

The practice and reflection of generative AI in the cultivation of aesthetic education in colleges and universities: centred on environmental design major

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Abstract. Through a comprehensive analysis of the development history of generative AI and its application in the aesthetic education of environmental design majors, this paper aims to reveal its potential significance and revelations in the field of aesthetic education. This paper first outlines the concept and development history of generative AI, and then delves into its practice in the aesthetic education of environmental design majors. For different application scenarios, including natural language processing, image recognition, audio processing and video synthesis, its specific applications and effects in aesthetic education are explored respectively. By analysing the practice of generative AI in the cultivation of aesthetic education for environmental design majors, it is found that it has potential value in several aspects, and generative AI can provide students with more personalised and diverse learning experiences and expand the boundaries of aesthetic education. At the same time, it can also assist teachers in teaching design and assessment, and improve teaching efficiency and quality. With the continuous development and application of AI technology, the combination of generative AI and aesthetic education in environmental design will show a more diverse and extensive trend

1 Overview and development of generative AI

ChatGPT is a large-scale language model developed by OpenAI based on natural language processing and deep learning techniques, known as Chat Generative Pre-trained Transformer (i.e. "Generative Pre-trained Chatbot"). It will be released in November 2022. ^[1]It combines the functions of dialogue and chat, information retrieval, knowledge service, AI creation, etc., and is the most powerful AI generative product nowadays. With the global economic globalisation and technological progress, AI and mobile learning have become

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mainstream and widely used in social life. The development of ChatGPT can be traced back to the first generation of chatbots launched by Microsoft in 2015 - Xiao-Ice. Subsequently, chatbots developed by a number of information technology companies appeared on social media and websites such as Facebook Messenger, WeChat, Telegram, etc., such as Baidu's "Wenxin Yiyin", Alibaba's "Tongyi Qianqian", and KU Xunfei's "Tongyi Qianqian". Baidu's "Wenxin Yiyin", Alibaba's "Tongyi Qianqi", and KU Xunfei's "Xinghuo Cognitive Big Model".^[2]

According to the "AIGC Development Research Report" recently released by Tsinghua University, generative AI like ChatGPT will have a profound impact on various industries. In recent years, the state has issued a series of documents to promote the development of AI education, including the New Generation Artificial Intelligence Development Plan issued by the State Council on 20 July 2017, as well as the Opinions on Regulating and Strengthening the Judicial Application of Artificial Intelligence issued by the Supreme People's Court on 9 December 2022 and the Interim Measures for the Management of Generative AI Services, which will come into effect on 15 August 2023 ", etc. These initiatives are gradually driving the implementation of intelligent educational applications, highlighting the urgent need to cultivate a new generation of talents and matching the trend of future technological development.

2 The practice of generative AI in aesthetic education for environmental design majors

The field of art and design is at a moment of new challenges and opportunities as artificial intelligence (AI) technology continues to evolve. The development of this technology enables art students to perceive things, understand human nature and culture more clearly, providing them with more innovative and disruptive thinking and approaches. With the aid of AI technology, art creators can explore and experiment with ideas more quickly, expanding their creative scope and imagination. At the same time, the application of AI technology also helps to shorten the time and cost required for art creation, allowing artists to focus more on the exploration and expression of the creative process, rather than being limited by cumbersome technical details. The use of this technology also promotes changes in the creation and dissemination of environmental design works, providing more possibilities and ways for the display and communication of art works. Therefore, the continuous progress of AI technology brings broader development space for the field of art and design, and also brings more creative inspiration and creation methods for art students.

2.1 Close connection between environmental design and aesthetic education

In the environmental design programme, emphasis is placed on spatial aesthetics and artistic expression, aiming at creation and beauty. This pursuit of beauty is closely related to the goal of aesthetic training, which is dedicated to cultivating students' aesthetic awareness and artistic literacy. In the practice of environmental design, through the guidance of aesthetics, art and aesthetics, students gain a deeper understanding of the nature of artistic expression, and develop their sensitivity and understanding of beauty. Environmental design integrates multiple disciplines such as architecture, fine arts, engineering, humanities and social sciences, and also combines knowledge of architectural aesthetics, design theory, humanistic considerations and other aspects in teaching, exposing students to the diverse contents of aesthetic education. Designers not only need to have an aesthetic sense, but also need to have an in-depth understanding of technology, materials and spatial planning. Environmental design emphasises innovation and practical ability,

requiring students to combine theoretical knowledge with practical operation, which is in line with the goal of encouraging students' creative thinking and practical ability in aesthetic cultivation, and fosters students' ability to think independently and design innovatively. Designers need to have the ability to think across disciplines and synthesise knowledge from different fields to create design works that meet functional and aesthetic standards. In addition, environmental design focuses on humanisation and emotional communication, paying attention to human feelings and experiences in the designed space. Aesthetic training also emphasises the development of students' emotional experience and expression skills, enabling them to better express and convey emotions in design.

