Teaching Mode of Chinese and Western Art History Course Based on Big Data

Bin Qi¹,²

¹Xi’an Academy of Fine Arts, Xi’an, 710065, Shaanxi, China
²*Corresponding author E-mail: 41114@xafa.edu.cn

Abstract. At present, with the rapid development of network technology and social economy, the reform of teaching concept is deepening. The traditional teaching mode can no longer meet people's growing learning needs. The application of network technology in teaching is more and more common. The corresponding network teaching platform is also in continuous development, at the same time, its hybrid teaching mode combined with traditional teaching is also constantly deepening into the classroom of colleges and universities. Based on the subject of "Chinese and Western art history" course in a school, this paper first summarizes the teaching characteristics and defects of Chinese and Western art history course, and describes the application method of big data technology in it. Through practical statistics, students' views on the new mode of education are counted. Through data analysis, the help of new education mode on students' learning results is obtained. Compared with the traditional education mode, the new education mode can enhance students' interest in learning and improve their academic performance.

Keywords: Chinese and Western Art History, Big Data Technology, Network Technology, Teaching Characteristics

1. Introduction

Art is an important part of Chinese and Western culture. It can be seen that the development of Chinese and Western art history is not only closely related to people's daily necessities (such as pottery, bronze, painting, lacquerware, etc.), but also related to people's spiritual needs. It is also a political need. Chinese and Western art is the crystallization of human culture. Understanding and mastering the history of Chinese and Western art is one of the courses that art students in Colleges and universities must learn. Learning the history of Chinese and Western art is helpful to improve the quality and quality of art college students. In recent years, many fine arts colleges have set up this course and regard it as one of the compulsory courses. With the advancement of curriculum reform and the development of quality education, as an important part of art teaching reform in Colleges and universities, the curriculum reform of Chinese and Western art history is imminent.

Art management is a new discipline. Art management major in European and American countries
was established in 1960s and 1970s. The earliest single subject art management major in China was established in 1987 by the management department of Beijing Film Academy. After years of development, art management colleges and universities in China have gradually formed their own unique teaching modes according to their own advantages. At the same time, in terms of cognition of the curriculum system, colleges and universities have gradually formed three relatively consistent curriculum modules: general knowledge of culture and art, basic courses; interdisciplinary courses of culture and art and management, economy, marketing, communication, law and other disciplines; and expansion courses reflecting school running characteristics, combining with local talent demand and highlighting practical ability. The history of Western art belongs to the first course module in most of the universities offering art management. Western art history course is regarded as a compulsory basic course in fine arts colleges and departments. In the curriculum of art management, western art history is also an important professional basic course. Although art management has a consistent understanding of the importance of the western art history course, the specific teaching still faces some difficulties. For example, how to determine the teaching purpose of the western art history course; how to design the teaching content and teaching links according to the characteristics of art management students; what teaching methods should be adopted to distinguish them from art majors. With the advent of the era of big data based on "big data + cloud computing", people's life becomes more and more convenient, and the communication between people is also increasingly convenient and close. The big data technology has been rapidly applied to various fields including Internet, government management, medical treatment, finance and so on. The data source of big data is closely related to sensor technology, fingerprint identification technology, RF technology, and coordinate positioning technology. These devices can capture and collect data 24 hours a day. Through the combination of big data and the education industry, it can effectively help the key and difficult points of teaching in Colleges and universities.

This paper expounds the relevant teaching contents and core concepts of the Chinese and Western art history course, analyzes various problems and difficulties existing in the teaching of the course in Colleges and universities, uses computer technology big data technology for auxiliary teaching, through reasonable investigation and analysis, analyzes the survey and statistics results, and studies the teaching mode of Chinese and Western art history course based on big data.

2. Concepts Related to the Teaching Mode of Chinese and Western Art History Course Based on Big Data

2.1 Big Data Related Theories

Wikipedia analyzes the concept of big data from two aspects of data capacity and database management technology. It thinks that big data refers to the data set that can not be intercepted, stored, processed and sorted out by current conventional software in a reasonable time. It can be seen from the above that it is difficult to reach an absolute consensus on the concept of big data.

Although there is no generally accepted standard definition of big data, there is a relatively unified summary of its basic attributes: scale, diversification, speediness and value. Data itself has no value, its value lies in the information behind the data. In order to obtain the information value behind the data, we must apply new information technology to mine and analyze it, so as to discover the information behind the data, so as to create new value and new knowledge.

