

Design and Implementation of Interdisciplinary Thematic Learning in Middle School Art Supported by Digital Technology

-- Taking the Project-Based Learning of "The Immortal Path of Painting Works" as an Example

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Abstract: Digital technology is helpful to the interdisciplinary subject learning and practice. In junior high school art "painting road of eternal life" project learning process, "how to better save and show paintings" as the essential problem, "painting the road of eternal life", relying on art, history and information technology learning field, fusion of multidisciplinary methods and means, design data investigation, analysis, experimental exploration, creative practice, materialized achievements and display interdisciplinary series of learning activities, realize high order thinking package low order thinking, guide students in the checking, iteration gradually towards innovation.

Keywords: Interdisciplinary Subject Learning; Project-based Learning; Digital Technology; Junior High School Art.

1. Introduction

Education digital transformation is the inevitable trend of education to adapt to the digital age the development of [1], "compulsory education art curriculum standard (2022 edition)" (hereinafter referred to as the "curriculum standard") suggested "use a variety of media, the organic combination of inheritance and innovation", practice shows that the use of appropriate digital technology and education science theory is an important way to promote classroom innovation quality turn. This paper will take the project learning of "The eternal Road of Painting Works" as an example to illustrate how digital technology supports the design and implementation of interdisciplinary art theme learning in junior high school.

2. Overall Design Idea

Based on the curriculum standard "infinite creative" learning task requirements, project select students in the campus festival real situation problems, the related core literacy and concept "life and design", "art, performance" creative practice "reasonable into protection painting project learning, let the students in the real problem situation comprehension art essence, improve the core art accomplishment. Apply digital technology means to support the project learning development, innovate and explore the problem solution path, realize the project value in the process, and realize the advanced training of thinking.

Centering on the core issue of "how to better preserve and display paintings", the project combined with the use of digital means, to "find the eternal road of paintings" as the driving issue, guide students to carry out data investigation, analysis and investigation, comparative experiments, creative practice, physical and chemical results of the project planning. The implementation process of the project is divided into six stages: problem determination, research investigation, group exploration, creative practice, concept recognition and achievement display. With project learning as the carrier, digital technology means, core literacy as the connotation,

problem solving and materialized results as feedback, the project is designed.

3. Specific Implementation Path

(1) Determine the problem: the data to clarify the context

Continuous exploration activities driven by challenging problems is an important feature of project learning. Starting from the depth of the real situation, guide students to think about the spontaneous problems and summarize the problems to be solved —— How to better save the painting works? Through the cooperation with students to encounter the problems of the integrated and clarified screening, and then analyze the deep problems —— What are the ways to preserve the painting works? Finally, form the driving question —— How to make the art work "immortal"? Then refine the driving problem, analyze the problem layer by layer, and gradually form the problem system: what are the categories of hand-drawn art works? What factors will art works be destroyed? What kinds of methods can extend the life of traditional art works? What kind of protection methods can make the traditional art works "immortal"? Through the problem string, cultivate students' ability to find problems, actively think and solve problems. The questionnaire star software was used to edit the questions into an online questionnaire, the link was published in the campus "all-around wall", and students who encountered the same problem were invited to answer the questionnaire. According to the data visual analysis function of the questionnaire star, the practical direction of the project was clearly outlined. The use of digital technology optimizes the form of data collection to facilitate the acquisition and analysis of project data.

(2) Research and investigation: to construct the project framework

Teachers from Dunhuang Mural Research Institute were connected through the cloud to conduct online interviews and interactive q & A. The researchers introduced to the students the basic painting steps of Dunhuang murals, as well as some mineral pigments and bone glue, which can resist oxidation

and corrosion, and are not easy to change color for thousands of years. It also explained the basic protection methods of the Mogao Grottoes in Dunhuang, and students have a deep understanding of the influence of the environment such as climate, ultraviolet light and air humidity on the paintings. The activity lets the students understand that "Digital Dunhuang" is a digital resource bank that uses digital technology to light up the national art and art treasures, show the magnificent grotto art to the world, and reproduce and preserve the precious intangible cultural heritage.

