Application and Innovation of Network Education Technology in the Teaching of Visual Communication Design in Colleges and Universities

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Abstract: The popularization and rapid development of network education in the art education of contemporary colleges and universities pose a challenge on the ideas, theories and methods of Chinese art education both in theoretical and practical terms. The network teaching of visual communication design in colleges and universities has applied various new network media technologies, has optimized and combined image technology, sound technology, recognition technology, photography and video technology, interactive techniques, light and shadow technology, TV media technology and other media and has released a student-centered teaching model in art education across schools and regions. With the continuous progress of science and technology, the widespread application of multi-dimensional space, virtual reality, augmented reality, artificial intelligence and others in network teaching and even the possibility of biological science, quantum science and other frontier research participating in network teaching have made various software, hardware and technology application constantly updated and changed and made our network education of art design constantly face reform and iteration, and constantly inspire the progress of course design and the innovation of teaching practice.

1. Application value of the development of network education technology in the teaching of visual communication design

1.1 Expand contents to improve the efficiency of visual communication design teaching

In the field of education, handheld digital tools that use wireless mobile devices to access the Internet within 24 hours/7 days are opening up new approaches for learning. With the advent of social media and the rise of the Web, school managers and teachers are paying more and more attention to creating learning opportunities by use of mobile technology. These are opportunities for the development of digital courses and teaching. The network education technology with openness and universality makes the resources and contents of art teaching in colleges and universities wider, more comprehensive and more real-time. The application of network education technology in the course selection of visual communication design teaching and actual teaching can effectively expand the course teaching content of theory and practice. The application of network education technology in the teaching of visual communication design helps students master the theoretical and practical knowledge of visual communication design and improve their learning efficiency.

The network course teaching of visual communication design focuses on the source and specific knowledge system of art design experience and art education imported to students by designers or visual communication design experts and professors. In the development of network art courses, the new understanding of visual senses entered teaches students to use different senses for learning practice, thus making them mobilize their emotions, imagination, memory, body and spirit to achieve education goals while conducting the cognition.

In order to develop a content platform for visual communication design teaching, we have found many interactively created art design classrooms and art centers, databases, museums, libraries, etc., through which we can not only get rich resources, but also output a lot of teaching classroom contents. For example, in addition to provision of contents required for specialized courses of

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students, once various multimedia videos and audios recorded for courses by use of professional equipment and facilities are published to the public education network or public network, the network content capacity of the major is expanded and the breadth and quality of the art experience content of the online audience or learners are increased, it will enhance the overall teaching efficiency in the field of visual communication design.

1.2 The independent learning of students is realized through interactive teaching form

Promoting the development of students' visual communication design knowledge and performance-related skills is the main purpose of teaching of visual communication design in colleges and universities and improves students' art design learning ability. The application of network education technology in the teaching process of visual communication design promotes art and design teaching resources to be integrated by the course, so that students can share effective professional teaching resources. In the teaching of visual communication design, interactive teaching forms are often used. Professional teachers interact with students through video, audio or recognition technology in the implementation of teaching, and encourage students to have a good habit of independent learning and mutual learning on the platform before, after and during class.

In our conventional teaching of traditional visual communication design, the teacher-centered teaching is often adopted and the emphasis on stimulation of external factors in teaching is better than observing students' psychological reactions, making students learn passively. The interaction of network education is actually a powerful gravitational force and triggers students' strong intrinsic interest and proactive thinking. The application of interactive network education technology can be more student-centered and can be centered on its independent professional learning in the teaching of visual communication design. The enthusiasm of students and their domestic demand have been mobilized, and the students' potential of research and cognition of visual communication and design has been fully developed.

1.3 Data records provide effective personalized teaching approaches

The network teaching not only provides an interactive and flexible learning environment, but also completes the process of real-time data recording, collection and update while realizing real-time asynchronous interaction between professional teaching information and students, students and students, teachers and students. For example, different network questions and online answers, a question raised by a student to a teacher through the network, or problems discussed between classmates or recorded questions when the collaborative learning is conducted are recorded in big network big data system. The development of the teaching plan and course content is based on the follow-up data records of the students' learning progress, and is also linked to the database. Therefore, the disadvantages of the separation between teachers and students and the separation between students caused by network education to the professional learning environment can be avoided in the teaching of visual communication design. The database is used to create a professional learning environment, establish personal learning file for students, and analyze the learning background, knowledge base, learning method, learning style, learning ability and other individual differences of different students and establish a personalized learner model. The data analysis, artificial intelligence and other network education technologies are used for inference. The teaching of visual communication design provides an effective teaching path to enhance the adaptability of network teaching system to the learning of distance art major. Therefore, the two-way adaptive mechanism between students and the system in remote network learning is realized, so that the network learning of visual communication design can be more directional, more concerned about different individuals or clusters, and more mature.

