

The Prospect of Virtual Technology in Education Field

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Abstract. The virtual technology industry is experiencing exponential growth on a global scale, particularly during and after the pandemic, due to the escalating demand for remote work, online education, digital entertainment, and other related sectors. Currently, virtual technology has made significant progress and breakthroughs across multiple fields and levels; however, it still faces certain technical difficulties and bottlenecks that need to be overcome. This paper focuses on the application of virtual technology in the field of education and its transformative impact on traditional education. From an educational perspective, this paper explores the influence of virtual technology on the current education landscape. Additionally, it analyzes the positive impact and benefits of virtual technology on the overall development of students in education. The paper further discusses and summarizes the transformative changes brought about by virtual technology in the realm of traditional education. For a comprehensive understanding, this paper meticulously categorizes and discusses various applications of virtual technology in the education sector, such as virtual reality experiences, distance learning, cross-cultural communication, art, and creation, as well as vocational and simulation training. The paper concludes with a summary and outlook.

Keywords: virtual technology; education; vr; ar.

1. Introduction

Virtual technology refers to the technology that provides users with visual, auditory, tactile and other sensory experiences interacting with the real or fictional world through computer technology and using head-mounted or wearable devices. Virtual technology has a high degree of immersion and interactivity, can bring users a new way of perception and experience, so it is considered to be one of the important directions of future information technology [1-3]. Virtual technology can simulate various scenes and environments, such as historical events, scientific experiments, etc., so that people can experience and explore.

In the field of education, virtual technology can help students better understand subject knowledge and stimulate their interest and curiosity. Its application scope includes kindergarten education, primary education, secondary education, higher education, vocational education and so on. Its research significance is to make people receive more intuitive and effective education and do not limit the place and time.

This paper focuses on the application of virtual technology in the field of education and its change to traditional education. From the perspective of education, this paper looks at the impact of virtual technology on the current education field, and draws a conclusion to answer the application and change of virtual technology in the education field.

2. Virtual reality experience

Virtual reality experience can indeed bring students an immersive learning experience and stimulate their interest in learning. Through virtual reality (VR) and augmented reality (AR), students can visit historic sites, explore the natural environment or space in an immersive manner. This kind of experience can increase students' understanding and memory of knowledge.

The real environment created by virtual technology allows students to visit museums, monuments, etc., in new ways, such as through VR glasses or watching rendered 3D animations. These technologies provide realistic physical feedback and stereoscopic 3D animation, resulting in a more realistic experience for students. In addition, through the online museum, students can see the

different states of the exhibits, and even restore the excavated oxidized objects to the state before the excavation. Taking the virtual museum - Panorama of the Forbidden City, which is displayed online by the Palace Museum, as an example, compared with the traditional way of visiting, the use of virtual technology is more convenient and faster, and it is also more convenient for teachers to manage and guide students [4-5].

However, the current virtual technology still has certain limitations. Although these technologies can stimulate students' audio-visual senses, there is still a difference compared to real experience. Virtual environment can not fully restore the real physical feeling and immersive feeling. Virtual technology currently relies mainly on audiovisual stimuli and cannot provide the participation of other senses, such as touch, smell and taste. As a result, students may still feel different experiences in the virtual reality experience than the real one.

3. Distance learning and cross-cultural communication

Distance learning and cross-cultural communication with virtual technology do bring many conveniences and opportunities. Through virtual classrooms and online learning platforms, students can interact and collaborate with teachers and students from different geographical locations. This approach breaks the geographical and time constraints and promotes global educational exchanges.



Fig 1 VR online conversation teaching

Based on computer and electronic information technology, virtual technology creates a kind of virtual world that is different from the real world. However, with virtual reality technology, people can participate in the real world in an immersive way [6]. Online courses are one of the typical applications, through electronic devices and online platforms, people can conduct remote teaching and distance learning without the need to physically go to the classroom. For example, during the pandemic, online courses have been widely used, and students can participate in online lectures through mobile phones and other electronic devices (Fig.1). In addition, virtual reality technology can also create a multi-dimensional learning space, and students can learn in-depth knowledge through virtual reality technology [7]. Virtual learning Spaces are not limited by time or place, such as online museums and graduation displays, where students can access the knowledge they need through videos and 3D objects. This can reduce the cost and time required for travel and site visits.

However, virtual distance learning also has some disadvantages. For example, in a video call, the teacher does not have a full picture of the student's learning status, and the student may not be able to give timely feedback. In addition, the course may not be able to run properly due to network problems. These are questions that are rarely encountered in a traditional offline classroom.

4. Art and creation

The application of virtual technology in art education is not limited to painting and creation, it can also be extended to dance, music, performance and other art fields. Through virtual reality technology, students can immerse themselves in a virtual stage and learn dance techniques and performance

abilities with virtual dancers [7]. They can create and play music using virtual instruments and interact with virtual musicians. This approach allows students to experiment with various art forms in a virtual environment and broaden their artistic horizons.

Virtual technology can provide students with creative inspiration and experience that cannot be compared with the real world (Fig.2). Through the creation of virtual scenes, students can bring themselves into an art space far away from the real world. They can explore some special scenes or impossible creative themes, which can inspire more unique creative ideas. Virtual technology can also provide opportunities for co-creation with artists, where students can interact and collaborate with virtual artists to create unique works of art together.



Fig 2 The results of VR painting

Virtual technology can also provide more possibilities for assessment and feedback in art education. Students can learn about their own creative process and room for improvement through the recording and analysis of virtual technologies. Virtual environments can provide more data and indicators to help students and teachers better evaluate students' artistic performance and give targeted guidance and suggestions [8].

