Research on Interdisciplinarity-Teaching of Digital Media Art Under Big Data

Yuanyuan Tong¹, Jie Wu², Xinyue Zhang*
¹Guilin Tourism University, Guilin, Guangxi, 541006, China
²Mokwon University, JieWu, 35349, Korea
*xinyuezhang@gxnu.edu.cn

Abstract: Digital media art has been developed unprecedentedly under the influence of big data, but its development also has some problems such as technology shortage, backward technology and lack of big data support etc. Especially, the cross application in media technology has not been deeply developed and used interactively, so that media technology is hindered in the big development. As a combination of technology and art, digital media art itself is a data crossover, and the study of its cross teaching in the context of big data is conducive to the healthy development of digital media art education and the industry. In this paper, we analyze the problems related to the current teaching situation of digital media art, conduct research from the application of interdisciplinary courses within the discipline, seek solutions to related problems, and provide scientific guidance for the innovative development of digital media.

1. Introduction

Digital media art is an art form that deals with information carriers in the form of binary numbers, including digitized text, graphics, images, sound, video images and animations [1]. Under the support of big data technology, digital media art can continuously create new art forms through big data technology and make accurate predictions of future development trends, ultimately realizing the scientific allocation of industry resources, so that the economic and social benefits of the digital media industry can be significantly improved [2]. Consequently, the education and teaching of digital media art must undergo a comprehensive technological revolution in the context of big data, and recognize the value of big data in digital media art and the significance of digital media art teaching at a deep level, so that digital media education is always in the middle of a benign development track.

2. The current situation of digital media art education under big data

As the society develops and the big data technology continues to promote, the traditional radio, TV and film are rapidly developing in the direction of digital audio, digital video and digital film, which constitute a new generation of digital media with the increasingly popular computer animation and virtual reality, and finally show a new development style through media integration and technology transformation and upgrading. However, since digital media art is a new discipline, there is a shortage of people who can fully master the technology in this field compared to the demand of the society, which makes the current situation of education lagging behind.

At present, the main courses of digital media art in most colleges and universities in China include: digital signal processing, digital image processing, web page design, Multimedia Information Processing and transmission, streaming media technology, animation design, film and television...
technology, video special effects and non-linear editing, virtual reality, etc. Although these courses can not represent the whole courses of digital media art, they also show the existence of some problems.

2.1. Lack of attention to interdisciplinary
Digital media art is a comprehensive discipline that spans Natural Science, Social Science and Humanities, and is a high synthesis of science and art. It is a Technical Education based on science and Technology, based on the media industry, and based on the artistic innovation and design of digital products. Interdisciplinarity is not emphasized its intersectionality is reflected in the cross-application of technology from multiple disciplines: knowledge in plastic art, art design, interactive design, computer language, computer graphics, information and communication, virtual reality technology, etc. is cross-applied to technology. From the professional technology listed above reflects the broad cross-application characteristics of the technology, but the actual teaching is affected by the lack of actual technical teaching staff, insufficient teachers and other problems, or a long-term commitment to the specialized teaching of a certain technology, so that certain technologies are lacking and can not achieve the professional and technical cross-application of the participants.

2.2. Unclear technical interdisciplinary objectives
Under the influence of expanding student population and faculty shortage, some digital media arts disciplines have unclear curricular integration and interdisciplinary goals, and more majors offer courses for supplemental credits, or courses that are not related to digital media majors in order to arrange those professional teachers who have been eliminated by the times[3]. Such courses are not linked in the structure of professional knowledge, and have no permeability and extension with related majors, so they can not form interdisciplinary or the interdisciplinary direction is not clear, and lose the meaning of interdisciplinary.

2.3. The teaching contents and teaching materials of interdisciplinary-courses lack depth and moderation.
In the digital media art major, there are many interdisciplinary-courses and interdisciplinary-technologies, such as virtual reality technology, in the animation design course to learn this technology, in the Environmental Art Design, Product Design 3d Max such as the design to learn this technology. The focus and technology interdisciplinary of the same technology teaching in different curriculum contents are also different, the depth and moderation of technology teaching also deviate from the teaching objectives.

2.4. The application of big data technology is not deep
Under the influence of the internet, big data technology can be applied to the corners of every industry and promote the vigorous development of all walks of life. The full application of big data technology in digital media art can optimize the teaching method and promote the informatization process of teaching technology. Originally, the digital media major should be able to give full play to the advantages of internet big data, but due to the influence of teacher structure, leadership concept, management mode, incomplete equipment and other factors, the application technology of big data is lagging behind or not deeply applied, and the interdisciplinary-required skills of big data technology can not reach the educational level of professional level.

