New development trends of “metaverse + psychology” blending virtual and reality

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ABSTRACT

Metaverse is a hot topic recently, which has aroused widespread concern from all walks of life. The possible impact of the metaverse on the field of psychology includes creating a new field of panoramic learning process by creating an educational metaverse, creating a more scientific and novel teaching model by creating a MOOC metaverse, breaking the “magic circle” to alleviate interpersonal avoidance and promote individual social behavior, fostering individual self-identity by shaping the metaverse cyberpunk culture, improving the effectiveness of school mental health education by building a metaverse psychological experience center, creating a metaverse psychological intervention system based on traditional behavioral therapy to improve the effectiveness of psychological counseling, etc. However, the emerging technology represented by the metaverse is a double-edged sword. It is not only necessary to pay attention to this opportunity to create a perfect world or to create miracles, but also to guard against potential harm to the development of human society.

Keywords: metaverse; virtual reality; augmented reality; embodied cognition; identity

1. Introduction

Metaverse is a hot topic recently. Many people wonder why it suddenly becomes a hot topic. As a Chinese saying goes, the originator of the metaverse is “get up early and catch up late”. At present, it is recognized that in 1992, Neal Stephenson, a famous American cyberpunk science fiction writer, first proposed the concept of “metaverse” in the science fiction novel snow crash. In this science fiction novel, the author depicts a virtual digital world parallel to the real world, namely “meta world”. Each person in the real world has a virtual avatar in this “meta world”, and people can realize their will by controlling this virtual avatar. Therefore, the concept of “metaverse” is closely related to concepts such as

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“virtual world”, “virtual reality” and “augmented reality”. In fact, the ideological source of “metaverse” can be traced back to the story described by Zhuangzi, a representative of Chinese Taoist school, in Qi Wu Lun more than 2000 years ago, “in the past, Zhuang Zhou’s dream was a butterfly, and it was also a lifelike butterfly. I don’t know whether Zhou’s dream was a butterfly or a butterfly’s dream?” Zhuangzi incarnated into a butterfly in his dream and experienced the dream world as a butterfly. When he woke up, he couldn’t tell where he was at the moment. This kind of cognition that eliminates the distinction between waking up and dreaming is called “materialization” by Zhuangzi. In fact, it is a “metaverse” that blurs the boundary between virtual and reality.

Since modern times, this way of trying to establish a connection between virtual and reality has been warmly pursued by science fiction writers. With the development of computer technology, some people embody it in specific equipment, and then put forward the concept of “virtual reality”. In 1933, Laurence Manning described in his short story the man who awoke an era when people wanted to connect with a machine, which replaced all senses with electric pulses, and creatively put forward the concept of “virtual life”[1]. In 1957, American photographer Morton Heilig designed the sensorial simulator based on his shooting experience in films, which is usually considered to be the first virtual reality device born in the world[2]. In 1987, Jaron Lanier, the founder of VPL (virtual programming language) Company in the United States, officially put forward the concept of “virtual reality”, which was soon widely accepted by the industry and became a proper term[3]. In his correspondence with Wang Cheng in 1990, Qian Xuesen translated “virtual reality” into a phrase with “strong Chinese flavor”—“spiritual realm”. However, since the 1990s, “metaverse” has not triggered extensive discussion in all fields of the whole society as it is now, and has not even reached the popularity of “virtual world” or “virtual reality”. There are two possible reasons why “metaverse” will “suddenly emerge” and “rejuvenate” in 2021 and quickly become one of the hottest concepts in today’s society: first, to maximize the integration of virtual reality and reality, we need the support of key technologies. In addition to the virtual reality technology that can provide immersive experience and the related augmented reality technology and hybrid reality technology. We also need to use digital twin technology to build a real mirror world, and rely on big data technology and artificial intelligence to generate a virtual original cyber culture, establish a virtual world economic system with the help of blockchain technology. These technologies just started at the end of the 20th century and gradually matured in recent years. Second, a series of hot events of social concern in 2021 also contributed to the popularity of the metaverse. For example, in March 2021, Roblox, the first stock of the metaverse concept, was officially listed on the New York Stock Exchange; in May 2021, Facebook[3] said it would transform into a metaverse company within five years, and changed its name to “meta” on October 28, 2021; in August, 2021, the company invested heavily in the acquisition of virtual reality start-up company and Pico (smart wearable device brand) under Beijing Birdie Look Technology Co., Ltd.

