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VISUAL ANALYSIS OF THE KNOWLEDGE MAP AND TREND OF DIGITAL TECHNOLOGY AND NEW MEDIA ART FIELD BASED ON CITESPACE

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ABSTRACT

Considering that people focus more on the rapid development of digital technology and its application in the new media art field, it becomes worthwhile to have in-depth research on the future development trend of digital technology and new media art. In order to analyze current research situation of the combination of digital technology and new media art, research hot issues towards and predicting the future trend of the combination of digital technology and new media art, and provide data reference for the development in the field, this paper presents visualization knowledge graph analysis on the relevant literature found in Web of Sciences (WOS) database using bibliometric method and CiteSpace visualization software. The findings of this study could become references for scholars to understand the development history, international collaborations and future trend of development for the research on integration of digital technology and new media art. Through analyzing the existing research findings, it evidently reveals the problems encountered in the process of integrating digital technology in the development of new media art movement. It could constructively clarify the direction for the future research in supporting or facilitating the future development of new media art through adoption or integration of digital technology.

1. INTRODUCTION

The development of science and technology plays a decisive role in art innovation and development. The emergence of the Renaissance, the Rococo Baroque era in Europe, and Impressionism and Cubism all developed on the basis of science and technological innovation at that time. With the rapid development of science and technology, the art of new media has spread rapidly, highly interactive, amongst a large population, and is increasingly popular within the social media industry. It has greatly influenced the lives of people in modern times (Wei, 2015). Since the 20th century, the impact of technology on the arts has become more significant and rapidly developed, while the development of digital technology has expanded the possibilities for art creation and performance (Liu, 2014). In the 21st century, the development of the new media art is increasingly integrated with high technology element, including the interference of artificial intelligence (Li & Jin, 2020). The development of new media art will gradually grow along with the advancement of digital technology (Kim & Park, 2019). It shows strong inclusive characteristic as new media art focuses on the interaction between works and audience.

Thus, the public will be engaged with full of curiosity and expectation towards new media artworks.

New media art is different from other traditional art, as it depends on the development of science and technology (Min, et. al., 2020). Therefore, the rapid development of science and technology will strongly impact the growth of new media art. In terms of the design of new media art, it is necessary to introduce new methods as well as fashionable and innovative approaches to combine media and art towards extending the research on the potential of emerging technologies (Liu, 2014). As the result, the combination of digital technology and new media art is potential research direction to focus on. Based on the summary of the previous research, this article researches and extracts relevant literature published in the past 20 years from the WOS database. Data visualization based on CiteSpace relevantly presents keywords co-occurrence, cross-nations collaborations, as well as emerging keywords towards analyzing the existing situation in the field of research on digital technology and new media art. In addition, it also looks at its progress and future research trends.

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2. LITERATURE REVIEW

New media art is a new form of art developed on the basis of the advancement of digital technology. Since after the third image revolution in the 1980s and the 1990s to the present, new media art has been transformed into a new presentation in the field of art. The 21st century is the era of the Internet economy and the rapid development of new media art. In the developed countries such as the United States, the United Kingdom, and Japan, digital technology adoption in the creative industries has become the core of the knowledge economy, while globalization has accelerated the development of new media art (Qian, 2017). One of the studies by Song & Liu (2016) pointed out that under the continuous development of social technology, more and more advanced technologies will emerge and diverse scientific and technological approaches enable new media art to grow more dynamically. In order to promote the better and faster development of new media art, researchers may look into the extending correlation between the digital technology and new media art, so that they can develop together and achieve a win-win situation. In addition, Xue (2016) argues that the combination of digital technology and new media art is the progress and evolution of the era. With the continuous updating and development of digital technology, it provides a wider range of forms for the expression of new media art. The integration of the two is the inevitable result of conforming to the evolution of the era. Along with the development of science and technology, the combination of technology and new media art captured increasing scholar's attention. Therefore, in order to better promote the future development of new media art, a systematic analysis of the research on the combination of the two subject matters is crucially needed. Lyu & Li (2020) have applied CiteSpace visualization software to study and analyze the form and technical implementation of contemporary new media art. Their study has mainly elaborated and summarized the scopes of application of new media artworks and the technical realization of new media art creative process. However, the said study has not explored the future development trend of research on integration of both subjects.