1.4 The platform-based extension classroom helps students develop in an all-around way

The online education system lit by Internet technology builds a big intelligent classroom based on independent learning. In the teaching of visual communication design in colleges and universities, the platform is relied on to integrate and optimize resources, thus creating an environment for teachers and students to learn and grow on the Internet. The platform-based

extension classroom can make students form the consciousness of learning art design, and guide students to apply network education technology to practice visual communication design theory knowledge and digital media design, constitution design, sculpture installation, interactive art design and other professional skills. The network education platform, including professional platform and cross-border platform, has created a three-dimensional and multi-dimensional learning environment, and has created communication between teachers and students, between students and between school learners and the outside world. With the development of computer network technology and the development and application of network functions, teaching activities participated by use of social network platforms such as campus BBS forum, chat room, guestbook, WeChat group, QQ group, and various conference systems have emerged endlessly to achieve unique professional teaching and learning. Students carry out learning in forms of group discussion and entry into virtual space, such as visual communication speeches and feedback, online interactive question answering, topic debate and seminar, video simulation exercise, accent synchronization training. In a broad, active and free platform environment, students, as members of the learning community, discuss a design point of view independently, equally and friendly, study the difficulties of a design, debate the positioning of a design, and jointly plan and create a creative visual communication design project, etc. Such an open platform-based extension teaching makes each student's private opinions and wisdom shared by the whole group. The network platform resources with openness, sharing and developability have broken through the limitations of visual communication design course classrooms and textbooks to achieve the purpose of helping students realize healthy and all-around development.

2. Disadvantages of application of network education technology in the current teaching of visual communication design

2.1 Limitations of application of network education model in practice teaching of visual communication design

In the process of visual communication design teaching, teachers use the Internet platform for main classroom teaching, assisted teaching and collaborative teaching. The mode of teachers guiding students to carry out independent interactive learning is the basic mode of network education. Various network education technologies used in practice teaching of visual communication design in colleges and universities help integrate and refine various effective network resources, and support the interactive form of dynamic teaching and learning. Such an educational mode is applied to the teaching of visual communication design courses and is beneficial to increasing the breadth and depth of the classroom and theoretical research efficiency, but it has certain limitations for the practice teaching of visual communication design. First of all, as the network classroom is newly developed, most of art design teachers fail to fully understand and master the professional network teaching system and application technology. In the process of practice of visual communication design and teaching of practical operation courses, teachers can't achieve effective teaching of relevant training, performance and creation and other practice courses and can't realize the control of the classroom and the management of students because they can't operate the network education technology masterly, thus resulting in deviations of teaching purposes from effect. Secondly, the advantage of practice teaching of visual communication design courses is the on-the-spot teaching of combination of theory with practice and students' substantial progress in professional learning is realized usually through real scene case, words and deeds and real-time error correction of teachers in class. The current network education is technically unable to achieve the teaching effect of making students personally on the scene, which is also the limitation of network education on the practice courses of visual communication design.

2.2 Scarcity and misuse of network education resources in the teaching of visual communication design

In the theory teaching of visual communication design in China's colleges and universities, there

are some problems in the network teaching resources, basically including mixed resources, lack of textbooks, backward search engine and inability to push accurately. Firstly, we have very rich paper textbooks, materials and reference books of visual communication design theory, but the great majority of these professional books and materials are collected by professional colleges or institutions, and aren't to be public, so it's difficult to search them on the Internet. Secondly, the textbooks on visual communication design theory currently used in domestic network teaching are of diverse varieties, messy compilation, no systematicness and relevance, and cannot effectively reflect the professional teaching rules of visual communication design; Thirdly, in the textbooks of Chinese schools of arts, the construction of network textbooks of the visual communication design theory lacks guidance and only some contents of the visual communication design paper textbooks are copied partially and electronically, resulting in incompleteness, knowledge system incoherence and other issues in the professional course textbooks in theory. Fourthly, it becomes very difficult to use the Internet to directly look for international data on relevant visual communication design theory or platforms and libraries with open links due to domestic and foreign network limitations. The firewall of this network blocks the provision of international textbooks on visual communication design theory, and confines the teaching and learning resources to a very small range; Fifthly, we find that the search engines of social platforms, news platforms, shopping platforms, and other platforms are very advanced, and intelligent push is being optimized continuously, but the search engines of resource platforms or websites related to visual communication design theory are relatively simple and backward. They are basically focused on searching words and expressions, and don't even have the picture recognition function, so that the teaching of visual communication design theory is much less supported by textbooks and related resources; Sixthly, the importance to timely communication and exchange between students and between teachers and students must be attached in the network teaching of visual communication design theory. Some school websites and teaching platforms only attach importance to presentation in class, simply play teaching videos and audios, and pay no attention to interactive communication channels. Or even if a communication channel is set up, but the channel is always in an inactive state, without delivering textbooks, asking questions and answering questions, so such an interactive channel exists in name only. This is neither beneficial to the development of students' independent learning, nor to the efficiency of network teaching and learning in visual communication design.

