Curriculum and Teaching Methodology (2025)
Clausius Scientific Press, Canada

DOI: 10.23977/curtm.2025.080509
ISSN 2616-2261 Vol. 8 Num. 5

The Impact and Challenges of Generative Artificial Intelligence on the Arts Education

Yaxing Zhang

College of Humanities, Guangxi Arts University, Nanning, The Guangxi Zhuang Autonomous Region, 530000, China
1529110758@qq.com

Keywords: Generative Artificial Intelligence, Artistic Creation, Arts Education

Abstract: The extensive implementation of generative artificial intelligence within the domain of art has precipitated a new phase of growth and innovation within the art industry. Moreover, advancements in the arts education have contributed to the emergence of a new generation of talent, thereby facilitating the advancement of China's art industry towards higher levels of quality and sophistication. In the context of the contemporary silicon-based artificial intelligence era, generative artificial intelligence has the potential to function as an auxiliary instrument in the realms of art creation and the arts education. This integration has the capacity to exert a favourable influence on the evolution of the arts education model and the enhancement of the evaluation and feedback mechanisms. Concurrently, the integration of database resources and their subsequent sharing are concomitant with the establishment of regulatory frameworks pertaining to the arts education. These frameworks are subject to challenges pertaining to creativity and originality, ethics and morality, and technology access and safety.

1. Introduction

The proliferation of generative AI tools, exemplified by ChatGPT and GPT-4, has led to their increasing integration into the realm of the arts education as auxiliary tools. On September 10, 2024, Chinese President delivered remarks at the National Education Conference, underscoring the importance of prioritizing the cultivation of virtue and talent in education. He also emphasized the strategic utilization of artificial intelligence to facilitate educational transformation. As an integral component of aesthetic education, the objective of the arts education is to cultivate well-rounded individuals who primarily possess aesthetic concepts and appreciation abilities, with creative abilities as a secondary focus. Generative AI technology, as a representative of new technologies, presents both opportunities and challenges when deeply integrated with arts education. A critical imperative for comprehending the evolution of art in the era of generative AI is to investigate the profound interweaving and transdisciplinary convergence between arts education and generative AI. This exploration is not merely an academic exercise but carries profound ramifications for the advancement of Chinese-style modern arts education. By leveraging arts education as a conduit, this study aims to enhance individuals' aesthetic cognition and emotional expression capabilities, thereby contributing to the enrichment of their personal and collective experiences.

2. The Impact of Generative Artificial Intelligence on Arts

2.1 Assisting Artistic Creation

2.1.1 Artistic Creativity Stimulation

Generative artificial intelligence is distinguished from its predecessor, the single-language generation of artificial intelligence, by its capacity to draw upon a vast array of data sets, extract, reason, and edit information, synthesize and discern the principles and techniques of artistic creation, and generate original artistic compositions. The provision of learning materials for the arts education is an integral component of this initiative. It also utilizes the way in which students interact with the classroom, through a generative approach to arts creation, to experience arts, to increase students' interest in art, to cultivate students' artistic thinking and inspiration, and to stimulate enthusiasm for arts creation. The initiative fully mobilizes students' enthusiasm for the arts course.

Generative AI has the capacity to accurately identify students' preferred artistic expressions or styles. In response to specific input conditions or instructions, it can imitate and generate a variety of multimodal artistic creations. This capability assists students in identifying and nurturing their individual artistic inclinations and enhancing their artistic literacy. The academic education in arts utilizes a generative AI model that conducts in-depth algorithmic analysis of creative backgrounds and artworks. This analysis assists students in accurately refining keywords for academic research. The model facilitates a more efficient understanding and grasp of the thematic characteristics of collected research materials. Additionally, it enables students to explore new research and application directions.