The summary of the findings of the previous studies shows that scholars' researches on the relationship between the two subjects and their development trend is mostly subjective and personal in nature. In order to look into the process and development trend of research on digital technology and new media art in a more rational way, this study adopts a bibliometric approach. This study attempts to analyze the history of the researches on digital technology and new media art in the past 20 years in order to clarify the current status of international collaborations, and then to identify the possible topics for future research about the integration of digital technology in the field of new media art. It also discusses the problems encountered while adopting digital technology in the field of new media art. This study attempts to provide references for supporting theories and data towards facilitating the future research and development of new media art, international collaborations and digital technology adoptions.

3. METHODOLOGY

The process of data analysis in this study is carried out by applying the information visualization software CiteSpace V, which was founded by Chen Chaomei, the internationally famous information visualization expert. This software was developed on the base of JAVA application program. It can make visualization analysis with scientific documents, follow the hot issues in the field of study, and explore the research trend in the field (Li & Sun, 2020). The relevant documents were retrieved and exported from WOS database, and the respective written contents were selected as all cited documents, which were then exported in the format of "text". Subsequently, the documents were imported into CiteSpace for analysis based on four modules including the number of published articles of each year, the collaborative countries involved, the keywords co-occurrence, and the keyword map in the field. The visualization analysis was made on the existing research on the integration of digital technology and new media art, the hot issues discussed and the trend of future research.

4. DATA COLLECTION

This paper selected Web of Science as the core database to do retrieval of relevant published articles because it featured international research papers with long established interdisciplinary academic research foundation. It could guarantee the reliability or validity of effective data for analysis of visualization. The retrieval method was: Topic= ("Science and Technology" OR "Digital Technology*" OR "Digital Technique" OR "Media Technology*" OR "Modern Technology*" OR "New Technology*") AND ("Media Art*" OR "Digital Art" OR "Digital Media" OR "Video Art" OR "Computer Animation" OR "Virtual Art" OR "Internet Art" OR "Interactive Art*" OR "Video Games" OR "Computer Art" OR "Sound Art"); Document type=All document types. Besides, with consideration of the uniqueness of new media art, there should not be specific limit for the document type during the retrieval of documents. The selected years of publication was limited to the past twenty years (i.e. from 2001 to 2020). Digital technology and new media art are relatively cutting edge and actively discussed topics of academic research. The search finally retrieved 375 articles. After manually filtering unrelated subjects and replicated articles, 345 documents were obtained.

5. RESULTS

In order to understanding more clearly about the developing progress and future trend of the existing research on integration of digital technology and new media art, the relevant published articles were systematically sorted out for analysis. The number of the articles published yearly, to some extent, can reflect the extent to which the subject has been focused on by the academic field as well as its developing trend in research (Chen,2006). Figure 1 shows the number of published articles about digital technology and new media

art yearly between 2001-2020. Among them, between 2001-2003, there is only one article found. The reason is that on one hand, digital technology was weak and mainly with single aspect of application at that time. On the other hand, the works created with the combination of digital technology and new media art was still limited, which couldn't attract the focus of the academia. Between 2004 and 2011, the number of articles is in a trend of growing slowly and the scale of increasing is relatively stable. But between 2011 and 2012, the number is decreasing obviously, from 24 to 9, reduced 62.5%. It should be noted that from 2014 to 2015, the number of articles rises from 15 to 43, increased 230%. This relevantly reflecting that from that period of time onwards, the movement of integrating digital technology and new media art are expanding significantly. The number of articles began to grow extensively, marking the historical transition of research in the said field of knowledge. Also, it reflects the growing maturity and diversity for applications of digital technology in the new media art field. Between 2015 and 2020, the number of articles is growing, and there are 43 in 2015 and 2017, reaching the maximum number. This evidently shows that with the growing maturity of digital technology advancement along the time, integration of digital technology in the new media art field becomes the actively discussed subject in academic research. Scholars began to focus on the relevant research on this particular field. In 2020, the number of published articles is only 28, which is not very high. The possible reason of this phenomenon is due to the outbreak of Covid-19, which has affected almost every industrial sector including the arts sector. With the development of improvement of digital technology, it can clearly predict that the research on the adoption or application of digital technology in the production of new media art will keep growing.

