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Design and Application of a Multi-Semantic Art Education Communication Platform

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ABSTRACT

The lack of corresponding learning service platform will lead to the decline of the teaching quality of art education. Therefore, based on the principle of multi semantic fusion, this paper establishes a multi semantic art education exchange platform and discusses in detail the function mechanism in the process of establishing the platform. Then, the platform is applied to the art education and learning of students of different grades in colleges and universities. By comparing the art education and learning of students of different grades, the platform is designed and improved, which greatly improves the teaching quality of art education. At the same time, in view of the problems existing in the process of art education, the art education exchange platform based on multi semantic fusion can still put forward corresponding rectification measures. The experimental results show that the multi-semantic art education exchange platform is conducive to students of different grades learning art education courses and improving the quality of art education teaching.

KEYWORDS

Application, Art Education, Integration, Multi Semantics, Platform

INTRODUCTION

In the modern talent training of colleges and universities, we began to pay attention to the training of art talents. The traditional art teaching system only focuses on technology. Most of the curriculum systems focus on the cultivation of students' practical ability. The cultivation of innovative talents mostly depends on students' independent learning process, forming a new education system, such as innovative consciousness, innovative personality, innovative ability and so on (Quigley et al.,2021). Colleges and universities begin to advocate innovative consciousness to realize innovative education, constantly stimulate students' creative potential, and give full play to students' creative talents.

The theory and practice of school art education in some developed countries in the world can provide us with useful reference. Taking a comprehensive view of art education in the United States, France, Britain, Japan and other developed countries, it can be summarized as the following characteristics: in terms of understanding the importance of art education, all countries regard art education as a compulsory course for students in the stage of compulsory education (Li, 2018). Foreign well-known colleges and universities must face all students. In terms of establishing the objectives of art education, they all emphasize improving students' artistic aesthetic quality through art education,

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cultivating people's imagination, developing people's creative ability, cultivating comprehensive and harmonious individuals with rich emotions and strong life consciousness, and promoting social development (Liu, 2022).

In choosing the content of art education, it has the characteristics of interdisciplinary, multi-level, comprehensive and life-oriented. For example, the content of American art education is "comprehensive art". "Comprehensive art" not only emphasizes art production, but also integrates art history, art appreciation and criticism, aesthetic knowledge, and involves anthropology, ecology, film and television, and even modern science and technology (Munochiveyi et al.,2021). At the same time, it also emphasizes the practicality of art education and the participation of students, so that students can learn art, understand art and grasp art in activities.

With the development of art education, the research on art education in China has been developing continuously. There are many research achievements in the aspects of concept, policy, curriculum, teaching and practice. The concept involves a wide range of aspects, mainly including the purpose, value, content, method and evaluation of art education (Wang et al.,2020). The purpose of art education is to face all students and improve each student's artistic aesthetic quality, rather than to face a small number of students with professional education in artistic skills (Huizhong et al.,2022). The value of art education is mainly reflected in improving students' artistic aesthetic cultivation and promoting the harmonious development of students' body and mind, rather than the so-called value of moral, intellectual and physical fitness (Pakdeetrakulwong & Wongthongtham, 2013). The content of art education not only refers to music and art, but also extends to film and television, digital, drama, photography, sculpture, handicrafts, dance, etc. The teaching method is not only to impart artistic knowledge and skills, but also to cultivate students' artistic interest, appreciation, performance and creation of art. The evaluation of art education should be marked by improving the artistic quality of all students and starting from the value of art education (Ramadass & Shah, 2022).

At the teaching level, Chinese art educators have been making beneficial exploration and put forward many targeted and effective teaching principles. For example, the principle of participation emphasizes the participation and experience in the teaching process; the principle of pleasure enables students to enjoy art, stimulate their interest in art, meet their spiritual needs and feel their emotional edification; the principle of integration requires that the school should be good at skillfully integrating various art forms, fully integrating all aspects of the same form, properly integrating disciplines and other related disciplines, organically integrating teaching content, teaching environment and teaching atmosphere, and integrating school art teaching and social art practice, etc. (Hu et al.,2021). These will greatly enrich students' art content, expand students' art space, stimulate students' artistic interest and creation, and improve teaching level. As for the specific teaching methods and forms, all localities have made some useful explorations.

At the practical level, many schools have actively explored in the field of art. A number of art education schools with characteristics have sprung up in China. These successful schools have their own unique school running ideas and their own set of feasible school running models, forming characteristic schools with individuality (Pasquaré Mariotto et al.,2021). They have accumulated a lot of experience in hardware construction, teacher construction, curriculum design, teaching methods, teaching mechanisms, teaching evaluation and art environment construction, and gradually explore and grasp the general laws of art education (Brandão et al.,2022).

The wide application of multimedia technology in art design education has promoted the development of art teaching mode based on modern design theory. The traditional art design theory emphasizes that the relationship between teachers and students is only knowledge transfer and acceptance (Segantebuka et al.,2021). Modern design theory overcomes the shortcomings of the traditional teaching mode, emphasizing student focus, requiring students to shift from passively accepting concepts to actively constructing knowledge, information, and materials, and requiring teachers to shift from knowledge disseminators to helpers

for students to actively construct knowledge and develop thinking, effectively developing students' creative thinking (Zheng et al., 2021).

With the rapid development of network technology and its wide application in art education, it also provides great help to multimedia art education (Tang, 2021). The development of network technology makes it more convenient for students to collect materials and receive art edification (Havrilova et al.,2021). It provides the possibility for students to choose content from a large number of materials, so that students with different ideas and abilities can obtain information and materials by themselves and interact with others, so as to improve their analysis and induction of art works. Because of its own teaching characteristics, art education is technical and empirical. In the traditional professional basic courses, it needs to be taught in the way of "face-to-face" and "hand-in-hand", which is similar to apprentice inheritance education. The development of information age, especially the maturity of video conference system technology, has brought a great impact on the teaching of art design, especially the analysis of art ideas and the reproduction of art techniques, which are new with the help of multimedia technology (Rao et al.,2021).

