From Virtual Reality to Metaworld: New Trend of Network Teaching

Liu Jian, Wang Xue, Gao Chang, Hu Yong

School of Foreign Languages for Business, Guangxi University of Finance and Economics (Guangxi 530000)

Abstract: Metauniverse is a new era in the development of virtual virtual technology. Its essence is an online virtual space associated with the real virtual world. Innovation and development of contemporary human society. The development of virtual reality technology has gone through four stages: desktop virtual reality, immersive virtual reality, extended reality and metaworld. Meta-space has crossed the gap between time and space, will reshape the "co-existing" network teaching space, and create a meta-space intelligent network learning environment. The technical system of intelligent network learning environment includes the construction environment, information environment, psychological environment and spiritual environment, including composite resources, intelligent tools, image activities, whole-person evaluation, precision teaching, learning partners and teaching groups, including composite resources, intelligent tools, image activities, whole-person evaluation, precision teaching, physical learning, learning partners and teaching groups, and focuses on promoting learners' intelligence in terms of training objectives. The meta-space will deeply reconstruct the network teaching resources, teaching modes, learning support services and the verification of network teaching. The future meta-space will be a new starting point for the transformation of online teaching. We must plan online teaching in meta-space in advance, accelerate the development of new infrastructure, build its development foundation, build a new research framework to form its development momentum, and explore new ethical ideas to clarify its development logic.

Key words: metauniverse; Network teaching

1. The time context of the universe entering the field of education

Online teaching is the major development direction in the future, and the new round of popularity after 2020 has accelerated this change. According to the provisions of the Alliance and according to the information provided by UNESCO, most countries and regions will, in order to ensure its sustainability and stability when education stops due to the outbreak of COVID-19 (UNESCO, 2021), online teaching is a major part of modernization. However, the debate about online teaching is divergent, and many people have pointed out some problems in the current online teaching: first, the online page is too monotonous to stimulate students' enthusiasm for learning (Violante et al., 2015); In the teaching process, the interaction mode of students is relatively single, while the participation of students is poor (Wen Shufeng et al., 2017); There is no complete learning materials to evaluate the learning effect of students (Guo Cultural Revolution, 2020); Lack of skills training atmosphere and internship connection (Carrillo et al., 2020). It can be seen from this that at present, web-based teaching based on Web 2.0 has entered the "bottleneck" stage of development, and two-dimensional technology is a new way of learning. It is difficult to support students' needs in immersive learning environment, human-computer interaction and "face-to-face" social interaction. A creative "singularity" has promoted the transformation of online teaching, which is to seize the future education highland. Virtual reality technology, virtual reality technology, virtual reality technology and digital twin technology are continuously reconstructing online teaching from learning resources, teaching organization, system construction and other aspects (Liu Geping, 2001). Metaspace is an important part of the future. It is a new information technology that combines VR/AR/MR, 5G, cloud computing, artificial intelligence and digital twins. With the development of the Internet, people will usher in a new era of the Internet. Roblox, an online creative game platform, believes that the elements that make up the metaworld include identity, friends, immersion, low latency, diversity, anytime, anywhere, economic system and culture. These eight elements will form a virtual and real integration, universal interconnection, intelligent openness and decentralization. 3D virtual heart. Therefore, taking meta-space as a new network platform for network teaching will change the development direction of network teaching. Online teaching and evaluation methods to promote individual and overall development.

Many news organizations have set 2020 as the "era of yuan". Although the metauniverse is still in the primary stage of development, it has shown a large space for development. Starting with the characteristics of meta-space and the historical background of technological development, this paper discusses the application of meta-space in network teaching, the application of meta-space in network teaching, and the application of meta-space in network teaching.

2. Characteristics and development track of the development of metacosmic technology

2.1 Metaworld characteristics

Metaverse is the English translation of metacosmology, which

means the combination of "meta" (meaning "transcendence") and "universe" (meaning "universe"). The purpose is to show that metacosmos is a seamless and deeply integrated digital world, which can create great significance beyond reality. Facebook has changed its name to "META". The metauniverse will become an unprecedented capital market, and its destructive influence in the whole human society will gradually enter this society. The metaworld has four characteristics: first, the deep combination of fantasy and reality. From the perspective of its survival form, the deep combination of "illusion" and "reality" is its most essential feature. Metaspace is a "digital twin" based on advanced digital technology and combined with the real world. It contains real digital replication and self-creation. The metauniverse helps users improve the quality of online interaction and communication in the metauniverse through the equipment of vision, hearing, touch and body feeling, as well as low latency and highly realistic interactivity, to achieve an immersive virtual world. Therefore, the construction of "digital twins" and immersive games can make users feel both real and detached from reality in the virtual space. A set of intelligent digital technology. Metaworld is an extremely open, free, complex and huge integrated system, covering the entire network space, terminal equipment and actual situation. It is a huge digital application ecosystem jointly established by many developers (Zuo Pengfei, 2021), and these foundations are based on a variety of intelligent and digital technologies. Metaspace is based on MR technology, blockchain technology, communication technology, cloud computing technology, Internet of Things technology and artificial intelligence technology. Through MR technology, brain-computer interface technology, Internet of Things technology and wearable technology, users can feel and interact in real life. Through blockchain technology and artificial intelligence technology, the metauniverse is monitored and maintained to ensure its continuous stability, compliance with standards and effective operation; Through 5G and cloud computing technology, a large number of users can interact in real time, ensuring smooth and low latency. On this basis, more and more high-tech and new ways of application will be added to the meta-space. Integration of online and offline. Due to the high combination of virtual and real, the boundary between virtual and real will become blurred in the meta-space. Users can freely switch between virtual and real social forms according to their own needs. Each user in the metaworld can obtain a unique meta-space identifier, which can establish a realistic social network in the metaworld. At the same time, using this identity recognition, users can use the corresponding digital devices at any time and place to carry out social activities such as learning, work and life in the meta space. In this process, the virtual or group role of users will maintain completeness and integrity in the transition between the network and the network (Dionisio et al., 2013). Meta-space will have a profound impact on various organizations and operation modes of today's society, thus establishing a new social connection outside the network and the network.

