Application of Virtual Reality Technology in Entomology Teaching

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Abstract: The in-depth application of communication technology and computer technology has promoted human society to enter the information age. In the teaching of entomology, virtual reality technology is increasingly widely used. Compared with the traditional entomology teaching mode, the adaptability of virtual reality technology teaching has been significantly improved, which can meet the increasingly diversified teaching needs. With the help of virtual insect teaching system, the continuity, interactivity and authenticity of college classroom can be effectively improved. Therefore, it is more and more important to promote the transformation of teachers' roles and realize the sharing of high-quality higher education resources.

1. Introduction

Virtual reality technology focuses on the construction of three-dimensional virtual world. It can provide participants with tactile, visual and auditory simulation in a specific space, giving participants a sense of immersive experience. Participants can feel and observe things in three-dimensional space independently. Strengthening the application of virtual reality technology can create favorable conditions for the promotion of entomology teaching. The creation of real situations can help teachers and students overcome the difficulties in practical teaching and learning. It is of great significance to develop a virtual insect teaching system with the help of virtual reality technology.

2. Overview and advantages of virtual reality technology

Based on information technology such as computer technology, virtual reality technology is actually a computer system to create an artificial world. This technology can combine human psychological and physiological activities and changes to build specific three-dimensional images. As a comprehensive integration technology, virtual reality technology effectively brings into play the advantages of different technologies, such as artificial intelligence technology, image processing and pattern recognition, computer technology and voice and audio technology. The construction and improvement of infrastructure has laid a solid material foundation for the in-depth application of virtual reality technology in the education industry. Compared with the traditional teaching mode, the introduction of virtual reality technology has promoted the transformation of entomology teaching classroom, effectively respected the students' principal position in learning, and effectively reduced

the teachers' teaching pressure to made the entomology teaching classroom vivid and interesting. It is helpful to mobilize students' enthusiasm for learning.

The advantages of this technology are mainly reflected in the immersive environment, in which students' learning motivation is effectively stimulated and learning efficiency is significantly improved, laying a solid foundation for students' knowledge transfer and situational learning in the later period. According to the relevant teaching work, when virtual reality technology enters the classroom, the teaching content will first become intuitive; Secondly, it will simplify the complex teaching content; Finally, it can promote the visualization of micro learning content. The traditional entomology teaching classroom has been effectively transformed, which has promoted the optimization and upgrading of the teaching mode. In addition, it is also conducive to the cultivation of students' innovative thinking and consciousness, and the cultivation of students' independent learning and independent inquiry ability.

3. Application prospect of virtual reality technology in entomology teaching

Virtual reality insect teaching system is the concentrated embodiment of hi virtual reality technology in entomology teaching. Virtual insects are established based on the relevant principles of entomology. With the help of computer technology, they simulate the behavior and growth of insects in a specific three-dimensional space, which not only reduces the research cost invisibly, but also improves the pertinence of research and teaching. As the first interactive device, "A-Volve" was founded in 1993. Related artificial creatures not only have some living habits and growth habits of natural creatures, but also can continue to evolve.

Since then, along with the progress of related technologies and the improvement of infrastructure, the teaching methods of entomology have also been continuously optimized and improved. Chinese scholars have also established the method of automatically making three-dimensional models of insects, which has laid a solid theoretical foundation for the advancement of entomology teaching and related research work. But according to the actual research work, the current related research work is still in an important stage of development.

Taking desert locust as an example, compare it with an aircraft. Each rivet and bolt on the aircraft is flush with the wing surface, and the external structure is relatively smooth. However, the wings of desert locust are full of wrinkles, and deformation and distortion will occur during the beating process, but the locust can achieve high-speed flight. In order to solve this problem, engineers and biologists made active exploration and analysis. Adrian Thomas, a biomechanist at Oxford University in England, carried out further research. He was able to grasp the details of the changes in the wings of locusts during their flight. He collected a large number of motion data of locusts through multi-point tracking, and finally formed a three-dimensional computer model of locusts through analysis and integration. In the process of simulation analysis, the relevant simulation results are close to the mechanical laboratory data of locust wings. Finally, through various analysis and comparison, it is found that the curved and twisted wings of locusts can increase the lift by an additional 10%. Compared with the flat rigid model, the flight efficiency has been significantly improved. Because if there are no twisted wings, there will be greater friction when the wings are separated. The locust can effectively avoid related problems by maintaining the angle between the airflow and the wings. It can be seen that virtual reality technology is of great significance to the research and teaching of entomology.

4. Promotion of virtual reality technology on entomology teaching

4.1. Promoting the transformation of teachers' roles

Due to the lack of corresponding display, in the past entomology teaching, teachers' work pressure was relatively high, and it was difficult to improve their work efficiency. After the application of virtual reality technology, this kind of problem was effectively solved. In the teaching process, students can combine their own learning foundation to independently choose learning methods, learning ways and learning strategies, which is helpful to help students achieve their own learning state. In the later teaching process, teachers should realize the change of their own roles, actively communicate and communicate with students in the learning process, and create rich teaching scenes, in order to stimulate students' enthusiasm and creativity in learning, and objectively help students develop good learning habits.

In the current era, the teaching of entomology has a new appeal. Therefore, teachers should not only master the knowledge in textbooks, but also actively learn relevant skills after class. In addition, the application of virtual reality technology in entomology teaching is also used for reference by other courses.[1]

4.2. Sharing high-quality teaching resources

As a key component of educational resources in colleges and universities, the effective use of information technology can be realized. Based on the actual teaching needs and students' learning foundation, decentralized entomology teaching resources can be summarized and integrated, so as to build a complete information and knowledge system, and at the same time, a good entomology teaching environment can be built. According to the actual situation of higher education, the teaching of relevant courses is highly professional, so higher requirements are put forward for teaching staff. Relevant teaching staff should not only have basic professional knowledge and professional skills, but also keep pace with the development of the industry and the times, and promote the update of their knowledge system.

