



## The Development of CAD Technology in the Mobile Internet of Things Environment and its Application in Digital Media Teaching Mode

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**Abstract.** With the sharp increase in the demand for digital media technical talents, the socialization function of education has been fully reflected. Major colleges and universities have set up digital media-related teaching majors. As a special way of personal investment, education plays an important role in supplementing the gap in the talent market. However, this is not the case in the current teaching market development. There is an embarrassing situation in the society where graduates majoring in digital media technology cannot find suitable jobs. This situation indicates a relative surplus of human resources in this field. The fundamental reason for this situation is that the training of digital media technology professionals does not meet the needs of the industry, and the content of students' learning does not match the needs of society. On the other hand, the students' practical ability is too poor, and the practical knowledge they have is not competent for the work of the corresponding position. The major of digital media technology is a multi-disciplinary interdisciplinary subject, which mainly cultivates applied talents. In addition, the traditional practice teaching method is no longer suitable for this discipline, and colleges and universities should strengthen the practice teaching reform of digital media technology majors. This teaching reform is a very important and necessary means. Based on this situation, this paper attempts to construct a teaching practice system for talent training suitable for digital media technology majors. This paper takes the digital teaching mode of CAD technology as an example, and further analyzes the specific content of the practical teaching system in detail.

**Keywords:** CAD technology; Mobile Internet of things; Digital media teaching; Application mode

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## 1 INTRODUCTION

The production method of digital media communication supported by computer technology has broken the traditional production mode of digital media. Data analysis and mining improve the authenticity and objectivity of digital media, and broaden the depth and breadth of digital media reports. In the era of big data, Austin et al. [1] believed that data not only refers to traditional numbers, but also describes the process of development of things and the behavior of relevant personnel. The digital media data analysis has gradually become the key content of big data analysis. In recent years, "robot digital media" related content has gradually emerged in the digital media field. The core work in this field is to use computers to read large amounts of data and measure the digital media of the data. At the same time, the computer transforms the informational material into human-readable content following the framework of the digital media report. He et al. [2] believed that the development of big data provides more possibilities for the production and dissemination of digital media. With the development of the mobile Internet, social media has become a mass productivity resource and has received extensive attention from journalists. Traditional digital media portals have been transformed from PC terminals to mobile phone terminals, and digital media information channels are established through APP software. This channel can get rid of the dependence of social media channels such as WeChat. But for now, Gioux et al. [3] believed that the effect of this kind of social media work is not obvious. Social applications represented by WeChat have become one of the most important platforms for digital media and public opinion dissemination. In addition, Chinese private digital media portals do not have the authority to review digital media. Shah et al. [4] believed that this situation makes it difficult for traditional digital media sites to reverse the general trend of user resource loss. For traditional digital media portals, computer-supported digital media communication technology has changed the current text-based digital media narrative. In the current environment, it is rare to see social media that integrates data mining, analytics-driven, and in-depth digital media. At the same time, most digital media portals in China mainly rely on reprinting and adapting other digital media channels to achieve digital media production. Dong et al. [5] believed that the digital media production mode limits the information production capacity of digital media subjects.

Computer-supported digital media communication technology originated from the use of data in digital media reports. The British "Guardian" published a report on "About the Minor Education System" in its inaugural issue in 1821. The report is considered to be the earliest application of computer-supported digital media communication technology. However, strictly speaking, this report cannot be regarded as a computer-supported digital media communication technology in the modern sense, but also a report of digital media. Although the concepts are different in nature, the emergence of computer-enabled digital media communication technology did not happen overnight. This technology is gradually developed on the basis of accurate digital media, computer-aided reporting.

