

Research on the application of artificial intelligence aesthetics in the cultivation of aesthetic literacy of art-normal students

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ABSTRACT

The aesthetic literacy of art-normal students is an important aspect of cultivating outstanding art education talents. However, the traditional aesthetic education model has problems, such as low personalization and unclear evaluation standards. Therefore, it is of great significance to study the application of artificial intelligence (AI) aesthetics in the cultivation of aesthetic literacy of art-normal students. This research uses literature review and analysis methods to systematically sort out the relevant research results and theoretical foundations of artificial intelligence aesthetics and the cultivation of aesthetic literacy of art-normal students and discusses the application methods of artificial intelligence aesthetics in the aesthetic cultivation of art-normal students. The research has found that artificial intelligence aesthetics can provide personalized learning and guidance for art-normal students and improve the learning effect by recommending learning resources and works suitable for their needs and levels.

KEYWORDS

Cultivation of aesthetic literacy; Art-normal students; Artificial intelligence aesthetics; Aesthetic knowledge achievement.

1. INTRODUCTION

The aesthetic literacy of art-normal students is essential to cultivate outstanding art education talents. However, the traditional art education model has some challenges and limitations in aesthetic training, such as the low degree of personalization and unclear evaluation standards, which limit the aesthetic development of art-normal students. Traditional methods usually use collective teaching methods, which cannot meet the individual differences and needs of each art-normal student. Each student's aesthetic background, hobbies, and learning style are different, but traditional methods often fail to provide personalized guidance and support. It often pays too much attention to skill training and standardized teaching, which can easily limit students' creative development. They may emphasize specific aesthetic standards and traditional art forms, resulting in a lack of diversity and freedom for students, and it is difficult to cultivate unique artistic expression skills. Students' artistic materials and reference materials mainly come from limited teaching materials, teacher guidance, and school resources. This limits students' vision and creative inspiration, and it is difficult to obtain rich and diverse artistic information and cultural exchange opportunities. Therefore, there is an urgent need to find new methods and ways to improve the aesthetic literacy of art-normal students.

The purpose of this article is to explore the application research of artificial intelligence aesthetics in the cultivation of aesthetic literacy of art-normal students and to analyze the significance of its research methods. Artificial intelligence aesthetics is a method of combining artificial intelligence technology with aesthetic theory, analyzing the composition, color use, form, etc., of works of art

through algorithms and providing personalized learning and guidance. This research method provides art-normal students with a more in-depth, personalized, and diverse aesthetic cultivation and learning experience. Artificial intelligence aesthetics can provide personalized learning content and guidance according to the individual differences and needs of each art-normal student. By analyzing students' learning data, hobbies, and learning preferences, the artificial intelligence system can tailor courses and exercises to meet students' learning needs better and stimulate their creativity and aesthetic potential. Through the Internet and digital technology, it provides art-normal students with rich and diverse art resources and reference materials. Through platforms such as virtual museums, art exhibitions, and online art communities, students can be exposed to works of art and cultural exchanges from all over the world, broaden their horizons, and inspire creativity. Artificial intelligence aesthetics can also provide more practical opportunities and instant feedback. Through virtual reality technology and simulation experiments, students can carry out more artistic practice and try different creative methods and techniques. At the same time, the artificial intelligence system can provide instant evaluation and feedback based on students' works and performance to help them improve and improve their artistic skills.

This article is divided into three parts to discuss the application research of artificial intelligence aesthetics in the cultivation of aesthetic literacy of art-normal students. First of all, we will review the research background and introduce the limitations of the traditional art education model and the motivation for research. Secondly, we will discuss the specific application methods of artificial intelligence aesthetics in the aesthetic cultivation of art-normal students and analyze its significance in personalized learning and guidance, work creation assistance, artistic expression expansion, and aesthetic theory research. Finally, we will summarize the research results, put forward prospects for future research, and emphasize the potential value and challenges of artificial intelligence aesthetics in the cultivation of aesthetic literacy of art-normal students.

The innovation points of this article are mainly reflected in the following aspects. First of all, this study combines the cultivation of aesthetic literacy of art-normal students with artificial intelligence aesthetics to provide a new training model that breaks through the traditional teaching methods and limitations. Secondly, this article will design and implement a personalized cultivation system to provide customized learning content and feedback according to students' individual differences and needs to promote the all-round development of their aesthetic abilities. Finally, this article will evaluate the application effect of artificial intelligence aesthetics in art-normal students through empirical research and provide empirical support and guidance for the field of art education.