For China's information education system, the network teaching support platform is still in its infancy (Qu et al.,2022). However, through the joint research of the education department and the scientific and technical staff, the network teaching platform will be widely used in the future education period. Most colleges and universities began to give affirmation to this kind of network system teaching, and actively adopted the research method, and the successful products are relatively excellent.

Currently, the education information system of the art discipline places too much emphasis on the surface layer such as equipment update, network courseware, and multimedia display (Lai et al.,2021). The curriculum lacks interactive design, evaluation, and feedback. At the same time, due to the exposure of some drawbacks of information technology and network teaching in art education and teaching, such as excessive reliance on computers by students in design, and the time spent by students in the performance of computer effects in designing works greatly exceeds the time spent in conceiving design schemes, seriously strangling the fleeting design inspiration in the process of conceptual design (Liang et al.,2022). The research on art education in China is relatively weak both in practice and theory. This topic strives to find new growth points in the combination of theory and practice based on previous research.

Qiao et al. (2021) uses the feature of multi semantic fusion to solve the problem that data computing cannot be parallelized, and establishes an art education exchange platform, which greatly improves the effect of art education. Li (2022) uses the scale invariant transformation method to study the application of art education. Experiments show that this method can promote the establishment of art education platform, but it is difficult to predict the advantages and disadvantages of art education. Paul et al. (2021) adopts the local binary model to fuse multiple semantics, and based on this, establishes an art education exchange platform, which has been applied and analyzed in art education in different colleges and universities, and is widely welcomed by colleges and universities. According to the Xu's study (2021), the linear tracking method is used for the first time to analyze the fusion of multi semantic features, which greatly improves the accuracy of the fusion of multi semantic technology, and has been applied to art education among colleges and universities, and achieved good application results.

Therefore, in order to study the art education among colleges and universities, based on the fusion multi semantics method, this paper studies the algorithm principle of fusion multi semantics in detail, and discusses the design method of fusion multi semantics (Brisebois et al.,2017). Subsequently, an art education exchange platform was established and applied to the art education of students in different grades to compare the teaching quality of art education in different grades. Finally, in view of the problems of art education among colleges and universities, this paper puts forward corresponding countermeasures, which provides a certain reference for the art education.

FUSION OF MULTIPLE SEMANTIC PRINCIPLES

Basic Framework Integrating Multiple Semantics

Semantics refer to the meaning in language. Multiple semantics refers to the different meanings expressed by the same word or phrase in different contexts. Level refers to the hierarchical organization of different concepts according to their internal relationships, forming a structure from simple to complex, and from low to high. Multiple semantics and levels can be used to describe the complexity and structure of semantics, which can help computer systems better understand and process natural languages. For example, using multiple semantics and levels can optimize search engines to achieve more accurate and intelligent search services. Digital technology enables computer systems to process semantic information more quickly and accurately, thereby achieving automated semantic analysis, understanding, and reasoning. For example, natural language processing technology and knowledge mapping technology can help computer systems better understand and process natural language, thereby achieving semantic search, question answering systems, and other functions.

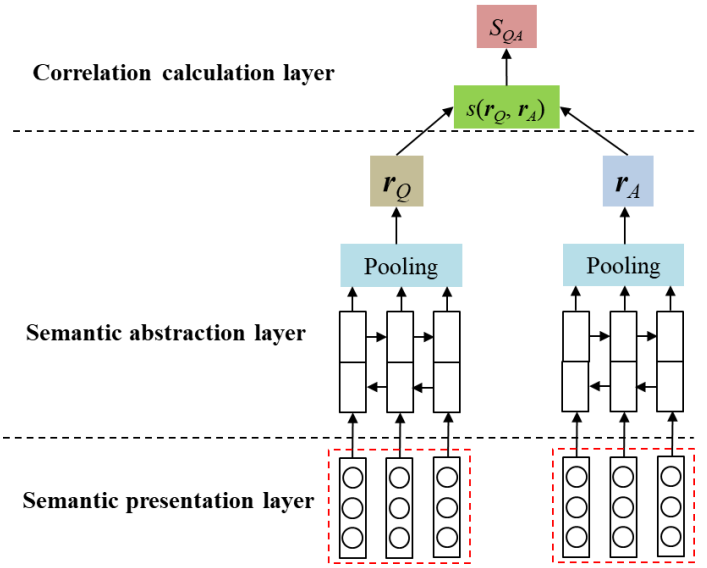
The basic framework for integrating multiple semantics is shown in Figure 1, which is included the semantic representation layer, semantic abstraction layer and relevance calculation layer of questions and candidate answers (Pakdeetrakulwong & Wongthongtham, 2013).

1. **Semantic presentation layer:** In the multi-semantic fusion framework, there are a large number of semantic components, among which the question and candidate answer are the most critical, which can reflect the multiple attributes of semantics, and can learn the semantic matching relationship between the question and the candidate answer at the semantic level to improve the selection effect. Using the word vector of the word information contained in the question and the candidate answer, the question and the candidate answer are semantically represented respectively, and the semantic representation $\boldsymbol{Q}(\boldsymbol{w}_{q1}, \boldsymbol{w}_{q2}, \ldots, \boldsymbol{w}_{qnQ})$ of the question and the semantic representation $\boldsymbol{A}$ $(\boldsymbol{w}_{a1}, \boldsymbol{w}_{a2}, \ldots, \boldsymbol{w}_{anA})$ of the candidate answer are obtained, where n_Q and n_A are respectively divided into the number of words in the question and the candidate answer, $\boldsymbol{w}qx$, $\boldsymbol{w}_{ay} \in R^{1\times d}$ $(1 \le x \le n_Q, 1 \le y \le n_A)$ is the word vector of the x word of the question and the Y word of the candidate answer respectively, and the dimension of the word vector is d.
2. **Semantic abstraction layer:** Bi-directional Long Short-Term Memory (Bi-LSTM) + Pooling is used to semantically code the context of the semantic representation of the input question and candidate answer, and the semantic representations $\boldsymbol{r}_Q$ and $\boldsymbol{r}_A$ of the question and candidate answer are obtained respectively.
3. **Correlation calculation layer:** The cosine similarity is used to calculate the semantic representation of the question and answer. The similarity S_{QA} between $\boldsymbol{r}_Q$ and $\boldsymbol{r}_A$ is used as a measure of the correlation between the question and answer.

