Training of Digital Media Art Talents in the Era of Digital Full Connection Intelligence

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Abstract. It is a blank of traditional education to cultivate new compound artistic design and creation talents with both technology and art, and it is also an urgent need for the rise of emerging industrial markets. The training of students majoring in digital media in universities focuses on the field of art design, and the lack of technology makes this kind of students lose their advantage in the employment field and market demand. In this article, data mining (DM) technology is used to extract implicit and useful knowledge from the data of digital media talents, to explore the development and management rules of talent development in the direction of CAD interactive design, and then to explore a new mode of digital media talents training in the era of digital full-connected intelligence. The results show that, compared with the traditional methods, the accuracy of the information mining algorithm for digital mediaists in this article is improved by 22.64%. Universities should change the traditional instructional mode of digital media talents, and cultivate a group of digital media talents suitable for social needs through the structure of strategic education and the countermeasures of cultivating comprehensive quality and ability.

Keywords: Digital Media Art; Talent Cultivation; Data Mining; CAD Interactive Design.
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1 INTRODUCTION

The era of digital fully connected intelligence not only shows that the media has entered the stage of all-round integration, but also shows the full effectiveness, full staff and full stage of the media [1]. The arrival of the era of digital all-connected intelligence represents the new direction of media development, shows the new trend of information industry development, forms a brand-new information dissemination pattern and media ecology, indicates the emergence of new demand for media channel reform and content reform, and puts forward new requirements for

cultivating more digital mediaists who adapt to social growth and needs [2]. At present, intelligent technologies such as big data analysis, artificial neural network and deep learning are developing rapidly, which has effectively promoted the intersection and integration of digital media and digital media technology and other related disciplines. To improve the quality of talent development, it is need to innovate the mechanism and mode of talent development and explore and practice various forms of course learning method. The training of students majoring in digital media in universities focus, and the lack of technology makes this kind of students lose their advantage in the employment field and market demand [3]. Digital media professionals must be based on technical means, with artistic thinking and creative thinking to contribute to the social, economic and cultural growth of the country.

The realization of enterprise innovation depends on whether the enterprise has scientific and technological talents with innovative ability. In order to meet the needs of market talents, social education training for digital media majors came into being, but social training is mainly skill training, and comprehensive quality and innovation ability can not meet the social needs of high-level talents. According to the practical and applied characteristics of digital media technology, cultivate students' creative consciousness, interest and innovation ability [4]. There are many decision-making problems involved in the teaching decision support system in universities, such as making a higher-level analysis according to the existing students' grades, and providing practical basis for leading departments at all levels to improve teaching quality and optimize teaching resources. Based on the theoretical study of DM, this article describes the application of DM in information mining of digital media talents, and then explores a new mode of digital media talents training in the era of digital full-connected intelligence [5].

This article puts forward innovative strategies for digital media talent development based on DM, which provides ideas for the further growth of the construction and optimization of talent development mode in universities. Its main innovations are as follows:

(1) This article uses DM algorithm to analyze the information of digital media talents, and provides strategies for talent introduction and training in universities, and supports human resource management in universities.

(2) Studying the use of DM to extract implicit and useful knowledge from digital media talent data, and studying the basic composition of talent development mode in the direction of CAD interactive design.

The first section of the article is the introduction, which introduces the significance and research methods of cultivating digital media talents in the era of digital full-connection intelligence; The second section is related work, which analyzes the scholars' research on talent development and assessment; The third section is the method and theory part, which analyzes the present situation and significance of digital media talent development, and puts forward the information mining and assessment method of digital media talent based on DM; The fourth section verifies the effectiveness of this method through experiments, and puts forward innovative ideas of digital media talent development mode; The fifth section is the conclusion, which summarizes the contribution of this article to the cultivation of digital media talents and puts forward the development direction of talent cultivation in CAD interactive design.

2 RELATED WORK

With the development of technology and the attention of design to people, there are more and more ways of interaction between software and people, which are also closer to natural interaction. Interaction design is often inextricably linked with interface design and product design, and people often confuse the concepts of these two. The following will discuss the differences and links between interaction design and interface design and product development. The types of interaction design include user research, user relationship and interface research, and interface visual design research. In addition to aesthetic requirements, interface design must also find users, use environment, use methods and design for end users.