Figure 1: Literature distribution for research on integration of digital technology and new media art from 2001 to 2020

5.1 Analysis of country

To look at the international collaborations in research on integration of digital technology and new media art, the filtering mode of CiteSpace was selected by countries. Then the visualization network as shown in Figure 2 was generated. It relevantly maps out the international collaborations by marking the network connections between different countries based on their collaborations in researches on integration of digital technology and new media art field. As shown in Figure 2, there are 56 nodes in total, and 73 network connection lines. The interconnected network lines between countries reflects that within the selected period of time, the international collaborations are active. That becomes a driving force for the development of academic research in the field. It also reflects that the field of research on digital technology and new media art is currently capturing global attention across different countries, in which actively venturing into international collaborations on research and development. The purple circles in the figure and the thickness of the circle represents the centrality. From the figure, it relates that the centrality of England is the strongest, which has recorded the highest frequency of cooperation with other countries in this particular area of research. England cooperates closely with Australia, Wales, Spain, France, Denmark, Pakistan, USA, Singapore, Greece, Germany, Norway, United Arab Emirates and Belgium. This reflects that England serves as an international academic networking bridge in the field with a stronger influencing voice within the field of knowledge.
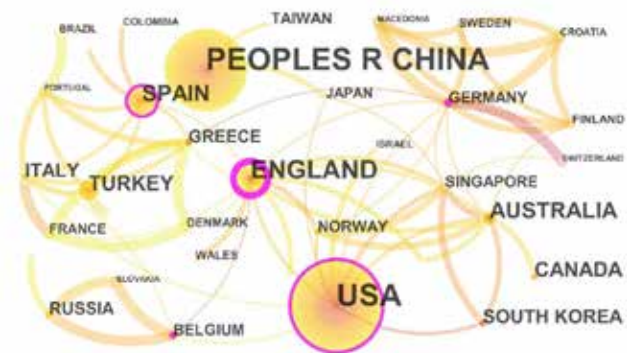

Figure 2: Map of international networking between different countries based on their collaborations in research on integration of digital technology and new media art, 2001-2020

England has a strong art creation environment and several famous art colleges. Roy Ascott, who is known as the father of new media art; John GoTo, who creates new media art to express his political views; and Neil Mendoza, a new media artist who is famous for dynamic art, have all played an important role in driving the development of Britain's new media art. As shown in the Figure 2, China has the largest number of published articles about research on digital technology and new media art field, 67 in total. It followed by USA with 63, Britain 32, Spain 19 and Australia 16. The USA holds a strong position in the development of new media art, with educational institutions in the USA have first taken an interest in it in the 1990s. Around 1995, universities and art schools began offering courses related to new media art, and almost every university and art schools on the West Coast has both digital technology-related and new media art courses. In addition to this, a constant stream of

conferences and seminars in American academia and the initiation of New Media Arts scholarships by the relevant councils (the Social Science Council and the Rockefeller Foundation) have been an important catalyst for the development of New Media Arts in the USA (Manovich, 2003). China has a larger number in the research field, probably due to the growing number of higher-educational institutions including almost a hundred colleges or universities in China that offer new media art programs. Thus, China tends to have greater initiatives focusing on the academic research on the said field of knowledge (Duan, 2015). On the other hand, the support of research funding is strong in China. For example, Tsinghua University founded TASMAL in 2010, which has initiated the plan for visiting international artists to stay, and provided funding to support Chinese new media artists to explore cutting-edge creation through interdisciplinary adoption of art and science (Yang & Chen, 2020). Overall, China is ahead of the world in the field of academic research, but international collaborations might need to be strengthened, and academic research should have an international vision.

