Application and Thinking of Virtual Reality and Human-computer Interaction Technology in the Cultivation of Undergraduates' Moral Personality

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Abstract— In recent years, how to broaden the application fields of virtual reality and human-computer interaction technology has received widespread attention of domestic and foreign scholars. However, less attention has been paid to the field of moral cultivation. This article systematically studies the cultivation of undergraduates' moral personality by virtual reality technology in the era of big data. First, this article briefly introduces the concepts of virtual reality and human-computer interaction technology and undergraduates' moral personality respectively. Additionally, it makes a statistical analysis of the application fields and literature review of the virtual reality and human-computer interaction technology industry in 2017-2021. Finally, it discusses the possibility of cultivating undergraduates' moral personality with the help of virtual reality and human-computer interaction technology.

Keywords - virtual reality, human-computer interaction; moral character cultivation

1 INTRODUCTION

In recent years, with the continuous development of science and technology, China has vigorously promoted the application of 5G, cloud computing, big data, artificial intelligence, virtual technology, human-computer interaction and other new technologies. Virtual reality technology and human-computer interaction technology as a new technology in the future, showing rapid development trend, virtual reality and human-computer interaction technology application prospect is more and more broad. Many colleges and universities have applied this technology to the cultivation of undergraduates' moral personality and have achieved good results compared with traditional technology.

1.1 Virtual Reality and Human-computer Interaction Technology

Virtual Reality Technology, referred to as VR, is based on computer technology, artificial intelligence, simulation technology, etc., to build a virtual and realistic combination of simulation environment, give people a sense of hearing, vision, touch and other multi-sensory immersive experience, so as to achieve immersive state. [1] As a technology in the 20th century, it has experienced the stages of germination, formation and application. Because of the interactive characteristics of simulation, it has been applied in many fields. These applications simulate the scene through VR technology, using immersion, simulation, interaction and other features, easier to achieve better results. [2] As a simulation system, virtual reality technology

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has three characteristics: immersion, imagination and interaction. Immersion refers to the feeling of an individual in a virtual environment that is highly similar to the real environment, including vision, hearing, and smell. Imagination means that virtual reality technology can combine the rationality and sensibility of individuals to create things and situations conceived in the brain and to innovate thinking. Interaction means that individuals interact with the virtual environment in a natural way with the help of some interactive devices.

Human-computer interaction technology (HCL) refers to the use of a dialogue between man and computer or man and machine language, in a certain way of interaction, to complete the task of determining the man and computer or man and machine information exchange process. [3] Since the birth of the computer, in just a few decades, human-computer interaction technology has undergone tremendous changes, from simple to complex, low-level to high-level direction of rapid development, human-computer interaction technology has experienced a command interface, graphical interface, multimedia interface and other major stages of development. Since the 1990s, with the rapid development of science and technology, people have the pursuit of a higher level of human-computer interaction.[4] The traditional human-computer interaction has become increasingly unable to meet people's needs, which has promoted the birth of a new generation of human-computer interaction technology, namely virtual reality and interpersonal interaction technology.

The basic characteristics of virtual reality and human-computer interaction technology include: people-oriented, diversity, intelligence, efficiency, freedom, and immersion. [5] People-oriented refers to the people as the center point, people in daily life to interact with the machine. Diversity means using multiple channels to interact in a natural way to achieve efficient human-machine communication. Intelligence means that machines can accurately understand human thinking, correct errors in human expression, and intelligently respond correctly. High efficiency refers to support high input broadband, fast mass input information. Freedom means that information is entered in multiple ways, regardless of location. Immersion refers to the promotion of human-computer integration, making people more immersive, enhance the interaction between man and machine and interesting.