Nishikawa and Bae [6] believes that designers should not only be able to operate software skillfully, but also be able to use program design to achieve artistic effects that cannot be achieved by software alone. These knowledges are undoubtedly computer theories and skills that must be prepared by students majoring in new media art and design. The creation and display of digital media art requires network equipment, and the creators of digital media art need creative software. Compared with the dependence of traditional art on creative materials, the dependence of digital media art on technology is completely different. Niu et al. [7] believes that new media artists should constantly learn and master the use of newer and more powerful creative platforms to create. Digital media and its means of transmission play a very important role in the creation, display and popularization of works. The media dependence of digital media art is the dependence on various traditional and modern media. Students learning digital media art must have the content of media technology and applied communication in their knowledge structure. Digital media art is the emerging interdisciplinary science and technology and technology for its talent training. With the help of the super function of computer creation software, with the deep artistic foundation and the grasp of visual language, we have also made achievements in the field of digital art. It is obvious that the emergence of powerful software and the increasingly humanized interactive interface design have helped them. In recent years, digital media has become increasingly important. Geometry and geometric objects are increasingly suitable for the use of computer-aided design software in mathematics classes. Take Tinkercad as an example, Pielsticker et al. [8] discussed the use of CAD software in the field of subjective experience and Toulmin model. This is a new and challenging primary school environment. An empirical study examined the influence of Tinkercad on students' development of geometric solid models and related reasoning processes in mathematics classes. Sanka et al. [9] believes that digital media art is an advanced art creation activity as an art category. In all these modules, especially the creation of digital media art in art education, we can see the fact that although many artists lack the experience of computer programming, this does not affect the works with higher artistic level. The major of digital media art emphasizes practical teaching. Vairamutu and Anouncia [10] believes that the design quality and skills should be strengthened by ladder practice and ladder practical ability training mode in the teaching process. At the same time, a large number of enterprise factors are introduced into the teaching process, and the integration of production and teaching, students, teachers and majors are seamlessly connected with the needs of enterprises.

3 METHODOLOGY

3.1 Social Development Needs of Digital Media Industry in the New Era

At present, the creation of digital media needs strong technical support to have a more diversified and expressive presentation, and the combination of art and technology can create unparalleled exquisite works of art. As a diversified interdisciplinary subject, digital media major is a representative major of the current integration of art and technology. In the all-media environment, the growth of this major is greatly influenced by the growth of technology, and digital art and science and technology cannot be integrated in a reasonable and orderly way from teaching concepts to means, thus hindering the overall growth of the major and limiting the more possibilities of talent development. In the era of digital all-connected intelligence, to construct the concept of cultivating digital mediaistic talents, we should optimize intelligent education under the guidance of the educational policy and educational purpose determined by the state, and on the premise of respecting the law of artistic development and mastering the stage of technological development. In the all-media environment, the teaching reform of digital media specialty should focus on the integration of technology and art, cultivate compound talents who can flexibly use digital technology in the current digital information era and have the ability to effectively enhance the growth of digital media industry.

The creative thinking of art has never been borderless, and the presentation and expression of artistic thinking has always been a major problem that puzzles every artist. However, the

emerging technologies in the all-media environment, represented by Internet communication technology, can bear the infinite thinking of artistic creation to the maximum extent. In order to train qualified professionals in digital media, universities building related majors must face up to the irreplaceable role of technology in art education. Especially in the field of digital media, the integration of art and technology is not only reflected in the construction of a single course, but more importantly, it should be reflected in the concept of talent development, and the goal of talent development should be formulated from the perspective of intelligent education. Because the subject content of digital media is different from the direction of digital media technology, the curriculum focus is still on art and design, and the proportion of art and design should be increased in the digital media teaching and training plan. In the curriculum training plan of digital media specialty, the content of courses to stimulate students' independent creative ability should also be increased. According to the training objectives, universities should refine the professional training direction, design training specifications, update training concepts, select training channels and implement them, and form a compound talent development model that adapts to the new era.