5.2   Analysis of keyword co-occurrence

Keywords play a conclusive role in the articles and are also being the core summary of the entire article, which can relevantly reflect authors' opinions and main ideas. Therefore, the results of keywords co-occurrence analysis on the articles published since year 2001 to 2020, could present the distribution of frequency of keywords co-occurrence amongst the published articles that were written about the integration of digital technology and new media art. Figure 3 shows the keywords co-occurrence visualization graph, which has relevantly combined 408 nodes and 906 connecting network lines. The size of nodes and font represent the frequency of the co-occurrence of keywords.

Figure 3: *A keyword co-occurrence visualization map for academic articles about digital technology and new media art that published from 2001 to 2020.*

Table 1 shows the statistics for the top 20 ranking keywords in published articles about the new media art field for digital technology between year 2001 and 2020, which were ranked according to the frequency of bursting keyword. In the table, it lists out items by keyword appearance frequency (Counts), the first year that the keywords appeared in the period (Year), keywords (Keyword), among which the top ranking five keywords are "Video game", "Digital Media Art", "New Media Art", "Digital Technology", and "Interactive Art", with the frequency of 68, 46, 42, 39, and 13, in respectively. These five keywords represent the most frequently discussed themes or issues in researches on digital technology and new media art between year 2001 and 2020. Apart from "Digital and New Media Art" as the core theme that being focused in this paper, "Video Game" has the highest frequency of appearance and reaches 68 times. This shows that in this phase of the academic research, scholars pay close attention on "Video Game". While "Video Game" is categorized as part of the new media art, further analysis from multiple angles on literature retrieved is meaningful.

Firstly, video game has emerged since the end of the 1960s and experienced long path of development. Video game has rich types and diverse operation media. It can be applied in different fields and attracted interest of a wide range of people. Secondly, the development of video games and new media art, both exploring new forms of expression and creative media to provide audiences new art or media engagement and experiences. For example, the video game "Minecraft" strengthens the interactivity in new media art, allowing players to interact directly with the game. The engagement breakthrough the traditional form of game experience and brings a new visual sensation and physical perception. For new media art, the most distinctive feature of new media art is connectivity and interactivity, which is integrated into the art creation through technology and upgraded level of the interactive experience (MacIntyre, et. al., 2021). Therefore, the development of video games and new media art have many overlapping similarities. In the future, with the rapid development of technology, video games will continue to improve their technology and new media artists will further experiment diverse creative mediums. Finally, we believe that there will be more and more new media artists and groups flexibly apply video games as a creative medium to create excellent artworks in future (Jiao, 2016). With the rapid development of many kinds of digital technologies in the 21st century, smart electronic devices or gadgets have rapidly become popular. In the future research of new media art, video games will become a very important field of research amongst scholars, who are interested in topics related digital technology and new media art.

As shown in the table, "education" is one of top frequently appeared keywords. Although the main research content in this paper is about integration or application of digital technology or new technology in supporting the development of digital media or new media art, this finding evidently supported that the development of digital

technology not only bringing impact on the new media art but also in the field of education. Thus, the combination of topics of digital technology, new media art and education is also a potential topic of research.

Besides, "Interactive Art", VR, 3D, "Contemporary Art" are also hot keywords that have been discussed in existing researches. These keywords clearly show that the current research on the combination of digital technology and media art mainly look into the aspects of design, art and engineering field. Furthermore, the findings proved that new media art is an interdisciplinary and inclusive research field.

Table 1: Ranking of keyword co-occurrence amongst literature about digital technology and new media art from 2001 to 2020

Ranking	Counts	Year	Keywords	Ranking	Counts	Year	Keywords
1	68	2007	Video game	11	6	2009	3D
2	46	2009	Digital media Art	12	6	2009	Media
3	42	2009	New media art	13	5	2007	Creativity
4	39	2011	Digital technology	14	5	2007	Behavior
5	13	2010	Interactive art	15	4	2007	Design
6	11	2007	Internet	16	4	2008	Information
7	10	2003	adolescent	17	4	2011	Application
8	9	2009	Virtual reality	18	4	2017	Gamification
9	8	2009	Computer animation	19	4	2008	Contemporary art
10	7	2008	Education	20	3	2020	Experience