1.2 Undergraduates' Moral Personality Character

Moral personality is the sum of internal and external moral quality and external moral behavior which is formed by participating in the socialization of social practice in specific social relations. Moral personality has four basic characteristics: subject integrity, self-identity, free will and active transcendence, and three content structures: moral norm consciousness, moral goal consciousness and moral responsibility consciousness. [6]

Undergraduates’ moral personality is an important part of college students' individual personality. It is an organic combination of undergraduates’ specific moral cognition, moral emotion, moral will and moral behavior habits. [7] The moral personality of undergraduates is the sum of people’s cognition gradually formed in their social life practice. The development of undergraduates’ moral personality is to emphasize the rational thinking and conscious grasp of undergraduates on moral related issues. Emphasizing the rights and obligations of individuals in the field of morality; emphasizing the respect and maintenance of self-subjective interests while respecting the subjective rights of others. The process of undergraduates’ moral

personality development is the process of undergraduates' moral self-discipline. The process of continuous improvement in the spiritual field.

As a key force in building socialism with Chinese characteristics, the cultivation of undergraduates' moral personality is undoubtedly crucial. Cultivating undergraduates' moral personality can promote the perfection of undergraduates' moral quality and cultivate talents with both ability and virtue for the society. Undergraduates are an important group in society, and the cultivation of their moral personality is also an important task in the construction of social morality. Cultivating undergraduates' moral personality is conducive to the formation of a good moral atmosphere in the whole society. The formation of a good moral atmosphere in the whole society is also conducive to the subtle influence of undergraduates' moral personality. Youth makes the country prosperous, cultivating undergraduates' moral personality, can make undergraduates cultivate the moral feelings of the unity of the country and contribute to the country, fulfill the ambition of a strong country, forge the moral spirit of bravery and daring to be the first.

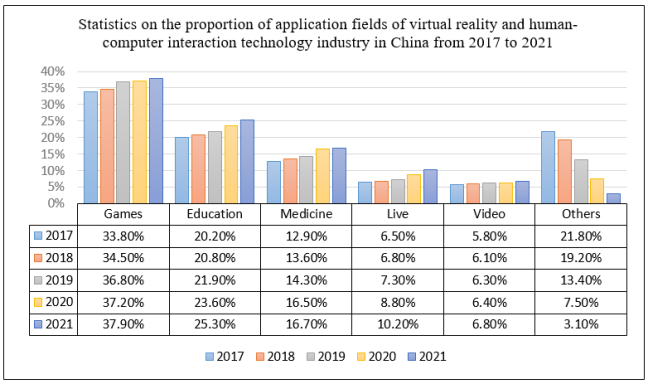
2 INDUSTRY APPLICATION FIELD AND LITERATURE ANALYSIS

In recent years, virtual reality and human-computer interaction technology industry more and more widely used. Table 1 shows the proportion of virtual reality and human-computer interaction technology applications in China from 2017 to 2021. As shown in Table 1, China's virtual reality and human-computer interaction technology industry, the largest proportion of games and increased year by year. In 2017, the proportion of games was 33.8 %. By 2021, the proportion of games increased by 5.1 %. The second is the proportion of education, which was 20.2 % in 2017 and increased by 5.1 % in 2021. Overall, China's virtual reality and human-computer interaction technology industry in the field of games and education more applications.

Table 1 The proportion of virtual reality and human-computer interaction technology applications in China from 2017 to 2021

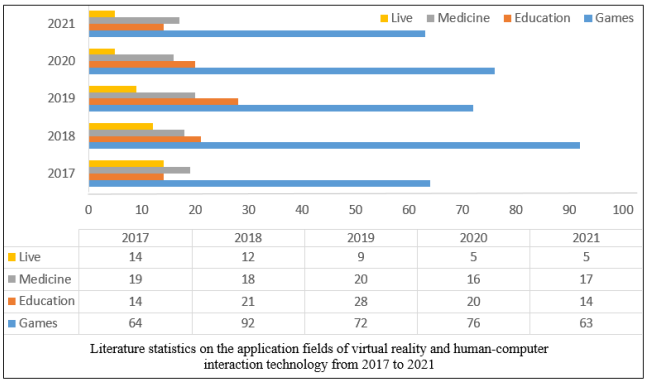
Literature statistics on the application fields of virtual reality and human-computer interaction technology from 2017 to 2021				
Application area	Games	Education	Medicine	Live
Documents quantity	365	97	90	45