Make users' thoughts more concrete. Metaspace allows users to visualize their thoughts in the real world through a large number of data and technical means. First of all, users are "free" and "omnipotent" in the metaworld. They can directly convert their thoughts into physical objects, so that abstract and complex thoughts become clearer and more concrete, and thus better understand and communicate with themselves. Secondly, visual thinking can make users concentrate on their own thinking and avoid the decline of attention, reflection and logic caused by the influence of "intermediary".

2.2 Metaworld of technological evolution

The "meta universe" is not a new concept. It was originally produced in a scientific fantasy "Avalanche" published in 1992, Neil Stephenson once described the metauniverse in his book as follows: "By wearing earphones and glasses and looking for terminals connected to the real world, we can simulate the virtual world that matches the real world through computer (Wang Chenguang 2021) 。 The current meta-space is equivalent to the regeneration of this traditional concept, which is formed on the basis of new technologies such as virtual reality, augmented reality, blockchain, cloud computing, and digital dualism. According to the "Research Report on the Development of the Metauniverse from 2020 to 2021" of the Institute of New Media of Tsinghua University, "Metaspace" is based on virtual technology, virtual reality technology, virtual reality and virtual reality to build a virtual virtual world and a new ecosystem based on blockchain. Metauniverse is the most advanced visual immersion technology at present. Its essence is a kind of cyberspace parallel with real network data, and a cyberspace centered on it and virtual reality technology. According to the development and use of this technology, it can be divided into four development periods: first, virtual reality on desktop computers. Its typical example is the Internet-based 3D virtual reality world (Linden 2020) launched by Linden Laboratories in 2003. Users can establish "Avater" in Second Life, participate in various explorations and social exchanges in virtual space, make and sell virtual goods and provide services. During this period, users only watch through the computer screen, and are limited by interactive devices, stereo vision and 3D modeling, resulting in a low degree of immersion. SecondLife has been widely used in online office, remote social networking and other fields. Especially since the outbreak of COVID-19, SecondLife has attracted 12 million visitors every month. The second level is to experience virtual reality. With the help of immersive and human-computer interaction technology, experiential, passive, one-way experiential, three-dimensional, active and interactive leapfrog. Especially after 2016, VR terminal products such as Oculus and HTC Vive have developed rapidly. All kinds of senses (vision, hearing and touch) people feel in the game can be converted into real perception on the basis of VR devices and body perception, without being bound and bound in any form. The third period is mainly to expand the dual technology of reality and digital. With the continuous deepening of the new generation of information technology and virtual reality technology, and the in-depth integration of 5G, cloud computing, artificial intelligence and other technologies, a more complete meta-space technology system is gradually taking shape. 5G has the characteristics of high speed, low latency, large-scale device connection, etc. It can connect multiple geographically dispersed users or multiple virtual spaces, so that users can participate in the same virtual space at the same time and experience real virtual experience together. VR/AR/MR technology is used to realize the transition from the real world to the virtual world to the real world and the real world; The digital dual technology is to connect the space between the physical object and the physical object, to achieve the perfect combination of reality and virtual, and to achieve the perfect combination of reality and virtual. Big data, cloud computing, artificial intelligence and other technologies have laid a solid foundation for the development

of the metauniverse in terms of computing power and intelligence, thus promoting the high-quality development of the metaworld.

The fourth level is the embryonic form of the metaworld. Through the brain-computer connection, the boundary between reality and virtual can be broken, and users can freely control their bodies and communicate with their brains. The brain-computer interface has the ability of two-way transmission, which can transmit various perceptual information to the user's brain through the brain information, so as to achieve the same perception as in reality, and thus achieve the goal of interaction between people. In the metauniverse, blockchain technology is the core technology to achieve dimensional upgrading. Through it, an economic link can be built between reality and reality, realizing the real combination of value and value. The metaworld will combine human with virtual world, real world and virtual world.

3. The Theoretical Basis of the Application of Metauniverse in Network Teaching

The metauniverse constructs a three-dimensional virtual horizon of online education, and the relevant theories supporting its scientific development will also transform from body to body. The embodied cognitive theory, distributed cognitive theory and immersion theory have certain theoretical guiding significance for the application of meta-space.