5.3 Analysis of bursting keywords

In CiteSpace, the algorithm put forward by Jon Kleinberg in 2002 was used to make the detection. According to the difference of bursting nodes, the keywords can be divided into themes, documents, authors, journals and fields, and etc. In CiteSpace, the more bursting nodes it has in a certain cluster, the field of research will be more actively conducted or captured the emerging trend for research among scholars (Li & Chen, 2017). So, this paper uses CiteSpace bursting keywords and the burst strength to analyze the future developing trend in the field of research on digital technology and new media art. Figure 4 shows the top 10 bursting keywords in the field between year 2001 and 2020. The figure includes bursting keywords, burst strength, as well as the beginning and ending time of the burst. The blue line segment represents the entire selected time period, while the red line segment represents the beginning and ending time of appearance of bursting keywords within the collection of references.
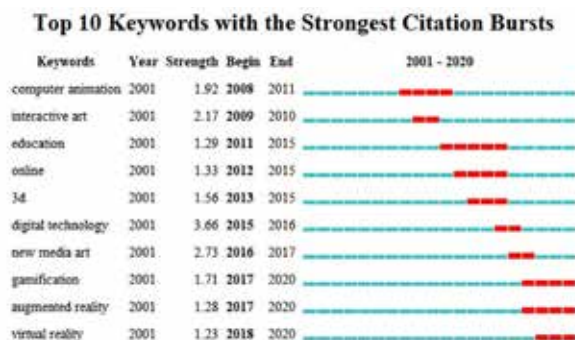

Top 10 Keywords with the Strongest Citation Bursts

Keywords	Year	Strength	Begin	End	2001 - 2020
computer animation	2001	1.92	2008	2011	
interactive art	2001	2.17	2009	2010	
education	2001	1.29	2011	2015	
online	2001	1.33	2012	2015	
3d	2001	1.56	2013	2015	
digital technology	2001	3.66	2015	2016	
new media art	2001	2.73	2016	2017	
gamification	2001	1.71	2017	2020	
augmented reality	2001	1.28	2017	2020	
virtual reality	2001	1.23	2018	2020	

Figure 4: Top 10 bursting keywords with the strongest citation bursts

As shown in the Figure 4, the earliest emerging bursting keyword is "computer animation", which always being the main content of research in the application of the combination of technology and computer animation in education, or in creation of artworks. Among others, the keyword with greatest burst strength is "Digital Technology", which reaches 3.66. It is also the core keyword in the field of research for this paper. The discussion in the selected articles relevantly addresses the innovative relationship between digital technology and new media art. That includes the interdisciplinary integration development as well as the application of the combination of both in the creative art production and education development. According to Figure 4, the focused keywords in the past few years are "gamification" augmented reality" (AR) and "virtual reality" (VR), which relevantly reflects that the future research trend on the integration of the digital technology and new media art will probably focus on the following direction in respectively:

Digital technology: with the combination of digital technology and new media art, "AR" and "VR" technology application in new media art will become a future developing trend. Currently, more and more art creators begin to explore the application of AR and VR digital technology to present interactive new media art. AR- or VR- oriented new media artworks have successfully attracted greater attention from the audience (Zhang,2022). As the result, "AR" and "VR" digital technology will be capturing more focus in future with wider application in the fields of art and culture, such as art exhibition, museum, tangible cultural heritage and etc. Scholars as well as new media art practitioners shall take this as a reference for planning of their future initiatives and endeavors in research or practice.

New media art: "Gamification" will emerge in the development of digital technology and new media art. The result of analysis on emerging keywords from relevant references reflects that the potential trend for future research emphasis will tend to center on a video game or gaming direction.

In order to better predict the future trend of combining digital technology and new media art. A total of three representative new media art colleges was selected from the United States, the United Kingdom and China, and the curricula were analysed from the official website presentations. The analysis was conducted to understand the current trend of cultivating new media art talents from the aspect of education and training.