2. LITERATURE REVIEWS

Many scholars have conducted research on the aesthetic training of art students. Li (2019) believes that art-normal students in colleges and universities should have the core literacy of image reading, artistic expression, aesthetic judgment, creative practice, and cultural understanding. These qualities need to be studied for a certain period of time before they can be gradually formed, and art appreciation is one of the effective ways to cultivate core qualities. The methods of art appreciation carried out by art-normal students from the perspective of core literacy are multi-dimensional. Gu and Hou (2022) believe that art-normal colleges and universities should cultivate the ability of normal students to find problems and think about problems from the perspective of experts so as to effectively improve the artistic literacy of normal students, so as to lay a good foundation for the future increase in teacher strength. Shih (2020) discussed the importance of art education to aesthetic development, and it introduced the role of visual art in cultivating individuals' aesthetic abilities and sensitivity. The literature also discusses how art education can promote the development of students' perception and understanding of beauty through creative expression and artistic experience. Ibraimov and Shovdirov (2023) aim to provide an understanding of the basic concepts and theories of aesthetics and art philosophy. It covers the history of aesthetics, the different schools of aesthetic theory, and the core

issues of art philosophy. Franklin (2021) emphasizes the positive impact of art education on students' personal expression skills, creativity, critical thinking, and interdisciplinary learning. Lynch et al. (2020) studied the contribution of different art forms to aesthetic development and compared and analyzed the educational value of different art fields, such as music, dance, drama, and visual arts. Sadiev (2023) introduced the concept and characteristics of artistic literacy and discussed the influence of artistic literacy on individual cognition, aesthetic experience, and cultural participation.

There are also researchers who have discussed AI aesthetics. Wei (2024) believes that generative art, as the main form of combining artificial intelligence and art, is the driving force for digital art innovation and aesthetic and critical innovation in the future. Digital generative art uses the information provided by computers to create works of art with computational visual aesthetic characteristics in order to continue the goals and principles pursued by modern art, changing the way, process, and result of artistic creation, and expanding the boundaries of human creativity. Zhu (2023) elaborates that at present, artificial intelligence-generated content (AIGC) has penetrated into various design fields, and its aesthetic paradigm has gradually developed from the initial imitation to the formation of its own unique linguistic rules and laws, and gradually affected the aesthetic transformation of the public sphere. In this process, we urgently need to pay attention to the fact that AIGC, as an artistic tool and technology, cannot reverse control art creators, so as to avoid the negative impact of aesthetic change and technological substitution on the art field. Tao and Liang (2023) argue that AI design is the trend of the times, triggering changes in design creation, human rationality, human-computer relationships, and even the way humans understand it as a whole. We should grasp the scale of "forward" and "avoidance", avoid the excessive integration and penetration of technology into the field of human creativity, and the core of artificial intelligence technology should always be the interests of human beings and nature. Li (2023) elaborates on the characteristics of interactivity, virtuality and popularization of art and design aesthetics in the era of artificial intelligence. Artificial intelligence can break through traditional time and space limitations, change the aesthetic cognition of the masses, and change the inherent evaluation system. The application of artificial intelligence technology in art design aesthetics should strengthen the virtuality of the existence and interactive form of art design aesthetic objects, use artificial intelligence to optimize the color setting of the art design, and continuously enrich the connotation of the art design, and at the same time strengthen the integration of teaching and aesthetic education to ensure the healthy development of student's physical and mental health.

The above opinions and methods provide good inspiration for the research of this paper, and this paper will further study the improvement of the aesthetic literacy of art-normal students through the aesthetics of artificial intelligence.

3. METHODS

3.1. Data collection and processing methods

In the study, data collection and processing are key steps to support the application of artificial intelligence aesthetics in the cultivation of aesthetic literacy of art-normal students. Data collection can be carried out in various ways, and the behavior patterns of art-normal students in the process of art creation and evaluation can be recorded by observation. Secondly, it explores the influence of different teaching methods on the aesthetic quality of art-normal students through experiments. Finally, the literature research method is used to analyze the existing theories and research results to provide theoretical support and background information for the research.

The collected data may include art-normal students' aesthetic evaluation of art works, features and ratings of works created by individuals, interactive feedback in the learning process, and behavioral data obtained through online learning platforms. In this process, it is also necessary to ensure the accuracy and reliability of the data.