The concept of accurate digital media was first proposed by American media reporters in the 1960s and 1970s. This concept uses sociological and statistical methods of investigative analysis to report digital media. Hahn et al. [6] believed that the method follows the norms of quantitative research, and its purpose is to achieve objectivity, notarization, and neutrality in digital media reporting. In general, precision journalism supports journalists from observation and interviews to more in-depth investigation and professional research. Qin et al. [7] believed that the digital media broadcast mode breaks the combination mode of "digital media + literature" in traditional reports. Although there are various differences between computer-supported digital media communication technology and accurate digital media, computer-supported digital media communication

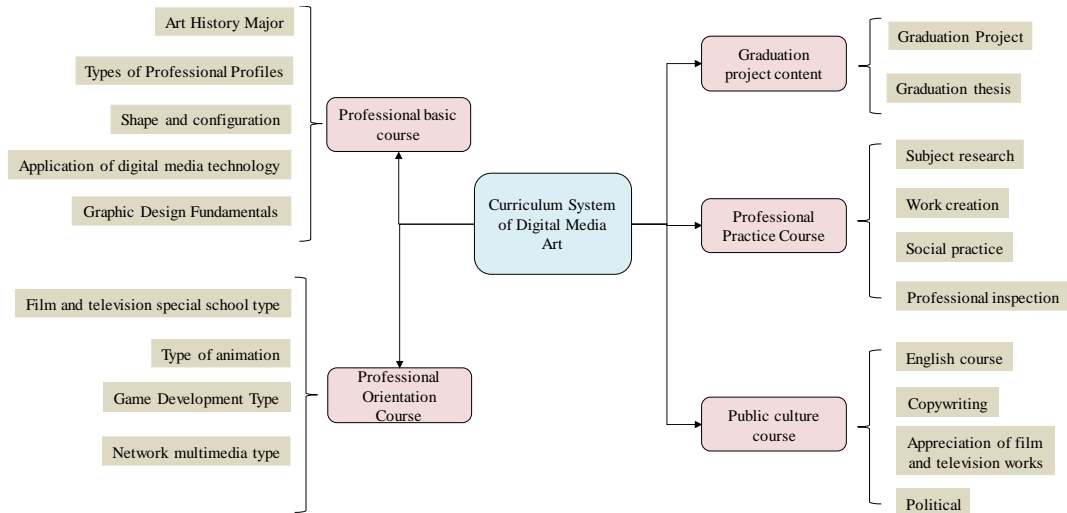
technology inherits the relevant norms of quantitative research in accurate digital media. Shadrina et al. [8] believed that the technology implements the objective and fair reporting concept of digital media, and lays an ideological and conceptual foundation for the development of computer-supported digital media communication technology.

Therefore, the computer-supported digital media communication technology that relies on portal website dissemination usually reflects the characteristics of strong interactivity, comprehensive functions and complex digital media events. Mokni et al. [9] believed that the digital media portals around the world are also the main platforms for disseminating computer-supported digital media communication technology. The Guardian in the United Kingdom and the New York Times in the United States are still users of computer-supported digital media communication technology. When reporting major and complex events such as the U.S. election, computer-supported digital media communication technology occupies an important position. In addition, Herminio et al. [10] believed that the winning works of the previous computer-supported digital media communication technology awards, the PC-side computer-supported digital media communication technology occupies an absolute advantage. This also shows that the current digital media portals occupy a greater advantage in the promotion of computer-supported digital media communication technology.

### **1.1 The Related Research on Practical Teaching of Digital Media Majors in China**

In recent years, colleges and universities in our country have realized that the practical teaching of digital media is an effective teaching method. This method plays an important role in cultivating students' practical ability. Many colleges and universities have further set up practical teaching activities for the ability training of students majoring in digital media. However, the process and effect of the current teaching activities are not ideal. Many scholars have made profound reflections and researches on this phenomenon, and put forward many suggestions for reform. Some scholars expounded the shortcomings of the experimental teaching of digital media majors from the aspects of practical course understanding, course design, course arrangement, teaching materials and teaching methods. Some scholars have made useful practical teaching explorations from the aspects of curriculum design, teaching mode and experimental type design of experimental teaching activities in combination with the content of classroom teaching activities. Some scholars have analyzed the practical teaching mode of digital media majors in China, and put forward the method of engineering practical teaching. Scholars analyzed the methods and effects of digital media teaching. Some scholars have analyzed the development status of practical courses for digital media majors. Scholars have pointed out that practical courses should be given great attention through research, to break through the difficulties faced by practical teaching, and completely change the concept of emphasizing theory and ignoring practical teaching. The main content of digital media teaching and the application direction of CAD technology is shown in Figure 1.