This basic framework only calculates the similarity between the semantic information between the question and the candidate answer, but for the question, when calculating the similarity with the candidate answer, it hopes that the part related to the question in the candidate answer will occupy a higher weight, and the part not related to the question will occupy a lower weight.

As shown in Figure 1, the basic framework for integrating multiple semantics is a hierarchical structure. It transforms input information into higher-level, more abstract, and more structured semantic representations through hierarchical processing such as correlation computation, semantic abstraction, and semantic presentation, thereby achieving more accurate and intelligent information processing. The main function of the correlation calculation layer is to calculate the correlation between input information and known semantic information. Input information can be natural language text, images, sounds, and other forms of data. The semantic abstraction layer abstracts the results obtained by the correlation calculation layer to better represent the semantic meaning of information. The semantic

Figure 1. Schematic diagram of basic framework integrating multiple semantics



presentation layer represents abstract semantic information, enabling machines to better understand and process this information.

Multi Semantic Feature Extraction and Fusion

The multi-level threshold attention layer mainly includes two parts, sentence level attention layer and document level attention layer. The sentence level attention layer is used to obtain the semantic features of sentence level event correlation, which reflects the relevance of sentence semantics and the relevance of events. It can effectively combine the components of a sentence to generate new meaning and give the sentence more contextual relevance. For each candidate trigger word e_l, the sentence level semantic information is calculated as follows:

$$sh_t = \sum_{k=1}^{N_w} \alpha_s^k \boldsymbol{h}_k \tag{1}$$

$$\alpha_s^k = \exp\left(z_s^k\right) / \sum_{j=1}^{N_w} \exp\left(z_s^j\right) \tag{2}$$

$$z_s^k = tank\left(\boldsymbol{h}_t \boldsymbol{W}_{sa} \boldsymbol{h}_k^T + \boldsymbol{b}_{sa}\right) \tag{3}$$

where α_s^k is the sentence level attention weight, $\boldsymbol{h}_k$ is the word feature of m extracted by the bidirectional LSTM network layer according to the context, z_s^k represents the correlation between the t-th word h_t and the k-th word h_k, $\boldsymbol{W}_{sa}$ is the weight matrix, $\boldsymbol{b}_{sa}$ is the offset.

Similarly, the document level attention layer is used to obtain the semantic features of document level event correlation. Document-level relationship extraction requires integrating information in multiple sentences of a document and capturing complex interactions between entities between sentences. For the *i*-th sentence, its calculation method is as follows:

$$dh_t = \sum_{k=1}^{N_s} \alpha_d^k h_{S_k} \tag{4}$$

$$\alpha_d^k = \exp\left(z_d^k\right) / \sum_{j=1}^{N_s} \exp\left(z_d^j\right) \tag{5}$$

$$z_d^k = tank\left(\boldsymbol{h}_{s_i} \boldsymbol{W}_{da} \boldsymbol{h}_{s_k}^T + \boldsymbol{b}_{da}\right) \tag{6}$$

where α_d^k is the document level attention weight, h_{Sk} is the sentence feature obtained by combining the forward and backward hidden layer features of the bidirectional LSTM network layer, z_d^k represents the correlation between the *i*-th sentence h_{Si} and the *k*-th sentence h_{Sk}, $\boldsymbol{W}_{da}$ is the weight matrix, $\boldsymbol{b}_{da}$ is the offset.

Finally, feature fusion gate is a good fusion technology, which can comprehensively analyze different types of content to obtain the optimal solution. Therefore, the document level features and sentence level features are fused by using the feature fusion gate, and the context information is expressed as:

$$Oh_t = G_t \times sh_t + \left[\left(1 - G_t\right) dh_i\right] \tag{7}$$

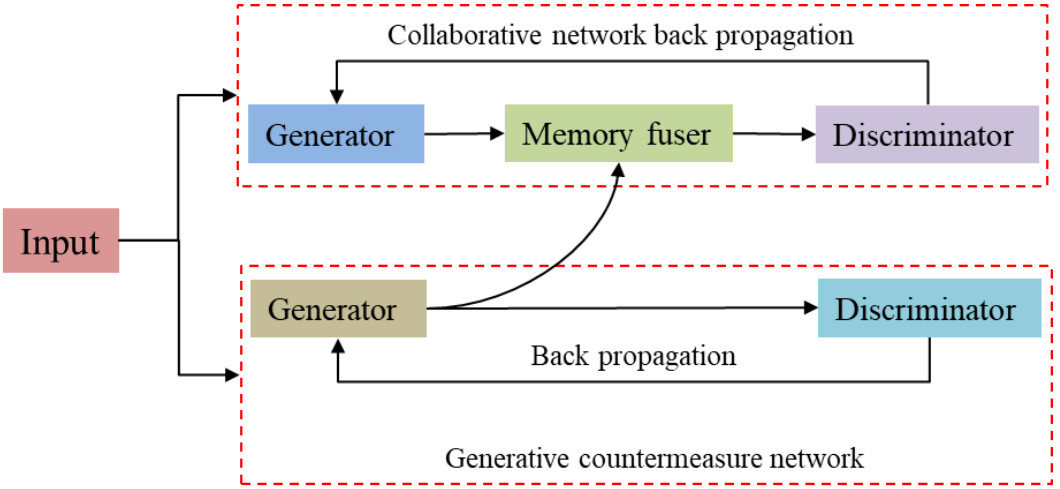
The fusion gate is calculated as follows:

$$G = \tilde{\mathrm{A}}\left(W_g \left[\mathrm{s}h_t, \mathrm{d}h_i\right] + b_g\right) \tag{8}$$