In fact, entomology science popularization is also a process of information transmission, with multiple functions such as entertainment, education and culture. Virtual reality technology has gradually become an important platform and bridge for entomology science popularization. Colleges and universities can strengthen exchanges and cooperation with museums and other relevant departments, simulate a variety of environments where insects live and grow, which can not only inject new power into the teaching work of colleges and universities.[2] At the same time, it can also enhance the public's awareness and understanding of insects.

4.3. Improving the quality of course teaching

Teaching quality is the ultimate goal of this kind of course teaching, and it is also true in college teaching. According to the research work of entomology, if you want to have a comprehensive understanding and grasp of the life habits of an insect, it will take at least a few months or even a year of research time. Therefore, the daily teaching task is relatively difficult. With the help of virtual reality technology, this kind of problem can be effectively alleviated, which is of great help to shorten the teaching cycle and improve the teaching efficiency.

It is worth noting that a large number of insect specimens, instruments and equipment, especially some complex biological characteristics, are often used in the experimental teaching of entomology. In order to create convenience for later teaching work, relevant images and information can be obtained from living insects, which will be transformed into virtual insect images after specific

processing. Therefore, in daily life, it is necessary to strengthen the grasp of insect morphological structure and living habits. Learning investment is actually a kind of productive investment. With the help of relevant technologies, students' learning efficiency can also be effectively improved.[3]

5. Application strategy of VR technology in entomology teaching

5.1. Promote the construction of teaching bases

The construction of practice teaching base is an important place for entomology teaching. Advanced teaching base can not only greatly improve the efficiency and quality of teaching work, but also effectively reduce the teaching pressure of teaching staff. A lot of work can be completed with the help of information equipment. Participants can get sufficient practice through practice base, such as can from different angles to the virtual farm related insects activity process observation and analysis, under the simulation environment, all kinds of environmental factors become variables, practice personnel can take different management measures, analyze the governance results, compared with the traditional teaching mode, the teaching mode can help participants to abstract the basic theory of agriculture and explore. From another point of view, it is also of great significance for the cultivation of students' innovative spirit and practical ability. However, combined with the practical application of relevant technologies, many schools are limited by economic strength, the construction of practical teaching bases is relatively small, and many equipment and machines are relatively old, which is not conducive to the follow-up teaching work, so it is necessary to promote the construction of practical teaching bases.[4].

5.2. Enrich practical teaching methods

In the current background of The Times, the transmission efficiency and quality of information transmission have been significantly improved, and the emergence of big data has actually also promoted the change of people's life concept. Therefore, in the teaching process of entomology teaching, it is particularly important to avoid copying the traditional teaching mode and enrich the practical teaching mode.

As a key link in teaching, practical teaching is related to the quality of the whole teaching work. Combined with the actual teaching work, the open experimental teaching is widely used, and this teaching mode can reflect the modern open education concept. In view of the richness of practical teaching methods, there are mainly the following key points. First, summarize previous educational experience, especially some issues arising from teaching work, and focus on analysis and research. Secondly, based on the actual situation of the teaching of relevant courses, such as the learning foundation and hardware facilities of students, optimize the teaching mode and develop a teaching method that meets the teaching needs. Finally, keeping up with the development of the industry and the times, and constantly endowing teaching work with new epochal significance, relevant teaching personnel should strengthen the study of professional knowledge, especially the study of cutting-edge knowledge in the industry, and timely promote the optimization of their own knowledge system, which helps to create convenience for the promotion of later teaching work.

5.3. Promote resource integration

The study of entomology should not only strengthen classroom teaching, but also pay attention to the after-class study of relevant personnel. As an important place for learning, the library will also have an important impact on the study of relevant personnel. Combined with the actual development trajectory of entomology, the related disciplines are closely related to biology, forestry and agronomy.

However, the distribution of traditional entomological literature in the library is complicated, and it is easily difficult to search for literature and data. The timely integration of relevant materials and resources is helpful to greatly improve the learning efficiency of teachers and students.

From the perspective of teaching in related disciplines, traditional library collections have gradually become difficult to meet the actual needs of teaching work. This type of learning has a relatively poor adaptability and is prone to constraints of time and space. Therefore, promoting the construction of information based libraries and virtual entomology electronic literature libraries is particularly important. The integration of relevant teaching and learning resources not only reflects the strong vitality of entomology, but also marks the rapid development of science and technology in China. For the advancement of resource integration, there are several key points: First, for the construction of a virtual entomology electronic literature library, relevant technical personnel can leverage surface synthesis technology, image recognition technology, and sensor recognition technology to bring the advantages of relevant technologies into play, Map entomology related knowledge to different specifications of book models, and then use computer multimedia technology and human-computer interaction design to complete the page flipping of e-books. Virtual books can be flipped in the hands of readers, thereby vividly displaying relevant knowledge; Finally, grasping the internal links between entomology and forestry, agronomy, biology, and other disciplines can not only cultivate students' innovative awareness and overall concept, but also create convenience for their later employment. From a long-term perspective, relevant resource integration work is also conducive to promoting the dissemination and sharing of scientific research resources.

6. Conclusion

Virtual reality technology is increasingly widely used in entomology teaching, which not only reflects the rapid development of information technology, but also reflects the rapid development of China's education industry. Educators and relevant departments should play their role in guiding and supervising, strengthen the application of new information technologies such as virtual reality technology, and promote the training of professional teaching talents, which summarize and integrate the past teaching experience. It can respect the individual differences of students, develop diversified teaching methods, and closely follow the development of the industry and the times to promote the enrichment and optimization of teaching content.

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