Chinese colleges and universities have learned from the curriculum settings of international digital media-related majors. Institutions of higher learning have changed the traditional curriculum setting method and proposed that the practical curriculum should be set up from the perspective of project progress. The course schedule is not limited to just one semester. Some scholars have analyzed the importance of practical teaching, and proposed that the teaching of professional courses needs to be practiced through the way of project promotion. The practical teaching model should actively cooperate with social enterprises and the market, and establish an off-campus industry-university-research cooperation base. Some scholars have absorbed the professional teaching methods of digital media in other regions, and proposed that the practical teaching mode should develop towards diversification and autonomy. The practical teaching system mainly includes two parts: the teaching practice system and the graduation design practice system. Under the current diversified teaching practice system, students choose different learning modes according to their own interests and strengths.



**Figure 1:** The main content of digital media teaching and the application direction of CAD technology.

The goal of students' participation in practical teaching is to continuously cultivate and strengthen their own abilities. In addition to the above-mentioned studies, some scholars have studied the content of practical teaching assessment and practical ability composition in digital media majors. For example, some scholars have analyzed the current situation of digital media professional practice course examinations, and discussed the reform direction of the assessment. Specifically, the current curriculum training focuses on the diverse characteristics of talent training models and teaching forms in terms of examination content.

## 1.2 The Research on Foreign Digital Media Teaching and Practical Education

As early as the end of the 20th century, some international colleges and universities have set up digital media as a separate professional course. Relevant research has achieved relatively prominent results, which has greatly promoted the rapid development of the digital media industry. To summarize the success factors of this kind of teaching, it is mainly reflected in the following aspects: First, foreign digital media education focuses on the training of students' self-cultivation and basic skills. The core courses of major colleges and universities are basically the same, generally including three parts: media arts and sciences, introduction to digital media and a brief history of digital media development. The focus of college curriculum teaching is to lay a solid foundation for students' professional knowledge learning. The cultivation of professional knowledge in colleges and universities pays special attention to the training of students' basic skills and basic knowledge. Secondly, digital media majors in colleges and universities attach importance to cultivating students' autonomous learning skills and respect students' individual needs. Students choose courses that suit them according to their interests and strengths. Third, the school curriculum is adaptable and flexible. Faculty and departments can unite with each other to set up interdisciplinary disciplines. The school uses studios and open laboratories to provide students with different levels of scientific research training in various time periods, fully exercising and improving students' scientific research ability.

The teaching process of international digital media practice teaching is dominated by enterprises. For example, German colleges and universities carry out research on practical teaching with student ability as the training goal and evaluation standard. Canada's hands-on teaching model emphasizes a contextualized learning environment. The practical teaching of

American colleges and universities mainly adopts the qualification certificate system to promote the development of practical teaching. Computer-supported digital media communication technology has significant advantages. This technical feature can make up for the disadvantage that small digital media have no editing rights in interviews. The innovative practice of China's digital media communication technology took the lead from the portal website. At present, some digital media portals have taken the lead in opening the column "The Way of Numbers", which introduces the computer-supported digital media communication technology in detail. In addition, computer-supported digital media communication technology needs to demonstrate its superiority through visualization methods. The method utilizes advanced computer network engineering technology to convert digital media data into digital images. The technology displays digital images on a screen. On this basis, the computer performs image processing on the digital media information. The digital media no longer appears to the public in the form of words, but conveys digital media content with visual impact to the public in a visual form. At present, computer-supported digital media communication technology is on the rise. On the one hand, it is due to the rapid development of big data technology, and on the other hand, it is due to the rapid development of data visualization technology.