However, although virtual technology plays an important role in art education, people still prefer traditional art works and creative methods. Traditional creative works still play an important role in art education. The art works created by virtual technology still face certain challenges of recognition and acceptance in the art world.

5. Vocational training and simulation training

Virtual technology is widely used in the field of vocational training and simulation training, it not only provides students with a safe and effective practice environment, but also can expand the scope of training, and improve the quality and effect of training.

First, virtual technology enables students to simulate various scenarios and challenges in a real career environment by creating a highly realistic virtual environment. For example, in flight simulators, students can simulate flight operations and face various weather conditions and emergencies, thereby improving their flight skills and coping abilities (Fig.3). In the surgical simulation, students can train in surgical operations through virtual reality technology to improve their accuracy and surgical skills. This simulation training based on virtual technology can greatly reduce the risk and impact of mistakes that students face in a real environment.



Fig 3 How does VR simulate the scene of car driving

Secondly, virtual technology can also expand the scope of vocational training, giving students access to training resources that are difficult to obtain in the real environment. For example, in the virtual flight training in the aviation field, students can simulate various flight tasks and scenarios and master flight skills and characteristics of flying machines [9]. This virtual training can save time and cost and provide more comprehensive and diversified training content. Similarly, in virtual surgical training in the medical field, students can simulate various surgical operations and become familiar with the use of different surgical tools to improve surgical skills and decision-making.

In addition, virtual technology can provide instant feedback and assessment capabilities to help students self-evaluate and improve. Through virtual technology, students can reflect and adjust according to the performance and indicators in the simulation training process, so as to improve their skill level [10].

Although virtual technology has many advantages in vocational training and simulation training, it still cannot completely replace real practical training. Virtual technology can only provide a certain degree of simulated experience and practical opportunities, and learners still need to enhance their experience and coping ability through practice in real environments.

6. The impact on student development

6.1. Subjective initiative

Virtual reality technology can better give play to students' subjective initiative. By using virtual technology, teachers can visualize abstract objects or things, thereby mobilizing students' enthusiasm and initiative to participate in activities, increasing students' understanding of abstract concepts and enhancing students' creativity, so that teachers can give students better feedback and teaching guidance. And it can expand students' unrestrained imagination ability, so that students can take the initiative to learn and understand.

6.2. Improve cognitive ability

In the process of using virtual reality technology, students can understand and improve their cognitive ability. In the process of using technology to teach, students will relatively produce a series of problems related to teaching, which will lead students to solve and understand knowledge on their own, so that students can further improve their cognitive ability of why this question arises. And expand this knowledge.

6.3. Increase practical experience

Virtual reality technology can allow students to better increase practical experience, virtual technology provides real physical engine and real environment. It can allow students to experiment and simulate before actual combat, so as to increase practical experience in the virtual environment, so as to avoid accidents that occur in real practice [11].

The application of virtual technology in traditional education has brought about many changes. Here are some of the changes and impacts associated with virtual technology:

Transforming the learning experience: Virtual technologies provide a more immersive learning experience through virtual and augmented reality technologies. Students can learn by immersing themselves in a virtual environment, making the learning process more lively and interactive. Students can visit distant places and experience different scenarios to gain an in-depth understanding of related concepts and knowledge.

Resource enrichment and expansion: Virtual technology has brought more abundant learning resources to education. Students can access educational resources, virtual LABS, museums, libraries and more around the world through the Internet to get a broader and deeper learning experience. Virtual technology enables students to access resources and information that are difficult to obtain in traditional classrooms, expanding their learning content and scope of knowledge.

Innovation and diversification of teaching methods: Virtual technology provides teachers with more innovative and diversified teaching methods. Teachers can use virtual technology to create real scenes, situational simulation, gamification teaching, etc., to stimulate students' interest and participation, and improve teaching effect. Virtual technology can also provide teachers with real-time feedback and assessment tools to help them better understand their students' learning progress and needs.

Personalized Learning support: Virtual technology makes personalized learning easier to implement. Through virtual technology, teachers can provide customized learning experiences and teaching resources according to the different needs and learning styles of students. Virtual technology provides more flexible learning paths and teaching methods, which can better meet the individual learning needs of students.

To sum up, virtual technology has had a profound impact on traditional education. It transforms the learning experience, enriches learning resources, innovates teaching methods, and supports the implementation of personalized learning. Virtual technology will play an increasingly important role in the future of education, bringing more opportunities and richer educational experiences to students and teachers.

7. Conclusion

This paper focuses on the application of virtual technology in the field of education and its change to traditional education. Firstly, the learning experience brought by virtual reality experience is expounded. We then discuss the importance of distance learning and cross-cultural communication enabled by virtual technologies. We also delve into the positive impact of virtual technology on art and creation, as well as vocational training and simulation training. Finally, we analyze the positive impact of virtual technology on student development, including the support of personalized learning and the cultivation of creativity.

In summary, the application of virtual technology in education has brought great changes to students and the field of education. Virtual technology provides students with a learning experience closer to reality, broadens the scope of learning resources, and stimulates students' interest and engagement. At the same time, virtual technology also creates more teaching methods and tools for teachers, improving the teaching effect and the implementation of personalized education. The application of virtual technology has also actively promoted the development of distance learning and cross-cultural communication, as well as promoted the artistic creation and vocational ability training of students.

However, virtual technology still faces several challenges in education, including technology cost, teacher training, and market acceptance. In order to better promote the application of virtual technology in education, we need to strengthen relevant research and promotion work, provide better technical support and training, and establish relevant certification and evaluation systems. Only in this way can virtual technology truly realize its potential in the field of education and make greater contributions to the innovation and development of education in the future. We are confident in the application prospects of virtual technology and believe that through continuous efforts and innovation, virtual technology will bring broader possibilities to education.

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