3. Teaching strategies of network education technology in the teaching of visual communication design in colleges and universities

3.1 Apply the network education technology to manage the teaching process of visual communication design

We can support the teaching process of visual communication design through a large amount of content resources and advanced network application technology, and constantly optimize the teaching link of professional courses. In the current art design teaching in China's colleges and universities, the network education technology is only regarded as an assisted teaching means of the traditional classroom, and its role of optimizing art teaching hasn't been fully played. Therefore, professional course teachers should lay emphasis on the course objectives of the design course in the teaching, and effectively and reasonably apply network education technology to manage and innovate all teaching links of visual communication design in the teaching of visual communication design in colleges and universities.

In the teaching implementation process of visual communication design, teachers can effectively manage and control the teaching process, find various beneficial network resources, and design and optimize course contents by applying the good enough technology. When participating in online courses and preparing to use course resources for learning, students must first register a student account, and then can participate in courses, take lessons, interactively ask and answer questions, follow up the classroom learning content, deliver homework, etc. by use of the registered network

learning identity and can also interact with their teachers or classmates after class through the network teaching platform. The network education technology can help schools monitor and manage the teaching of visual communication design, and help teachers monitor and manage students' learning of professional courses to confirm the progress of students' major development. The network education technology participates in the staged assessment and final examination of students, so that teachers can do statistics and analysis of students' achievements in different learning periods, and modify and optimize the course strategy and implementation details based on the assessment and analysis results. This not only provides the basis for individualized teaching for a design student, but also optimizes the teaching management of a certain design major course.

The remote interactive processing, automatic management function and other network education technologies support the teaching management automation of visual communication design and can be applied to the teaching and teaching affairs management of visual communication design network education. The computer network teaching management platform has remote interactive processing and automatic management functions, and its technology can support teaching management automation of visual communication design. The network remote interactive system has a very wide management scope, so we have every reason to achieve intelligent management by relying on this network education technology.

3.2 Apply the network education technology to expand the teaching content of visual communication design

As for a series of courses in the direction of visual communication design, it has very limited network education contents, and professional courses offered on the network teaching platform are largely limited by traditional disciplines. As the times are developing, and the demand for talents by the world, state, provinces and cities, and communities is constantly being updated with the progress of the society, the course design that meets the needs of the society should combine theory with practice well in content to convey applicable talents to the country or the community as the foundation of knowledge and abilities. There is a popular vane of era on the Internet, so the content trend of art education can be analyzed through network big data to make the design of course content both fashionable and cutting-edge and basic and practical. The design of visual communication design teaching content should meet students who have clear learning needs, so that they can find suitable course resources and paths. For example, there are three courses designed in the teaching of visual communication design. The first course is about the introduction of visual communication design, including art design appreciation and design knowledge. It is short-term; the second course is about the theory and practice teaching of visual communication art and design technology, including professional training methods and design practice. It is long-term; the third course is about realization of the dream to be a visual communication artist and designer, including the creation of visual works and network exhibitions. It is an open and extensible course content. We can set up a linear order learning process for these contents, and disassemble the learning of the course content into three steps, so that the learners can learn easily and step by step, and have a sense of gain. Therefore, the purpose of our course is realized. In fact, this setting divides learners into three types, namely appreciators who are interested in visual communication design, learners who are passionate about visual communication design, and artists and designers who pursue visual communication design (or future artists and designers).