3.2 DM and Assessment Model of Digital Media Talents

The era of digital fully connected intelligence not only means the deepening of the integration of various media forms, but also represents the deep integration of society and media. Media no longer exists in the form of traditional information media and even becomes the social environment itself. This change will profoundly affect the intelligent and digital turn of education, and provide more opportunities for the growth of media education and digital media talent development. Digital full-connected intelligence, how to cultivate digital media talents to adapt to the ever-changing media development, so as to solve the problems of slow growth of traditional media education and art education, and the disconnection between talent development and social needs, is a new problem that the media industry and the education industry need to think about. The research and analysis on the cultivation of digital media talents in universities should focus on cultivating the comprehensive quality of digital media talents.

The whole stage of DM is not a simple mining process. The DM architecture of digital media talent development is shown in Figure 1.

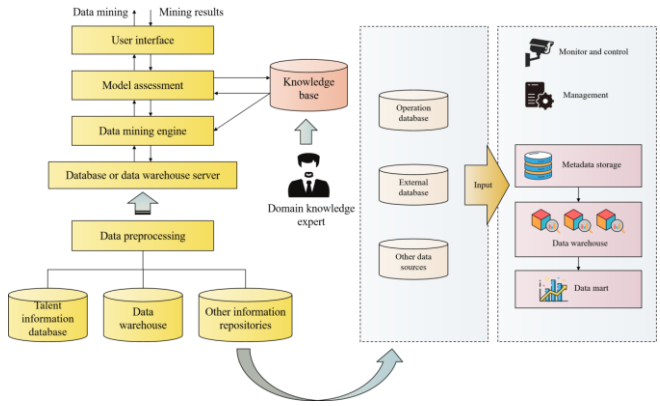

Figure 1: DM architecture of digital media talent development.

By using DM methods such as correlation analysis and time series analysis, this article compares the influence of different instructional modes on students' grades and mines effective information from the teaching database. DM can be used to process the data of various teaching indicators in the database to determine whether students are suitable for the difficulty and scope of teaching,

whether the teaching schedule is reasonable, whether the teaching ideas and language expressions are clear and easy to understand, and whether the teaching methods match the teaching contents and teaching objects. The DM processing stage of digital mediaistic talent information is shown in Figure 2.

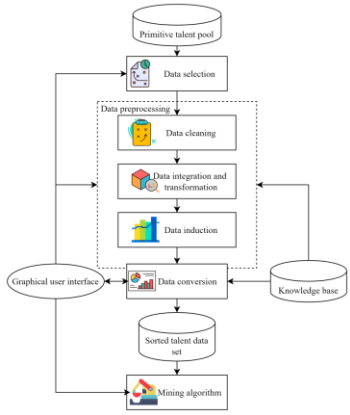

Figure 2: DM processing stage of talent information.

In the all-media environment, to build a professional curriculum system with high pertinence to the needs of the digital media industry, we should not only go deep into the digital media industry, but also deeply understand the new development opportunities brought by digitalization to the whole social industry. The cultivation of digital media talents should comprehensively carry out professional ability analysis, and set up courses based on this, choose and reconstruct course content based on post work process, and construct teaching schedule according to cognitive law and educational characteristics of universities, so as to comprehensively improve students' comprehensive quality and ability. DM solves the problem of having a lot of data but lacking useful information in the growth of information technology and completes the transformation from business data to decision information.

u_{ij} is used to represent the comparison results of digital media talent development modes. After comparing all elements at each level pairwise, a pairwise comparison judgment matrix is obtained, and the matrix is expressed as follows:

$$U = \left(u_{ij}\right) n * n = \begin{bmatrix} u_{11} & u_{12} & \ldots & u_{1n} \\ u_{21} & u_{22} & \ldots & u_{2n} \\ \ldots & & & \\ u_{n1} & u_{n2} & \ldots & u_{nn} \end{bmatrix} \tag{1}$$