2. Binary universe and psychology

838 records can be obtained by searching only with “metaverse” as the subject word on China Knowledge Network, and 331 records can be obtained by searching only with “metaverse” as the subject word on web of science. Due to the inseparable relationship between “metaverse” and “virtual world”, 10,892 records can be obtained by searching on CNKI with “metaverse” and “virtual world” as the subject words at the same time, and 51,099 records can be obtained by searching on web of science with “metaverse” and “virtual world” as the subject words at the same time. It is not difficult to see that metaverse and virtual world are not only widely discussed topics in science and technology, financing and other fields, but also academic issues of great concern to the academic community. On November 18, 2021, Chen Gang and Dong Haoyu of Peking University published the phased achievement
of metaverse research—the start Atlas of metaverse characteristics and attributes, and defined the concept of “metaverse”. They believe that metaverse is a virtual world linked and created by scientific and technological means, mapped and interacted with the real world, and a digital living space with a new social system. However, the results retrieved on CNKI or web of science mostly limit the research scope of metaverse to computer science, engineering, communication, business, education and other fields. “Virtual reality” and “augmented reality” are enduring research topics in psychology. Under the current situation that there is no research work on psychology based on metaverse in China, this paper attempts to clarify the existing combined practice and possible development direction of the concept of “metaverse” in the field of psychology from the following three representative psychological fields.

2.1. Metaverse + educational psychology

Since the 1990s, embodied cognition has triggered a huge research upsurge in the field of cognitive psychology and even the wider field of cognitive science, and gradually established its leading paradigm position in the research of the second generation of cognitive science. According to the proponents of embodied cognition, effective cognition occurs in the interaction between the body and the environment. Only by closely connecting cognitive activities with the interaction between the nervous system and the body and the environment can we realize the correct interpretation of cognitive activities. Therefore, it is not difficult to find that embodied cognition advocates that the interaction between the body and the learning environment is the key to in-depth knowledge learning. In the field of embodied cognition, some scholars are keen to explore the relationship between embodied cognition and virtual reality. For example, Chai and Chen believe that at present, the mainstream embodied cognitive environment includes three different types: the sensory enhancement environment for understanding information through organ perception and limb movement, the proportionate posture action environment based on the matching of gesture and perceptual symbols, and the learning environment for the body to participate in movement combined with direct embodiment and agent embodiment. Due to its outstanding advantages of multimodal perception and immersive experience, virtual reality environment has greatly contributed to the construction of embodied cognitive environment and learners’ deep cognitive processing. Therefore, it is regarded as an important way to explore whether and how the combination of technology and embodied cognition can effectively promote learning. In addition, with the wide application of various modern information technologies such as virtual reality and augmented reality in learning situations, learning behavior and its psychological mechanism based on immersive virtual reality fusion environment have become the frontier issues concerned in the field of educational psychology. The learning behavior in the virtual reality fusion environment, its information acquisition method is multimodal perception, and the process of learners’ participation is an embodied cognitive learning process. The above functions realized by virtual reality and augmented reality technology are exactly the picture depicted by the metaverse.

In a broader sense, the metaverse may serve the field of educational psychology through the following ways:

First, create an educational metaverse to provide a new field of panoramic learning process. The core issue of educational psychology is the learning process, which is the fundamental way to achieve learning goals. Therefore, whether we can obtain the support of external resources in the learning process determines the learning effect to a great extent. However, the traditional learning process is limited by the separation of time and space, outdated learning resources, scattered learning space and other factors, which separates classroom teaching from pre class learning. The results of in-depth discussion or innovative inspiration are difficult to verify and continuously improve in time, which is ultimately not conducive to the occurrence of effective learning process. The creation and
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development of metaverse will provide effective solutions to the problems in the process of traditional teaching and learning, and the new field of panoramic learning will provide comprehensive support for teachers’ teaching and students’ learning. The new field of panoramic learning is an educational metaverse based on digital twin, Internet of things, brain computer interface, wearable devices and other technologies. Super social, deep immersive experience, free creation and other functions provide comprehensive support for learners’ learning process. In the educational metaverse, teachers and students can use relevant equipment to realize the deep integration and continuous development of teaching and learning activities before, during and after class, and continuously strengthen the learning process by creating a virtual reality integrated learning environment in which there is reality in the virtual and there is virtual in the real, so as to achieve a win-win situation for teachers and students.