4. Innovation of teaching of visual communication design in colleges and universities based on the development of network education technology

4.1 Innovation of network education courses for teaching of visual communication design in colleges and universities

The innovation of design of visual communication design courses in network teaching emphasizes content innovation and form innovation. The teaching resources can be maximized through network teaching technology. We can find a variety of education teaching resource libraries

and resource platforms on the Internet, which make the course content be extended to a great extent. The huge expansion of the amount of related information will inevitably trigger the reform of course design and make the visual communication design education in colleges and universities transcend the limitations of the campus, so that a larger education territory has been opened up, and may be extended at any time. This is also an opportunity for colleges and universities to give full play to their own advantages in art education resources and disciplines, and to be bold in innovation. The teaching form of visual communication design is changeable in network education. We can systematically track, collect and sort students' information and data and learning process in real time when using network information database program, control software, interactive program and other network applications. The network teaching and learning service system can provide personalized learning suggestions to any student according to students' personalized materials and needs. This is very beneficial to realization of personalized teaching design innovation based on accurate data. When visual communication design teaching is organized, our network education puts a particular emphasis on learning interest and the enhancement of teacher-student interaction. In addition to the one-to-one mode, one-to-many mode, BBS mode, video communication mode, etc., more diverse and innovative learning modes can be expanded, to achieve broader interaction, stimulate students to learn more actively, and achieve effective learning.

4.2 Innovation of role of network education teachers for teaching of visual communication design in colleges and universities

Every professional teacher undertakes the task of teaching organization and instruction in the teaching of network visual communication design. They teach students and help students use the network to realize classroom and after-school learning through relying on the network system in teaching. Compared with physical classrooms, the role of teachers has changed in network virtual classrooms. They transform them into a diversified, student-centered and dynamic professional knowledge guider role. In the teaching process of visual communication design, the teacher is not only the organizer of a course, but also the direct instructor of the course and also an assistant partner for students to learn through the network. He guides students to establish learning goals, updates learning content, organizes learning activities and helps students solve problems. Teachers and students often change their roles on the Internet. Teachers must not only master the professional knowledge of teaching of visual communication design, but also design personalized network teaching software for the characteristics of different students according to the teaching program of visual communication design, so this requires teachers to have skilled network education technology, cross-border knowledge and comprehensive capabilities. Today, with ever-changing information, teachers must use innovative design ideas and innovative methods to guide teaching, continuously develop and improve teaching, and lead students to use high-quality professional theoretical and practical resources on the Internet to help students develop their visual communication design skills.

4.3 Innovation of network education course platform for teaching of visual communication design in colleges and universities

With the rapid development of computer network technology and communication technology, the function of the network education platform has become increasingly powerful and perfect with the development of computer network technology and communication technology. Because of the innovation of the network education platform of visual communication design teaching, students' visual communication design courses can be completely put on the Internet, including learning, training and operation of theoretical courses, and learning and assessment of practice courses. For example, behavior performance visual courses can be learned on the Internet through voice recognition, while the image training and color training can be completed by relying on application of mature objects and color recognition technology in the network. For courses with greater operation difficulty such as multimedia interactive device design or interactive space design, we can also implement non-contact teaching through wide-angle camera, video motion capture software and motion recognition software, etc. The complexity of visual communication design course

teaching promotes the innovative application of various high-tech technologies on the network teaching platform, such as virtual reality technology, augmented reality technology, glasses-free 3D technology, brain waves, neuroscience, artificial intelligence. The openness of the network platform provides a wide space for teaching of visual communication design. Based on the platform's dynamic resource advantages, we have created a special space, which is a "virtual visual communication design works exhibition hall" created for interaction. Students carry on training in virtual classrooms and their works are exhibited in the exhibition hall. Various forms of works that students creatively design are made into multimedia content and presented through the open network in the exhibition hall. The real-time visual content delivery can also be achieved. Students' learning outcomes are publicly shown in the form of an exhibition hall, which is an innovative experiment of the network immersive experience teaching on the platform. The innovation of the network education course platform allows anything imaginable to be likely to happen.

5. Conclusion

The wireless access with higher traffic and 5G application and the constantly changing and updated network environment have brought various innovative challenges and opportunities for the teaching of visual communication design in colleges and universities. When students use the World Wide Web, peer-to-peer network, telephone network, and transportation network to create their works, their creations will benefit from the unique possibilities that the network system can provide, such as global synchronization, anonymity, collective intelligence, shared creation, randomness and occasionality. Only through continuous breakthroughs and innovations can visual communication design network teaching meet the students' demand for borderless learning and interactive learning, thus cultivating talents for the current learning society.

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