Self-Regulated Learning Layer

The level of multiple semantics refers to the hierarchical structure of meanings expressed by the same word or phrase in different contexts in a language system. Generally speaking, multiple semantics can be divided into three levels. The basic semantic level refers to the most basic and general meaning of a word or phrase. Contextual semantic level refers to the meaning of a word or phrase in a specific context. The professional semantic level refers to the meaning of a word or phrase in a specific field or profession. In practical applications, the level of multiple semantics can be adjusted and expanded as needed to adapt to different application scenarios and requirements. For example, in natural language processing, different semantic levels can be divided based on specific tasks and domains to achieve more accurate and intelligent semantic analysis and processing. Since the word vectors trained in multiple contexts will introduce noise that is not semantically related to the current context, a two-channel generative adversarial network (GAN) model based on self-adjusting learning is adopted to mitigate the impact of noise information, as shown in Figure 2. It mainly includes

Figure 2. Schematic diagram of a multi semantic art education exchange platform



two channel models: cooperative network and generative countermeasure network. Finally, the two models are fused by memory fuser to realize noise filtering, so as to improve the accuracy of feature representation (Ruas et al.,2020).

Dual Channel Model

Due to the collaborative network has the advantages of sensitive response, fast speed and high accuracy, and can fuse all kinds of data. So, the model is composed of generator *G* and discriminator *D*, in which bidirectional LSTM is used as the generator, and the output *Oh* obtained from multi-level feature coding layer is used as the input to obtain the hidden layer feature representation:

$$o_g = LSTM\left(Oh;\theta_g\right) \tag{9}$$

Depending on the output O_g, a fully connected network is used as a discriminator to obtain the possibility that a candidate trigger word triggers a certain type of event:

$$y = \mathrm{FN}\left(o_g;\theta_d\right) \tag{10}$$

The main purpose of the generative countermeasure network is to mine noise. Similar to the cooperative network, it is composed of generator *G* and discriminator *D*. Similarly, it uses LSTM as the generator and the fully connected network as the discriminator.

Training Process

The two-channel model uses cross entropy as the loss function, and the loss function has the function of multiple computation. The advantage of the loss function in the dual-channel model is that it can enhance the robustness of the model, because the loss from different angles can be considered at the same time, so as to optimize the comprehensive loss more effectively and improve the accuracy of the model. It can also reduce the deviation of the model and better capture the different features in the model:

$$\mathrm{L}\left(y_0,\mathrm{y}\right)=-\sum_{i=1}^{N}\sum_{j=1}^{C}y_i^j\log\left(y_{0i}^j\right) \tag{11}$$

For the cooperative network, the generator and the discriminator are trained together. The nodes in the network are responsible for storing, processing and exchanging data information, and cooperating to complete information exchange. The collaborative network can also use cloud services to store and analyze data, which is an important tool to achieve massive data fusion:

$$\theta_g,\theta_d=agrmin\left[L\left(y_0,y\right)+\tau L_{diff}\right] \tag{12}$$

where θ is all parameters of LSTM and fully connected network, N is the batch size of training data, which represents the aggregation degree of loss function and cooperative network in the two-channel model. The smaller the batch size, the stronger the randomness, and the stronger the generalization ability of the model. If there are many training data, the generalization of the model is not an indicator to be considered. You can set the batch size to the maximum to make full use of computing resources. In addition, y is an N-dimensional vector, τ is a super parameter.

For the generative countermeasure network, the generator is used to generate error features to make the data deviate from the correct distribution, and the discriminator is used to correct errors. Therefore, the generator is trained against the discriminator. Due to the different characteristics of the two channels, they will tend to be different in the training process.

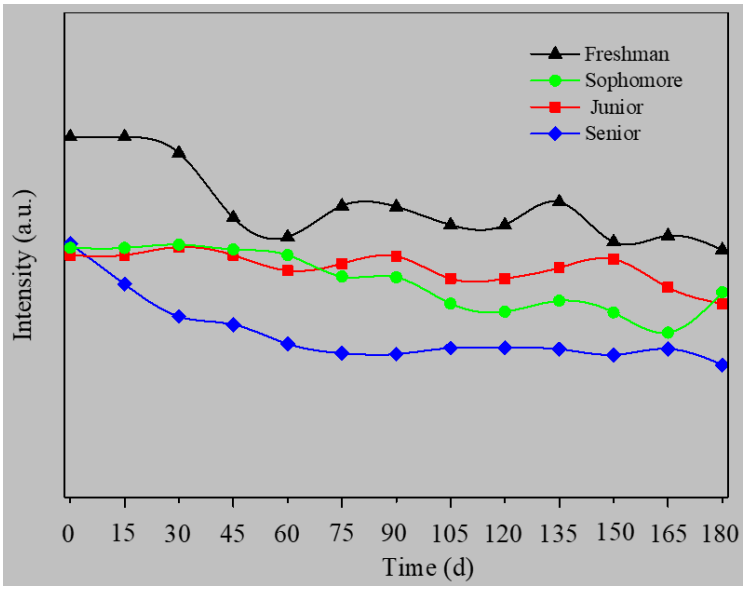
DESIGN AND APPLICATION OF ART EDUCATION EXCHANGE PLATFORM INTEGRATING MULTI SEMANTICS