The Integrated Digital Media Program at New York University (USA) has a core curriculum that covers human-computer interaction design, game design, AR/VR and augmented reality. The programme focuses on students' ability to interact with society and to become proficient in the use and development of cutting-edge technologies. This reflects the interdependence of new media art and cutting-edge digital technologies, and the need to appropriately address and integrate cutting-edge digital technologies in the development of new media art.

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The programme of Digital Direction of Art at the historic Royal College of Art was designed to enhance the understanding of digital culture. It examines the emergence of a new generation of technologies for storytelling (VR/AR and mobile platforms), the possibility of making AR documentaries with families, engaging with political or cross-cultural issues and creating new narrative experiences using digital imagery and artificial intelligence technologies. This course is designed to combine some of the emerging digital technologies with people's lives and the sociopolitical nature of the present, better fostering a concern for life and society. China as a strong support for the development of new media art, the digital media art direction teaching curriculum of the Central Academy of Fine Arts has been selected for analysis. The basic class of the programme for the training of new media talents covers game and entertainment design, digital imaging and basic animation creation. The comprehensive course covers XR immersive interactive media experience and sound art related courses. By collecting representative new media art schools from different countries, it is easy to see that the core curriculum related to new media art revolves around game design, AR/VR, artificial intelligence and interactive experience. As technology matures and new media talent diversifies in each country, the combination of digital technology and new media art will become even more diverse in the future.

6. DISCUSSION AND CONCLUSIONS

The main research subject of analysis in this article is 345 documents related to digital technology and new media art, in combination. All documents, including published research papers, articles or thesis were retrieved from the WOS database by specifying the year of publication as between 2001 and 2020. The literature review analysis and display of results were carried out using bibliometric visualization tool at CiteSpace. It generated knowledge map visualization analysis based on number of yearly published articles, cross-country collaborations, keyword co-occurrence and keyword burst. It then sorted out the hot issues or significant research themes about the integration of digital technology and new media art. Based on the findings and results, the following conclusions could be made:

(1) Number of documents: Generally, the number of published articles is on the upward trend, but with an unstable growing scale where the increase of publications about research on digital technology and new media art field is relatively inconsistent although this subject matter has captured the focus of academia. In the early 2000s, the application of digital technology in art presentation was relatively limited. The integration of digital technology in new media art creation was relatively not significant. It had not attracted academic attention at the earlier stage. For the development of new media art, the latest development or upgrading changes of digital technology have greatly influenced the degree of academic attention to it, especially in 2015, where academic publications obviously increased. At that point, the diversification of digital technology

application has enriched the expression of new media art and successfully captured interest from audiences, artists, and exhibition curators. In particular, the research on the forms, performance characteristics, and future development of the integration of digital technology and new media has largely attracted academic attention. It has contributed to the reason that academic development of this research is on the rise. However, in recent years, there are some new media artworks that focus only on the trendy technical expression form, while ignoring the essential characteristics of new media art. The presentation of some works with emphasis on technology but without elements of art has demotivated the scholars to further study the combination of both. It is also one of the reasons for the unstable development of academic research in this field. Therefore, the future research on a combination of digital technology and new media art should focus on the essential elements of art towards fulfilling the needs of the public on aesthetic appreciation on new media art. Researchers should explore the potential of advanced digital technology in facilitating the development of better quality of new media artworks (Du, 2020).

(2) Research country: the research collaboration among different countries is relatively close, but it tends to be more likely occurred between some developed countries such as Britain, USA, Germany and etc.

(3) Research topic: the co-occurrence analysis on keywords show that the existing research on digital technology and new media art are mainly focused on the application of the combination of digital technology and new media in the art exhibition, manifestation pattern analysis and interdisciplinary integrated communication. In the era of rapid development of digital technology, the interdisciplinary combination of technology and art is widening the boundaries of art, and various new digital technologies are applied in the creatives process of new media art. Ouchh, a multimedia art team from Turkey, focuses on kinetic sculpture and new media art. One of the representative works, "AVA_VE Particle Physics Scientific Device", was inspired by a major experiment in particle physics. The work is created by particle size measurement, using Physics, Dynamic Imaging and Architecture. The hemispherical structure made of translucent gauze is projected in all directions by six projectors, presenting a visual effect of particle-like changes.