Second, create a more scientific and novel teaching model by creating MOOC metaverse. Large open online courses (MOOC) have been widely used in the field of education and teaching because of their online, open and many other characteristics. However, MOOC also has many disadvantages, such as difficult to guarantee the teaching order, impossible to estimate the teaching quality, and difficult for students to study actively. The creation and development of metaverse is conducive to creating a more scientific and novel teaching model, which promotes the birth of MOOC metaverse. In MOOC metaverse, virtual reality technology can create a super real virtual environment, so as to more effectively mobilize the vision, hearing, touch and smell of teachers and students, so as to improve the breadth and depth of students’ access to information and the happiness of teachers’ teaching. For example, an exploratory learning module with the functions of virtual scene roaming and course information acquisition can be set in the MOOC metaverse to present relevant teaching contents through the virtual classroom, so that students can obtain a platform and system for autonomous learning. When students want to get teaching content and resources, they can call MOOC course information resources with the help of scene roaming function. When students need to carry out various exploration activities in the process of learning, they can obtain virtual scenes with the help of scene roaming function, so as to carry out independent exploration.

2.2. Metaverse + social psychology

According to the classical social identity theory, social identity consists of three basic processes: classification (including itself into a group), identity (considering itself in line with the general characteristics of members of a group) and comparison (evaluating the advantages and disadvantages, status and reputation of a group compared with other groups)[21]. Among them, identity is the core of social identity theory, and an important part of it is identity. In fact, metaverse is the evolution of the Internet into a virtual world in which people interact through digital self or avatar. Therefore, in the virtual world depicted by the metaverse, people will inevitably experience two prominent problems: the tension between virtual identity and real identity and the tension of identity within the virtual world. For example, in the scifi romance “Her” written and directed by Spike Jonze, the Theodore Tombury fell in love with a female voice from an advanced artificial intelligence operating system after ending a heartbreaking relationship. The girl named “Samantha” not only has a slightly hoarse sexy voice, but also is funny, humorous and considerate, which makes the lonely man deeply trapped in the mud. It can be expected that as more and more automated agents are put into use together, a new interaction mode will be generated, and these interactions must occur in the virtual reality world, because there is no cost there. Of course, social interaction with robots will also occur in the virtual world. However, it should be noted that the interaction using virtual reality must be the same as that in real life, otherwise the separation between virtual identity and real identity will hinder identity. People can also create their own virtual world, and such virtual world should interact seamlessly with the virtual world created by others,
so as not to weaken their identity in the virtual world.

In a broader sense, the metaverse serves the field of social psychology in the following ways: first, by breaking the “magic circle” to alleviate interpersonal avoidance and promote individual social behavior Katie and Eric Zimmerman put forward a ternary architecture model including “rules”, “play” and “culture”. They believe that “rules” are at the bottom of the game. On this basis, more relevant elements continue to be added and produce “play” and “culture”. The architecture of “rules” and “play” is directly related to the game. They constitute the internal space of the game, which is called “magic circle”[22]. The digital twin technology contained in the metaverse enables us to construct a virtual space with mapping with the real space, which can blur the boundary between the real world and the virtual world, and then bring the possibility of breaking the “magic circle”; second, strengthen individual self-identity by shaping the meta cosmic cyberpunk cultural circle. On the basis of digital twinning of real space, the open and editable digital resources of metaverse make it possible to transform virtual space. The virtual elements generated in the virtual space will be reorganized in the metaverse to form a virtual original cyber culture, so as to promote individual self-identity.

