Innovation and Application of Artificial Intelligence in Basic Art Courses in Vocational College

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Abstract

In the context of the deep integration of digitalization and artificial intelligence technology into higher education, basic art courses in universities are facing an urgent need for innovative teaching models. This study focuses on 30 first-year art students from Quanzhou Light Industry Vocational College. Adopting a quasi experimental research design, combined with pre-test and post test comparisons, questionnaire surveys, interviews, and action research methods, the aim is to explore the application effect of artificial intelligence assisted teaching in basic art courses in universities. The study conducted empirical analysis around the three core dimensions of students' academic performance, practical operation ability, and learning satisfaction. The results showed that AI assisted teaching can significantly improve students' academic performance in art basic courses, with an average score increase of 7.13 points, especially in the dimension of creative uniqueness; Students' practical skills such as dynamic capture and proportional structure have significantly improved; Students' overall satisfaction with AI assisted learning reached 4.25 points (on a 5-point scale), recognizing its value in skill enhancement and creative efficiency optimization. At the same time, research has found that AI tools have high operational complexity and some students have a tendency towards technology dependence. Based on this, this study proposes suggestions such as establishing a "technology+ humanities" collaborative evaluation mechanism and avoiding technology dependence. This study validates the effectiveness of combining artificial intelligence with basic art courses in universities, providing practical reference and theoretical support for the digital transformation of vocational art education.

Keywords: Artificial Intelligence in Education, Vocational Art Education, Instructional Innovation

1. Background and Significance of the Problem

In vocational education, most students majoring in art have weak painting foundations, and the traditional art teaching model is rigid, relying on teachers' experience demonstrations and students' repeated copying exercises. There are problems such as delayed teaching feedback, lack of personalized guidance, and low training efficiency. Long term, single training mode can easily lead to students losing interest in learning, lacking professional confidence, and struggling to adapt to the current demand for innovative and digital talents in the design industry. With the deep integration of digital technology and higher education, artificial intelligence technology is gradually reshaping the

teaching landscape in universities, providing a new path for the reform of basic art courses. Many domestic universities have carried out AI-empowered teaching practices, such as the Intelligent Learning Companion at Tsinghua University and the Artificial Intelligence Literacy Course at Sichuan University, to achieve personalized and efficient teaching implementation. Integrating AI technology into basic art courses in vocational colleges can compensate for the shortcomings of traditional teaching, optimize teaching modes, enrich teaching scenarios, help students consolidate professional skills, cultivate digital art thinking, and promote the digital transformation of art education. This has important practical necessity.

2. Research Purpose

his study focuses on the pain points of basic art course teaching in higher vocational education, explores the deep integration path of artificial intelligence technology with core courses such as sketch and rapid drawing, and constructs a new teaching model of "traditional techniques + AI assistance". Through empirical research, it verifies the improvement effect of AI tools on students' art modeling ability, color perception, and innovative thinking. It analyzes the acceptance and existing problems of teachers and students towards AI-assisted teaching, and avoids drawbacks such as technology dependence. Ultimately, it forms an AI application framework and practical scheme suitable for higher vocational art teaching, providing theoretical support and practical reference for the digital reform of basic art courses in colleges and universities.

3. Research hypothesis

This study adopts a mixed research method, combining quantitative and qualitative analysis to ensure the scientificity and comprehensiveness of the research. Specifically, it includes three research methods: The first approach is action research. A semester of teaching practice is conducted in selected training classes, advancing AI-integrated teaching in three stages: In the initial stage, AI tools are utilized for basic technique error correction training, recording teaching issues and optimizing plans; in the middle stage, an intelligent painting evaluation system is employed to achieve quantitative scoring and precise guidance for works; in the later stage, multiple AI tools are integrated to conduct human-machine collaborative creative writing training, forming a closed-loop teaching model of "practice-reflection-optimization". The second method is the comparative experimental approach. A traditional teaching control group and an AI-assisted teaching experimental group are established, with both groups maintaining consistency in student foundation, class hours, and course content. At the end of the semester, the learning outcomes of the two groups are quantitatively compared across four dimensions: modeling accuracy, visual expression, creativity, and completion efficiency, to verify the effectiveness of AI-assisted teaching. The third method is questionnaire survey and interview. Questionnaires are distributed at the pre-teaching, during-teaching, and post-teaching stages to investigate teachers' and students' experience with AI tools, teaching satisfaction, and changes in learning outcomes. At the same

time, semi-structured interviews are conducted with students of different levels of proficiency and instructors to delve into the underlying issues behind the quantitative data and supplement research details.