In the data processing stage, it is necessary to use statistical analysis methods properly to conduct descriptive analysis of data so as to better understand the general situation of normal university students' aesthetic literacy level and characteristics. In addition, techniques such as machine learning and deep learning can be used to build models to classify, cluster or predict data in order to extract and analyze potential aesthetic laws and patterns (Liang & Yu, 2021; Sang & Xu, 2022).

To dig deeper into underlying patterns and patterns in data, machine learning and deep learning techniques can be used to build predictive or classification models. Finally, these advanced analysis techniques can reveal the complex relationship between aesthetic accomplishment and learning behavior, psychological factors, social and cultural background, and other factors, so as to provide more accurate and personalized guidance for the cultivation of aesthetic accomplishment of art-normal students.

Data processing can also include integration with artificial intelligence aesthetic algorithms, such as using machine learning algorithms to train models to automatically evaluate the aesthetic quality of works of art or provide personalized learning suggestions. In addition, data visualization techniques can be used to present the processed data in the form of charts, images, or interactive interfaces to better understand and interpret the results of the data (Ebrahimi et al., 2020; Yang, 2020). Table 1 is the collected data on the aesthetic level of students:

Table 1. Collected data on students' aesthetic level

Student	Grade	Gender	Aesthetic Level
Student A	11	Male	8
Student B	12	Female	6
Student C	10	Female	9
Student D	11	Male	7
Student E	12	Male	8
Student F	10	Female	5
Student G	11	Male	7
Student H	12	Female	9
Student I	10	Male	6
Student J	11	Female	8

In short, data collection and processing methods play an important role in the application of artificial intelligence aesthetics in the cultivation of aesthetic literacy of art-normal students, helping researchers obtain effective information about the aesthetic literacy of the students, and provide useful guidance and support through analysis and model construction methods.

3.2. Selection and implementation of artificial intelligence aesthetic algorithms

In the selection and implementation of artificial intelligence aesthetic algorithms, multiple factors are considered to ensure their applicability and effectiveness. The appropriate algorithm depends on the research objectives and data characteristics. Choose Convolutional Neural Networks (CNN), an algorithm based on image analysis. If the goal is to analyze the aesthetic preferences of art-normal students or evaluate their learning progress, a recommendation system or sequence model can be considered (Sadatov, 2020; Matuk et al., 2022).

In the study and application of AI aesthetics, the implementation of algorithms is a complex and delicate process that involves multiple steps, from data preprocessing to model training to

optimization and evaluation. Data preprocessing is the foundation that needs to ensure the quality and consistency of the input data. Secondly, feature extraction is the key, which needs to be able to extract behavior patterns and learning habits from the interactive data of normal university students.

Model design is the core, and model design requires the selection or construction of labeled data sets suitable for a particular algorithm to supervise the learning algorithm. Each sample in these data sets has a corresponding output label, which is used to train the model to make accurate predictions. The unsupervised learning algorithm does not rely on the label data, and the final reinforcement learning is guided by the reward mechanism to make decisions and learn in a complex environment.

Parameter adjustment is also an essential part of the system. Only by adjusting parameters such as learning rate, batch size, number of network layers, and number of neurons can the performance and generalization ability of the model be improved.

Finally, the implementation of the algorithm also needs to consider computing resources and system integration. Some artificial intelligence aesthetic algorithms may require a lot of computing resources and storage space, so it is necessary to plan and configure the computing environment reasonably, and it is also necessary to integrate the algorithm with an educational platform or application in order to apply it to the aesthetic literacy cultivation of art-normal students, such as through online learning platforms or mobile applications to provide personalized aesthetic education and feedback (Hou & Seekhunlio, 2023; Lucey, 2021).

3.3. Ways for art-normal students to participate and give feedback

The participation and feedback of art-normal students is an important link of artificial intelligence aesthetics in the cultivation of aesthetic quality of art-normal students. Various ways are adopted to encourage art-normal students to participate and provide feedback actively. Organize artwork review meetings or discussion groups, invite art-normal students to evaluate and discuss works, and share their aesthetic views and insights. This interactive way can promote communication and learning among art-normal students.