In addition, the Japanese team TeamLab, selected by the authoritative website Design boom as one of the "Top Ten Must-See Exhibitions in the World", has created works themed on nature. The team's works are mostly themed in nature, exploring the harmonious relationship between man and nature and the world. One of the most famous works is "Forest of Flowers and People: Lost, Immersed and Reborn". In the huge enclosed space, through the projection, the blooming flowers will keep changing seasons every 5 minutes, spreading and growing around the viewer, forming a completely different landscape. If the visitor does not move into

place, the flowers will keep spreading and blooming around them. If the visitor touches or steps on the flowers, they will break. The interaction of these works is not produced in advance for screening, but generated in real time by a computer program. The Teamlab team works in a cross-disciplinary way, involving art, science, technology, design and nature. Disrupting the traditional model of art experience, the art is freed from physical limitations through multiple digital technologies (Li, 2021). With the development of society and the needs of the public. In the future development of new media art, multi-disciplinary and interdisciplinary art integration and theoretical research will be our next focus direction.

(4) Future trend: through the analysis on emerging keywords, it is predicted that the application of some interactive digital technology, such as "AR" and "VR" in new media art will become more popular in future, which also shows that the development and pattern of manifestation of new media art will change alongside with the advancement of technology (Xue, 2021). Nowadays, the development of technology brings both opportunities and challenges to the art industry. The application of AR/VR technology is an important step in the development of new media art. AR/VR technology presents a strong vitality for the creation and display of new media art. AR/VR technology applied in new media art presents stronger realism and interactivity, narrowing the distance between the audience and art works (Zhou & Zhao, 2019). Furthermore, it breaks through the traditional or conventional media art viewing format. The audience can better experience new media artworks through tactile, visual and auditory senses in a realistic experience. The audience showed great interest in the presentation of new media art in terms of the types of artworks. In addition, the emergence of AR/VR technology has enriched the creative tools of new media artists and enhanced the novelty of artworks. AR/VR devices will definitely become more popular and more diverse in the future development (Cheng, 2022). Therefore, in the future development of new media art, scholars or art practitioners could utilize the advantages of AR/VR technology and new media art to create more diversified artworks towards engaging the public and society in a more effective way. With the arrival of the new media era, it is believed that AR/VR technology will usher in an exploratory journey of innovation within the visual art sector (Chen, 2020).

Although the emerging digital technology brings opportunities for new media art, it also brings challenges at the same time. From the perspective of artists, some older artists are more conservative in their thinking. They tend to prefer to stick to their usual traditional art design concepts and methods, but rejecting the application of digital technology in presenting work of new media art. Some of them might have gradually developed a skeptical attitude towards the application of digital technology (Xie, 2020). In addition, due to the uniqueness of new media art works themselves, their expression forms are rather diverse. Some using VR/AR/projection, while some might use interactive interaction and etc.

For the breakthrough in curation of new media art, practitioners can no longer follow the traditional curatorial approach, but need to consider different digital technology presentation to enhance the effectiveness of new media artworks in engaging audiences (Gere, 2008). For instance, the curator may need to consider how to build a better site-based exhibition experience for audience engagement. Therefore, in the future research, scholars should pay attention on looking into the challenges encountered by practitioners such as artists and curators in adopting or applying the developing digital technology along the development process. Such scientific research could relevantly provide references with new theoretical support for the future development of new media art.

As the variety of digital technologies will become more abundant and advanced along the development process, it will give a great impetus to the advancement in the creation of new media art (Su, 2015). However, in the process of integration, the emphasis on both the advancement of technology as well as the creativity and aesthetic values of art presentation shall be considered (Gouveia, 2020). In addition to this, there is always a need to strengthen international collaboration and exchange in research towards finding solutions in facing the challenges encountered along the process. Overall, it is convincing that the integration of digital technology and new media art will be expanding alongside with the advancement of technology in the future towards presenting more potential and possibilities in creative arts.

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