Calculate the normalization for each column:

$$\overline{u_{ij}} = \frac{u_{ij}}{\sum_{k=1}^{n} u_{kj}} \tag{2}$$

Second, average the normative columns to determine the final weights:

$$\hat{w} = \frac{1}{n}\sum_{j=1}^{n}\overline{u_{ij}} \tag{3}$$

The feature vector is the weight of each factor:

$$\hat{w} = \left(\hat{w}_1, \hat{w}_2, \ldots, \hat{w}_n\right) \tag{4}$$

Compute the consistency metric for the constructed matrix:

$$CI = \frac{\lambda_{\max} - n}{n-1} \tag{5}$$

Compute the largest eigenvalue of the judgment matrix:

$$\lambda_{\max} = \frac{1}{n}\sum_{i=1}^{n}\frac{\left(U\hat{W}\right)_i}{\hat{W}_i} \tag{6}$$

$\left(U\hat{W}\right)_i$ indicates that the W -th element of vector i is used.

$$I\left(s_1, s_2, \ldots, s_m\right) = -\sum_{i=1}^{m} p_i \log\left(p_i\right) \tag{7}$$

$$E(A) = \sum_{j=1}^{v}\frac{s_{1j} + s_{2j} + \ldots + s_{mj}}{s} I\left(s_{1j}, \ldots, s_{mj}\right) \tag{8}$$

$$M\sum_{1}^{N} T_i \alpha_i \quad \left(i \in (1 \sim \mathrm{N}), 0 < \alpha_i < 1\right) \tag{9}$$

Where T_i is the quantized index value, and α_i is the weighting coefficient.

Take the average value of its expert assessment as the weight coefficient:

$$\overline{\alpha} = \frac{\sum \alpha_i f}{\sum f_i} \tag{10}$$

In the formula, $\overline{\alpha}$ is the index weight coefficient, α_i is the weight coefficient weighted by the i -th expert, and f_i is the quantity of people who choose the weight for the i -th index.

In order to ensure the quality of the weighting, the a test is finally performed, and the test formula is:

$$k = \frac{s}{\overline{\alpha}} \tag{11}$$

Where k is the equilibrium value, s is the standard deviation of the weighting coefficients of different experts for the same index, and $\overline{\alpha}$ is the weighting coefficient to be tested.

$$u_{\bar{k}}^{'} = \left(u_{1k}^{'} + u_{2k}^{'} + , \ldots, + u_{nk}^{'}\right) / n = \frac{1}{n}\sum_{i=1}^{n} u'ik \quad (k = 1,2,\ldots,m) \tag{12}$$

Find the standard deviation of these raw data:

$$S_k = \sqrt{\frac{1}{n}\sum_{i=1}^{n}\left(u_{ik}^{'} - u_{\bar{k}}^{'}\right)^2} \tag{13}$$

Then calculate the standard value of each data as follows:

$$u_{ik}^{''} = \left|\frac{u_{ik}^{'} - u_{k}^{'}}{S_k}\right| \tag{14}$$

To use the extreme value normalization formula:

$$u_{ik} = \frac{u_{ik}^{''} - u_{\min k}^{''}}{u_{\max k}^{''} - u_{\min k}^{''}} \tag{15}$$

4 RESULT ANALYSIS AND DISCUSSION

In the talent development scheme of universities, the curriculum has a certain logical order and relevance. Before learning some advanced courses, you must have the corresponding knowledge reserve and course foundation. If the pre-courses and corresponding knowledge points are not mastered, it will affect the learning effect of the follow-up courses. Data application and decision-making is to clearly convey the mined effective information to data users. This requires choosing a suitable visualization tool and delivering the results to users in the form of specific patterns or rules. DM needs to have a clear theme goal, which determines the various operations of DM in the future. DM is a stage of discovering and extracting hidden information or knowledge from a large database or data warehouse, and its purpose is to help analysts find potential relationships between data and find neglected elements. The quantitative data with large differences in data distribution intervals are discretized, as shown in Figure 3.

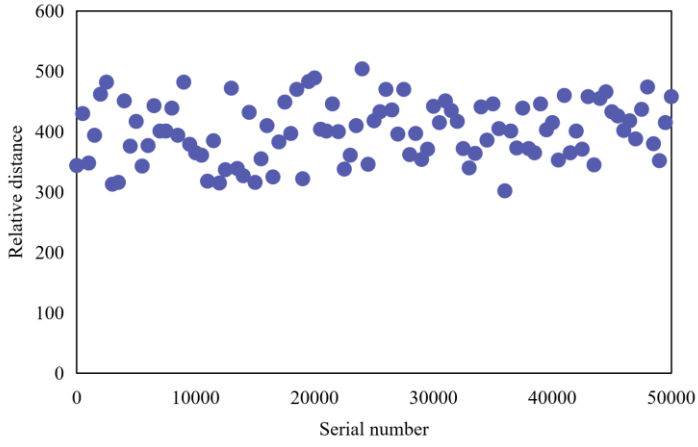

Figure 3: Data de-exception processing.