In addition, online learning platforms or applications tailored for art-normal students can provide personalized aesthetic education resources and feedback mechanisms. These platforms further help art-normal students improve their aesthetic literacy more effectively by utilizing artificial intelligence technology to further provide customized teaching content and real-time feedback based on their learning progress and performance. Through these interactive learning tools, art-normal students can explore and develop their aesthetic abilities in a supportive and responsive environment. The practical project or task is also the key link to cultivating aesthetic quality. Activities such as art exhibitions, competitions, or academic seminars not only provide a platform for art-normal students to display their work but also provide them with the opportunity to get feedback and suggestions from professional tutors or audiences. This kind of practice and feedback loop helps art-normal students constantly improve their art practice and their aesthetic and creative ability. The development of practical projects or tasks is also a key link to cultivating aesthetic literacy. Only by participating in activities such as art creation, curation, and criticism can art-normal students better transform theoretical knowledge into practical experience. Activities such as art exhibitions, competitions, or academic seminars not only provide a platform for art-normal students to display their works but also provide them with the opportunity to get feedback and suggestions from professional tutors or audiences.

In short, the participation and feedback of art-normal students can be achieved through artwork review meetings, online learning platforms, practical projects and questionnaires. These methods can promote communication and learning between teachers and students, provide personalized aesthetic education and feedback, and at the same time understand their views and suggestions on the aesthetic application of artificial intelligence from the perspective of teachers and students.

4. RESULTS AND DISCUSSION

Design experiments to verify the performance and effect of artificial intelligence aesthetic algorithms, evaluate the impact of artificial intelligence aesthetic algorithms on the aesthetic literacy of art-normal students and compare the effects of different algorithms in cultivation. This will provide researchers with clear guidance. Determine the number and characteristics of art-normal student participants required for the experiment to ensure the reliability and validity of the experimental results and provide appropriate technical equipment and resources to support the experiment. In order to evaluate the effect of artificial intelligence aesthetic algorithms, participants need to be randomly divided into experimental groups and control groups, each group of 25 people. The experimental group will accept the application of artificial intelligence aesthetic algorithms, while the control group will not accept or adopt traditional teaching methods. With this setting, the differences and effects between the two groups can be compared to draw conclusions and evaluate the performance of the algorithm. The evaluation indicators of this paper are the scores obtained from the aesthetic knowledge test and work performance assessment. During the experimental process, variables and interfering factors are recorded, and statistical analysis is carried out. To ensure the stability of the results, sufficient repeat experiments are conducted.

4.1. Aesthetic Knowledge Test Scores

The test scores of aesthetic knowledge can reflect the degree of understanding and mastery of aesthetic concepts, principles, and theories of art-normal students in the cultivation of aesthetic literacy. These tests usually include an examination of knowledge of art history, art theory, aesthetic philosophy, and artistic creation skills. Through the aesthetic knowledge test, it is possible to assess the degree of understanding of different art schools, artists, works of art and related concepts by art-normal students. The test results can reflect the art-normal students' mastery of art history and art culture, as well as the degree of understanding of different aesthetic views and theories. As shown in Figure 1:

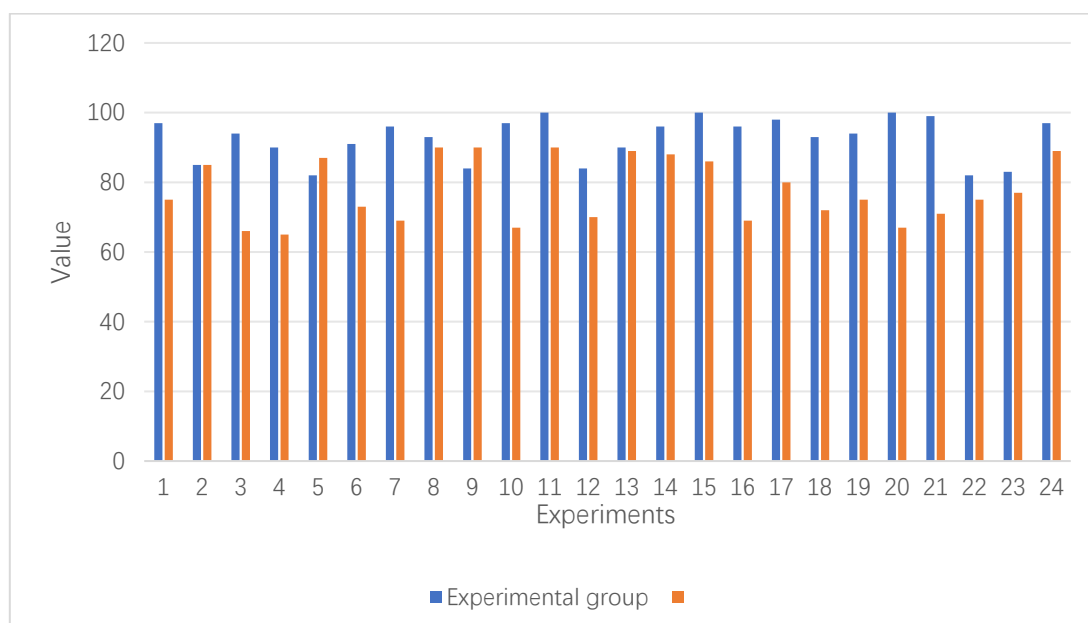


Figure 1. Aesthetic knowledge test scores

In the aesthetic knowledge test, the students in the experimental group of this article scored 82-100 points, while the students in the control group scored between 65-90 points, indicating that the method of this article can improve the aesthetics of art-normal students. High aesthetic knowledge test scores mean that art-normal students have a more in-depth study and mastery of art history, art theory and

