the effect of outputting the correct color.

2. The Influence of Digital Technology on the Creation of Comprehensive Printmaking

2.1. Digital Technology. Negroponte, a famous American computer culture expert, said that computing is no longer only related to computers; it determines our survival. With the frequent updating of computer technology, the digital processing of information has developed rapidly. The development of digital technology has formed an unstoppable trend around the world [1], whether it is nuclear magnetic resonance, ultrasound CT, ray CT used in the biomedical field, remote sensing satellites used in the aerospace field, as shown in Figure 2, or the image transmission, judgment analysis used by the public security system, and the automatic control and art fields used in industrial production. The digital synthesis and editing used are closely related to the digital revolution. In addition, the application of internet technology has made people's communication, exchange, and information transfer more convenient, and shopping and consumption in the virtual network world have made people closer and closer to the real world.

Some scholars believe that, through the use of internet information technology and digital technology, human activities have increasingly shown the characteristics of globalization. People from all corners of the world are connected with each other, and the global village culture has gradually formed. Art, as a cultural carrier, is constantly spreading and developing toward the trend of diversification under the situation of this global village culture [2]. The complete subversion of form and content can be one of the

Figure 2: Earth photos taken with digital technology.

most significant changes in master art production in the digital age. Art is numbers, and it can be said that numbers are art. In addition, traditional painting creation has also been caught in this digital storm. The printmaking works are moving from the traditional original four areas of concave, convex, flat, and hole to the form of nontraditional multimedia printing technology. The emergence of this new form is still controversial in the printmaking industry. It cannot simply constitute an obstacle to its own development, but is a driving force for the future research and practice of printmaking. What technology brings to art is not only the diversification of technical performance but also far-reaching significance. In other words, it has changed people's understanding of printmaking; whether it is practical creation or conceptual form, it will greatly break through the traditional restrictions. Today's artists cannot do without digital technology. On the one hand, digital technology has completely changed the methods and tools used by artists to create, and at the same time, it has brought them unprecedented opportunities.

2.2. Digital Print. At present, there are two types of understanding of digital prints: one is to copy the original work. The other is original prints. The digital prints discussed and studied in this article are specifically aimed at the second type. The definition of digital prints currently studying abroad is digital prints, which can also be called digital prints and computer prints. Digital engraving refers to the conversion of traditional engravings in a computer through high-tech digital technology to form material ink dots and then image in the computer to reproduce a limited number of original reproduction engravings by printing. It is different from traditional copying, but it truly reproduces the original work, with strong innovation and transformation capabilities.

Javorsky clearly explained the understanding of digital prints in his book "*The Definition of Digital Prints.*" [10] He believes that the understanding of digital prints can start from the technical and material characteristics of digital prints. Reproductions produced with the help of digital tools
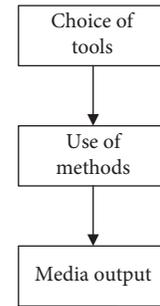

Figure 3: The production of digital prints.

and techniques can all be called digital prints. Digital tools and technologies generally include scanners, color inkjet printers, and laser markers. His definition further elaborates the judgment that digital prints are prints, provides new directions and possibilities for digital prints that are not yet clear so that people have a deeper understanding of digital prints, and promotes the further development of digital prints moving forward. The author defined the concept of digital printmaking in the "*Position, Vocabulary and Development Trend of Digital Printmaking*" as the use of digital equipment to create, plate, and print multiple original works of art, which can be called digital printmaking [7, 11]. Tools, plates, and printing of multiple originals are the common and essential characteristics of digital prints and prints. The two have an attribution relationship; that is to say, the positioning of digital printmaking is a kind of printmaking, and it is the latest form of current printmaking development, bringing unprecedented changes and innovations. The production process of digital prints is shown in Figure 3.