Based on the above symptoms of digital media art education, no matter from the interdisciplinary, curriculum and technology intersection, it reflects that people and the big data media technology they master are the bottleneck affecting the development of digital media art. And the factors that break through the barrier and then quickly are the focus of this paper.
3. Interdisciplinary-application of Digital Media Technology under big data

3.1 Teaching application of interdisciplinary courses

The interdisciplinary-curriculum has the characteristics of clear direction for the curriculum problems and the methods to solve the problems and the curriculum characteristics of the major. Therefore, clear direction is the key point of interdisciplinary-curriculum. The clear direction of interdisciplinary-curriculum refers to the teaching content of interdisciplinary-curriculum inclined to the major. Interdisciplinary-cutting courses are different from regular courses. Regular courses are more independent in their professional structure, while interdisciplinary courses are more connected and extended to other professional disciplines\cite{4}. interdisciplinary-curriculum is an important course of all kinds of art. according to different majors, the core of their demands is different. interdisciplinary-education around the core of each major is conducive to the integration and penetration of various knowledge, methods and research means.

The specific appearance of interdisciplinary-curriculum directivity is:

Basic interdisciplinary courses refers to the basic courses with similar teaching contents, for example, "Design Drawing" class opened in industrial design majors, should focus on the structural performance of the sketching object, while opened in graphic design majors, focus on the key performance of the sketching object's appeal point, such as opened in environmental art design majors, use focus on the relationship between each sketching object, emphasizing the overall effect of the environment.

Interdisciplinary courses Courses in which the system of expertise raises similar issues of expertise are also seen within the art and design discipline, but are ultimately resolved by the characteristics of the professional structure. The solution is to pour more knowledge and technology into the specialty from the new concept, new method and new structure of the specialty. For example, "virtual reality" design course, it exists in the digital media art professional curriculum, also exists in the interior design professional, product design professional curriculum, virtual reality technology can also be applied to a number of disciplines and industries. But in the digital media art, virtual reality should tilt to the virtual process and virtual details, while in the interior design specialty and product design specialty, it should tilt to the virtual environment scene and the display of product details.

Interdisciplinary-practice courses are courses that are integrated for design practice, and these courses can be simply called cross-practice. It is embodied in the research and application of multi-professional technical cooperation problems caused by practice projects. The difficulty of interdisciplinary practice is much greater than the first two. The span of study, the wide range of interdisciplinary scope, the number of participants, and the complexity of the procedure can determine the overall quality and ability of a student in the level of art and design. As shown in Table 1, the quality and ability of each quality and ability under the crossover of practice.

| Communication skills                                  | 100% |
|-------------------------------------------------------|------|
| Professional and technical competence                 | 90%  |
| Ability to learn new technologies and ideas           | 80%  |
| Planning ability                                      | 80%  |
| Project implementation capacity                        | 80%  |
| Collaboration and organizational coordination capacity | 80%  |
| Language expression ability                            | 80%  |
| Foreign language application and communication ability | 20%  |
| Ability to withstand difficulties and setbacks         | 80%  |
| Professional ethics and loyalty                       | 80%  |
| Dedication                                            | 80%  |
| Responsibility                                        | 100% |
3.2. Teaching suggestions for interdisciplinary-courses
Interdisciplinary-teaching is different from conventional teaching, on the basis of integrating the knowledge of several specialties, the teaching mode of cultivating students "comprehensive application of various knowledge and interdisciplinary-innovation consciousness, cultivating students" team cooperation consciousness, and cultivating students "multi-channel interactive communication consciousness is being respected and applied by Guangfa. According to many years of digital media teaching experience, the author puts forward the following suggestions.

3.2.1. Mixed teaching of interdisciplinary-courses. According to the requirements of "the Thirteenth Five-Year Plan" and "the fourteenth five-year plan," we should strengthen the link of professional courses and improve the teaching quality. Interdisciplinary-courses are particularly important in the link of professional courses, which plays a key role in improving the overall teaching quality. According to the characteristics of interdisciplinary-courses, through the mixed teaching of teachers of each major course, like the originator of interdisciplinary-curriculum, several major teachers jointly educate the students who offer this course, which can improve the students' interest in learning, and also can obtain different knowledge from different teachers, and can improve the students' comprehensive knowledge application\(^5\). The production of a complete animation film includes the comprehensive application of graphic design, three-dimensional animation design, and post-editing knowledge. In the mixed teaching, teachers have changed the mode of classroom teaching and started the mode of interactive education.in the mixed teaching, other professional knowledge involved not only has gains for students, but also is a necessary knowledge supplement for teachers, thus realizing the teaching effect of teaching and learning. At the same time, several teachers teach at the same time, which can find problems in time, and solve problems from different majors, improve the efficiency of teaching, and also reflect the advantages of mixed teaching.