2.2 The practice of generative AI in aesthetic education for environmental design majors

2.2.1 Natural language processing with generative AI and aesthetic theory learning for college students

The role of generative AI in the learning of aesthetic theory for college students is not only reflected in personalised teaching and intelligent assistance, but also in the deeper learning support and knowledge services it provides. Through the generation of personalised teaching materials and course content, AI is able to tailor the learning path for each student according to the student's learning needs and learning style, making the learning of aesthetic theory closer to actual needs and interests.

As an intelligent assistant, AI is not only a learning tutor, but also a learning companion, answering students' questions and providing guidance at any time, promoting students' in-depth understanding and application of aesthetic education theory. In addition, the knowledge map and digest functions of generative AI provide great convenience for students. By integrating various academic resources and literature, the AI can generate a rich and comprehensive knowledge map, enabling students to more systematically grasp the core concepts and developmental lineage of aesthetic education theory. This kind of comprehensive knowledge service not only saves students' time in searching for information, but also helps students' knowledge integration and application, and improves the efficiency and quality of learning. In addition, AI-generated texts that conform to grammatical rules and are semantically sound provide students with more diverse learning materials and thinking perspectives. Students can expand their horizons and develop critical thinking and literary appreciation by reading reviews, news reports and other forms of AI-generated content. This variety of learning experiences helps to stimulate students' interest in learning and increase engagement and motivation. Generative AI is not only a technical tool, but also a learning aid and enlightenment. It provides richer and more personalised learning resources for students' aesthetic theory learning in colleges and universities, and promotes the overall development of students and the cultivation of their creative abilities.

2.2.2 Image recognition and environmental design aesthetics in generative AI

The image recognition technology of AI in environmental design majors, through identifying, analysing and interpreting images, students are able to better understand the artistic elements and stylistic features in environmental design, and can gain a deeper understanding of various design concepts and artistic styles.

AI technology not only recognises images, but also generates rich and varied visual teaching resources, such as presenting and analysing a variety of image materials,

environmental design case studies, etc., to help students understand practical applications and innovative designs. This visual way of learning can stimulate students' creativity, provide them with design inspiration, and promote the improvement of design level. In addition AI's image recognition technology can assist the design process by recognising spatial elements or material features, providing automated design suggestions, speeding up the design process and enhancing the creativity and practicality of the design. By recognising images of students' artwork, AI can provide personalised feedback and evaluation to help students improve their designs and expand their horizons and skills in a more targeted way. This personalised guidance helps students to continuously improve their artistic and aesthetic skills during the design process.

2.2.3 Audio processing and environmental design aesthetics in generative AI

Generative AI's audio processing technology has a wide range of applications in environmental design aesthetics, covering the cultivation of sound design concepts, sound environment simulation and optimisation as well as sound art expression and innovation. Generative AI can assist students in identifying, analysing and designing sound elements, developing their ideas and creativity in the application of sound in spatial design. This provides students with the opportunity to explore sound art, expanding their understanding of sound in design and enabling them to be more comprehensive and creative in the environmental design process. Secondly by simulating and optimising sound environments, AI can help students gain a deeper understanding of the impact of sound on the environment, thus enabling them to better plan and design the use of audio in indoor and outdoor spaces, and to improve the sensory experiential nature of their design work. This not only helps to develop students' sensitivity to sound environments, but also enhances their technical skills in the application of sound in design. By integrating sound with design, students are able to create more creative and unique environmental design works. This innovative expression of sound art enriches students' design language and provides them with more space to display their individuality and aesthetic pursuits.

The audio processing technology of generative AI in environmental design aesthetics promotes students' deep understanding of sound, expands their design horizons, enhances the sensory experiential nature of the design works, and at the same time inspires students' enthusiasm for sound art innovation. This provides a richer and more interesting learning experience for environmental design students.

2.2.4 Generative AI for video compositing and environmental design aesthetics

The video compositing technology of Generative AI provides students with the possibility to simulate and demonstrate various design scenarios. Students can use this technology to simulate indoor and outdoor environments, landscape design, architectural structures, etc., which makes the design concepts and creative expressions more intuitive and concrete, and this kind of scene simulation and display helps students to understand the design concepts more deeply and strengthen their grasp of the design practice. Secondly, students can present and disseminate their design works in the form of video with the help of AI technology, which is more attractive and contagious and helps students to better present their design ideas and performance works, and enhances the influence and dissemination effect of their works. In addition, video compositing technology stimulates students' artistic creation practice. Students can integrate different artistic elements through video compositing to achieve more creative and imaginative design works, thus expanding the design forms and creative ideas. Using video compositing technology, students can show their design process and ideas more clearly, share their design ideas and practices with

others, and promote communication and sharing of creativity. This way of displaying and sharing design ideas not only allows more people to appreciate and participate in artistic creation, but also helps learning interaction and experience exchange among students, which not only promotes the in-depth development of aesthetic education, but also provides students with rich learning resources and creative platforms, and promotes the enhancement of students' creative expression and design practice ability.