The production of digital prints requires the help of professional image processing software Photoshop to complete the corresponding design and image processing. Photoshop software is very powerful image processing software. Digital prints also need to be used in other software such as CorelDRAW, Painter, and 3ds Max. Because the creative process is a closely coordinated process, it is inseparable from the assistance of these digital tools. Painter is a very important tool in painting. It constitutes various functions of painting. It can quickly and effectively process the elements that need to be processed in painting, give full play to the advantages of painting functions in digital software, and bring unprecedented production experience. It allows painting to get rid of the limitations of painting tools, promotes the development and innovation of the entire digital painting process, and brings far-reaching influence and significance, but we should also pay attention to the reasons that influence the experimental innovation of contemporary digital printmaking. First of all, digital printing technology focuses more on commercial value in production and output, and the artistic works produced by digital printer inkjet technology have rich and vivid colors. However, compared with traditional engraving works of art, it loses imprints, a specific artistic element of engravings. Secondly, digital prints are characterized by rapid dissemination, convenient production industry, and rapid development. This makes it cheaper and gets rid of the industrial

Figure 4: Digital prints based on black and white woodcuts.

and artistic connotations of traditional printmaking. Finally, digital art creation reduces the time for artists to create works of art, improves the creative thinking of artists, but also loses some technical craftsmanship. However, this craftsmanship is an indispensable element for the performance of traditional print art.

Usually, there are two main types of digital prints. For example, in black and white woodcuts, special processing is carried out by digital tools, showing a contrast between tradition and modernity, as shown in Figure 4. The other is a digital print made entirely by using a computer, through the computer's further screening of the candidate pictures, editing and modifying them through digital software, incorporating the traditional print language into it, and finally using the printing materials to output.

When outputting, you need to convert the color design of Photoshop software to CMYK mode to ensure its clarity. Although the print has been completed in the computer, it is necessary to set the printing parameters in the computer before it becomes a finished product. Generally speaking, commonly used printers can meet the output requirements of printing. For proofs and drafts, you can choose to use conventional printers for processing. However, the color requirements are relatively high or the final product needs a professional printer, so as to ensure the printing effect. Resolution adjustment is a very important part of printing. The resolution must be adjusted before printing to improve the clarity and color effect of the print. Through various technical processing, we strive to make the printing effect to an optimal level, so the final effect of the picture should be checked when outputting. The output of the medium is of great significance to digital printmaking. It is the last link of digital printmaking and plays a very critical effect.

The digital age has brought convenience to people. The simple image format can be downloaded through a computer and mobile phone and then edited and processed to form your own artwork. This kind of second-edited works of art narrows the distance between people and art and also

incorporates one's own desire for emotional expression. People choose to study and express art, which is actually the study and expression of people's own emotions. The development of digitization provides a platform on which anyone can express, and the creation of digital art enriches the desire for emotion in people's hearts. The creation of digital prints does not exclude the creative principles of traditional prints. It is still based on the main position of the creator himself and only uses the unique effects of computer digital drawing to broaden the development space of print art. From a subjective point of view, it is mainly a digital technology used to express the artist's own creative intentions or a certain emotional conception.

3. Comprehensive Prints

The uniqueness of the prints lies in the beauty of the prints themselves, and the form and material are important factors in the formation of print art. The language form of printmaking is manifested in the artistic laws and technical skills of printmaking, which is fully embodied in the three stages of painting, engraving, and printing. In the art of printmaking, the difference in the formal language of various editions depends entirely on the material used, and the material used directly affects the formal language. The formal language of wood engraving is relatively concise and general, and the technique and charm are the key to the formation of this formal language of wood engraving. The formal language of lithographs is delicate and soft. Lithographs mainly use pencils, ink, and wash, together with smooth and tough stones, which are an important condition for the formation of their formal language characteristics. Copper engravings have a certain degree of chance. Chemical acid corrosion is a way of their production. The rich texture is the basic feature of copper engravings, and it is also their unique formal language. Nowadays, more and more printmakers are using these language elements to construct print art with formal beauty.

The artistic technique of comprehensive printmaking is a comprehensive version of the development, evolution, and gradual integration of various types of prints. In contrast, the artistic method of comprehensive printmaking is an innovation and reform of the traditional artistic techniques of prints. Regarding the production technology, comprehensive printmaking combines the advantages of various types of prints on the basis of the past. While using media of different concave and convex qualities, it uses the principles of concave, convex, flat, and hole in printmaking and adds a variety of artistic techniques to make the relationship between the medium and the type of printing closer and integrated. In processing works, modern printmaking technology uses a variety of artistic techniques. Therefore, a single type of printmaking cannot surpass and replace the processing effect of modern printmaking techniques. For example, the overall tone coordination is the basic feature of the picture produced by the watermarking woodcut, and the taste and strength of the knife are the focal points of mimeographing. Imprints and lines are an important manifestation of the attention to detail in copper engravings.