Through CNKI advanced search "virtual reality" and "human-computer interaction" two keywords, a total of 1254 articles were obtained, and then the results were searched for "game", "education", "medical" and "live" four keyword search, selected 2017-2021 literature for statistical analysis, the specific situation as shown in Figure 1 and Figure 2. Similarly, more literature has been published in the field of games and education. There are 365 papers on applying virtual reality and human-computer interaction technology to the field of games and 97 papers on applying it to the field of education. In the time dimension, the number of articles published in these documents fluctuates less.



	Games	Education	Medicine	Live	Video	Others
2017	33.80%	20.20%	12.90%	6.50%	5.80%	21.80%
2018	34.50%	20.80%	13.60%	6.80%	6.10%	19.20%
2019	36.80%	21.90%	14.30%	7.30%	6.30%	13.40%
2020	37.20%	23.60%	16.50%	8.80%	6.40%	7.50%
2021	37.90%	25.30%	16.70%	10.20%	6.80%	3.10%

Figure 1 Literature statistics on the application fields of virtual reality and human-computer interaction technology from 2017 to 2021



	2017	2018	2019	2020	2021
Live	14	12	9	5	5
Medicine	19	18	20	16	17
Education	14	21	28	20	14
Games	64	92	72	76	63

Literature statistics on the application fields of virtual reality and human-computer interaction technology from 2017 to 2021

Figure 2 Literature statistics on the application fields of virtual reality and human-computer interaction technology from 2017 to 2021

In summary, virtual reality and human-computer interaction technology in the field of games and education use more. By consulting these documents, we find that some positive moral games and interesting moral courses play an important role in the cultivation of moral personality. [8] [9] Therefore, the use of virtual reality and human-computer interaction technology to develop the design of moral games and moral courses for the cultivation of undergraduates' moral personality unexpected role.

3 APPLICATION IN THE CULTIVATION OF UNDERGRADUATES' MORAL PERSONALITY

3.1 Constructing Virtual Campus and Virtual Learning Scene

Compared with the traditional education mode, virtual reality and human-computer interaction technology can provide more vivid and lifelike learning scene for undergraduates. The construction of virtual campus and virtual learning scene is one of the important manifestations.

[10] In this virtual environment, the main body of education creates a virtual situation that can cause undergraduates' moral conflicts through purposeful and planned creation. Through students playing different types of moral roles, they can arouse undergraduates' moral resonance, and finally make moral behaviors in line with social moral norms and their own moral development according to the existing moral cognition level. As a participant, students can play a specific role in it, give full play to students' subjectivity, and stimulate students' learning initiative and consciousness of moral personality cultivation. Virtual reality and human-computer interaction technology can transform abstract knowledge and boring content in the classroom into vivid, vivid and specific moral situations and content, and improve students' sense of experience and initiative in learning. In the cultivation of undergraduates' moral personality, excellent historical figures and other figures can be created into an interactive learning environment through virtual reality system, or some "figures" can be communicated through virtual reality technology, and students can be influenced by the words and deeds of advanced figures, so as to educate students and cultivate their moral personality. Combining virtual reality and human-computer interaction technology to build a virtual learning scene is conducive to mobilizing students' enthusiasm for learning, strengthening the cooperation and exchange between teachers and students, triggering students' association and thinking on resolving moral conflicts, using the knowledge they have learned to make moral judgments and choices, and enhancing the sense of moral responsibility.