2.1.2 Tools for Teaching Design of Arts Courses

Generative AI has the potential to play a significant role in the field of teaching design. It can assist educators in leveraging generated content to master the fundamental concepts and pedagogical techniques inherent in arts courses. Furthermore, it possesses the capability to swiftly analyze and summarize extensive artwork data sets and teaching cases, thereby facilitating the rapid development of teaching plans that are aligned with the unique characteristics of each classroom. The utilization of generative artificial further order in the intelligence of teaching plans and the generation of multimodal arts course teaching materials has been demonstrated to facilitate students' comprehension of artistic works, artists, and genres in a diversified manner. This approach has also been shown to provide insight into students' aesthetic preferences, artistic thinking, and learning progress, enabling the adjustment of teaching plans as necessary. Furthermore, it has been evidenced to offer students new perspectives and perceptions of their professional learning, thereby enhancing the efficiency and quality of classroom teaching in the arts course and ensuring the comprehensiveness of arts teaching. This significantly enhances the efficacy and caliber of arts course pedagogy within the classroom setting, thereby ensuring the comprehensive and uniform delivery of arts instruction.

Generative AI has the potential to function as an auxiliary instrument in the refinement of lesson plans, thereby facilitating the integration of innovative content and pedagogical approaches within arts courses. In the context of actual classroom implementation, generative AI has the potential to facilitate arts creation through human-like algorithmic programs or to generate courseware templates or case lectures that are essential in the arts education classrooms. This transformation of the traditional teaching environment is a key objective. The development of a human-computer interactive teaching platform and the creation of an interactive, situational, and immersive classroom mode of intelligent learning and creation for professional the arts education are also crucial. These

endeavors aim to provide students with a novel and suitable learning experience.

2.2 Optimize Students' Experience

2.2.1 Learning Motivation

The generative Al system has demonstrated remarkable capabilities in the domains of inspirational content generation, dialog context understanding, sequence task execution, and program language parsing in natural language understanding and content generation[1]. It is evident that, in consideration of the four aforementioned core competencies, Generative AI has the capacity to visualize traditional curriculum knowledge, thereby yielding inspiring and creative pictures, videos, animations, and other work materials. This augmentation in the frequency of students' "contact with arts" and their appreciation experience is a pivotal finding. Moreover, the application of Generative AI in the arts education is of great significance to the quality education of contemporary students. The development and promotion of generative AI products in various fields and disciplines within society also introduce novel strategies and opportunities for enhancing learning motivation in arts majors. To illustrate, consider the case of Suno Al, a generative AI music creation program developed by Anthropic Corporation. This program has the capacity to automatically generate highly realistic and diverse musical compositions by simply inputting basic textual requirements. Suno AI's low threshold of operation and ready-to-use features have attracted a considerable number of users. These users have attempted to utilize Suno AI products to independently create their own personal music. This endeavor has been driven by their personal interest in music creation and appreciation. The features of Suno Al's low operation threshold and its versatility have attracted a considerable user base, prompting many to experiment with Suno Al products in their personal music creation and to cultivate their interest in music creation and appreciation.

2.2.2 Increased Interactivity and Participation

The capacity for Generative AI, bolstered by the technical underpinnings of deep learning algorithms within the Large Language Model (LLM), lies in its ability to perpetually refine and enhance the language. The processing capability and the language feedback in certain areas have the potential to be expressed in a more human-like manner. Consequently, in the process of utilizing generative AI for artistic practice, students have the opportunity to delve more profoundly into their own personalized emotions and develop forms of artistic expression that resonate with their emotions. Generative AI has the potential to transform the learning space, learning process, and learning mode. It can promote the ubiquity of the learning space, empower individuals to meet the personalized needs of the learning process, and establish a learning mode of human-computer collaboration to achieve a higher level of personalized learning [2]. Furthermore, generative AI can provide students with customized sketches and conceptual samples of works, real-time feedback, and professional guidance functions. These functions can not only find new perspectives on arts creation for students but also provide a more convenient learning experience. The integration of generative AI in the arts education classroom has been demonstrated to enhance student participation and learning enthusiasm. Additionally, it has been observed to facilitate cognitive, emotional, and socio-cultural development in students[3].

