

Research on the Construction of Virtual Reality Technology Major Course System

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Abstract: Along with virtual reality technology is widely used in all walks of life, China's social and economic development urgently needs high-quality innovative, and compound virtual reality technical personnel. In this context, as the main front of training virtual technical talents, universities are urgently required to promote the innovative construction and deepening reform of the virtual reality technology curriculum system, and on this basis to promote the deep integration of the industrial chain, innovation chain, discipline chain and talent chain. Based on this, combined with the background of the optimization of the curriculum system of virtual reality technology major in colleges and universities under the new situation, this paper discusses the specific optimization path by elaborating the relevant optimization ideas to improve the quality of talent training for virtual reality technology majors.

Keywords: Virtual reality technology; Curriculum system; Construction path

Online publication: December 31, 2024

1. Introduction

As a new type of interdisciplinary discipline, virtual technology major is highly innovative, applicable and practical. As a result, some colleges and universities are faced with the dilemma of lagging behind the development of the industry in the aspects of specialty construction, course resource construction and teacher introduction, which further affects the effectiveness of virtual technical personnel training. Thus, it can be seen that the construction of feasible virtual technical personnel training program is of great practical significance for universities to optimize the construction of virtual technical majors. The construction of the curriculum system is the core and carrier of talent training. Therefore, taking the market demand as the guidance, by docking with the national vocational standards, the construction of the virtual reality technology professional curriculum system of colleges and universities based on vocational ability training is conducive to fundamentally promoting the sustainable development of the virtual reality industry.

2. The optimization background of the virtual reality technology curriculum system

Empowered by the new round of scientific and technological revolution, the continuous industrial transformation has fundamentally promoted the reshaping and reconstruction of the global economic structure and the global innovation landscape ^[1]. Virtual reality technology was born in this round of scientific and technological change, which gathers the advantages of digital technology in many fields, and creates new economic growth points and emerging industries with great development prospects for China's social and economic development. Therefore, to enable the implementation of the strategy of "strong science and technology" and the development and transformation of the virtual reality industry, in 2020, the country will incorporate virtual reality technology into the scope of undergraduate education, and support the first group of universities to set up a "major of virtual reality technology." Since then, the virtual reality technology major has formally entered a new stage of systematic development and connotative construction. Combined with the vigorous development of China's virtual reality industry at the present stage, it is urgent for colleges and universities with virtual reality technology majors to highlight their history, conditions and advantageous resources in the construction of virtual reality technology curriculum system, and then train high-quality talents in the field of virtual reality to promote social and economic development ^[2].

Curriculum is the basic element of training virtual reality technical talents in colleges and universities, and the important cornerstone of achieving training goals. Constructing a perfect curriculum system is the key to promoting the connotative construction of virtual reality technology majors. However, due to the existence of education lag, that is, there is a significant difference in time between the adjustment of education policy and course system of virtual reality technology majors in colleges and universities and the needs of society, industry, and enterprises at the present stage. In this regard, ways to train students to meet their social needs, guide them to master the theoretical knowledge and basic operational skills of virtual reality engine and related tools in undergraduate course learning and professional practice, and further exercise and develop their innovation ability and adaptability is still a practical problem that needs in-depth consideration in the construction of virtual reality technology major curriculum system in colleges and universities ^[3].

3. The construction of the course system of virtual reality technology

Driven and empowered by the new round of scientific and technological revolution, the emergence of computing power has become an important engine and catalyst for China's development of new quality productivity and improvement of international competitiveness under the new situation ^[4]. After theoretical derivation and scientific experiments, computing has become the third means of scientific research and has gradually developed into a technical means to support the two kinds of research. Under this background, it has become the common pursuit of all disciplines to cultivate innovative and interdisciplinary talents with basic computer application ability, computational thinking, software application ability, and programming ability in the computer field. At present, the vigorous development of virtual reality industry cannot be separated from the essence of "computing +." Therefore, the talent training of virtual reality technology majors not only needs to cover the core knowledge and basic ability in the computer field, but also needs to highlight the professional characteristics, and through the development of cross-field practical projects to lead students to learn in time and master the cutting-edge technology in the field of virtual reality technology and the industry. To ensure the advanced, forward-looking and evolutionary nature of the construction of the curriculum system of virtual reality technology ^[5]. Specifically, colleges and universities can focus on consolidating the foundation, highlighting the professional characteristics,

strengthening the interdisciplinary construction of the virtual reality technology curriculum system, and set up basic courses, professional courses and general courses ^[6].