1. Body cognition theory

Based on the dualistic epistemology of "body mind", this study proposes that cognitive thinking is the product of the interaction of brain, body and environment. The human body's sensorimotor system, morphological structure and experience play a certain role in the formation and development of cognition. F. Valera et al. made the following interpretation of the term "embodied": "First, knowledge depends on the experience generated by the body of different sensory activities; second, the skills of individual cognitive activities themselves are contained in a wide range of biological, psychological and cultural environments" (F. Valera et al., 2010). The central idea of embodied cognition is to attach importance to the body's participation in the cognitive process and the specific interaction between the body and the environment. Therefore, the cognitive process should focus on the situation, body perception and interaction process. The support of meta-space and the enhancement of network teaching can enable students to be in a broader social and cultural background. Through specific interaction with their own sensory activities and the surrounding environment, students' cognitive ability can be improved.

2. Decentralized understanding

The distributed cognitive theory puts knowledge within individuals, between individuals, media, environment, culture, society, time and other aspects. Distributed cognition is a cognitive behavior of information processing through the internal and external performance of individuals.

(Chuah et al., 1999). It not only pays attention to the interaction between individuals and artificial objects, but also pays attention to the system of cognition, and emphasizes the root and distribution of cognition. This paper proposes a new research method - research based on information technology, puts forward the concept of knowledge structure based on network environment, and puts forward the concept of information network, that is, knowledge structure based on network, information technology based on network, network technology based on information, technology based on network information, network based on knowledge, network information resources, network resources, network environment information, network tools, The use of information, the interaction of information and the transmission of information are all the transmission of information. Therefore, from the perspective of metauniverse learning resources, learning tools, learning behavior selection and design, the research of distributed cognition is of great significance to the development of online teaching. The second is to attach importance to the communication between students.

3. Immersion theory

Mihalyi Csiksczentmihaly et al. (also known as "flow theory") is used to describe a person who is completely engaged in a project that is not influenced by other external factors, In order to obtain an extremely pleasant mental state (CsikSczentmi et al. said. The link between "challenges" and "skills" is the most important factor. Some surveys have shown that in the face of high challenges and high technical level, there will be a sense of penetration. In addition, researchers also believe that most games that can make players feel immersed are based on "first person perspective" or "role play" (Wang Cixiao et al., 2017). In addition, students are also required to learn in a free and open way when creating their "immersion" experience. In short, "immersion" refers to students' "immersion" activities, which can provide metacosmic support for online teaching activities, learning tasks and exploration plans, thus improving students' learning enthusiasm and participation.

4. Establishment of network intelligent teaching system based on meta-space

The modern educational situation is moving towards wisdom, informality, integration, interaction and innovation. Huang Ronghuai (2012) proposed that intelligent learning environment includes perception environment, recording process, recognition situation and connection community. "Metaspace" has opened up a new way for people to explore the intelligent ecological environment of intelligent education. Therefore, this paper discusses the establishment of a network education system based on meta-space from three levels: technical architecture, system structure, constituent elements and training purpose (see the table below).

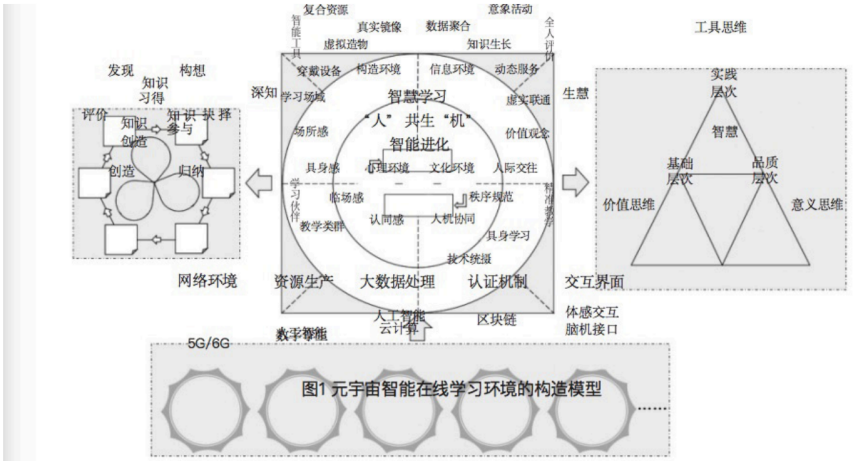

图1 元宇宙智能在线学习环境的构造模型

(1) Technology integration: the foundation for building a meta-world smart online learning environment

Metaspace is a new, subversive, intelligent, green and global development concept (Zhang Xuemin et al., 2021). It will continue to advance the technological development path of "single technology - comprehensive technology - rich technology" (Shen Xiucai, 2018). It will integrate different technologies and display new human wisdom. In general, the basic technologies of meta space include 5G/6G network technology. Metaspace will build a new generation of communication network based on 5G/6G, and comprehensively break the information transmission barrier based on intelligent technology. Meta-space network combines cloud computing, ubiquitous computing and boundary computing to build a new technology connection field and promote the in-depth integration of "information, entity and social". The development goal of Meta Universe Network is "Internet of Everything, Digital Twin" (IMT-2030 (6 G) Promotion Group, 2021), showing the innovative characteristics of intelligent endogenous, security endogenous, multi-domain integration, and multi-network integration. On this basis, real-time monitoring of virtual reality, holographic communication, sensory interaction, intelligent interaction and other activities can be realized.