3.2.2. Weighted interdisciplinary-ratios, increased practice cross. Interdisciplinary-Practice Course is the most important course in the above three interdisciplinary-courses, in practice operation, we should increase the amount of class hours to ensure the quality of interdisciplinary-practice. The chinese university of hong kong and Daye University of Taiwan have a much larger proportion of class hours in cross-curriculum than in regular courses, and a much larger proportion of class hours in practice cross-curriculum than in basic interdisciplinary-curriculum and professional interdisciplinary-curriculum. As shown in Figure 1, the proportion of class hours of the four courses is conducive to students "complete, comprehensive and detailed acceptance of various knowledge and technologies.

Interdisciplinary-practice courses should adhere to the market demand-oriented Digital Media Design practice, and the practice project should be able to cooperate with enterprises. Because the interdisciplinary-practice Course with the practice project of enterprise cooperation as the teaching
content can well cultivate and exercise the students "comprehensive knowledge and skills application ability and team cooperation ability. Around the theme of practice, teachers, students and technical personnel of enterprises discuss together, and continuously study and explore, which is the deepening of the teaching process in the practice link. In this process, the participation and emergence of different knowledge and skills, the knowledge, information, data, technology, tools, views, concepts and/or theories from different disciplines or specialties are purposefully integrated to promote students "basic understanding, or to solve those problems that can not be solved by a single discipline or research field, and activate students" learning enthusiasm; in this process, various practice links: Market Research, Research report production, video demonstration, etc., Drive students "learning enthusiasm and assiduous spirit. In this process of practice cooperation, we have learned how to communicate with personnel from different professional backgrounds, how to integrate different professional knowledge and culture, how to complete post responsibilities independently, not relying on teachers, how to compete, and how to unite and respect, trust and encourage each other, complement each other and explore together. It realizes the students "own value and team value, and fully demonstrates the advantages of practice interdisciplinary-curriculum.

3.2.3. cultivation and improvement of teachers self-ability under the background of big data. In the era of big data, digitalization has been integrated into all aspects of our lives. Industry development, scientific research and talent training can not bypass big data. The era of big data has brought a great impact on the global Education field. The emergence of digital learning, flipped classroom, microlearning, MOOC and major online education platforms has led to a fundamental change in the teaching competencies required of teachers, who must have the ability to use information technology in addition to their strong professional knowledge[6]. Through participation in new technology learning and training, it is necessary to learn more about the development trend of professional technology and interdisciplinary-discipline, and to be actively prepared to perfect to be competent in teaching new digital media technology. The four common it training models are shown in the table below.

| Name             | Content                                                                 | Characteristic                             | Efficiency (100%) |
|------------------|-------------------------------------------------------------------------|--------------------------------------------|-------------------|
| Sea quantification | The amount of information is large enough to have the capacity of sea water | Large amount of information, link information Islands | 90%               |
| Long-term effect  | The length of training may be longer                                     | Long time, learning at any time             | 95%               |
| Intellectualization | Online and offline learning in multiple ways                             | Immersive, interactive                      | 90%               |
| Refinement       | Provides a large number of high-quality miniaturization resources        | Short, scattered, leisure                  | 88%               |

4. Summary
To sum up, the education and development of digital media art under big data plays a decisive role in the operation of various industries. Digital media art education itself possesses very complex interdisciplinary technologies. If it is deeply integrated with big data technology, its high-quality data processing capability can not only make digital media products more relevant[6], but also improve the quality of digital media art education comprehensively, so as to provide scientific guidance for the benign development of digital media.

References
[1] Zhou Aolei. (2017) The application of digital media technology. Industry Observation, 10: 37-68
[2] Shi Wei. (2019) The application of big data in digital media. Modern Economic Information, 27: 342
[3] Hu Yu, Yan Bo. (2009) A brief discussion on the expression of linear animation under digital media art. Literature and Art Review, 02: 30.
[4] Niu Wenxin, Wang Lejun, Wang Jing, Zhu Rui, Shen Xia. (2020) A comparative study of learning performance and teaching evaluation of cross-category general education courses for medical and engineering students. Journal of Science and Education, 30: 41-42,50.
[5] Zhonglin Liu. Modern cross science. (1998) Zhejiang Education Publishing House, Hangzhou.
[6] Qianqian Xin, Zhang Maiman. (2019) Exploring the model of teacher information technology competence training in the era of big data. Teacher Construction, 01: 30.
[7] Aolei Zhou. (2017) Application of digital media technology. Industry Observation, 10: 37-68.