related concepts. Their understanding of different art schools, artists, works of art and related concepts is more comprehensive and in-depth.

4.2. Work rating

Aesthetic works are the external expression of the inner world of artistic creators. Through their own creative works, art-normal students can showcase their understanding, preferences, and emotional experiences of beauty. The form, color, composition, theme, and other elements in the work can all reflect their unique aesthetic views. It can showcase the skills and skill level of art-normal students. Through the painting techniques, material application, composition arrangement, and other aspects of their works, it can be seen their mastery of artistic language and techniques. The score of the work can reflect the understanding and use of artistic language and style by art-normal students. A high-scoring work may show familiarity and flexible use of different art schools, artists, and art styles, and reflect the unique artistic style and creative language of the individual. Figure 2 is a comparison of the scores of the works:

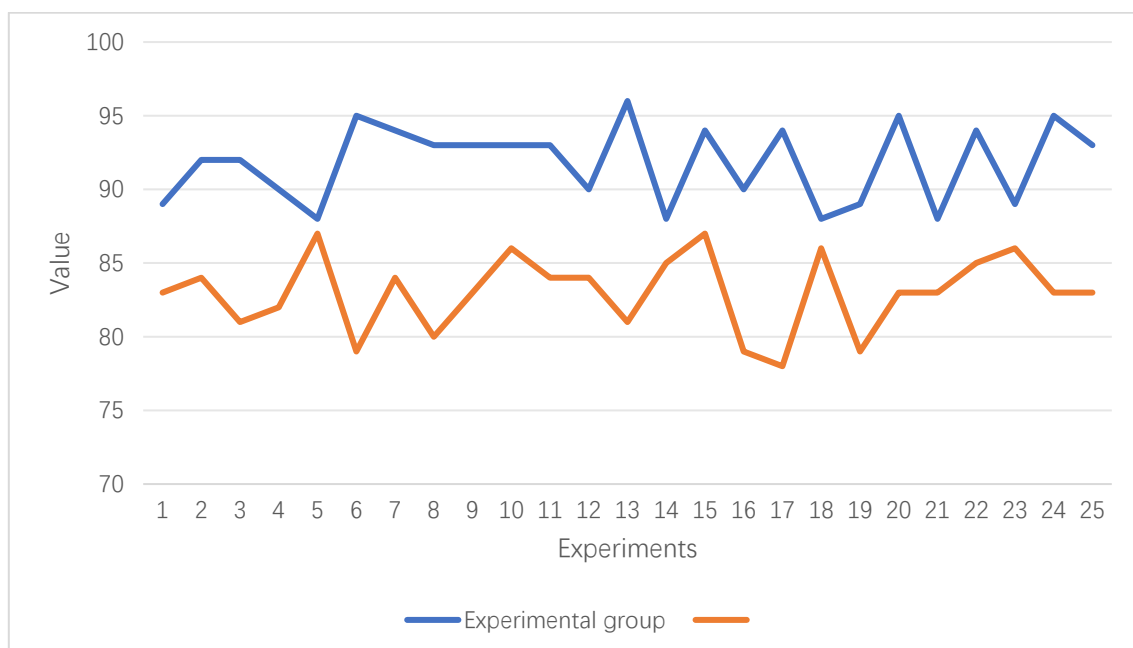


Figure 2. Work Rating

In the work scoring test, the works of the experimental group scored 88-96 points, and the works of the control group scored between 78-87. A high-scoring work may mean that art-normal students have a high level of creativity, expressiveness, skills, and artistic language. It may show the teacher's understanding and use of artistic principles and techniques, as well as sensitivity and creativity in composition, color, form, etc.