Production materials. With the support of artificial intelligence technology, the meta-space will build an ecological development field of resources. First, it will continuously generate a large amount of exploitable content intelligently, so that the resources of the meta-space will continue to grow. Secondly, according to the needs, personalized learning resources are intelligently generated, and the meta-space in the meta-space is dynamically and intelligently pushed. Third, a comprehensive resource audit ensures that all resources in the meta-space are safe and reasonable. Massive information. Metaspace will further promote intelligent computing and build a business system suitable for the collective configuration of Web3.0 network. With the development of cloud computing technology, the hardware of the metauniverse network teaching system has realized intelligent virtualization and intelligent services, thus enabling each subsystem to realize deep intelligent integration. Using cloud data cloud, resource cloud and business cloud, the seamless transformation of data from top to bottom, top to bottom can be realized in the meta space, forming a new logical framework, architecture and business model of the meta space network teaching, and realizing configurable scalability, multi-resource integration and sharing, and dynamic precision services.

Verification agency. Because of its decentralized, traceable, tamper-proof and untrustworthy characteristics, it will promote the change of the production mode among the meta-universe, transform the information network into a "value network", and build a certification ecosystem that conforms to the information network. In the construction of resources, blockchain technology can help the storage, connection, transaction, sharing and management of resources in the metaworld, so as to achieve the best circulation and allocation of resources. In the field of learning certification, it will promote the development of credit certification, learning achievement certification, skill certification and other fields, and make certification management more intelligent, safe, efficient and mutual recognition. Interactive interface. The metaworld will move beyond the interaction of graphical interfaces and really turn to RBI based on reality. The online interaction of meta-space will be combined in many forms, such as movement, touch, eye movement, gesture and electromyography, to achieve interaction with the body. From the perspective of brain-computer interaction, the meta-world will establish an intuitive connection with the human brain based on the brain-computer interface, so as to achieve the dynamic conversion of brain signals and external performance patterns, thus forming an ideal thinking learning experience.

(2) Architecture: the research and formation of the network learning environment oriented to the metauniverse

Professor Pan Yunhe believes that human living space extends to three dimensions, namely physical space, social space and information space (Pan Yun

2018, Crane.) According to Paul Milgram, a coherent model of reality and virtual

(Milgram et al., 1994), "virtual" makes reality more real, and "reality" is the "secondary" of human beings. The metauniverse is a perfect form of space continuation. It has broken the previous concepts and broken the previous concepts. From the perspective of technology empowerment, the intelligent network teaching environment system of metauniverse network education mainly includes: the first part is to construct the situation, which is the cognitive symbiosis field of teachers and students together. The meta-world construction situation endows reality and illusion, enabling learners to conduct ubiquitous, free and fruitful learning. Its main contents include: the realistic virtual reality learning situation, taking the actual physical learning situation as the object, and combining it with the background of the meta-space as required to realize the reconstruction of reality; Virtual creation means, to a certain extent, modeling and creating learning objectives through the understanding needs of students, so as to achieve deep and macro understanding and observation of objectives; Equipment can help students improve their cognitive experience of meta-space, so as to achieve a whole-hearted learning state and make the equipment form more intelligent, flexible and adaptable; Learning field is an ideal teaching field that organically integrates scenario presupposition, dynamic modeling and teacher's process editing. The second is the ecology of information, that is, information flow and information flow and service. Meta-space can not only provide intelligence information, but also enable students to go deep into knowledge and realize the combination of knowledge and knowledge. The main content is to integrate the dynamic information of learners' behavior, physiology, psychology and cognition into the system, teachers and learners to realize dynamic adjustment; Knowledge growth refers to the formation of knowledge circulation and dynamic dynamic updating between original resources, dynamic resources and renewable resources through the construction of intelligent knowledge base; "Dynamic" refers to bridging the boundary between knowledge presentation, scene representation, path optimization and intelligent push, so as to reduce the burden of knowledge and achieve the goal of "think and get"; The so-called "virtual and real" means that all the information in the metauniverse is perfectly connected with the information in reality. The third is the psychological situation of students, that is, the overall feeling of the dynamic and continuity of teachers and students. Meta-space can provide students with a new physical and mental space to meet the overall psychological needs of students. Its constituent elements are: local awareness, that is, the meta-space can produce students' identity, functional dependence and emotional dependence of the learning environment; Specific feeling refers to the deep interaction of body participation in movement, body proportion movement and sensory enhancement, which results in the high integration of environment, cognition and body; "On-site feeling" refers to cultivating students' feelings of emotional expression, open communication and solidarity and cooperation in the atmosphere of students' independent inquiry, cooperative inquiry and semantic integration; Cognition refers to students' evaluation of the situation, their own evaluation and their own evaluation, so that students can obtain higher cognition and their own norms. The fourth is the general external action obedience and cultural background between teachers and students. Internal values. Meta-space reconstructs the relationship between human and nature and forms a multicultural field of pluralism, harmony, openness and generation. Its main content is to organically combine human intelligence and mechanical intelligence to create "collaborative intelligence" (Cai Lianyu et al., 2021). In the meta space, intelligence technology is applied to the formulation of objectives, the generation of content, the planning and evaluation of processes, thus realizing a people-oriented knowledge system. The order norm refers to the operating standard of reconstructing the learning environment under the influence of the social rules generated by the metaworld; The interpersonal relationship is the free, equal and fair interpersonal relationship formed in the learning atmosphere of the rich media of the universe; Values refer to a comprehensive understanding of self, behavior, rules, morality and other aspects in the learning situation of the metaworld.