Plain colors and highlighting textures themselves are the main characteristics of silk-screen engravings. In short, at the technical level of the comprehensive version, the innovation of the picture effect lies in the comprehensive utilization of the uniqueness shown by different versions. In the West, many artists have made important practices in exploring the best means of expression among several painting types. Spanish artist, Joan Miro, mixed the slate and copper plates. The Norwegian artist Munch mixed the technique of slate in his chromatic woodcut to make the spiritual expression of the material more prominent, as shown in Figure 5. In order to make the picture more novel, the artist Hockney used the ink roller as a painting tool and used chemical detergent to process the picture, as shown in Figure 6. Regarding the expression language of the editions that he can master, printmakers can change their thinking and actively innovate on the original expression forms. For the artistic techniques of various editions, they can fully learn from and use the characteristics of them and combine and promote each other.

4. The Application of Digital Technology in the Creation of Printmaking

First, create a new file and set the parameters. We consider the size required for the output. The resolution is set to 300 pixels/inch. It is worth noting that the resolution cannot be lower than 150 pixels/inch; otherwise, the image quality will be very low, and there will be obvious aliasing. Next, the woodcut prints are directly transferred from the digital camera to the computer because the woodcut prints cannot use the scanner. Then, set the image resolution of the digital camera to 8 million pixels or more. For more delicate drawing levels, the digital camera's resolution is best to have 10 million pixels or more. After the photo is input to the computer, it is imported into the PS, and the parameters of the drawing are modified to pixels/inch, and the unit of width and height of the screen size are modified to centimeters. For the "constraint ratio" option, uncheck it. At this time, the value of the data will be 28.82 cm multiplied by 37.04 cm. Then, click the OK option; if the above steps are correct, then the input is completed.

The input artwork generally needs to be processed by the PS color management system, but the background of this artwork is black and white woodcut, so there is no need to do this step, only the fine adjustment of the curve channel. If you feel that the sharpness of black and white is not enough, you can perform sharpening. After the background layer is processed, copy the background layer and create a new layer 1. To draw the second version of the color scheme, you can use the Wacom hand-painted board to draw the part of the human body, then create a new layer 2 to color the part of the human body, set the layer transparency to 50%, and set the layer blending mode to multiply. The layer effects before and after are superimposed. Then, create a new layer 3 and layer 4, cut the selection of layer 1 and layer 2, respectively, create a new layer 5, and set a 35 cm long, 45.5 wide rectangle 92Y selection, centered on the center of the background layer.
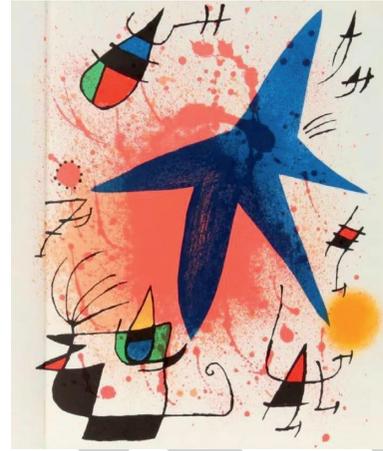

Figure 5: Miro's paintings.

Figure 6: Munch's paintings of vampires.

Copy the background of the same size at the same time, and place this layer below the color layer. Due to the time consumption and laborious application of anticorrosion coating, corrosion, anticorrosion, and overacid treatment of various technical effects in the traditional print printing process, this can not only simplify the production process in the traditional print printing process on a large scale but also improve printing efficiency. Then, use the concave-convex function in the filter to create a scattering-like convex-concave effect to enhance the visual sense of space. Image effect is the key factor affecting each layer. Each layer is relatively independent; the drawing effect and production will not cause conflicts and problems between each layer, especially when the coloring effect of each layer is produced; it can not only ensure the professionalism of the copper engraving but can also effectively avoid the occurrence of multiversion ghosting during its color registration. Finally, sort, name, and save the previously processed layers. The final output file must be CMYK printing mode. In addition to the special effects described above, there are many filters that are the same as traditional printmaking techniques. The filter library in PS is an important advantage and strength in the production of digital printmaking techniques.

