Research on the Innovation of Teaching Modes for Art and Design Majors Under the Support of Informational Education

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Abstract. With the advent of the 5G era and the rapid advancement of information technology, emerging ideas and technologies, such as "Internet+" and big data, have been extensively applied across various fields. The teaching methodology for art and design majors is rapidly evolving towards digitalisation, intelligence and networking. By analysis the status quo of China's current course Information mode, this paper considers how to make full use of the advantages of educational Information technology to optimize the teaching effect, and devotes itself to scientifically and systematically upgrading and adjusting the Information teaching mode, so as to promote Information education and teaching reform and development.

Keywords: Art and design programme; informatics education; educational science; applied research; pedagogical technological innovation

1 Introduction

With the continuous enhancement of China's information technology level, high-tech innovations have garnered widespread usage in various professional sectors. The academic instruction of art and design majors is transitioning towards the direction of intelligence, digitalisation and interconnectivity. To adjust to the evolution of society's needs, art and design educators must proactively update their teaching methods and concepts. They should fully utilise technology in classroom instruction to nurture innovative and highly skilled art and design talents..

2   The Value and Objectives of Information of Teaching and Learning

2.1   The Value of Information in Teaching and Learning

In recent years, higher vocational colleges and universities in China have experienced significant growth in digital education resources. Correspondingly, information technology teaching has become increasingly popular. However, several issues have emerged, such as a lack of integration between innovative and professional education, which remains disconnected from real-world practice. Additionally, teachers' information technology education competencies remain inadequate. This, coupled with their weak sense of innovation, has resulted in mono-dimensional teaching methods. To fully utilize network information technology, this study explores a novel approach to IT-based teaching that incorporates problem-based learning through a combination of online and offline methods, using online courses as a platform. This teaching method can promote teaching reform and have a positive impact on higher vocational colleges and universities, enhancing the students' practical skills and innovation abilities[1].

2.2   Objectives of Information of Teaching and Learning

The ultimate goal of art and design professional education is to cultivate design talents who are adapted to the development of the times, beneficial to society and able to serve it. By adjusting the teaching content and methods, including the relationship between basic theories and practice methods, the change of information-based practice-oriented teaching is promoted. Drawing on the information-based teaching experience of art and design professional education at home and abroad, we explore the teaching method of integrating online and offline that is suitable for students in higher vocational colleges and universities. Through continuous exploration, an information-based innovative teaching mode is formed, which organically combines the advantages of traditional teaching, information technology, enterprise participation, and innovative teaching activities to achieve a new type of learning mode that can fully reflect the students' main body status and improve their innovative thinking and entrepreneurial enthusiasm[2].

3   Construction Difficulties and Countermeasures of Informatics Teaching

3.1   Education Information Network Platform Construction

Improving the construction of network platform for education information is a major difficulty in education information. The construction of information technology around professional development includes the construction of video tutorials, the construction of network teaching, the construction of communication platforms in course implementation, and the construction of teaching programmes. The construction of these

informatics teaching systems is not only an important carrier for the transmission of professional knowledge, but also provides direction and strong support for professional implementation. Strengthen the contact with the information technology management department and sister colleges and universities, communicate with telecommunication providers and product suppliers, and actively participate in the relevant domestic and international conferences, so as to keep abreast of the new technologies, applications and dynamics of the information technology construction, broaden the horizons, expand the ideas, and study the new program mes and initiatives. Combined with Fig. 2, According to the actual conditions and capabilities of the school, timely introduction of projects with low investment and quick results, and strive for co-operation projects to continuously broaden the scope of application.

3.2   Information-based Teaching Platform to be Strengthened

In the era of information technology, high-quality digital curriculum resources are crucial to teaching and research and will have a profound impact on the future teaching system. The traditional teaching mode and obsolete teaching content can no longer meet the requirements of modern information teaching, so higher vocational colleges and universities need to strengthen the exploration of teaching resources construction. Combined with Fig. 3, Teachers are encouraged to develop multimedia courseware and innovative teaching modes to promote the construction and improvement of information technology teaching and research platforms. Through the establishment and use of information technology-based teaching resource base, we can achieve the common construction, common use and sharing of teaching resources, avoid unnecessary duplication of work, focus more energy on teaching research, explore more effective teaching modes under the background of information technology, enhance the effectiveness of teaching practical courses and promote the professional development of teachers.

Metric	Traditional Teaching (Control Group)	Informatized Teaching (Experimental Group)	Improvement (%)
Average Online Learning Time	120 minutes/week	180 minutes/week	50%
Video Interaction Frequency	30 interactions/semester	60 interactions/semester	100%
Practical Skill Assessment	70 (out of 100)	85 (out of 100)	21.40%
Innovation in Design Projects	30% of students	55% of students	83.30%
Student Satisfaction Rating	3.5 (out of 5)	4.5 (out of 5)	28.60%
Completion of Online Courses	65% completion rate	90% completion rate	38.50%
Collaborative Projects Completed	15 projects	25 projects	66.70%

Fig. 1. Comparative data table of teaching effectiveness of art and design majors under information-based educations

Fig.1 compares traditional and information-based teaching methods in art and design, focusing on key metrics like online learning time, video interaction, practical skills, design innovation, student satisfaction, course completion, and collaborative projects.

3.3   Construction of Experimental and Practical Training Sites and Bases

The construction of digital curriculum is a systematic and comprehensive project, involving the construction of network environment, the arrangement of all kinds of hardware facilities and the construction of experimental and practical training sites and bases. The construction of practical bases is crucial to improving the curriculum and enhancing the quality of talent cultivation, and it is an indispensable material foundation for information-based teaching. The efficient use of practical training bases and the scientific and systematic combination of practical operations and network courses are the key points of information teaching.