(3) Constituent factors: the central characteristics of smart online education in the metaworld

In terms of the components of learning environment, Brent Wilson put forward the "three elements theory" of resources, tools and interpersonal relationships (Wilson 1995), David Jonassen (David Jonassen et al.) and other factors based on problem space, social support and case studies (Jonassen et al. 2012). Huang Ronghuai et al. summarized the components of learning environment as resources, tools, learning communities, teaching groups Teaching mode and learning mode (Huang Ronghuai et al., 2012). The intelligent network learning situation of the metauniverse will reshape and deeply aggregate the original elements, focusing on learners, knowledge, evaluation, community and other different perspectives, so that it has its own characteristics. Generally speaking, it includes eight aspects: comprehensive resources. The composition of this resource is a field characteristic composed of context, content and activities; The performance of resources is multimodal. The same resources can provide multiple expressions to meet different learning needs; Resource generation is dynamic, including content aggregation and scenario model; In terms of resource experience, it is mainly manifested in the first person experience, and second, observation and research from the perspective of a third party. An instrument of wisdom. Can create a real touch feeling on the wearing device; It can react in real time and display the effect in an intuitive way; Various formats that can be selected to support individual selection of situational teaching; Efficient comfort can intelligently meet the needs of "body stretching". Imaginary behavior. Innovate scenarios. Teachers and students can use scenarios in the scenario database, and can also create combinations; In the design of teaching activities, teachers and students can adjust the layout of the scene according to the needs of students' activities, so as to integrate individual space and community behavior; Through the feedback on the effect of the event, we can deeply mine and analyze the whole event, and provide intuitive analysis reports for individuals and communities. Everyone gave such comments. Personal growth evaluation can be continuously formed and summarized, and data can be imported into the past in real time to conduct a comprehensive evaluation of personal development; The group development assessment is based on the new human-to-person interaction to establish a new teacher group and effectively monitor and evaluate its overall development effect. Accurate education. In terms of learning behavior adaptation, path orientation, process intervention and learning resource promotion, it is based on learning intelligence.

On this basis, we will optimize the teaching design, guidance and teaching decisions to achieve the purpose of accurate teaching. Teach by yourself. Multiple sensory interactions can stimulate multiple human senses and integrate multiple interaction modes such as proximity, ubiquity, multimodality and implantability (Wang Cixiao, 2018) to achieve technical and near-natural interaction; Multi-channel interaction can achieve different action goals through different methods such as voice, movement, eye movement and gesture; "Hands-on" interaction, through "hands-on experience" to understand "on-site" events, can make people understand reality and prevent danger. Study peers. In the metaworld, the "interpersonal" connection will break through the real limit, thus establishing closer cooperation. Its main forms are: "virtual partner" refers to a virtual image formed by intelligent technology that can change its own shape at will; The phantom partner is a virtual image of other students, and students can also modify their own image in a sense; Holographic companion is the real mirror of other students. Metaworld will create more forms of cooperation and establish multiple cooperative relationships. Teaching category. Teachers can also train students as their own students. Its content mainly includes: "virtual teacher", a "virtual image" with real image made by intelligent technology, can "change" at will according to the requirements of the classroom environment; The avatar teacher, that is, teaching in the way of "portrait"; Holistic teachers, that is, teachers use the mirror of reality to teach.

(4) Education purpose: network education aimed at promoting the network education of metauniverse intelligence

The space division of Meta-space intelligent online learning space breaks the separation between time and space of traditional online education, and makes space and time re-integrated, creating a new "coexistence" form that spans time and space. At the same time, it also breaks through the traditional "time and space constraints" and changes the natural "imbalance" between teachers and students in the classroom. It will completely change the traditional teaching mode and make it surpass the traditional online education mode and classroom mode. The metauniverse network education can not only achieve the traditional educational purpose, but also give full play to students' potential, cultivate students' intelligence, and meet the needs of cultivating intelligence in the new era.