During the weekend, the students visited the "Meet Dunhuang" Light Film Festival according to the guidance of the task list, and experienced the light and shadow feast created by digital holographic projection technology. Students have a dialogue with the paintings in the artistic spirit of kite flying diving, have a new understanding of the protection of art and inheritance of art works, and have a more profound thinking about the purpose of this interdisciplinary project-style learning. Through research and investigation, new tool supports and frame models are constructed in students' minds.

(3) Division of labor and cooperation: group investigation and exploration

After the study and investigation, in order to further enhance the awareness of competition and cooperation within the group, cultivate students' ability of collaborative exploration. Each group recommended a representative to make a report according to the research evaluation form, and then reorganized according to the overall plan of "Picture 1" The eternal Road of painting works "to lead the reform of education mode 10 / 2024 · 07 investment". For the students who have no clear idea because of the group again, invite the group by the way of "group leader appointment" [2]. Each group divides the labor according to the interests and abilities of the members, and defines the responsibilities of the members.

After the second grouping, the project is divided into digital collection group and color protection group. The digital collection team is responsible for digitizing the paintings through digital devices, and then storing and processing them. Students found that the color parameters restored by different mobile phones were very different. The professional scanner could almost restore the texture of the pigment. Using the high-definition scanner, the students scanned the paintings they wanted to protect into digital images, and learned the format, parameters and cloud storage methods of digital images. The color protection group wanted to find a way to retain the gorgeous colors on the original painting, so the group planned to use three sets of contrast experiments to explore the factors that affect the color protection of the painting. The color group went to the art hall of the school for investigation, made good investigation records, determined the form and method of the exploration experiment, borrowed the painting storage equipment from the teacher in the art hall, and counted the materials used for the temperature, environment, additives and other comparison experiments. All the group members used the same batch of raw materials to draw a batch of samples, and made the experimental record table for observing the experimental data, trying to find out the problem through the experimental data, and fully express the facts with the experiment.

(4) Creative practice: try to solve the problem

Heidegger said that what tools are used, what world is presented [3]. In the creative practice application of digital

learning support, teachers should examine the overall situation and do the "addition and subtraction" of digital learning support push. The students of the color group found that the digital color difference instrument can collect accurate color value, but its price is expensive and not, so there is a way to borrow it. The teacher recommended for the students to use digital software for measurement and color, through digital sampling, and then extract and analyze the color of the digital image, so that the accurate experimental value can be obtained. When students encounter difficulties in learning, provide them with digital resource supports. At the same time, students are encouraged to collect and analyze experimental data, edit and make "painting, manual", so as to give full play to students' ability, make technology disappear in learning, and cultivate students' ability to solve problems and creative practice.

Digital group scanning paintings, patterns used in the information science class PPT design and decoration, combined with subject classroom learning dig, background filling, creative cutting, and the digital technology, the combination of cultural creativity in design cup, clothes, canvas bag, notebook and supplies, image in the digital cyber space won the new, colorful interaction, creative practice between the reality.

(5) Concept recognition: guide the thinking to advance

"Beauty and aesthetic activities generally lie in all kinds of courses and curriculum and various factors, and aesthetic education also generally lies in all kinds of courses and curriculum and various factors." [4] Practice has proved that aesthetic education has multi-dimensional universality. In the process of project deduction, students through the painting to protect the origin, use, online questionnaire, nonlinear editing software, digital color measurement tools, experience the cloud studies, holographic projection, digital museum, landscape, made the digital image library, animation video, all kinds of products and project achievements, use of digital technology to grasp the interdisciplinary project learning process. Visualized digital technology creates a simulated world for students. In the face of the "super real" technology gaze, students feel and understand the digital technology.

In the process of the project, the students experienced the collection, processing, dissemination and display of digital resources, and also learned about the digital museum project established with the above digital technology. Digital museum relies on digital technology to break the physical space barrier, which is an effective practice of technology to promote the development of human civilization. Digital museums play a huge role in the preservation, display and exchange of cultural relics and cultures, By browsing through the digital museums, Cultivate the students' aesthetic perception and national feelings, From protecting one's own paintings to caring for the protection of national cultural relics, In this process, Students realize the connection between protecting a painting and the preservation of a national context, We are all part of the long history, We experience and make history, And also have the opportunity to feel and appreciate the verve of artistic paintings, Cultural relics and cultural heritage carry the genes and blood of the Chinese nation, This beauty and responsibility is the baton handed to us by countless sages, Catch it and fulfill our mission, In such a recognition of value, Students' thinking gradually rises from the thinking of the environment layer to the prospect of the vision layer.