3 The significance of generative AI in the cultivation of aesthetic education for environmental art majors

Generative AI technology for college aesthetic education can achieve a more personalised and innovative teaching method, and students' artistic ability and creativity are fully developed. This new teaching mode and technical means help to break the limitations of traditional teaching, and through interaction with AI, students can be able to explore the diversity of art and the infinite possibilities of creativity, and enhance the effect of aesthetic education.

3.1 Expanding students' artistic thinking and cultivating creative awareness

In the aesthetic training of environmental art majors, through its powerful algorithms and data processing capabilities, generative AI is able to produce a variety of unique artworks and design solutions, including painting, music, video and other forms. This diversity and creativity inspires students' exploration and understanding of art, helping them break the boundaries of traditional art and expand their own artistic concepts and aesthetic ideas. Secondly, in the learning and creation process of environmental art majors, generative AI provides students with innovative creative tools and platforms. Students can use the art materials and design concepts generated by generative AI to create and practice. This novel way of creation not only expands students' creative ideas, but also cultivates their creative consciousness and practical ability, making them more courageous and capable of exploring and breaking through in the art field. With the rapid development of artificial intelligence technology, generative AI has become one of the important tools in contemporary art creation. By learning and mastering the relevant knowledge and skills of generative AI, students will not only be able to better adapt to the future development trend of the art industry, but also be able to actively participate in the intersection of artificial intelligence and art creation, contributing their own strength to the development and innovation of art. By expanding students' artistic thinking and cultivating their sense of innovation, it lays a solid foundation for their future artistic creation and development, and at the same time provides new ideas and possibilities for the innovation and development of art education.

3.2 Shaping students' healthy personality and cultivating noble aesthetic sentiments

In the cultivation of aesthetic education in environmental art, generative AI provides an open and innovative art learning environment that stimulates students' creativity and imagination. By interacting, learning and exploring with the AI, students have the opportunity to think about the relationship between art and life from different perspectives, thus promoting the development and enrichment of their personalities. This open learning atmosphere helps students develop the personality traits of independent thinking and innovation. AI technology is also able to generate various forms of artworks and designs,

helping students to come into contact with more diverse and cutting-edge art styles and genres, and stimulating their perception and understanding of beauty. This diverse aesthetic experience helps to cultivate students' aesthetic sensibilities and enhance their appreciation and judgement of art. In addition, generative AI provides students with a platform for practice and expression, prompting them to pay attention to emotional expression and connotative thinking in art creation. In the process of participating in artistic creation, students can exercise their ability to express their emotions and cultivate a deep insight into life, society and human nature, thus promoting personal growth and personality shaping.

3.3 Cultivate students' aesthetic awareness and enhance their aesthetic literacy

Generative AI can provide a rich variety of artworks and design cases. In displaying artworks of various styles and genres, students can gain a deeper understanding of different aesthetic concepts and forms of artistic expression, thus expanding their aesthetic vision. By interacting with and learning from the generative AI, students are constantly exposed to a variety of artworks and develop their art appreciation and aesthetic taste. Generative AI can also help students understand the logic and ideas behind art creation and analyse the artworks it generates, so that students can explore in depth the artist's creative motives, artistic expressions, and the meanings and connotations behind the works. This cultivation of aesthetic thinking and analytical ability helps students to understand the nature of art more deeply and to improve their aesthetic taste and aesthetic literacy. Generative AI is important for cultivating students' aesthetic awareness and enhancing their aesthetic literacy in the aesthetic cultivation of environmental art majors, and it can provide students with personalised art learning and experience. Students interact with the AI, customise their learning plans according to their interests and needs, and select artworks that match their aesthetic inclinations for learning and appreciation. This personalised learning approach helps to stimulate students' learning interest and creativity, and enhance their aesthetic experience and literacy level.

4 Conclusion

In the context of the Intelligent Age, generative AI is becoming an emerging medium and means of expression for artistic creation, opening up a broader space for scholars in various fields to imagine and explore. In the field of art education, the use of generative AI will also lead to a more diverse and personalised approach to education. This trend not only activates students' thinking, but also injects new vitality into the environmental design profession, cultivates more creative talents, and improves the popularity and quality of university education. The combination of environmental design majors and generative AI brings rich opportunities for art aesthetic education as well as the entire art field. However, it also requires continuous in-depth research and exploration to meet the needs and challenges of future development.

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