First, he is very clear. Students are in a learning environment where they can experience the whole knowledge. The main steps are: identify the background of the problem, screen the type of the problem, and find solutions and ways in the construction environment; The concept is to use mixed resources and intelligent means to conduct experimental research and propose various alternative methods; Selection refers to the comparison, selection and implementation of various schemes through the auxiliary means of intelligent evaluation to select the best scheme; Induction is the thinking and summary of the learning process, knowledge acquisition and application methods; Innovation is to seek better answers to questions through your own creativity; Assessment is the organic integration of process intelligence assessment and self-reflection assessment to form a comprehensive assessment. The metauniverse network learning environment is conducive to students' effective acquisition of practical knowledge and active participation in various situational learning and deep knowledge innovation. Therefore, from the perspective of knowledge generation and development, the network learning situation of the metauniverse is conducive to the construction of knowledge externalization, internalization, combination and socialization (Nonaka et al. 1995), so that the mutual conversion between explicit and implicit knowledge becomes a cycle. The second point is wisdom. When students conduct in-depth learning

On this basis, it will develop towards a higher level of "intelligent growth" (Cao Peijie, 2018). In terms of the meaning of intelligence, its composition can be divided into three parts (Yang Xin et al. 2020): "instrumental thinking" of students' cognition, that is, students' realistic thinking of solving problems, exploring laws, and innovating knowledge; The values oriented by interpersonal communication include students' social cognition, life communication and the pursuit of group consciousness; The "meaning thinking" guided by "self-awareness" is a positive and positive "aesthetic" of life experience. In the learning of the meta-world, human knowledge and skill knowledge are combined to cultivate and cultivate a new knowledge system (Wang Xing et al., 2021): basic abilities, namely, basic abilities that match the needs of AI, including knowledge and cultural knowledge, including the deconstruction of materials, activities and models; "Pragmatization" refers to students' external intelligence activities, including learning intelligence composed of forming norms, self-control emotions and rational choices, and knowledge intelligence created by knowledge construction, paradigm extraction and integration; The quality level refers to the ethical knowledge of correctly treating the relationship between the host and the guest, between people and me, and between things and me.

5. An important link in the change of the metauniverse in network teaching

The network teaching based on meta-space will enter a new development period, that is, experiential learning and immersion interaction. It will break through the traditional online teaching mode based on planarization technology, so that the virtual reality space form combining virtual reality and virtual reality will become a perfect space form. Therefore, with the development of technology integration, business innovation-driven, knowledge innovation and innovation experience, and the staggered empowerment and spiral development, online teaching will have the innovation singularity of transformation and upgrading, and achieve a real leap in the form of development.

1. Online metauniverse teaching

"Metaspace" is the integration of various technical forms to build an immersive online teaching mode combining virtual and reality. The characteristics of the network course resources of Yuantiandi are as follows: First, the teaching of the course is carefully decomposed, the students are represented as a case, and the specific or situational demonstrations such as rotation, scaling and splitting are carried out to explore the underlying logic; The second is the flexible combination of the curriculum structure. Students can learn according to the original teaching order, customize the combination of the scene order, and reconstruct the scene through self-designed scenes; The third is the "curriculum upgrading" of "co-molding", that is, to comprehensively record the whole teaching process of teachers and students, deeply explore and analyze the teaching materials left over in the teaching process, and give dynamic feedback to them, so as to achieve the

best update of the curriculum. From the perspective of students' experience participation, the types of courses can be divided into three types: first, from the perspective of "others". In the process of "roaming", students learn in the form of "third person". This course takes computer, tablet or smart phone as the terminal, or tablet or augmented reality or enhanced stereoscopic display. The course content, learning path and interaction mode are all set in advance, and students are limited by the authority of homework and limited immersion feeling in the learning process. Second, "subject" teaching based on students' views. Students learn in the "first person" way in "immersion". This topic is based on the wearable virtual reality device. The user's perception immersion is related to the adequacy and matching of the user's wearing device. Although this type of teaching is also set in advance, students have greater autonomy in practical application. With the continuous improvement of students' perceived real feedback level, this type of curriculum will gradually develop into a meta-space curriculum. Third, look at the "real" classroom from the perspective of "transcendent". In the "second life", students carry out experiential learning in the form of "rebuilding life". This teaching mode is based on the rapid development of computing power and brain-computer interface technology. It completes the transmission of the nervous system in a connectable, computable and interpretable way. Students can fully "survive" here, and the virtual and realistic combination scenario has an understanding of students' thinking, which can be dynamically simulated according to the change of students' thinking, and truly achieve "what you think will get".

2. Metaspace online education mode

"Smart activation", "networking" and "terminal biochemistry" are the development trends of education in the future. Rod Gitchens believes that strengthening online education and eliminating obstacles in time and space are important factors to improve the effect of online education.

(Giessens, 2010). Although online synchronous education has gradually entered the mainstream, "technology presence" has covered up learning avoidance, technology abuse has led to the oblivion of value, interaction loss has led to the loss of emotion, and technology "concentration" has led to the "alienation" of education (Liu Min et al., 2021). It can be seen that the current online teaching is difficult to achieve real development in terms of interaction, emotion, quality and initiative. The metauniverse network education has opened up a feasible way for the study of this problem.