The specific operation of DM and data analysis is to retrieve effective and practical information from large databases and massive data, and use this information to make decisions. Using DM and data analysis, students' learning characteristics can be deeply analyzed. Different algorithms are used to predict the assessment results in the sample data of talent development assessment, and then compared with the actual results, and the comparison results are shown in Figure 4.

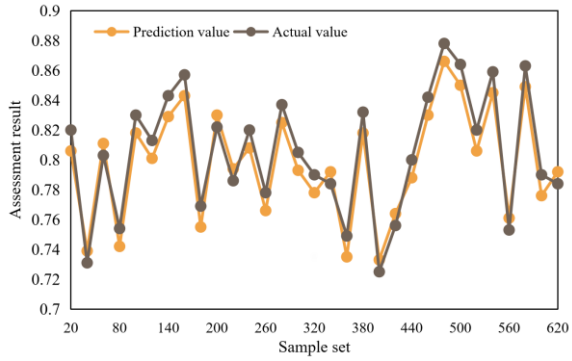

Figure 4: Comparison between predicted results and actual results.

The stage of talent assessment must be fluid in order to meet the establishment of the index of interdisciplinary compound ability. Combined with the ability index of cross-majors, the collected talent development results are dynamically measured and matched with the data of social demand changes, so as to form a comprehensive assessment of talent development effect. Taking the recall rate of digital media talent development assessment as the test index, FCA and ID3 are selected as the comparison objects, and the experimental results are shown in Table 1, Table 2 and Table 3.

Sample size	*Recall rate of talent assessment (%)*
15	96.89
30	95.64
45	94.47
60	93.88
75	93.21
90	92.88
105	92.17

Table 1: Recall rate of digital media talent development assessment in this method.

Sample size	*Recall rate of talent assessment (%)*
15	90.26
30	88.48
45	85.36
60	78.94
75	73.33
90	71.08
105	70.11

Table 2: FCA's recall rate of digital media talent development assessment.

Sample size	*Recall rate of talent assessment (%)*
15	87.55
30	80.21
45	77.38
60	72.15
75	69.46
90	67.45
105	66.22

Table 3: ID3' s recall rate of digital media talent development assessment.

When the quantity of test samples began to increase, the recall rate of talent assessment of different DM algorithms showed a downward trend. However, compared with traditional CF and ID3, the recall rate of talent assessment in this article is obviously higher. In the stage of constructing the practical teaching system, we should reasonably determine the practical teaching objectives on the premise of market research of digital media specialty, and break away from the traditional talent assessment method through personalized analysis of students' cross-platform practical ability.

These variables have a certain dependence on each other, that is, there is often a certain degree, sometimes even a high correlation between them, which makes the information in the observation data overlap to some extent. The assessment algorithm in this article is compared with FCA, and the result is shown in Figure 5.

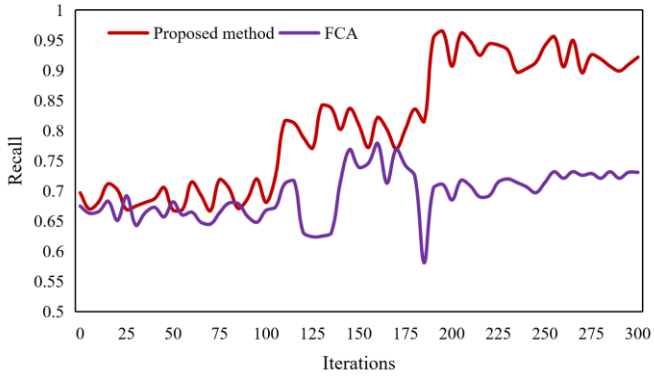

Figure 5: Comparison of assessment accuracy.