3.2 Developing and Designing Positive Virtual Moral Games

It should be noted that the existing virtual game design is mainly for physical and psychological pleasure, not specifically designed for moral cultivation, but its content also contains more or less moral factors. [11] For example : the "Three Kingdoms" series of games, to a certain extent, promote the loyalty, brave moral value ; "World Legendary Traditional Chinese Medicine Hand Tour" carried forward the people-oriented, harmony between man and nature, advocating life, harmony and benevolence and other Chinese cultural values ; many business games actually emphasize the importance of thrift and diligence ; in general virtual games, attempts are made to highlight the moral theme of punishing evil and promoting good. However, there are some negative and negative moral values in virtual games that should be paid attention to. For example, in the virtual space of "business tycoons", the value of honesty is devalued, and in order to achieve the purpose of "squeezing out competitors", any means can be taken, including immoral means. These positive or negative moral factors in virtual games will exert a subtle influence on undergraduates' moral personality. [12]

If we consciously design positive virtual moral games, use the fun of virtual games to strengthen moral personality education and cultivate moral personality, we will get the effect that the traditional way is difficult to obtain. The main purpose of designing such a virtual game is to "teach" rather than "play" but the content of "teaching" is contained in the form of "play". Linking the scores of the game with the quality of moral quality and the amount of moral knowledge will encourage the "players" of the game to actively and consciously enhance moral knowledge, improve moral quality and cultivate moral personality in the virtual world.

3.3 Establishing Virtual Laboratory and Moral Training Base

Using virtual reality and human-computer interaction technology to establish virtual laboratory and moral training base, namely using virtual reality and human-computer interaction

technology to simulate real moral situation. Virtual reality technology has the characteristics of immersion. The feelings that students get in this simulation system are roughly the same as those they get in the real system. Immersed in this simulation system, students interact with the simulation system through a variety of sensory, can produce "immersive" reality. [13] Because virtual reality technology has these characteristics, its participants are immersed in a multidimensional information space to autonomously simulate modeling, acquire knowledge and form new concepts. Therefore, through the training in the virtual laboratory and the moral training base, students can gradually form the corresponding ability to deal with various complex moral problems and cultivate moral personality. [14] Because of the similar relationship between virtual reality and real reality, students can achieve moral migration more smoothly and skillfully, and apply the moral knowledge learned in virtual training to similar real situations. The specific situation is shown in Figure 3.

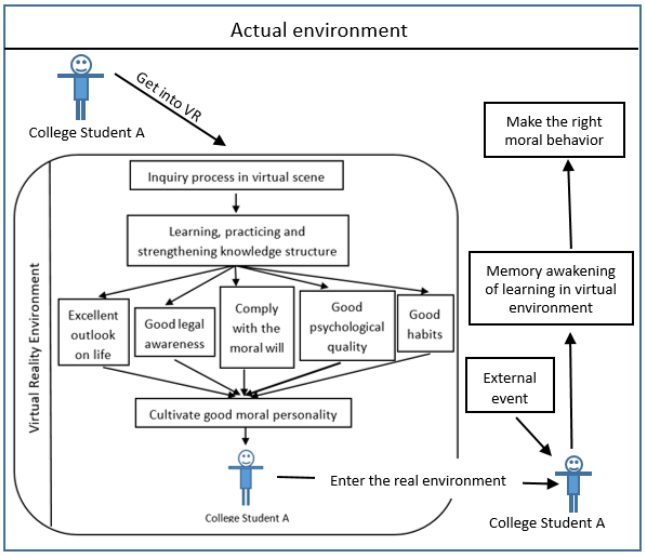


Figure 3 Moral personality training mode based on virtual reality and human - computer interaction technology

4 SUMMARY

In recent years, human-computer interaction technology gradually tends to intelligent, network, lightweight level. The smart, wearable nature of virtual reality devices frees them from the limitations of desktop applications only. With the progress of science and technology, virtual reality and human- computer interaction technology will become more and more mature. The application of virtual reality technology in the cultivation of moral personality will be more and more extensive, and the scope of application will develop to a wider and more real trend. This will become an important innovation in virtual reality and human-computer interaction technology.

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