Goal Analysis of Art Education Exchange Platform Integrating Multiple Semantics

Knowledge point teaching is a common form of network teaching. Knowledge point is usually designed as the smallest teaching unit in network teaching. Usually, each knowledge point is an independent learning unit, which makes the process of teaching according to the knowledge point also independent. Conduct in-depth research on the formulated professional training objectives, courses and unit objectives, and guide teachers to correctly formulate the teaching direction of professional courses. Teaching objectives are the fundamental basis for teaching evaluation. When encountering different learning theories and teaching models, there are different teaching objectives that teachers need to achieve. Based on the characteristics of teaching "theme", this paper makes a comprehensive analysis of teaching objectives, so as to realize the inheritance of knowledge or the construction of knowledge structure. The teaching objectives of art design based on network classroom must combine the characteristics of professional courses and adopt diversified and diversified teaching modes. The teaching model should include many aspects, such as basic objectives, accompanying objectives, performance objectives, and so on. After a period of teaching, teachers need to deeply reflect on their work, so as to make a good learning plan for the following work, so as to achieve the established teaching goals.

The application of art education exchange platform integrating multiple semantics is shown in Figure 3. It can be seen that, with the increase of art teaching time, the application of multi semantic art education exchange platform is different in different grades. Among them, the application of art education exchange platform by freshmen fluctuates greatly and tends to decrease gradually, while the application of platform by sophomores and juniors is similar and shows a relatively stable trend, The fourth grade students showed a range of changes from slow decline to stable. The main reason may be that the freshmen are not familiar with the use of the platform, and the students' familiarity

Figure 3. Application of art education exchange platform integrating multiple semantics



with the platform is also different, resulting in a fluctuation trend. However, sophomores and juniors have a good grasp of the platform after one year of study, so their application has not changed much. Due to the reduction of art education courses for senior students, students are busy looking for jobs and writing papers, which leads to the reduction and stability of the application of art education exchange platform. In general, the design of art education exchange platform should be carried out according to the familiarity of students of different grades with the platform, so as to improve the use of the platform by students of different grades.

Creation of Multi Semantic Art Education Learning Scenarios

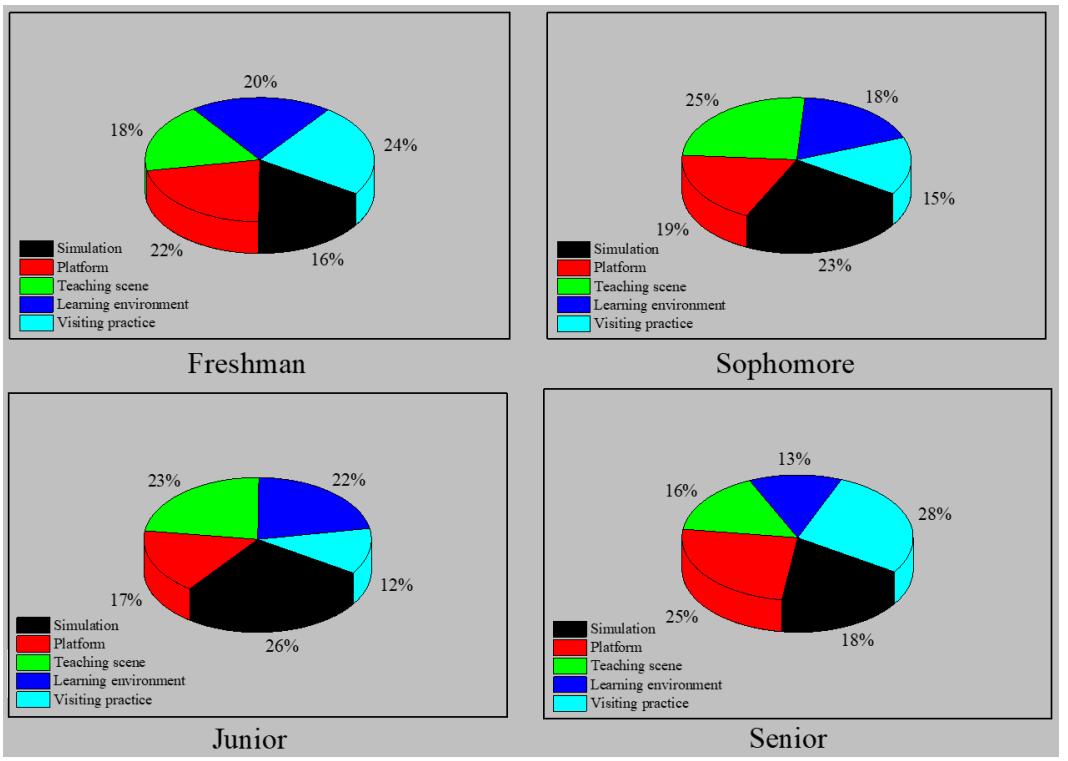
Creating a good learning situation can not only create a comfortable learning environment, but also bring convenience to teachers' classroom teaching. However, situational learning is often regarded as "being thrown into" a certain state of learning, while situational learning belongs to the "being thrown into" state of learning, and students are consciously or unconsciously "thrown into" a state by teachers, which has a great impact on students' learning. When teaching art design based on online classroom, the situations that teachers need to create for students include:

1. Using image, animation and virtual technology to simulate the existing original situation. By simulating real situations, students can better understand and master relevant art and design knowledge and skills, and can also more deeply experience and understand the connotation and essence of art and design.
2. Establish a network teaching platform with abundant resources and unimpeded information to create conditions for the art design teaching in the network classroom. The online teaching platform can enable students to enjoy a good learning environment in the online classroom, and also facilitate teachers' teaching management and guidance.
3. Create diversified teaching situations, so as to achieve the objective of the knowledge framework standards of various courses. Different students have different learning styles and needs, and creating diverse teaching contexts can meet different students' learning needs.