Not all the data used are valuable, so a series of processing must be carried out on the original data in order to transform the data into the information we need. At present, there are mainly two different data processing methods. One is real-time processing, also known as stream processing, and the other is batch processing. Data analysis is the core part of the whole processing system. It refers to a series of processes that use various statistical analysis methods or mathematical models to calculate a large amount of data, so as to form valuable information or conclusions. At present, the main analysis methods include prediction model, estimation, spatial analysis, ensemble learning, correlation or
association rules, neural analysis, emotional analysis, optimization, regression, mining, natural language processing, data clustering, machine learning, classification, etc.

\[ Y_t = c + \sum_{i=1}^{p} \beta_i Y_{t-i} + \sum_{j=1}^{q} \beta_j X_{t-j} + \mu_t \]  

(1)

The causal relationship between them needs to be further analyzed by Granger

\[ S_t = \left[ \frac{\sum (Y_t - Y_i)^2}{N} \right]^{1/2} \]  

(2)

\[ V_t = \frac{S_t}{Y_t} \]  

(3)

2. Key and Difficult points of Western Art History Course

As an important art professional course, Chinese and Western art history course is an important course for students to construct the basic knowledge system of Chinese and Western art history, and plays an important role in students' general education. At the same time, although the teaching theme of Chinese and Western art history is image, it also involves anthropology, history, archaeology, religion, folklore and other disciplines. The setting of courses, the use of teaching materials and the choice of teaching methods directly affect teaching. However, at present, Chinese and Western art history teaching only focuses on the discussion of art types with history as the main content, and pays attention to the systematicness and integrity of the context of art history. There is a phenomenon of stylization in Chinese and Western art history textbooks, which can not reflect the characteristics and interests of art teaching. For all kinds of fine arts, it only ignores the focus of teaching. Therefore, it is very important to understand the characteristics of Chinese and Western art history course, which is the primary premise of Teaching Reform [6].

From the current situation of art history teaching in China and the west, the content of teaching materials plays a direct guiding role in the course teaching, and the style of teaching materials usually determines the teaching methods. Great achievements have been made in compiling Chinese and Western art history textbooks. Generally speaking, the characteristics of these textbooks are mainly reflected in three aspects: first, the compilation of the general history of Chinese and Western art provides basic data for the teaching and teaching of Chinese and Western art history. Second, the time and age of painting and calligraphy, jade, pottery and other art types in textbooks provide time basis for related research. Thirdly, the historical structure of several large-scale art systems, such as painting, painting, pottery and calligraphy, provides an important premise for students to fully understand Chinese and Western art and culture. However, the textbook has not yet formed a clear standard in terms of systematic elaboration. Although Hong Zai began to pay attention to the contents and themes of compilation in the new history of Chinese and Western art, most of the textbooks of art history still have the situation of being listed according to the dynasties. As for the style standard of historical books, "the whole book usually has no single theme and core theme". In other words, although the current Chinese and Western art history textbooks have a general historical nature, they do not have the basic content of "historical works"[7].

2.3 Teaching Characteristics of Chinese and Western Art History

Unlike ordinary art majors, art management majors in most colleges and universities do not need to take a professional examination before entering school, and they are enrolled by virtue of their cultural achievements [8]. Therefore, before entering school, some art management students lack a certain understanding of the basic knowledge of the art field. The teaching purpose of art foundation course in Colleges and universities is not to train students majoring in art management to become artists and art theorists, but to cultivate their ability of appreciation, judgment and research, so as to establish a
historical framework for their art development and development. To lay the foundation for their future
art management work. The author calls it the cultivation of students' independent professional. The
ability of students to form their own professional ability refers to the ability of students to form their
own major. Today's college students are growing up with the development of the Internet. In the
Internet age, the boundaries between information consumers and producers are gradually disappearing.
They can use the latest media technology to create and disseminate diversified media content in
various ways, such as obtaining, diverting, transforming and modifying the media content, and then
for the teaching of Western art history, the relationship between teachers and students, teaching
process and learning methods have changed. First of all, students are used to the decentralization of
information. In the classroom, students are used to further search for the knowledge points mentioned
by teachers at any time, and have the desire to deeply understand the artists and artistic events they are
interested in [9]. After class, students are willing to point out the possible inaccuracy of the teacher's
expression and discuss different opinions with the teacher. The teacher-student relationship has
changed from the traditional teacher-centered, one-way dissemination of knowledge to a two-way
dialogue between teachers and students. Secondly, the network new media has extended the teaching
process. In the past, the teaching process basically happened in the classroom, teachers and students
need to complete the teaching process at a specific time and place. With the support of network
technology, online and offline teaching is carried out at the same time. Micro class and MOOC
take the lead in teaching methods without time and place restrictions. The interaction of information
dissemination makes academic discussion between teachers and students convenient outside the
classroom. Finally, students' learning styles tend to be fragmented. Network media provides a quick
way to obtain information, which also leads to the lack of patience of some students. For the western
art history course, in the past teaching mode, the explanation form with time linearity as the clue was
often accompanied by a large number of knowledge points, which easily made some art management
students feel tedious and boring, resulting in their lack of learning enthusiasm [10].

3. Research and Experiment on the Teaching Mode of Chinese and Western Art History Based
on Big Data

3.1 Experimental Reasons
In the past classroom teaching, due to the large number of students in class and the short class time, it
is difficult for teachers to know each student and have no opportunity to pay close attention to and
understand each student. That is to say, under the background of the new curriculum education reform,
it is still difficult for teachers to achieve "personalized" teaching. At the same time, it is not possible to
take students as the main body and make teaching decisions based on students' "acceptability". The
root cause of this situation is that in the past classroom teaching, most decision makers may not have
data to analyze, or they may not use data correctly, or they do not use data at all. In this context, the
majority of teachers' teaching decisions rely on previous experience or unilateral subjective decisions.
In addition, the limited professional knowledge mastered by decision-makers and the lack of analytical
ability are also one of the reasons affecting the implementation effect of educational decision-making.