4. Research scope

This study selected 30 first-year art major students from Quanzhou Vocational College of Light Industry as research subjects. All students had no prior experience in deep AI art learning, had similar painting foundations, were in good physical and mental health, and voluntarily participated in this study and signed the informed consent form. Additionally, two senior art instructors were included as interviewees. These instructors had rich traditional teaching experience and were willing to explore digital teaching methods, ensuring sample representativeness.

5. research methodology

Data collection is divided into four stages: pre-testing in the early stage, which involves professional drawing tests and questionnaire surveys to grasp students' initial drawing abilities, AI cognitive levels, and learning attitudes; mid-term teaching intervention, which involves implementing AI-assisted teaching in stages and dynamically tracking learning data; post-testing in the later stage, which compares students' professional ability changes before and after intervention; and finally, comprehensive analysis is completed by combining questionnaire, interview, and artwork scoring data. Data analysis employs a combination of quantitative and qualitative methods: quantitatively, descriptive statistics, correlation analysis, and paired t-tests are used to verify the significance of AI teaching in enhancing students' skills; qualitatively, coding is employed to organize interview texts, extract teaching strengths, existing problems, and optimization directions, achieving cross-validation of data.

6. Research instruments

This study employs five core research tools: first, mainstream AI art assistance tools (such as Art Plus AI, Midjourney, Upscayl, etc.), which are used for classroom teaching intervention; second, a self-developed questionnaire on teachers' and students' cognition and application of AI teaching; third, a test question bank for basic art skills (still life sketch and figure sketch), which is used for pre- and post-test ability assessment; fourth, a Likert 5-point satisfaction scale to evaluate the effectiveness of teaching implementation; fifth, a semi-structured interview outline for teachers and students, which is used for qualitative data collection.

7. Data collection

Data collection is divided into four stages: pre-testing in the early stage, where professional drawing tests and questionnaire surveys are conducted to grasp students' initial drawing abilities, AI cognitive levels, and learning attitudes; mid-term teaching intervention, where AI-assisted teaching is

carried out in stages, and learning data is dynamically tracked; post-testing in the later stage, where changes in students' professional abilities before and after intervention are compared; and finally, comprehensive analysis is completed by combining questionnaire, interview, and artwork scoring data.

8. Data analysis

Data analysis employs a combination of quantitative and qualitative methods: quantitatively, descriptive statistics, correlation analysis, and paired t-tests are used to verify the significance of AI teaching in enhancing students' skills; qualitatively, coding is employed to organize interview transcripts, extract teaching strengths, existing issues, and optimization directions, achieving cross-validation of data.

9. Research Summary

9.1 Artificial intelligence assisted teaching can significantly improve students' grades and professional skills. The real-time diagnosis, precise error correction, and creativity empowerment functions of artificial intelligence can effectively improve students' professional abilities, and the teaching effect is better than traditional models.

9.2 Students have shown a high level of acceptance and satisfaction towards integrating artificial intelligence into art courses. Artificial intelligence tools effectively lower the learning threshold for basic painting and stimulate students' interest in learning.

9.3 The implementation of artificial intelligence art teaching still faces many obstacles. Insufficient adaptability of tools, uneven operational abilities of students, potential risks of technological dependence, and the need for teachers to improve their digital literacy.

10. Suggestions/Recommendation

10.1 Build a hierarchical and progressive AI teaching system. In the basic stage of freshman year, traditional hand-drawn training is the main focus, with AI serving only as a tool for detail reference and work appreciation, to solidify students' foundation. In the improvement stage, AI-based intelligent diagnosis is utilized to carry out specialized error correction training. In the innovation stage, students are encouraged to collaborate with AI in creative works, balancing skill enhancement and creativity cultivation while avoiding technological dependence.

10.2 Strengthen the cultivation of teachers' digital literacy. Universities should regularly conduct specialized training on AI art teaching, covering topics such as tool operation, instructional design, and ethical norms. Establish inter-school communication platforms, promote mature teaching cases, and enhance teachers' digital teaching capabilities.

10.3 Optimize the construction of AI teaching tools and resources. Collaborate with enterprises to customize simplified AI tools tailored for vocational art courses, lowering the operational threshold. Establish an on-campus AI art teaching resource library, integrating tutorials, cases, and specialized exercises to enhance digital teaching resources.

10.4 Establish a diversified and collaborative teaching evaluation system. Break away from the single skill evaluation model, integrate diverse indicators such as hand-drawing ability, AI application ability, originality of creation, and innovative thinking, and combine teacher and student mutual evaluation with process data to achieve comprehensive evaluation.

10.5 Future research can expand the sample size, extend the research period, and explore the long-term effects of AI teaching; expand the application research of AI in various basic art courses; deepen the exploration of AI teaching ethics, educational equity, and other fields, improve the "technology-teaching-ethics" three-in-one teaching system, and promote the high-quality digital development of vocational art education.

11. References

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