4. Create a pleasant learning environment to help students' cooperative learning, so as to continuously enhance students' cooperative ability. A good learning environment can help students learn more happily, enhance their interest and motivation in learning, and also help them cultivate their sense of cooperation and ability to cooperate.
5. Lead students to visit the design of advanced workers and learn the knowledge and concepts related to art design. By visiting the designs of exemplary individual, students can better master the skills and methods of art design.

Figure 4 shows the proportion of art teaching learning scenarios based on multi semantic fusion among students of different grades. It can be seen that freshmen and seniors account for a relatively low proportion of simulation, while sophomores and juniors account for a relatively high proportion of simulation. Fourth year students pay more attention to teaching platforms, followed by freshmen, while sophomores and juniors have the same proportion of teaching platforms. For teaching situations, sophomores and juniors account for a relatively high proportion, while freshmen and seniors account for a relatively low proportion. Senior students do not pay attention to the learning environment, while freshmen, sophomores and junior students account for a similar proportion, both of which are high. The proportion of visiting practice in senior grade is relatively high, followed by freshmen, while the proportion of sophomores and juniors is relatively low. The reason for the different proportion of art teaching and learning of students in different grades may be that the learning tasks of students in different grades are different. Freshmen just start to study art education and need to visit and practice to improve their cognition, while sophomores and juniors enter the deep learning stage of art education and pay more attention to teaching situations, while seniors are in the stage of internship and job hunting, they need to visit and practice outside to improve their comprehensive ability and

Figure 4. Proportion of art teaching learning scenarios based on multi semantic fusion among students of different grades



competitiveness. In art education and learning activities, we should combine the needs of different grades, fully respect their wishes, fully mobilize their enthusiasm, and mobilize their interest in learning, so as to improve the quality of their art education and teaching.

Multi Semantic Art Education Environment Design

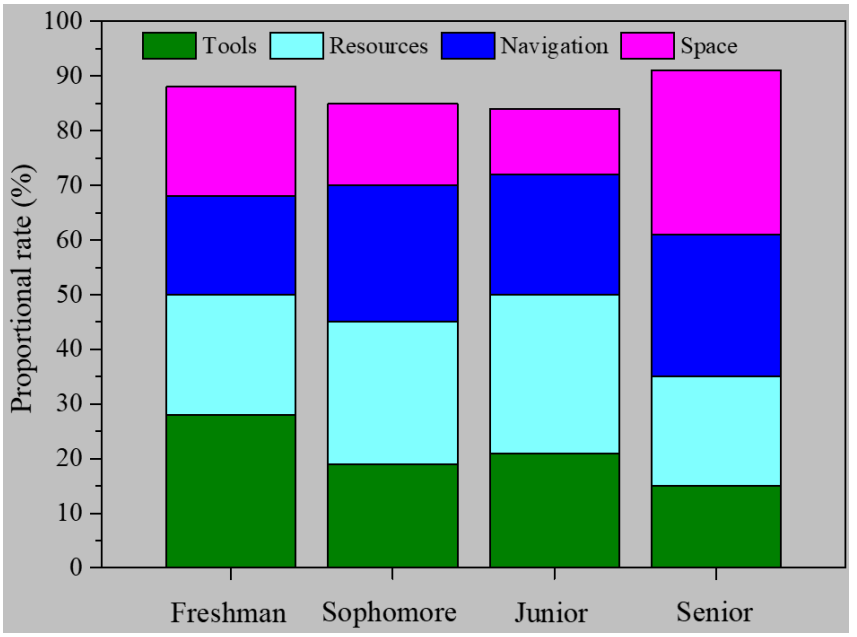
1. **Tools:** For art design teaching, information retrieval, website browsing, communication and file downloading are all common network tools for students. These tools not only have excellent performance, but also can avoid the obstacles students encounter in network operation, so that learners' network learning can achieve ideal results.
2. **Resources:** At present, the learning resources are gradually getting rid of the limitations of paper textbooks, which is a particularly prominent feature of art design teaching in online classroom. However, the three-dimensional multimedia resources such as text, pictures and images are widely used. They are jointly established by the simulation and simulation situations constructed by streaming media and virtual reality technology, so as to establish network teaching resources for the learning of all kinds of students.
3. **Navigation:** Network resource sharing makes students face a variety of resources, but these often make it difficult for students to grasp the use of resources. This requires the establishment of a relatively scientific navigation system for students, so as to avoid students' wrong choices when facing various resources and knowledge, and maintain a good learning state.
4. **Space:** Free play space is the basis for students to show their self-ability. The network learning environment should create an effective virtual space for students' autonomous learning, and learners should organize and design learning activities by themselves, and coordinate the operation of learning tools, learning rules, communication methods, etc.

Most of the art design teaching models established in online classrooms adopt standardized operating modes. The establishment of individualized teaching models requires the use of relevant software tools, such as CAI software and teaching resource libraries. Teachers need to collect and process different teaching materials, artistic works, text and pictures, student assignments, and teaching cases based on the current teaching schedule and students' desire to learn knowledge. Finally, a relatively perfect teaching courseware is provided to continuously establish CAI software and teaching resource libraries, integrate these resources into the Internet or build a comprehensive learning website in an embedded manner. In addition to relying on the guidance of teachers, the creation of modern knowledge structure models ultimately depends on the efforts of students themselves. Therefore, students can formulate their own learning plans according to their own needs. The autonomous inquiry learning model can precisely meet this requirement. This model fundamentally breaks away from the form of teacher guided teaching, allowing individual students to reflect the benefits of the new experience model in practice.