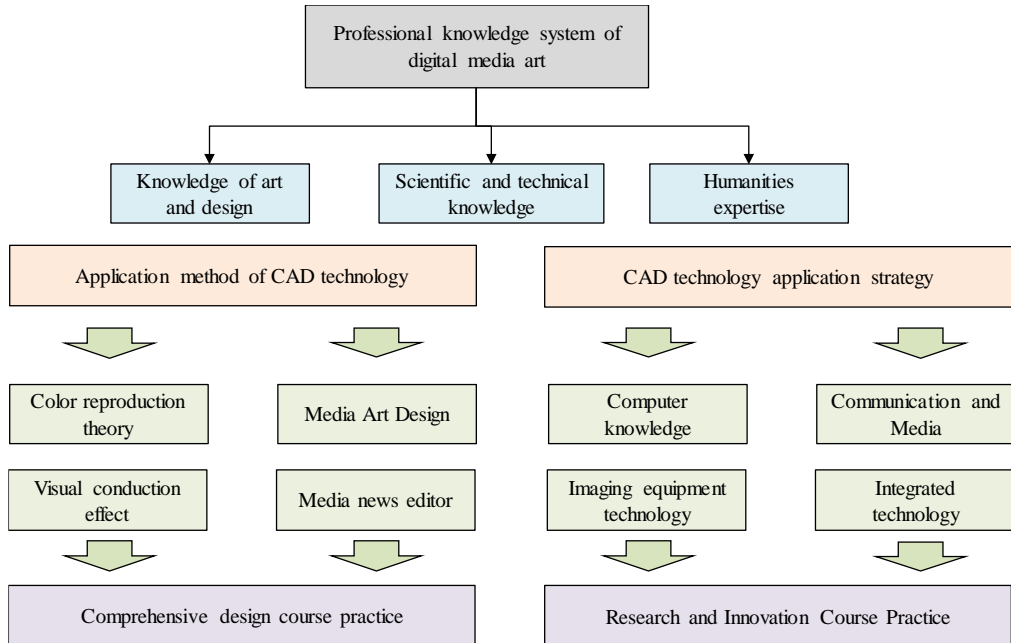
## **2 THE CONSTRUCTION OF DIGITAL MEDIA TECHNOLOGY AND PROFESSIONAL CAD TEACHING SYSTEM**

### **2.1 The Construction Target of Digital Media and CAD Teaching System**

Computer-supported digital media communication technology is in line with the development trend of the era of big data. As mentioned above, Chinese digital media portals were the first to introduce computer-supported digital media communication technology. Computer-supported digital media communication technology has rich interactive features. This technology is more suitable for deployment on the PC side. This technology is also an attempt made by digital media portals in the "post-portal era". Although the mobile Internet has developed rapidly, the computer-supported digital media communication technology still mainly relies on computer terminals for development and dissemination. This situation is related to the characteristics of the computer-supported digital media communication technology itself. Not only because of the variety of content involved in computer-supported digital media communication technology. These contents specifically include data mining and data analysis, which must be completed on the PC side. The most important data visualization work also needs to be presented on the big screen on the PC side. This allows technology users to have more room for manipulation, and it is more helpful for digital media practitioners to clearly explain the content of the digital media. In addition, the technology involves database search and personalized retrieval functions. Computer terminals have very superior operational advantages. These advantages make the dissemination of computer-supported digital media communication technology smoother and the user experience better. The knowledge system map of digital media art professional teaching curriculum is shown in Figure 2.

### **2.2 The Construction Principles of Digital Media and CAD Teaching System**

The principles of digital media technology and CAD teaching system construction are formulated according to the objective laws of school teaching process and teaching purpose. These principles are the basic requirements that must be followed in the course of CAD teaching activities. At present, according to the development of digital media technology and the actual needs of CAD teaching mode, the principles of teaching system construction mainly include the following. The construction of the CAD teaching system must first conform to the discipline characteristics and development laws of the digital media technology major. Secondly, the teaching process of this major should meet the actual needs of students and the development requirements of the school.