2.3 Establishment of Assessment and Feedback Mechanisms

2.3.1 Provide Real-time Feedback and Guidance

Generative AI has given rise to a novel form of education, and it is imperative to expedite the

development of human-computer collaborative intelligence, educational evaluation systems, and computation-based teaching strategy models. This will catalyze the transformative restructuring of the human education model[4]. Generative AI has the potential to serve as an automated assessment system for arts education. It can analyze internal aspects, such as the completion of artwork by students, the dynamics of the classroom environment, and the manifestation of skills and innovativeness. In addition, it can integrate external performance data, including learning records and classroom motivation. Ultimately, Generative AI can generate a comprehensive and objective learning assessment report. This report can assist students and teachers in accessing the performance advantages and improvements of artwork or professional skills. Concurrently, generative AI has the capacity to automate the evaluation of a substantial number of trendy artworks. This capability assists students in comprehending contemporary popular arts styles, forms of expression, and creative concepts. Moreover, generative AI is capable of screening and providing high-quality teaching materials for arts teaching professionals, and making adjustments to teaching content and methods.

2.3.2 Learning Motivation

In the long term, the advent of generative artificial intelligence, as exemplified by ChatGPT, has the potential to generate a multitude of needs and opportunities for the transformation of effective classroom teaching feedback methods. The emergence of metaverse and generative AI has precipitated a paradigm shift in the digital learning environment, characterized by human-computer collaboration. The virtual teacher, operating within the generative AI interface, is capable of providing real-time feedback on students' needs, thereby potentially enhancing learning performance to a considerable degree[5]. Generative AI is a tool that utilizes advanced algorithms to perform a thorough analysis of students' artistic works. This analysis assists students in identifying errors or deficiencies in their techniques and content displays. By facilitating the exploration of novel creative techniques and artistic styles, generative AI plays a crucial role in enhancing students' creative processes. In the domain of film and television scriptwriting, students can employ generative AI to visualize characters' actions, demeanor, dialogues, and other plot descriptions in the script. This process enables real-time feedback from data algorithms, as well as suggestions for changes and technical guidance provided by generative AI. Consequently, students can refine the storyline of the script and enhance its expression of emotions and sublimation of themes. This process fosters rapid learning and improves students' ability to apply new concepts and techniques.

3. Challenges of Arts Education in the Age of Artificial Intelligence

3.1 Challenges in Creativity and Originality

3.1.1 Technology Dependence and Lack of Creative Thinking Cultivation

Although generative AI has been demonstrated to facilitate numerous conveniences and inspirations for students' professional learning and artistic creation, an excessive reliance on this technology may potentially impede students' capacity to think independently, express emotions, and engage in creative thinking. Although generative AI exhibits a modicum of creativity, the content it generates is an inadvertent algorithmic arrangement and combination of existing human achievements. The substitution of AI for human has effectively eliminated the distinctive survival activities that are characteristic of human beings. The alternative narrative has effectively dissolved self-reflection [6]. Students who lack a strong professional foundation and/or who are unable to concentrate tend to rely on technology to the extent that they replace individual artistic creation and imagination with machine algorithms. Furthermore, the homogenized guidance of data algorithms to

individual thinking has the potential to reduce autonomy and mobility in students' learning and creation. Therefore, the arts teaching team should assume responsibility for cultivating students' critical thinking and creativity. This entails ensuring that students consistently maintain independent and innovative thinking in arts practice and respecting their individual expression.

3.1.2 Defining the Boundaries of AI-generated Works

The advent of "artificial intelligence artworks" signifies the evolution of artistic expression in the post-human-machine co-creation era. These works represent a conceptual reconstruction of the question of "what is art?" and make possible an hermeneutics based on artificial intelligence arts [7].The advent of generative artificial intelligence as a technological instrument in the domain of artistic creation has given rise to a novel genre of artistic expression: AI arts. This emergent form of arts is generated by artificial intelligence algorithms. Conventional human-centric concepts of arts and interpretations of artistic works are no longer adequate for defining AI arts. Consequently, there is an imperative for a unified set of standards to define AI-generated works in contemporary intelligent education classrooms. This standardization is crucial for distinguishing between human arts, human-machine arts, and AI arts. In order to enhance students' understanding of generative AI tools and enable both students and teachers to accurately grasp the applicability and practicality of AI-generated content, it is essential to establish corresponding evaluation criteria and definition methods.