The art education mode established by means of modern distance education technology is a new and open mode with students as the main body in the future. The key issues to be solved are: Re-examine and evaluate the traditional art education mode, and conduct scientific research on the fledgling modern distance art education, so as to build a scientific and reasonable information system for higher art education. At present, in the research and practice of online art education, many models have emerged at home and abroad, of which two are the most representative. One is the modern distance education mode based on computer network technology, and the other is the network art education mode based on digital library technology. Both of these models are using various new technologies and new means to create new art education, which has brought revolutionary impact on traditional art education.

Figure 5 shows the proportion rate of multi semantic art education environment design in different grades. It can be seen that the proportion of students in different grades in the design of art education

Figure 5. Proportional rate of multi semantic art education environment design in different grades



environment integrating multiple semantics is different. Among them, the proportion of freshmen in the art education design of resources is the highest, and the worst is the freshmen in the fourth grade. The main reason is that freshmen need some tools to learn art education, while seniors pay more attention to space, mainly because they are in the graduation window and need space to find work and write graduation thesis. However, sophomores and juniors are at a critical juncture of learning art education courses. They need resources and navigation to learn art education courses, so as to better improve their professional courses and comprehensive ability. In a word, when carrying out art education courses, we should formulate according to the needs of students of different grades, carry out corresponding teaching environment design according to local conditions, and cooperate with students to improve the teaching quality of art education. Art education and teaching activities should take students as the main body, mobilize students' enthusiasm and initiative in learning, and stimulate students' thirst for knowledge and creative consciousness. The development of art education and teaching activities should reflect the characteristics of education, attach importance to the cultivation of students' comprehensive quality, and promote the all-round development of each student.

Analysis on the Combination of Multi Semantic Art Education and Campus Culture

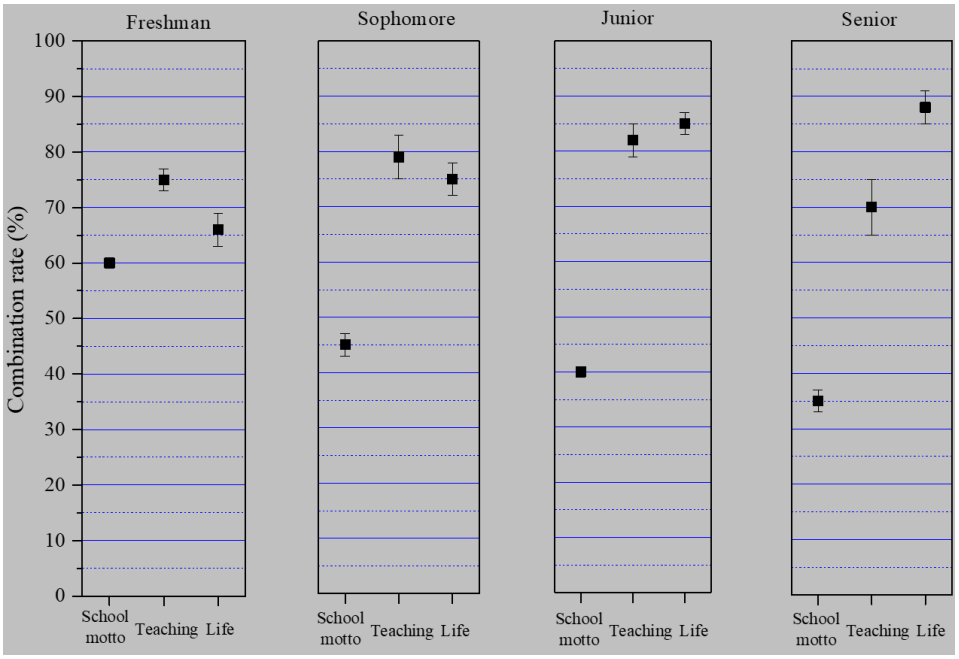
Art education, as an activity with art products as the media or means, operated by both the teacher and the recipient, requires the teacher to create, select and use art, give full play to the function of art education, and require the recipient to consciously and freely accept art infection, edification and training, so as to realize the effect of art education. It can be said that art is an image activity, an emotional form, an emotional symbol, an emotional representation activity. Therefore, our leaders, managers and teachers at school must have an affinity in image, posture and language, and fully demonstrate their broad wisdom and profound humanistic connotation from amiable language. In teaching, the instructors are required to create a relaxed and pleasant aesthetic teaching scene, stimulate the imagination and creativity of the learners, let the learners experience and comprehend the mystery of knowledge with their hearts, improve their interest, motivation in learning, and skills of various disciplines.

The combination rate of multi semantic art education and campus culture in different grades is shown in Figure 6. The campus culture is mainly divided into three aspects: school motto, teaching and life. There are great differences between the combination rate of multi semantic art education and campus culture in different grades. For freshmen, the combination rate of the school motto is the highest in the process of art education and teaching because they have just entered school. With the increase of grades, the combination rate of the school motto shows a downward trend. This is mainly because senior students have a deeper understanding of the school motto and pay attention to the transformation to teaching and life. Among them, sophomores and juniors pay more attention to teaching and life, while seniors pay more attention to life, mainly because sophomores and juniors are in the critical period of learning art education courses, while seniors face the pressure of graduation, immediately enter the society and learn to seize the last period of campus life, so their life combination rate is the highest. From the perspective of multi-semantic theory, the meaning of "learning cognition" is not only the evaluation of students' artistic works, but also the process of students' value judgment and selection of the artistic works themselves and the cultural phenomena reflected. Therefore, in the process of art education, teachers need to start from the theory of multiple semantics, combine the teaching objectives of art education and the characteristics of students, build a hierarchical, targeted and changeable teaching model, and play the role of "multiple semantics" in art education.