So, we can make a summary of the application of digital technology in comprehensive printmaking.

(1) First of all, through digital technology, you can express your artistic emotions more easily, which will greatly make up for the lack of artistic effects in traditional prints. Digital technology is a high technology. It has vigorous vitality. It gives print creation unprecedented opportunities for development and aesthetic appeal. Its commendability lies in the organic combination of the past art expression techniques such as black and white woodcuts and silk-screen prints. Together, it gives new vitality to traditional prints and brings unprecedented sensory experience to viewers and readers.

(2) Secondly, in the process of creating prints, all artists have to highlight their artistic skills through print layout design and expression, and they pay attention to expressing the ability to control technology in the process of printmaking creation. Digital printmaking needs to rely on digital technology, and digital technology is more difficult to master. Therefore, many printmakers tend to be more obsessed with the operation of digital technology and ignore the creative inspiration and expression of printmaking so that the content of printmaking is hollow and unnutritious. It lacks the meticulous craftsmanship and imprint flavor of traditional prints. In the creation process of traditional prints, great attention is paid to the choice of print boards. For example, some artists prefer to use wooden boards, some artists like to use copper boards, and some artists like to use silk-screen boards. These unique boards can make the prints more diversified and bring a different experience to the audience and readers. However, the woody and imprint flavors that are the most characteristic of prints have not been fully displayed in digital prints, which is also a major drawback of digital prints.

(3) The artistic creation form of prints, based on digital technology, can flexibly adopt various effects, give various special effects to prints, and make the spread of prints faster. Digital technology is synonymous with efficiency and speed, which has doubled the publishing speed of prints, but at the same time, the precision of traditional prints has also disappeared invisible under digital technology, and there is no substantial sublimation. On the contrary, the high efficiency and reproducibility of digital prints also caused many people to misunderstand digital prints. At the same time, because of the difficulty of mastering digital technology, many artists are obsessed with studying digital technology, ignoring the original meaning of printmaking.

Finally, we discuss how to actively construct the experimental application and creation of contemporary digital prints.

First of all, the creative expressiveness of digital prints should be built vigorously. For printmaking creators, digital printmaking is a material formation process that uses digital media as a configuration for processing and transformation. As a form of physical work, it is always inseparable from creating the author's thoughts and perceptions. The creator's attention to the development of science and technology and social reality helps to improve the language connotation of the work and can make the work connect with the social background and local culture. Secondly, the relationship between digital prints and other types of prints should be handled well. The emergence of digital technology can improve the shortcomings of traditional prints and promote the promotion of prints. Now, more printmakers like to combine digital prints with traditional prints to create prints. This way of presenting prints to people improves their visual and appreciation. It can be said that digital printmaking not only assists traditional printmaking but also blends into it. Finally, we should make scientific use of digital technology and dare to experiment and innovate. Creators scientifically use digital technology to express the art of printmaking, and through reasonable experimentation and exploration, can they narrow the distance between digital printmaking and traditional printmaking and promote the development of printmaking art.

5. Conclusion

As one of the forms of the printmaking system, comprehensive printmaking is a new breakthrough on the basis of printmaking and a new form of expression. In contemporary art, traditional printmaking is bound to undergo diversified development with the changes of the times. However, the uniqueness of printmaking itself, as well as the characteristic artistic expression form, cannot be replaced by today's digital technology. From the perspective of development, digital technology has undoubtedly brought a broader expression and development space for printmaking. Not only has it conformed to the trend of the times and has it abandoned this ancient and long-lasting traditional technique but also has enabled creators to have more diversified creative methods. Adhering to the creative concept of advancing with the times, prints will radiate more vivid colors and vitality in the hands of artists.

Data Availability

No data were used to support this study.

Conflicts of Interest

The authors declare that there are no conflicts of interest with any financial organizations regarding the material reported in this manuscript.

Acknowledgments

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