The simulation of the real world based on computer science makes it possible for colleges and universities to offer virtual reality technology majors. Therefore, the construction of basic courses for virtual reality technology majors should cover the content of natural basic courses, engineering basic courses and foreign language courses, to guide students to master the basic theoretical knowledge of engineering in the course learning. This further enhances their engineering consciousness and ability ^[7]. The curriculum emphasizes the training of students' technology research and development ability and scientific and technological innovation ability for future positions related to the computer field and virtual reality industry. Colleges and universities need to introduce professional features such as basic theory algorithms and human-computer interaction mode in the field of virtual reality into the curriculum, to guide students to fully understand the research and development and application of science and technology in the field of virtual reality technology in course learning and professional practice ^[8]. In addition, combined with the current changes in the virtual reality industry, colleges and universities can set up liberal arts general courses and regularly invite scientific research experts and enterprise engineers in the industry to hold knowledge lectures on different topics for virtual reality technology. This will help to continuously enrich students' professional cognition, further improve their comprehensive literacy and broaden their knowledge ^[9].

4. Guarantee measures for the construction of a virtual reality technology professional curriculum system

4.1. Strengthen the construction of professional course content

The innovation and optimization of the course system construction of virtual reality technology in colleges and universities in the new situation aims to train innovative and composite virtual reality technical talents with high quality and high quality, guided by market demand. Based on this, strengthening the content construction of the curriculum system of virtual reality technology majors and following the principle of progressive learning from basic to advanced can gradually lead students through the study and practice of professional compulsory courses, professional elective courses and comprehensive practical training courses, and constantly improve their comprehensive ability and accomplishment of applying virtual reality technology. In the initial teaching stage of the virtual reality technology major, the course content gradually transitions from basic principles and skills to two-dimensional design field, guiding students to design user interfaces (UI) ^[10]. This stage focuses on cultivating students' aesthetic vision and improving their technical precision skills. After entering the intermediate level, the course gradually shifts to 3D design and production, focusing on guiding students to master the specific methods of creating objects and scenes with 3D modeling software, and teaching them how to improve the look, feel and lighting rendering of 3D models. At the same time, according to the students' actual acceptance ability, teachers can also introduce panoramic image shooting and production, and guide them to operate panoramic cameras and create interactive panoramic experience scenes through panoramic image production. This will help to activate students' innovative consciousness and encourage them to burst out new creative inspiration in the production of panoramic images. Advanced-level courses aim to develop students' deep programming ability in VR technology, requiring them to be able to use VR development tools and engines to solve complex problems, such as optimizing application performance and giving users a better experience. This systematic and logical progressive curriculum breaks the boundaries between professional compulsory courses, elective courses, and comprehensive practical training courses, promotes the seamless connection between theoretical teaching and practical operation,

and helps to continuously consolidate students' professional foundation ^[11].

4.2. Strengthen the training of double-qualified teachers

Training double-qualified teachers is an important guarantee for improving the construction quality of the virtual reality professional curriculum system, and it is of great significance and value for improving the quality of training virtual reality technical talents. Virtual reality technology with the characteristics of multi-fields and multi-disciplines is committed to improving the students' specific ability to comprehensively apply the knowledge of different fields and disciplines to solve practical problems, which puts forward stricter requirements for the training of double-qualified teachers in colleges and universities, that is, teachers can meet the diversified and personalized needs of students in cross-disciplinary exploration under different scenarios ^[12,13]. At the same time, in the face of the rapid change of the virtual reality industry, dual-qualified teachers with profound theoretical knowledge and rich practical experience can timely adjust and optimize the course content, and carry out teaching design around the latest developments in the virtual reality industry to ensure that the construction of the curriculum system of virtual reality technology majors keeps pace with social development. To give students a more in-depth and comprehensive learning experience in the course teaching, this will be of great help to students' future career development. Faced with the shortage of double-qualified teachers in virtual reality technology major, colleges and universities can provide a solid guarantee for the construction of virtual reality technology major curriculum system through the way of "please come in and go out." For example, relying on the platform of university-enterprise cooperation and integration of industry and education, universities regularly invite enterprise engineers and lecturers with rich teaching and training experience to campus for project exchanges and technical discussions with virtual reality technology professional teachers, so as to encourage them to transform real business projects into course resources on the basis of deep cooperation. At the same time, colleges and universities should also actively encourage teachers to participate in a variety of teacher training activities, and use winter and summer vacation time to go to enterprises for temporary training. The training of double-qualified teachers can help to promote the flow and transformation of resources and meet the diversified and personalized needs of students ^[14].

4.3. Building a diversified practical teaching system

Practical teaching is important content for optimizing the course system of virtual reality technology in colleges and universities and is the concrete performance of applying professional knowledge to practical work, which is of great value for cultivating innovative talents. At the same time, the major of virtual reality technology has a significant practicality and attaches great importance to practical operation. It can be seen that for students majoring in virtual reality technology, whether they have good practical skills is an important factor affecting their future career development. In this regard, colleges and universities can build a comprehensive and three-dimensional practical teaching system, which includes classroom teaching, competition to promote learning, and school-enterprise cooperation, to improve students' job skills in a targeted way. To be specific, college teachers can use the VR training room on campus to build an integrated teaching mode of teaching, learning and doing, and lead students to continuously improve their comprehensive ability in the actual operation of virtual scenes through teaching activities such as designing role modeling and making virtual scenes. It should be noted that colleges and universities should provide rich practical teaching resources and equipment for virtual reality technology majors to ensure that they can carry out various practical teaching activities smoothly. Promote learning through competition means to train students' teamwork ability, adaptability, and innovation ability by