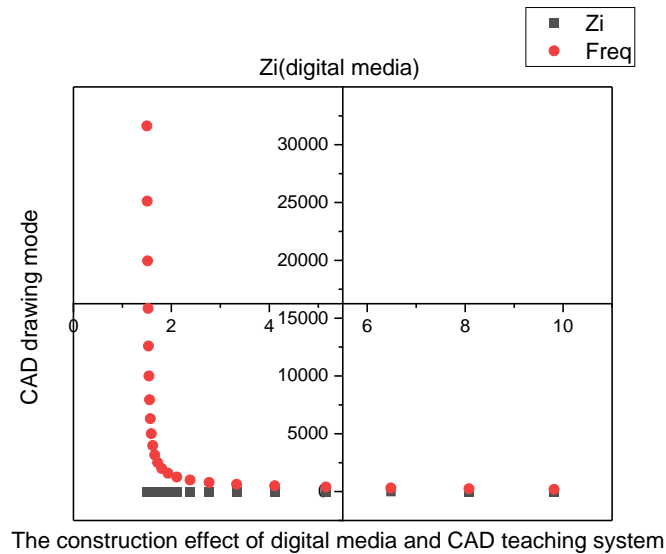


**Figure 2:** The knowledge system map of digital media art professional teaching curriculum.

The practicality and applicability of the discipline are the fundamental attributes of the digital media technology major. The digital media technology major is a dynamic development discipline, and students need to repeatedly train and verify in the process of learning. The process of learning is an iterative process from awareness to practice, and then to awareness. Therefore, the CAD teaching system must conform to the discipline characteristics and development laws of digital media technology majors. The characteristics of students and the situation of colleges and universities will affect the effective development of subject CAD teaching. The major of digital media technology is a compound and comprehensive discipline. Students have different knowledge backgrounds, and different colleges and universities have different school-running concepts. Schools also have different training goals. The focus of each school on the construction of the CAD teaching system, as well as the time and content arrangements of each link of CAD teaching are different. The construction effect of digital media and CAD teaching system is shown in Figure 3.

### 2.3 The Overall Structure of Digital Media and CAD Teaching System

Therefore, colleges and universities should choose appropriate practical teaching methods according to the actual situation of the school's major. Schools need to build a teaching model that is in line with the school's talent training goals. Schools also need to build a practical teaching system that conforms to the characteristics of students and the advantages of disciplines and majors. At present, the relevant teaching system of colleges and universities regards the organization as an open socio-technical system. The system includes not only organizational structure and technical factors, but also economic, political, social and cultural factors. Systems theory treats all of these factors as building blocks of the whole. These elements are interrelated and mutually conditional. The systemic principle requires schools to build a CAD teaching system. The school combines CAD technology with digital media, which together form an integral part of the curriculum.



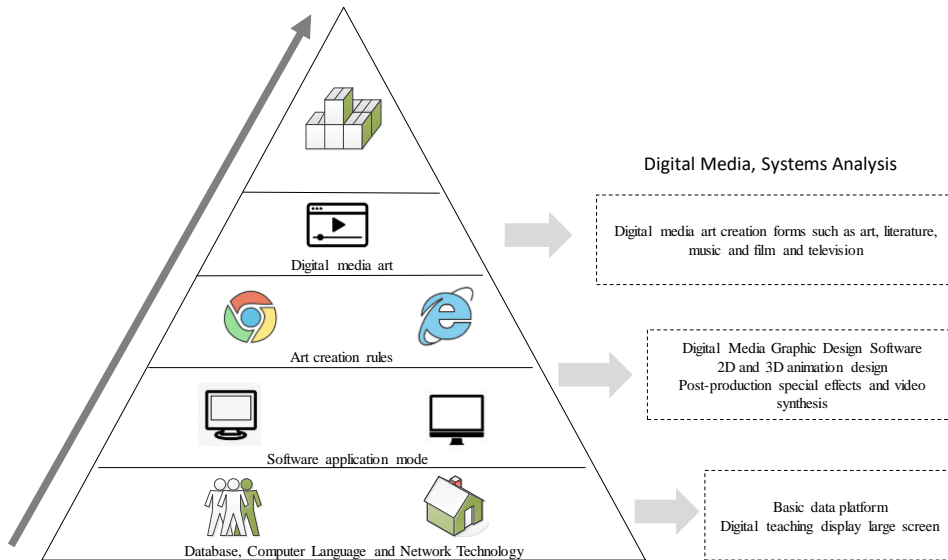
**Figure 3:** The construction effect of digital media and CAD teaching system.

Therefore, the teaching construction of CAD technology should be combined with the curriculum. Specifically, we need to integrate CAD teaching reform into the relevant curriculum system and teaching content. In addition, schools need to properly handle the relationship between practical behavior and theoretical teaching. Schools need to reasonably allocate the proportion of class hours between practical teaching and theoretical teaching. At the same time, schools also need to maintain the integrity and systematization of such subject knowledge. In addition, the CAD teaching links set up by schools need to be self-contained. The school's teaching courses are logically closely linked, and the training process of students also requires systematic planning. The construction of disciplines is not a simple addition of several links. The content of the subject should not only meet the students' own abilities, but also meet the actual requirements of the development of the subject. At the same time, the training mode of disciplines should also meet the needs of the talent market. The CAD drawing process and digital media teaching mode based on mobile Internet of things technology is shown in Figure 4.