According to the applicable fields of metauniverse online education, it can be divided into the following three categories:

First, social networking. On the basis of distributed virtual reality, students can conduct large-scale online teaching and online teaching on the Internet. Communicate with different terminals in different places

Users can use avatars to conduct the same virtual learning environment; In addition, it can also share resources, cooperate and exchange, and have physical experience according to the social laws of the metaworld. Students can freely conduct independent learning, inquiry learning, cooperative learning and innovative learning in various learning situations, and interact with other virtual people, virtual people, etc. Teachers can organize teaching, demonstration and sharing among teachers, set flexible teaching methods, change the situation in the classroom at any time, and effectively intervene in the classroom according to the accurate response of students. This method can break the boundary between "teaching" and "learning", and let students and students reconstruct "social connection" together in the experience of "context". Second, network teaching and classroom integration. Meta-space network education will truly break through the traditional "closed" teaching mode and realize the organic combination of "in class and out of class". The teacher group should face both the local class and the students from other places. The teachers still use the local traditional teaching method, while the students from other places have two different ways of participation: first, combine the virtual and reality of the podium into the online education system of the metauniverse, so that non-registered learners from other places can participate in classroom learning in a virtual form; Second, for registered students, virtual projectors and other technologies are used to play video on the local classroom or the teacher's console, so that students can truly participate in classroom interaction activities. In this way, the real classroom will be completely open, so as to maximize the educational benefits of the school. Third, the experimental nature of online education. The meta-space network experiment course will go beyond reality and reproduce the "real" situation, the reflected phenomenon, the record of the process and the avoidance of possible dangers. In terms of practical needs, it can be divided into three types: the first type is process experience type. This type of test is aimed at specific service industries. During production, it is necessary to accurately comply with the provisions in the procedure, so that students can experience the "real situation" in person. The second is the simulation experiment, which requires students to give accurate feedback according to the experimental results, experimental results, experimental results, etc. The experimental results and experimental results are correct, and the most important is scientific feedback. The third is terminal entity manipulation. This kind of experiment uses virtual objects as the medium. Manipulating real objects can not only get real test results, but also avoid possible test risks. Its core is to make it consistent with the reality as much as possible.

3. Online metauniverse support service

Learning support is the key link of online teaching and the key factor to improve learning quality and reduce dropout rate. Innovative services based on new technologies are emerging, but the public's satisfaction with online teaching is not high at present (Fang Xi et al., 2016). Metaspace can establish a systematic learning support service system through "micro world". First of all, data-oriented, metauniverse online education will form a closed-loop information integration, which will maximize the improvement of the dynamic service decisions of enterprises. Secondly, it is the help of intelligence. Meta-space online education system can intelligently analyze the process of teaching and learning, and combine the function of technical support with learning. Third, the whole process, the metauniverse network education system can provide all-round support for students' study, life, work, etc. The metauniverse online education system will make full use of the multilinear characteristics of instant services, and integrate education, learning, management and evaluation into one, so as to achieve the combined force of multiple services and achieve the maximum benefits. According to its classification, it can be divided into three categories: first, "full perspective" auxiliary teaching. The virtual assistant in the meta-space has a variety of external forms, and students can freely make personalized choices. The existing

experimental results show that through facial expression change and body interaction, students' learning motivation can be improved, their cognitive burden can be reduced, and their efficiency can be improved (Elliott et al. 1998). The main content of online learning includes: real-time situational push based on learners' interests, learning content, knowledge situation, social network and other factors; Educational interaction (Almajanoe et al., 2014); Emotional regulation refers to the use of students to recognize and adjust students' emotions, so as to achieve the purpose of mobilizing students' positive emotions.

Second, people-oriented "intelligent" education assistance. Metacosmic intelligence situation is characterized by its "external intelligence", which can enable teachers and students to achieve "humanized" understanding and teaching. First of all, in the early stage of the class, students can be provided with intelligent instructional design and auxiliary resources according to the needs of teachers. Through simple operation, students can be corrected and optimized for learning. Secondly, in the classroom, we can conduct a comprehensive and dynamic analysis of students and class groups, formulate reasonable education policies and intervention measures for them, and work with teachers to carry out "double teacher" cooperation. Third, through intelligent evaluation of students, dynamic feedback and comprehensive evaluation of students, help teachers reflect on teaching and promote the improvement of students' information quality and professional ability.

The third is to establish a "one-stop" management support based on process reorganization. Metauniverse online education will build a unified data center system, and carry out ecological symbiosis through multimodal data, making the decision-making and execution of each management subsystem more scientific and intelligent. First of all, we should improve the efficiency of single administrative affairs as a whole, shorten the process as much as possible, implement personalized work, and track the whole process. Secondly, the intelligent integration of multiple management-related transactions should be able to achieve intelligent connectivity at the bottom level, timely update the relevant information according to the change of an event, and also provide intelligent guidance for the processing route. Finally, based on the change of the project and the development of technology, the implementation process of the project is dynamically optimized and adjusted.