3.2 Challenges in Ethical and Moral

3.2.1 Copyright and Intellectual Property Disputes in Generative AI Artworks

The integration of generative artificial intelligence (AI) in the domain of arts education content creation has been observed to impede students' aesthetic cognition and creativity in artistic production. The risks posed by copyright disputes in artistic creation in the AI era should not be overlooked. The copyrightability of generative AI content is a subject of ongoing discussion, and the establishment of criteria for the recognition of generative AI works and the determination of copyright ownership is imperative. The legal validity of AI works' copyright should be comprehensively judged based on the requirements of originality and empirical sharing, and the copyright owner of generative AI works should be determined [8]. On the one hand, there is currently no unified or precise standard for determining the copyright ownership of artworks generated by generative AI. When students use generative AI to create works for academic or course assessments, this may lead to disputes over the copyright ownership of the generated works. On the other hand, the algorithmic databases of generative AI incorporate the digital integration of global artistic works and educational resources. Without the permission of the intellectual property rights holders of such works and data, the application and demonstration of generative AI in arts classrooms may constitute digital infringement. In response to this issue, arts education institutions and third-party generative AI technology providers should ensure the procedural compliance and legality of data collection and use, cultivate students' awareness of intellectual property protection, and voluntarily accept supervision from students and the general public.

3.2.2 Lack of Accountability and Responsibility Mechanisms

Essentially, the creativity of generative artificial intelligence is based on the re-decomposition and recombination of learning materials. Artificial intelligence-generated content (AIGC) is constrained by the logic of the creative subject, and the recognition of AIGC works cannot escape the constraints of the human-machine relationship and subject status, leading to a dilemma of subjective-objective

opposition. This presents a systemic dilemma for existing copyright laws, which struggle to recognize AIGC as arts works [9]. Consequently, the implementation of generative artificial intelligence as an instructional tool within the domain of the arts education invariably gives rise to contentious debates concerning copyright infringement and associated liabilities among students, educators, educational institutions, development organizations, and artists whose creations are utilized as educational materials. However, a standardized evaluation system for determining the copyright status and infringement of works generated by generative artificial intelligence as a teaching tool has yet to be established. Confronted with this ethical and moral challenge, it becomes imperative to establish foundational guidelines for evaluating and assessing generative works as a distinct category. The establishment of specialized institutions to effectively evaluate and supervise the educational applications of generative AI is imperative. Robust mechanisms for determining liability and accountability must be established. It is incumbent upon the arts education institutions and third-party generative technology providers to ensure procedural standardization and legality in data collection and use. By doing so, they can legitimize the educational benefits of generative AI in the arts education.

3.3 Challenges in Technology Acquisition and Security

3.3.1 Technological Barriers and Resource Gaps

The economic challenges faced by economically underdeveloped regions with limited digital resources are significant barriers to accessing and applying generative AI technology. These challenges stem from the high costs associated with purchasing and maintaining generative AI technology and equipment, as well as the need for advanced computer hardware and network support. In the context of the uneven development of intelligent technology across regions, there is also the risk of personal artistic works being arbitrarily appropriated or misattributed in AI applications, leading to serious issues of copyright infringement due to information disparities. This is particularly evident among art students, who allocate the majority of their time and effort to conceptualization and creation, and thus possess a relatively superficial understanding of generative AI technology. The dearth of proficiency and experience in the utilization of intelligent technology hinders students from fully recognizing the value of generative AI in the domain of artistic creation [10].

Generative artificial intelligence has the potential to provide the arts education with substantial support, characterized by richness, efficiency, and precision. However, this development also presents challenges to the role of arts teachers. Teachers' understanding and mastery of generative artificial intelligence technology varies, and this disparity may have implications for their professional artistic abilities and classroom teaching efficiency. Consequently, arts educators are strongly encouraged to engage in ongoing professional development to expeditiously enhance their capacity to leverage intelligent technology within the instructional setting. This involves providing students with guidance on the judicious utilization of generative artificial intelligence tools to facilitate artistic creation and professional development. Moreover, educators are urged to prioritize the nurturing of highly skilled artistic talent that is adept at adapting to the evolving technological landscape of the future.