2.3. Metaverse + clinical psychology

In recent years, China has paid more and more attention to people’s mental health. Many policy documents related to people’s mental health, such as the guiding opinions on strengthening mental health services and the outline of “Healthy China 2030” plan, have been issued one after another, all emphasizing the need to effectively improve people’s mental health awareness and strengthen the construction of mental health service system. The influence of the metaverse on mental health is often through an indirect way: the virtual world depicted by the metaverse is realized by people with the help of digital technology, and the use of digital technology will have varying degrees of impact on people’s mental health. Most of our citizens are in good psychological condition, and a small number are in “poor” or “poor” mental health status, especially the mental health index of teenagers (the mental health index generally takes 500 points as the average, and the total score can measure the overall mental health level) shows a downward trend with the growth of age[23]. metaverse will make people excessively immersed in the virtual world, affect their life in the real world, and even cause some psychological and physiological disorders, such as depersonalization disorder, realization disorder, motion sickness, cyberloafing[24]. In addition, the metaverse also makes the existing standards for distinguishing physical injury from psychological injury no longer applicable. In the virtual world created by the metaverse, the avatar attacking a person has a “physical” nature in the virtual world, but from the real world, it is more psychological, which is also harmful to the individual’s mental health to a certain extent. In addition, there is a huge demand for psychological counseling services, but there are still some problems in health counseling in China, such as relatively low professionalism of employees, lack of support from relevant laws, and insufficient attention of citizens to mental diseases. With the rapid development of network and digital technology represented by metaverse, using these emerging technologies to improve people’s mental health has gradually become a hot spot in the field of psychological counseling, which roughly includes four aspects: first, use the network platform for psychological science popularization, training or consultation; second, the use of computerized psychotherapy procedures for self-help or semi self-help treatment; third, use network or digital technology to detect, track and intervene emotions or behaviors in real time; fourth, the application of chat robots and other emerging networks or digital technologies.

In a broader sense, the metaverse may serve the field of clinical psychology through the following ways: first, the effectiveness of school mental health education is improved by building a metaverse psychological experience hall. The venue learning theory points out that the venue is the second education system besides the school. Compared with
classroom teaching, the venue has rich learning resources, relaxed environment, flexible time and free learning, providing students with a relaxed, free and self-directed unstructured learning method. The creation and development of the metaverse effectively meet the requirements of the virtual and real integration learning environment. The real situation, experience and immersion of venue learning greatly promote learners’ understanding of knowledge and the cultivation of critical high-level thinking ability. By building the metaverse psychological experience hall, students can visit, experience and carry out various psychological counseling and training in a real-time interactive way in the virtual environment, so as to get an immersive feeling; second, the effectiveness of psychological counseling is improved by creating a meta cosmic psychological intervention system based on traditional behavioral therapy. The creation and development of metaverse is conducive to promoting the deep integration of traditional behavior therapy and virtual reality technology. The setting and presentation of virtual scenes partially replace the interaction between consultants and visitors, so as to reshape visitors’ cognition and concept and improve their skills. In addition, individuals with borderline personality disorder show a wide range of emotional disorders, behavioral disorders and other characteristics, and the creation of virtual situation can effectively alleviate these symptoms. For example, social situations of different nature (such as rejection, neglect, confrontation, acceptance, understanding, empathy, etc.) can be designed to successfully induce and improve the bad cognitive patterns of individuals with borderline personality disorder, so as to achieve the effect of continuous correction. All these works can ultimately promote the establishment of the meta cosmic psychological intervention system based on traditional behavioral therapy, which is conducive to fundamentally changing many limitations in the existing psychological counseling, so as to make psychological counseling used to improve and enhance people’s mental health in a more effective and convenient way.

3. Conclusions

As one of the hottest emerging tracks in the current industry, metaverse depicts the ultimate form of the human world and responds to the immortal dream of conscious life. In terms of the current development trend of metaverse, it is bound to bring major changes to human civilization and greatly promote the development and transformation from industrial civilization to intelligent civilization. The virtual experience given by the metaverse is profoundly affecting people’s thoughts, emotions and desires, changing memory, experience and self-cognition, and breaking the boundary between reality and fantasy. However, science and technology is a double-edged sword from beginning to end. On the one hand, the metaverse provides an opportunity to break away from the constraints of reality, re-examine and change themselves, and even create a perfect world or miracle, but on the other hand, it will make people excessively immersed in the virtual world, affect their life in the real world, and even cause problems such as psychological barriers and physiological disorders. More importantly, the essence of the metaverse is still the network virtual space, which will become an ideal representation of the digital intelligence world in the future through the superposition of data and intelligence. Therefore, while the topic of metaverse is hot today, we also need to think about the negative impact it may have on people’s psychology and behavior, and think about how to prevent and resolve it with the help of psychological knowledge.

Conflict of interest

The authors declare no conflict of interest.

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