The construction of CAD teaching system is an important way to cultivate applied talents. The system is also an important link to achieve the goal of talent training. With the rapid development of digital media education, innovative CAD teaching system has become a social consensus. At present, colleges and universities need to deepen the connotation of CAD teaching and explore new models of CAD teaching. Colleges and universities need to further build a CAD teaching system that is guided by social needs, based on ability, and promotes the development of students' personality. These contents have become hot issues that digital media technology professionals must solve. In addition, colleges and universities need to pay more attention to the construction of CAD teaching system for digital media technology majors. This is related to the effect and quality of practical teaching of digital media technology. This move directly affects the quality of talent training. Therefore, the school needs to implement the innovative talent training model, and the school needs to build a CAD teaching system that fully respects the development of students' personality. Schools need to give full play to the learning enthusiasm and development potential of each student. This teaching mode enables students with different personalities to obtain maximum development. Schools need to further strengthen the cooperative relationship



between production, learning and research, and narrow the gap between school teaching content and actual work needs.



**Figure 4:** The CAD drawing process and digital media teaching mode based on mobile Internet of things technology.

Schools need to continuously improve and update the CAD teaching content, and actively explore new CAD teaching methods. On the basis of traditional CAD teaching, the school adds a series of CAD teaching contents with professional characteristics. This teaching method is conducive to comprehensively improving the quality of students and promoting their individualized development. This teaching mode can improve students' development level as much as possible and cultivate students' innovative practice ability. The school will integrate personality education and innovative education for students into the talent training model. The school expands the optional range of CAD teaching content by adopting various forms of CAD teaching methods. The school promotes the individualized development of students by teaching students in accordance with their aptitude.

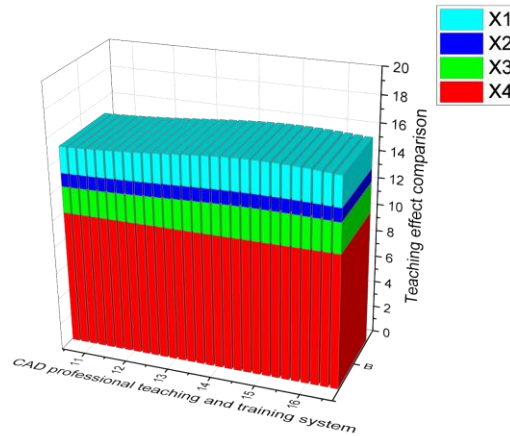
### 3 THE SPECIFIC CONTENT OF DIGITAL MEDIA TECHNOLOGY AND CAD TEACHING SYSTEM

#### 3.1 The Multi-level Project Practice Teaching System

The reform and innovation of the content and mode of experimental teaching has become a hot topic in today's society. The society requires subject education to improve students' practical ability and innovative spirit. Aiming at this goal, many scholars have carried out a series of explorations. The subject of digital media needs to cultivate innovative talents that meet the needs of the times, and the emphasis is on strengthening the openness and multi-level of experimental teaching. Multi-level experimental teaching specifically refers to the design of experimental projects into different levels of experimental categories such as basic type, comprehensive design type, and research innovation type under the guidance of the experimental outline and target specification. Students carry out progressive project training from different aspects such as basic norms, comprehensive design, research and innovation. Students of different levels can choose the



appropriate experiment according to the actual situation. This teaching method is conducive to teaching students in accordance with their aptitude. The Comparison of Expression Effects between Computer CAD Drawing and Traditional Drawing Methods is shown in Figure 5.