3.2 Experimental Steps
The first step: scene annotation, including video recording time, venue, classroom introduction, etc., to
get the labeled classroom video;
The second step: video extraction, based on the marked classroom video, the video image sequence
is extracted according to a certain time interval;
The third step: image annotation, marking the observed object in the image sequence, including the
state of the observed object, posture, action and the state of the surrounding object, so as to obtain the
expression sequence of the observed object;
Step 4: quantify performance. According to the weight of behavior factors, the execution order of
the observed object is quantified, and the computable value of the execution ability of the observed object is obtained.

The fifth step: performance analysis, combined with the value and time of the observation object performance, get the sequence diagram of the observation object's classroom performance. Then, on the basis of sequence diagram and performance evaluation method, the comprehensive performance value of the observation object is obtained.

4. Analysis of the Experimental Results of the Research on the Teaching Mode of Chinese and Western Art History Based on Big Data

4.1 Performance Factor Design

| Performance factors          | weight | Performance factors          | weight |
|------------------------------|--------|------------------------------|--------|
| Pen Spinning                 | 0.08   | Bite your hand               | 0.01   |
| drink water                  | 0.02   | Touch your face              | 0.04   |
| speech                       | 0.12   | Bow your head                | 0.05   |
| Touch your nose              | 0.02   | play with the smart phone    | 0.08   |
| yawm                         | 0.05   | Get on the table            | 0.05   |
| Tickle                       | 0.02   | Pick your ears               | 0.02   |
| Keep your hands crossed      | 0.03   | Grooming your hair           | 0.03   |

Through video and actual observation, it can be concluded that when students do not listen carefully in class, they have the performance factors in Table 1. The weight of each performance factor for not listening to the result is also reflected in the table. The test results below analyze the degree of students' class seriousness through these performance factors, so as to conduct statistical analysis.

4.2 Students' conscientiousness Curve in Class
According to figure 1, this chart records the inattention weight curve of three students in the same course in each period. It can be seen from the figure that students are distracted and not focused in the front part and the back part of the class, and they are more serious in the middle part of the course. Through the intervention of this technology, teachers can pay close attention to students' real-time learning dynamic situation, provide different learning programs according to different students, and individualize teaching.

### 4.3 Score Statistics

| Class | Number of people | Average | Standard deviation |
|-------|------------------|---------|--------------------|
| A     | 49               | 72.95   | 3.56               |
| B     | 50               | 61.33   | 1.81               |

| Class | Fail | Number of people | Percentage | Good | Number of people | Percentage | Excellent | Number of people | Percentage |
|-------|------|------------------|------------|------|------------------|------------|-----------|------------------|------------|
| A     |      | 3                | 6%         | 43   | 87.7%            | 3          | 6%        |                  |            |
| B     | 23   | 46%              |            | 27   | 54%              | 0          | 0%        |                  |            |

It can be seen from table 2 that the average score of class A in the course of Chinese and Western art history is 72.95, with only 3 people failing, 43 with good results and 3 with excellent results; the assessment of class B in the control group is not ideal, with 23 students failing and 27 good people, and the average score is only 61.33, and the standard deviation is 1.81, indicating the performance of class B students focus on both sides of the pass line. From the results of this assessment, we can see that there is a significant gap between the learning situation of the course under the new mode education and that of the traditional mode education. The teaching effect of the class using the mixed teaching mode is significantly better than that of the class using the traditional teaching mode.

### 4.4 Students' response to the Teaching Mode

![Figure 2. Students' attitude towards the teaching mode](image-url)
As shown in Figure 2, the number of students who are very satisfied with the teaching is 42, the number of people who are more satisfied is 6, and the number of people who are not satisfied is 1. The satisfaction of class B in the control group is relatively poor, with 32 satisfied, 13 satisfied and 3 dissatisfied. The number of satisfied persons was 2. Through the investigation of three students who are very dissatisfied, the main reasons are as follows: 1. The teaching methods of teachers are not the methods they like, which leads to low learning enthusiasm; 2. Teachers cannot estimate their own learning situation, which leads to giving up learning later; 3. The learning content is too boring.

5. Conclusion

With the development of Internet technology, network teaching has become a choice of more and more universities. Through the research and analysis of big data, we can draw a conclusion that the hybrid teaching method based on big data can improve students' learning enthusiasm and improve students' learning performance. Through abundant online teaching resources and content, students can learn more effectively. Can choose the corresponding learning path according to their own learning progress and situation. The mixed teaching mode based on big data can avoid the teaching results of thousands of people in traditional education mode, and lay a good technical foundation for thousands of people and thousands of people in university education.

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