4. Online teaching verifies the system of the metauniverse

Red Hoffman said that the development of online teaching has made online learning more valuable. "In the future, a certificate can be used to record the formal and informal learning experience of each school, and provide specific learning materials and learning skills." (Hoffman, 2016) Based on the existing authentication system, combined with big data, artificial intelligence, blockchain and other technologies, create a new ecosystem of online teaching verification. The metauniverse network teaching verification system has built a new development foundation, which will allow the whole society to achieve greater development, optimize the allocation of public education resources from the macro perspective, and achieve the inclusive development of everyone from the micro perspective. From the perspective of personal development, it includes three levels: one is to complete personal social survival through "identity authentication";

In the metauniverse, students have unique recognition characteristics. At the beginning of the construction of this recognition, it is necessary to properly map the real identity to reflect the subjectivity of the real identity, combine it with the real social identity, and fully display its reconfigurable characteristics, providing a certain space for future development. In addition, students can participate in a more appropriate "learning circle" according to their own development "identity", and effectively conduct formal and informal learning, which can effectively improve the learning efficiency of network knowledge (Iriberri et al. 2009). At this time, students can feel both the reality of external experience and the existence of their hearts. The second is to promote personal social development through "growth certification"; Metaworld can truly record students' learning process and socialize it. The metauniverse can classify, dynamically classify and analyze learners' learning paths all their lives, and confirm them with the students' only additional implementation. At the same time, it can also track students' learning materials throughout the process, thus effectively maintaining students' learning and intellectual property. In addition, through the establishment of a results-based certificate system, students' formal and informal learning results can be verified, as well as the interaction and mutual recognition between actual verification and actual verification when needed. Third, build personal social relations based on "standard certification". The metauniverse is not only to create a "situation" for students, but also to achieve "educational purposes". It can make the organic operation of "society" work, thus giving practical significance to the construction of "second space" for people. First of all, it is necessary to realize the connection between each sub-module in the network teaching of the metauniverse, realize the interconnection between each sub-module, and realize the collaborative development. At the same time, we should establish the connection between online teaching and other meta-world systems, so that online teaching can timely empower human development. In addition, we should work together to face the reality and the future of the metauniverse, establish the internal balance between reality and virtual, reshape the correct world outlook, outlook on life and values, and make full use of online teaching as the key factor to promote the coordinated development of the two civilizations.

6. The Prospect Planning of Network Teaching Based on Metaspace

The metaworld has changed the development of online teaching, and we will also experience this change personally. It breaks through the limitations of traditional mathematical thinking and experimental thinking, and provides a new way for people to understand the laws of nature. The meta-world is an aggregation of human external intelligence and technology, and an advanced form of visual immersion development. Meta-space reconstruction of online teaching is groundbreaking and will be an innovative wonder of education transformation and upgrading in the era of intelligence. Metaspace network teaching is a progressiveness and urgent development trend, which must be planned in advance, and can focus on the following contents:

1. Accelerating the new infrastructure: building the cornerstone of the development of meta-space network teaching

"Take 2025 as the center, take structural optimization, intensive

and efficient, safe and reliable new education infrastructure" as the main line (six ministries and commissions including the Ministry of Education, 2021). Its development trends include information networks, digital resources, platform systems, trusted security, innovative applications, intelligence, resilience, green, ecology and governance (Zhu Zhiting et al., 2021). The new network teaching infrastructure based on meta-space must be subject to top-level planning and scientific planning: first, it is mainly based on demonstration, and it is mainly based on demonstration in advance, and it is demonstrated by advanced models to drive development. Secondly, we should strengthen research and development, give full play to the synergy of production, learning and research, integrate university research and scientific research resources, and jointly build a diversified network teaching of the metauniverse. The third is policy support. A set of relevant policies to promote the construction of new infrastructure has been issued, and it has been the first pilot in online teaching.

2. Construct a new learning framework: the development impetus of meta-space online teaching

The influence of meta-space on online teaching is systematic. It represents the creativity of the form and the reconstruction of the operation process, and the most important is the innovation of the theoretical framework of online teaching. The new research will contribute to the sustainable development of the network teaching of the universe. First of all, the new learning concept was deeply discussed, and a large amount of relevant knowledge was drawn from learning methods such as behaviorism, cognitivism, constructivism, and connectionism, and the new theory of context with ontology as the core was deeply discussed, focusing on the internal transformation of students. Secondly, it discusses the new educational concept, discusses the concrete embodiment of the concepts of "teaching based", "learning based", "subjectivity subjectivity" in the metauniverse, and carries out continuous practice on the creative "ontology" teaching. Third, through comprehensive management of learning behavior data and biological data, multi-mode integration and empirical analysis, promote the transformation of teaching and research models. Fourth, we should establish a new concept of development, that is, cultivate intellectual talents to meet the needs of the new era.

3. Explore new moral concepts: clarify the development of the network teaching of the universe

Educational ethics is not only the permanent development, but also the characteristics of the times. Human beings in the metaworld can be represented in various ways, including projection, avatar, and intelligent "virtual human" with external characteristics. Therefore, the moral problems existing in the network teaching of the metauniverse can be summarized as the relationship between people and things, people and "people", people and "virtual me", "virtual people" and "virtual people". From the perspective of data, it mainly includes: the moral issues of data, data collection should be comprehensive and transparent, storage should be safe and controllable, and data application should be scientific; Second, in terms of algorithm morality, scientific intervention, accurate intervention and efficient intervention are needed. From the perspective of the relationship ethics of "man" and "man", the first is the cooperation between "teacher" and "virtual man", that is to say, we should make proper use of it, instead of relying too much on "virtual man" and losing subjectivity; The second is the conversion between the "virtual self" and the "id" of students, that is, students should correctly view, accept, use and reshape themselves.

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