(6) Achievement display: internalize core literacy

Project results are the external forms of students' cognition. The main forms are the combination of individual results and group results, the combination of stage results and final results, and the combination of consciousness results and physical results. Through the achievement display activity, students can feel the sense of achievement of project learning, further reflect on the problems and improvement direction in the activity, encourage students to explore the margin of theme activities, and give birth to a series of activities. Show and report the project results to all sectors, just like a product being tested by the market. In the achievement presentation, students learn to express, criticize, tolerate, accept, and follow analysis, evaluation, creation and other training of high-order thinking ability, the innovation and growth of knowledge will have more possibilities. Students take the initiative to materialize the results, constantly package and optimize the results under the premise of ensuring the truth, accept all kinds of feedback and opinions, and develop new learning.

The internalization and acquisition of core literacy should be achieved through students' experience and interpretation of specific knowledge, as well as the experience and grasp from principle to form. After the release of the project results, students improve their conclusions and results independently or under the guidance of teachers, and produce the digital animation and actively contribute to the campus TV station, which has attracted a lot of attention in the campus. Before the exhibition, the student representatives submitted to the school leaders the painting manual, suggesting that the school transform the interior decoration gallery, create a more suitable environment for the preservation and exhibition arrangement of paper paintings, and add the electronic gallery cloth exhibition area. In the highly creative practical experience, the core accomplishment of the art discipline is internalized in the hearts of students. The achievement display is a "panoramic position" provided by teachers for students. Through display and comparison, students form independent judgment, from knowledge to ability, from language to thinking, and gradually form the artistic core accomplishment that supports students' deep learning.

4. Evaluation and Reflection

In accordance with the requirements of promoting learning and teaching through evaluation in the curriculum standards, adhering to the principle of expressive and multi-subject evaluation, taking core qualities such as "creative practice" and "artistic expression" as the basis, classroom evaluation is designed according to the main links of evaluation, and homework evaluation and achievement evaluation adhere to the unification of process evaluation and final evaluation.

First, the implementation of the activities in the scattered evaluation. Project-based learning adheres to the evaluation when there is implementation, and the whole process of activities should be brought into the field of evaluation, and

attention should be paid to the "immediacy" of activity evaluation. The scattered evaluation is the immediate evaluation generated in the interaction between teachers and students, which runs through the whole process of activities; With encouraging language, movements and eyes, teachers need to pay attention to the whole staff and the whole process, and take the "promoter" as their own role positioning. In the preparation of the activity, we set up activity evaluation forms for students to visit the museum and the school art hall, involving cooperation performance, ability level and innovative thinking. In the group, the group leader carried out self-evaluation and other evaluation.

Second, the achievement evaluation table of each stage becomes the ruler of leading students' activities. The achievement evaluation form is set up in each link of the project, and the activity guidance function is both set up in the setting of the achievement evaluation sheet, and students are guided to carry out activities better through clear evaluation mechanism and evaluation gauge.

Third, the portfolio evaluation continues throughout the activity. As the carrier of evaluation, the archive bag itself has visibility, which can let teachers, students and parents intuitively see the real development of students' literacy. At the same time, the portfolio evaluation is used. The form selection and preservation of the portfolio are decided by group discussion, and teachers give guidance. In the important link of the activity, help and remind students to record, in the activity has a preset way to create a sense of ritual for students. In the summary link of the activity, the selection and sharing of excellent portfolio activities were carried out, so that students can further deepen their understanding and perception in the activity evaluation. According to the archives content to carry out the centralized evaluation, the project planning, the student activities of photography, excerpts, opinion, experimental experience, and works classification in the school, set up the booth participants for visiting guests, enjoy activities, improve students to participate in the project of pride and a sense of accomplishment.

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