Application Satisfaction of Art Education Exchange Platform Integrating Multiple Semantics

Art education is the main content and way for the school to implement aesthetic education. It plays an irreplaceable role in ensuring the comprehensive growth of school cows. If education is an important means to create a new generation, aesthetic education should run through all educational subjects, and art education should be an important part of aesthetic education. Give full play to the harmonious role of art education in the aesthetic education of various disciplines in Colleges and universities. Through art education, create a good learning atmosphere, stimulate students' learning enthusiasm,

Figure 6. The combination rate of multi semantic art education and campus culture in different grades

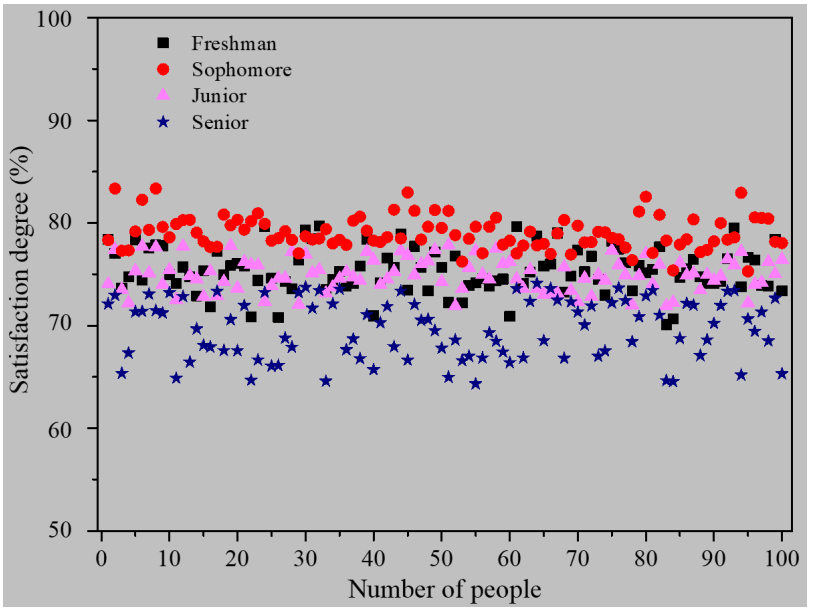


improve and cultivate the ability of learning cattle to feel, appreciate, discover and create beauty, so as to raise students' thoughts to a new spiritual realm, edify their personalities, sublimate their sentiments, and fully realize the harmonious development of people and society.

We surveyed 100 students of different grades. The application satisfaction of art education exchange platform integrating multiple semantics in different grades is shown in Figure 7. The satisfaction of sophomores and juniors is good, with low fluctuations and tends to be stable, followed by freshmen. However, the fourth grade students' satisfaction is low, and everyone's satisfaction fluctuates greatly. The main reason is that sophomores and juniors are familiar with the application of the multi semantic art education exchange platform and can learn art education courses through the platform. Although freshmen first contact this platform, they still have good satisfaction with the platform after a certain period of study. However, senior students are uninhibited and love freedom, and they are about to graduate. If they use this learning platform to study art education, they will hate it, which leads to the reduction of senior students' satisfaction. In the application of the platform, we should investigate the learning interests and conditions of students of different grades and promote the platform to them. At present, the multi-semantic art education platform is still in its infancy, and many functions of the platform have yet to be developed, including the interaction between students, teachers and students. Therefore, it is necessary to study the teaching function and mode of the platform in depth, and actively improve and innovate in order to improve the students' sense of using the platform and improve the teaching effect.

In past research, art education often focused on the training of students' skills and aesthetic literacy. However, in actual teaching, due to factors such as students' individual differences and teachers' teaching methods, there is often a decline in students' learning interest and learning effectiveness. Therefore, this article applies multi semantic technology to art education. The art education communication platform based on multiple semantics provides personalized learning experiences and teaching services for each student according to their individual differences. Based on students' learning behavior and performance, intelligent evaluation and feedback are conducted on students' learning situation. The application of multi semantic technology in art education can provide students with more personalized, intelligent, and cross-cultural learning experiences and teaching services, thereby improving the quality and effectiveness of art education and teaching.

Figure 7. Application satisfaction of art education exchange platform integrating multiple semantics in different grades



The way of online learning makes students' learning behavior decentralized and not centralized, but education is originally a group activity. In order to improve students' initiative and interest, the future online art education platform can create an online learning community, facilitate students to see the basic learning situation of surrounding people, and create a learning PK model. In the learning process, timely evaluation and motivation methods are very important for students. If there is only a single course content in the learning process, it is easy to cause students' fatigue. Therefore, timely feedback on students' learning needs to be provided, and users receiving this information can help improve learning motivation.

CONCLUSION

The online teaching platform mainly provides students with a relaxed learning environment through online teaching and autonomous learning. The teaching platform is a relatively small online education system that can achieve the initial functions of online education. With the rapid development of multi semantic technology, in response to the problems existing in multi semantic, this article integrates multi semantic, studies in detail the functional principles of multi semantic, and combines the characteristics of art courses to design and develop a network teaching platform that conforms to teaching laws and can fully utilize the advantages of network teaching and is easy to maintain and manage. Then, the platform is designed and analyzed, and applied to art education and teaching courses for students of different grades. The experimental results show that the multi semantic art education communication platform is beneficial for students of different grades to learn art education courses and improve the quality of art education teaching. More importantly, the platform can propose corresponding countermeasures for the problems existing in the learning process of art education for students of different grades, which is conducive to the development of art education.

The multi semantic art education platform is still in its infancy, and many functions of the platform still need to be developed, including interactions between students and between teachers and students. Therefore, it is necessary to conduct in-depth research on the teaching functions and models of the platform, and actively improve and innovate in order to enhance students' awareness of the use of the platform and improve teaching effectiveness.

CONFLICT OF INTERESTS

The author declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

DATA AVAILABILITY

The figures and tables used to support the findings of this study are included in the article.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

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