The results show that the talent assessment model in this article has higher accuracy than FCA. DM is a stage of discovering and extracting hidden information or knowledge from a large database or data warehouse, and its purpose is to help analysts find potential relationships between data and find neglected elements.

DM and data analysis methods embody the student-centered educational concept, and teachers and teaching management departments should make dynamic targeted adjustments based on the feedback information, so as to realize the precise docking of talent development in universities with the needs of economic and social growth. The teaching management system is generally stored in a relational database, and the association rules in the relational database reveal the internal relationship between the values of attributes in the relational table. Therefore, when

mining association rules, we should consider the data types of different attribute values. The test results of the talent assessment model using FCA are shown in Figure 6. The test results using this talent DM and assessment model are shown in Figure 7.

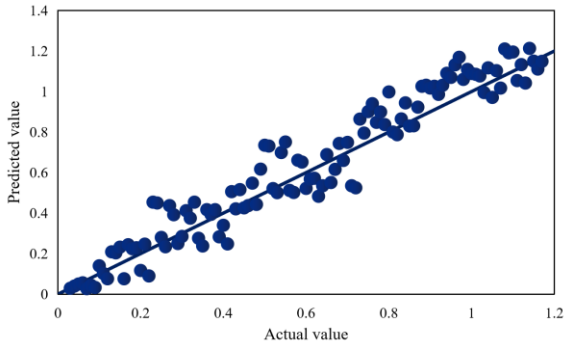

Figure 6: Scatter plot of actual value and predicted value of FCA.

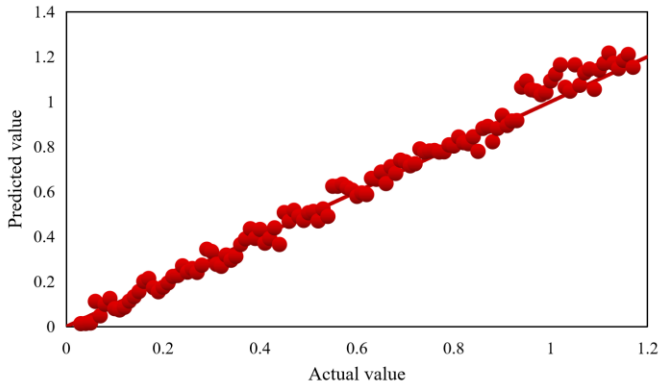

Figure 7: Scatter plot of actual value and predicted value of this algorithm.

It can be analyzed that the DM and assessment model of digital mediaists based on this algorithm are better than the comparison method in both accuracy and efficiency. Compared with the traditional methods, the accuracy of the proposed information mining algorithm for digital mediaists is improved by 22.64%.

DM is a stage of discovering and extracting hidden information or knowledge from a large database or data warehouse. As a tool for information extraction, DM's output is a reference for decision analysis, which can't replace the analysis work of professional analysts in the industry, and the mining method to solve a certain problem is not unique. The application of specific methods depends on the modeling ability and industry experience of DM personnel. By using DM methods such as correlation analysis and time series analysis, this article compares the influence of different instructional modes on students' grades, mines effective information from the teaching database, and finds out the key factors affecting the instructional effect and the quality of talent development according to the above information, so as to improve the rationality of talent development scheme and curriculum system.

5 CONCLUSIONS

The training of students majoring in digital media in universities focuses on the field of art design, and the lack of technology makes this kind of students lose their advantage in the employment field and market demand. To improve the quality of talent development, it is need to innovate the mechanism and mode of talent development and explore and practice various forms of course learning. Based on the theoretical study of DM, this article describes the application of DM in information mining of digital media talents, and then explores a new mode of digital media talents training in the era of digital full-connected intelligence. Compared with the traditional methods, the accuracy of the proposed information mining algorithm for digital mediaists is improved by 22.64%. Digital media art, as a comprehensive art major, needs to objectively understand the increasingly diversified, dynamic and radial demand for compound talents in the era of digital all-connected intelligence and the media industry, and reform the existing training mode of digital media talents. DM can help people extract higher-level information, interesting knowledge and laws from the relevant data sets of the database.

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