Artificial intelligence aesthetic methods can obtain rich information and patterns from large-scale art datasets by processing them. This data analysis capability enables artificial intelligence to accurately capture the aesthetic features and patterns in art works. Traditional methods often rely only on limited samples and personal experience, while artificial intelligence can provide more comprehensive and accurate guidance on aesthetic literacy through learning from a large amount of data. It is based on deep learning and pattern recognition technology, which can provide detailed analysis and dissection of artistic works. Through deep learning networks, artificial intelligence can learn to perceive and understand visual elements, composition patterns, color combinations, and other information in artistic works. This in-depth analysis and understanding ability can help art-normal students better grasp the elements of artistic creation and enhance their aesthetic literacy. It provides personalized guidance and feedback based on individual needs and characteristics. By analyzing and comparing

individual works, artificial intelligence can provide specific suggestions and improvement directions, helping art-normal students better develop their aesthetic abilities. Traditional methods usually only provide general guidance and lack personalized targeting. In the process of simulating art creation, inspiring and expanding the creativity of art-normal students by generating new works of art. Through learning and analyzing a large number of artistic works, artificial intelligence can generate new works, presenting creativity and unique aesthetic styles, thereby providing new artistic perspectives and creative inspiration for art-normal students.

Although artificial intelligence aesthetic methods have many advantages in improving the aesthetic literacy of art-normal students, they cannot completely replace traditional methods. Traditional aesthetic education is still very important because it involves the inheritance of human culture and the cultivation of creativity. Artificial intelligence aesthetic methods should be regarded as a beneficial auxiliary tool that can provide more comprehensive and accurate aesthetic guidance and creative inspiration for art-normal students.

5. CONCLUSION

This research aims to demonstrate the significant contribution of artificial intelligence aesthetics in cultivating aesthetic literacy among art-normal students. By analyzing the shortcomings of traditional methods in the cultivation of aesthetic literacy of art-normal students, the researcher recognized that the introduction of artificial intelligence aesthetic methods and technologies can make up for these shortcomings and provide more personalized, innovative, and comprehensive aesthetic cultivation for art-normal students. In this paper, a personalized cultivation system based on artificial intelligence aesthetics is designed and implemented, and its influence on the aesthetic literacy of art-normal students is evaluated through empirical research. The following is a summary of the main findings and conclusions of this research: Artificial intelligence aesthetics has broad application prospects and research value in the cultivation of aesthetic literacy of art-normal students. Combining artificial intelligence technology and aesthetic theory can provide art-normal students with a richer, in-depth, and personalized aesthetic cultivation and learning experience. Artificial intelligence aesthetics can provide personalized learning and guidance. By analyzing students' learning backgrounds, interests, and characteristics, the artificial intelligence system can recommend works of art, theoretical knowledge, and learning resources suitable for their needs and levels. This helps to stimulate students' interest in learning and improve learning effectiveness. Artificial intelligence aesthetics can assist art-normal students in the creation and evaluation of works. Artificial intelligence algorithms can analyze the composition, color use, form and expression of works of art, and provide useful feedback and suggestions. This helps art-normal students to find problems, improve their skills, and improve the quality and artistic value of their works in the creative process.

Artificial intelligence aesthetics can also provide art-normal students with more comprehensive and diverse ways of artistic creation and expression. Through artificial intelligence technology, art-normal students can try new media art forms such as digital art, virtual reality, and interactive installations that are different from traditional art forms. This helps to cultivate the innovative consciousness and open thinking of art-normal students and expand their artistic expression skills. In summary, artificial intelligence aesthetics has great potential and advantages in the cultivation of aesthetic literacy among art-normal students. Through personalized learning, rich artistic resources, practice and feedback, and innovative teaching methods, artificial intelligence aesthetics can provide personalized, innovative and comprehensive aesthetic cultivation for art-normal students. However, art education should also note that the application of artificial intelligence aesthetics in art education still faces some challenges and limitations. For example, artificial intelligence systems cannot completely replace the role of human teachers. Teachers still need to use their professional knowledge and experience to guide students' learning and development. In addition, personal privacy and data security issues also need to be properly handled to ensure that students' information and work are

properly protected. At the same time, in order to avoid the impact on traditional aesthetics, attention should be paid to the problem of aesthetic degradation that may be caused by the assimilation of works in some artificial intelligence aesthetic creation modes.

In future research, more exploration can focus on the application fields and methods of artificial intelligence aesthetics in depth. In addition, it is worth researching how to combine artificial intelligence with traditional art education to find the best teaching model and strategy. Furthermore, it is possible to explore ways of enhancing the intelligence of AI systems to better comprehend and assess students' artwork, ultimately providing more personalized guidance and feedback.

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