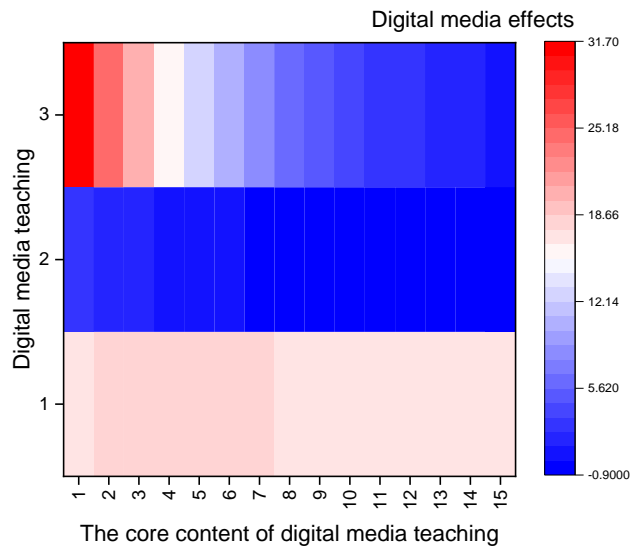
**Figure 5:** The Comparison of Expression Effects between Computer CAD Drawing and Traditional Drawing Methods.

### 3.2 The Project Teaching Content of Multi-directional Modules

Project practice is a comprehensive practical teaching link and an important part of professional talent training. Through project practice, students can synthesize the acquired skills and knowledge. Students can experience strict, systematic and comprehensive basic ability training and practical skills practice. The training content of digital media project practice strictly revolves around the three directions of the profession. These three directions specifically refer to digital film and television production, animation and game design, network communication and new media. The subject training sets up corresponding project practice activities with specific directions as modules. The digital media project practice focuses on a one-month teaching period. Students work in teams to complete digital media projects under the guidance of teachers. Generally speaking, students need to prepare the necessary basic knowledge and skills in the early stage before carrying out the practical activities of animation projects. These skills include a series of skills such as writing a storyboard script, basic knowledge and skills of 2D animation or 3D animation production, and summary report writing. Therefore, students should carry out the practical study of the project after completing the corresponding experimental courses and theoretical courses. Therefore, the course should be offered in the second semester of the second year of college. Based on the opinions of the students, the duration of the project practice should be maintained at about one month. The Comparison of the core content and teaching effect of digital media teaching is shown in Figure 6.

### 3.3 The Focused CAD Professional Training Teaching System

Digital media companies have higher requirements for internship students. However, fresh graduates are not qualified for internship positions. Students cannot get practical training, cannot effectively improve their practical ability. Schools need to ensure that students can better integrate into the environment when they enter the company for internships, and truly achieve on-the-job internships. Students must go through a more formal professional training session before the internship.



**Figure 6:** The Comparison of the core content and teaching effect of digital media teaching.

The focus of professional training is truth, and this work is a bridge for students to go from school to actual work. In this process, instructors carry out one-on-one professional guidance. Teachers train students until they have the knowledge they need to meet industry needs. The school's curriculum teaching should ensure that the skills learned by students match the requirements of industry skills. As a combination of a series of abilities such as knowledge, ability and comprehensive quality, professional training has become the key content of practical teaching of digital media technology majors. Professional training teaching has an extended effect on classroom teaching. Professional training is an important channel for students to cultivate professional ability, familiarize themselves with the professional environment, and understand practical knowledge. Through professional training, students can transform and apply the knowledge they have learned. At the same time, practical training can also enable students to continuously improve their knowledge structure in the process of learning. This course can help students gradually adapt to the skill requirements of occupational positions and exercise their own occupational adaptability. This training mode helps students to accumulate social experience and improve the social adaptability of the student group. The comparative analysis of the effect of the combination of CAD drawing and digital media teaching is shown in Figure 7.

#### 4 CONCLUSION

The teaching system of digital media focuses on the mutual coordination and connection in the practice link. The entire teaching process emphasizes a step-by-step relationship. The school conducts an overall optimization design for each link of practical teaching. This paper focuses on sorting out the specific role of each CAD teaching link in the overall training goal of digital media discipline. Through the organic connection of basic CAD teaching and comprehensive CAD teaching, the discipline forms a system of practical ability training. On this basis, subject education organically combines theoretical teaching and practical teaching to form an organic whole. The school realizes students' practical exploration, experience and application of subject methods and knowledge through overall coordination.



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