3.3.2 Data Security and Privacy Protection

The rapidly developing generative artificial intelligence technology itself is still imperfect and poses significant security risks in terms of data quality, data privacy, and data protection[11].In the context of students and arts teachers leveraging generative AI to support their artistic endeavors, potential security vulnerabilities in the platform or the illicit disclosure of user data by operators may

result in the public dissemination and unauthorized plagiarism of personal concepts or original works, thereby significantly infringing upon the personal privacy of students and teachers. This phenomenon not only tarnishes the institution's reputation but also has a deleterious effect on students' mental well-being, thereby diminishing their enthusiasm for academic pursuits and creative endeavors.

The application results of certain contemporary artificial intelligence technologies are constrained by factors such as the content and language of the pre-training data sets. This may result in discrimination in dialogue content, discrimination against specific groups, and artificial algorithmic bias [12].The preponderance of extant, widely utilized generative AI tools has been developed by foreign companies. The applicability of these tools within China's arts education system is constrained by a paucity of training and simulation in areas such as China's traditional cultural background, philosophical implications, and artistic styles, particularly with respect to specific regions or arts forms. Moreover, due to the absence of strict regulatory standards and effective oversight mechanisms, generative AI systems and virtual databases are unable to conduct on-site investigations to understand the real world. Consequently, the outputs produced by contemporary generative AI models may not consistently guarantee precision, and there is a possibility that they may exhibit inconsistencies or deviations from reality, potentially leading to misleading conclusions.

Acknowledgements

This paper is the research result of “Postgraduates” Human Settlement Industry Innovative Program, Guangxi Arts University", titled “Artificial Intelligence-Based Cultural Tourism Scene Image Construction and Enhancement System” (Project No.2024CJ008).

References

[1] Lu Yu, Yu Jinglei, Chen Penghe, et al. Educational Applications and Prospects of Generative Artificial Intelligence: A Case Study of the ChatGPT System [J]. Chinese Distance Education, 2023, 43(04): 24-31+51.

[2] Yang Zongkai, Wang Jun, Wu Di, et al. An Analysis of the Impact of ChatGPT/Generative Artificial Intelligence on Education and Corresponding Strategies [J]. Journal of East China Normal University (Education Science Edition), 2023, 41(07): 26-35.

[3] Lin Jing, Zhang Chenchen, Tan Xin. Research on Innovative Design of Artificial Intelligence Integrated with Digital Twins Based on Aesthetic Education for Adolescents [J]. Packaging Engineering, 2024, 45(04): 466-477.

[4] Zhang Zhi. ChatGPT/Generative Artificial Intelligence: Reshaping the Underlying Logic and Potential Pathways of Education [J]. Journal of East China Normal University (Education Science Edition), 2023, 41(07): 131-142.

[5] Zhai Xuesong, Chu Xiaoyan, Jiao Lizhen, et al. Research on Human-Computer Collaborative Learning Models Based on “Generative Artificial Intelligence + Metaverse” [J]. Open Education Research, 2023, 29(05): 26-36.

[6] Li Zhenglin. Unleashing Imagination: Ethical Review of Artificial Intelligence Applications in Education and the Future of Education [J]. Research on Educational Technology, 2023, 44(08): 18-25.

[7] Gu Pengfei. A Further Discussion on the Hermeneutics of Artificial Intelligence Art [J]. Social Sciences Journal, 2024, (04): 183-191+239+241.

[8] Deng Wen. A Study on the Copyrightability of Generative AI Content Represented by ChatGPT [J]. Politics and Law, 2023, (09): 84-97.

[9] Cai Lin, Yang Guangjun. The Dilemma of Recognizing Works Generated by Artificial Intelligence (AIGC) and the Construction of Copyrightability Standards [J]. Publishing and Distribution Research, 2024, (01): 67-74.

[10] Niu Jie. Technology and Fine Arts in Digital Media Art Education [J]. Journal of Shanxi University of Finance and Economics, 2023, 45(S1): 259-261.

[11] Sun Dian, Wang Li, Shang Liyuan. The Connotation, Challenges, and Pathways of Artificial Intelligence Empowering High-Quality Development in China's Higher Education [J]. Modern Education Management, 2024, (06): 34-42.

[12] Zhu Yongxin, Yang Fan. ChatGPT/Generative Artificial Intelligence and Educational Innovation: Opportunities, Challenges, and the Future [J]. Journal of East China Normal University (Educational Science Edition), 2023, 41(07): 1-14.