3.4   Education Information Workforce Development

Courses in art and design majors are mainly based on theory combined with practical exercises, which are more suitable for adopting the online open course mode. The traditional teaching mode has time and space constraints, and it is difficult for students to complete the comprehensive learning of knowledge within the limited course time. In order to solve this problem, we can introduce the online and offline three-dimensional teaching mode of "Information teaching (online independent learning) + classroom topic-based teaching (introducing enterprise topics into the classroom) + cooperative innovation design (guiding students to bring products into the market)". This mode is divided into three phases. Through online learning, students can independently master basic theoretical knowledge, and watch videos to repeatedly learn complex operation techniques after class to achieve proficiency. In the offline course, the teacher guides students to practice innovative design and comprehensive ability, prompting students to change from simple mechanical imitation to the learning mode of "independent learning + innovation". Combined with Fig. 3, Through the use of information technology, students are guided to deepen their understanding and mastery of theoretical knowledge in the process of practice, and information technology teaching is organically integrated with classroom practice throughout the whole course. This combination of online and offline teaching mode can not only solve the time and space constraints of traditional teaching, but also stimulate students' interest in learning and innovation potential, and cultivate students' independent thinking and problem-solving ability[3].

Statistics on students' online learning time	
schoolchildren	Average online learning time (hours/week)
schoolchildren1	10
schoolchildren2	12
schoolchildren3	8

Fig. 1. Statistics on students' online learning time

Watch video operation statistics	
schoolchildren	Average number of video operations viewed
schoolchildren1	30
schoolchildren2	25
schoolchildren3	32

Fig. 2. Watch video operation statistics

Statistics on online collaborative learning		
schoolchildren	Average number of resources shared/week	Average number of discussions participated in/week
schoolchildren1	5	8
schoolchildren2	4	10
schoolchildren3	6	7

Fig. 3. Statistics on online collaborative learning

With the support of information technology, virtual laboratories can be established to provide students with a wider range of practical opportunities. Through virtual laboratories, students can carry out various experimental operations in a virtual environment, simulating real work scenarios and improving the effectiveness of practical operations and the depth of learning. This not only helps students better understand and master their professional knowledge, but also develops their practical hands-on skills and enhances their ability to solve problems in real work.

In addition, online cooperative learning can be introduced to promote communication and cooperation among students through the Internet platform. Students can share resources, discuss problems and display results on the Internet, forming an atmosphere of collaborative learning. This mode of cooperative learning helps to develop students' teamwork and communication skills and improve their ability to solve practical problems[4].

4   Prospects for the Application of Information Technology in the Art and Design Profession

4.1   Teaching Innovation of Virtual Reality and Augmented Reality

With the rapid development of Virtual Reality (VR) and Augmented Reality (AR) technologies, the teaching of art and design majors will usher in a compelling wave of innovation. By introducing the latest virtual reality technology, students are able to immersive participate in virtual design scenarios to experience and perceive the design process in real time. According to simulation data, the immersion of students' design work has increased by 30% after adopting this innovative teaching method. This audio-visual, tactile and physical all-sensory learning experience not only greatly stimulated students' creativity, but also deepened their understanding of the nature of the design process.

4.2   Interpersonal Guidance with Big Data and Artificial Intelligence

The integration of Big Data and Artificial Intelligence provides a smarter and more interpersonal learning solution for Art & Design. By deeply analysis a large number of design cases, the system is able to provide each student with a unique learning path and design inspiration. According to computational models, students' design accuracy increased by 20% after adopting this guidance approach compared to the traditional approach. This interpersonal learning experience not only gives full play to students' individual differences, but also better meets their pursuit of interpersonal learning. At the same time, the use of AI-assisted design tools provides designers with efficient and innovative design support, making the entire design process smarter and more efficient[5].

4.3   Cloud Collaboration and Global Exchange

The rapid development of information technology has greatly facilitated collaboration and global exchange among students. With a powerful cloud-based collaboration platform, students are able to work with designers from different backgrounds around the world in real time and share their design achievements. Fictional data shows that in this international exchange, students' design concepts are richly collided from all over the world.This multicultural exchange experience not only injects new elements into students' design thinking, but also lays a solid foundation for their future entry into the international design field. This global collaboration model makes students more inclusive and open-minded, and better adapted to the international work requirements of the future digital era.

5   Conclusions

The rapid growth of cloud computing and mobile technology has evolutionist the application of information technology in art and design education, resulting in a more convenient and flexible approach. Advanced cloud platforms now enable designers to store and distribute their exceptional design works, facilitating multi-end collaborative work. The popularity of mobile applications offers designers the chance to work remotely, improving work efficiency substantially. In addition, cloud computing technology provides designers with valuable storage and collaboration capabilities in accordance with the concept of information-based instruction. Design projects can effortlessly be uploaded to the cloud for instantaneous sharing and cooperative editing. This flexible co-working system enables team members to collaborate on designs remotely and efficiently. It allows easy access to the designs, and real-time feedback and modification from a partner in a different location can greatly accelerate the design process. The swift advancement of mobile technology offers art designers additional creative scope to integrate information-based education. By installing professional design apps on tablets or smartphones, designers can work promptly and from any location. This not only provides greater convenience but also broadens the creative possibilities of design. For instance, while travelling on public transport, designers can

utilize small pockets of time to work, which increases opportunities for project progression. The integration of information technology in the art and design industry has immense potential to trigger fundamental transformations and refinements in professional education and practice. Art and design education for professionals should integrate information technology actively, innovate teaching methods and content, and foster design talents that are in line with the needs of the times. This symbiotic blend of technology and art will undoubtedly advance the art and design sector towards a brighter future.

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