organizing diversified discipline competitions and professional competitions. Since the major of virtual reality technology has the characteristics of interdisciplinary integration, teachers can encourage students to actively participate in vocational skills competitions such as the National College Digital Art Design Competition and the China College Student Computer Design Competition, to provide students with a platform and opportunities to show their abilities. This can effectively improve their professional competitiveness. In addition, deepening school-enterprise cooperation and guiding enterprises to participate in the construction of a virtual reality technology professional curriculum system can provide diversified practical teaching resources for students. For example, college teachers can guide students to carry out project practice with the help of a real post-environment ^[15].

4.4. Establish a scientific curriculum evaluation system

Under the traditional teaching perspective, the course evaluation model based on the final assessment is difficult to adapt to the diversified needs of the virtual reality industry for talent training under the new situation, so it is very important to build a scientific course evaluation system. Specifically, colleges and universities can rely on the digital teaching platform, introduce diversified evaluation methods, and build a course evaluation system that combines process evaluation and formative evaluation. For example, teachers in colleges and universities can objectively evaluate students' project-based learning by setting quantitative evaluation indicators, and provide feedback to them on the development and improvement of their skill level and teamwork ability by establishing a continuous evaluation feedback mechanism to help them carry out continuous self-improvement and adjustment.

5. Conclusion

To sum up, improving the construction quality of the virtual reality professional curriculum system under the new situation has an important value of the era for cultivating high-quality virtual reality talents. In this regard, colleges and universities should deeply grasp the current development trend of the virtual reality industry, and optimize the professional course system on this basis, to ensure the coordination between the construction of the professional course system and the development of the industry.

Disclosure statement

The author declares no conflict of interest.

References

- [1] Qian Y, 2024, The Practice of "Four Education Integration" Under the Background of "Great Ideology and Politics" -- A Case Study on the Construction of Labor Education Practice Mechanism of Virtual Reality Technology Application Major in Higher Vocational Colleges. *Academy*, 17(5): 1–3.
- [2] Wang Y, Bekri YS, Yue Y, et al., 2023, Application of Virtual Reality Technology in Teaching Under the Background of New Agricultural Science -- Taking Hydraulic Transmission Course as an Example. *Jiangsu Agricultural Mechanization*, 2023(6): 39–42.
- [3] Li L, 2021, Study and Practice of Virtual Reality Application Technology Major Curriculum System in Higher Vocational Colleges. *Computer Knowledge and Technology*, 17(24): 250–251.
- [4] Zhao S, Guo Q, Sun Y, 2021, Optimization Research and Practice of Virtual Reality Application Technology Major

- Curriculum System -- A Case Study of Virtual Reality Application Technology Major of Zhengzhou Railway Technical College. *Science and Technology Wind*, 2021(6): 71–72.
- [5] Qin L, 2017, Exploration of Constructing Practical Training Course System with Virtual Reality Technology: Taking Environmental Art Design Major as an Example. *Sichuan Construction Materials*, 43(7): 242–243.
- [6] Lei Y, 2015, Exploration of Constructing Practical Training Course System of Environmental Art Major with Virtual Reality Technology. *Art Education*, 2015(7): 269–270.
- [7] Zhao Z, 2011, Application of Virtual Reality Technology in Mining Engineering Curriculum System Teaching. *China Science and Education Innovation Guide*, 2011(1): 182 + 184.
- [8] Bai Z, Lu C, 2024, Application of Virtual Reality Technology in Outdoor Sports Course Teaching: Advantages, Challenges and Countermeasures. *Information Technology for Education*, 2024(10): 47–50.
- [9] Wang X, 2024, Teaching Practice of Virtual Reality Technology in Case Course. *Electronic Technology*, 53(8): 390–391.
- [10] Cao X, 2024, Python Curriculum Reform Design Based on Virtual Reality Technology. *Software*, 45(8): 105–107.
- [11] Xie X, 2024, Research on Teaching Content and Method Reform of Virtual Reality Technology Course. *Office Automation*, 29(8): 39–41.
- [12] Zhang L, Wang Y, 2024, Teaching Practice of Virtual Reality Technology Deep Integration Professional Course. *China Packaging*, 44(2): 102–106.
- [13] Shen Y, 2019, Project-Based Teaching Design and Practice of Photoshop Course Based on Virtual Reality VR Technology. *Electronic Technology*, 53(1): 317–319.
- [14] Liu Y, Kang L, Hou Q, et al., 2023, Application of Virtual Reality Technology in Practical Teaching Course. *Journal of Science, Normal Universities*, 43(12): 99–101 + 106.
- [15] Wang G, Liu Y, Li J, et al., 2022, Application of Virtual Reality Technology in Artificial Organ Teaching. *Laboratory Science*, 25(5): 74–77.

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