

# Educational Metaverse - A New Teaching Mode of Virtual Immersion

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**Abstract:** In the context of the information age, the metaverse, as an effective collection of immersive reality and virtual twin concepts, constructs a binary mirror virtual world for relevant users, which also builds a new social adaptation space with grassroots social networks, economic interaction, and intelligent decision-making. As an important component of social development, the concept of the educational metaverse has pointed out a new direction for the development of education. Based on the technical and learning characteristics related to the educational metaverse, this article explores the changes and innovations in educational scenarios and directions, and analyzes the advantages and disadvantages brought by the educational metaverse.

**Keywords:** Educational Metaverse; Virtual Immersion; A New Mode of Teaching

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## Introduction

As a new type of virtual reality internet application and social form, the development of the metaverse effectively utilizes current information network technology to provide relevant users with an immersive experience based on virtual reality technology. The effective application of the metaverse in the field of education has been reflected in the epidemic prevention and control period, and students' graduation ceremonies can be demonstrated through games and other means, which is the best example. In the process of educational development, the metaverse has attracted the effective attention of many experts and scholars in the field of education due to its combination of virtual and real, and the characteristics of digital twins. The development of the metaverse combined with information technology is an important direction for the future development of the educational metaverse, and also an important thinking content for current experts and scholars to innovate educational content. Based on this, this article mainly starts from the characteristics of the educational metaverse, combines the characteristic relationships of the educational metaverse and the important impact of the metaverse on the educational field, and explores how to use the metaverse to improve the quality of education<sup>[1]</sup>.

## 1. The Origin and Development of the Metaverse

The proposal of the concept of the metaverse originated from the worldview proposed by Stephenson in "Avalanche" in 1992, which connects people from the real world to the virtual world through a brain computer interface, and directly controls the behavior of virtual characters in the virtual world through the human brain. In recent years, the technology and concept of the metaverse have been continuously developed, especially with the rapid development of information technology providing an important foundation for it. The concept of the metaverse was proposed in terms of the authenticity and interaction of the virtual world. People can appreciate the real sensory experiences in different environments, and through the relevant behaviors in the virtual world, even significant forces can be generated to change the real world. In the field of education, many experts and scholars are also committed to studying the binary world of the combination of virtual and real worlds in the metaverse. By changing individual behavior in the virtual world, the knowledge level of individuals in the real world can be improved, which is also an important goal that the educational metaverse aims to achieve<sup>[2]</sup>.

## **2. The Characteristics of the Educational Metaverse**

The metaverse is based on intelligent technology, and in the context of the information age, the development of the educational metaverse provides individuals with personalized learning methods. The rapid development of science and technology has also contributed to the effective improvement of education quality. The educational metaverse has changed the scene of education, providing learners with diverse learning methods, and constructing a new teaching mode of virtual immersion.

### **2.1 The Technical Characteristics of the Educational Metaverse**

The development of the educational metaverse has adapted to the current needs of educational development. With the high-quality technological foundation provided by internet science and technology, the development of virtual technology has been utilized to construct effective virtual images for teachers and students, creating digital twin images for learning individuals in an immersive virtual world. The core of education lies in promoting the comprehensive and free development of people. In this regard, the educational metaverse should also attach importance to creating virtual social networks, constructing open entrances for liberalization, allowing teachers and students to collide with knowledge and thinking in a more equal and free virtual world, and promoting human freedom. The educational metaverse aims to construct more visualized real personality entities, which is also an important reflection of humanistic educational concepts in the field of educational metaverse.

The development of artificial intelligence is based on the important result of the explosive leap in computing power in the current big data era, and the development of the educational metaverse is also based on the support of underlying computing power. The development of the educational metaverse should attach importance to the combination of virtual and real, and construct a new teaching mode of virtual immersion. If only the creation of immersive learning is emphasized, then students only focus on one educational context and ignore other educational contexts, which may also lead to a decrease in educational quality and learning quality. The education metaverse focuses on building an immersive interactive education environment. Through the effective development of current artificial intelligence technology, it meets the important attributes of education itself, effectively matches the educational characteristics of the virtual world with the educational environment of the real world, and more helps to promote the improvement of education quality, meet the personalized learning and development needs of learners, break the time and space limitations of traditional education, and create educational virtual society, Meet the development needs of the education era. In the real world, the transmission of educational knowledge is often achieved through books and language. In the virtual world constructed by the educational metaverse, the transmission of knowledge can be fixed and transferred through digital means with the help of relevant technologies. This can achieve many teaching goals effectively achieved during lunch in the real world, and more quickly analyze knowledge for multiple learning subjects to meet the personalized learning needs of different learners.

### **2.2 The Learning Characteristics of the Educational Metaverse**

The development of the educational metaverse provides effective technical guidance and support for learners' digital twins. In the educational metaverse, different learning individuals can achieve a social state in real life through immersive interactive experiences in a virtual environment. The educational metaverse can create an interactive learning environment, where teachers and students' learning is no longer limited to the time and space constraints of the classroom, but rather relies on the interaction of electronic products in the virtual world to achieve better teacher-student and classmate communication. The educational metaverse can also create different virtual environments for teaching, provide more interesting ways for learners to interact with the environment, and present relevant knowledge to students through the externalization of the environment. Students can use their visual, auditory, and even tactile senses to perceive this knowledge in the virtual world. This immersive interactive experience of the environment is more in line with the learning needs of current students. Constructivists believe that the construction of knowledge by individual learners is mainly discovered through their own exploration, while the educational metaverse constructs a virtual immersive teaching mode, guiding students to think independently and explore new knowledge, breaking free from the teaching drawbacks of traditional education models, and more satisfying learners' curiosity and exploration desire for knowledge itself, helping students establish a good knowledge system and knowledge structure, Better achievement of educational goals.

The educational metaverse allows learners to engage in immersive learning by creating a real, relevant, and fitting virtual world for them. The creation of a virtual environment can help learners better immerse themselves emotionally, construct a metaverse image of digital twins, and also help learners present their inner thoughts and cognition in a visual state in the virtual world, creating

a real user experience. Actively participate in the exploration and learning process of knowledge, obtain knowledge and cognitive experiences consistent with real life, and obtain inner satisfaction.

### **3. The Change of Educational Metaverse to Educational Scenarios**

The knowledge construction theory of constructivism emphasizes the important auxiliary role of the environment for learners. The emergence of the educational metaverse plays an important role for instructional designers, allowing them to freely construct the external environment of learners and help them effectively understand their learning behavior. In addition, in building virtual textbooks and providing students with learning knowledge, the educational metaverse can provide learners with a more targeted and suitable teaching environment, changing the educational drawbacks of previous teaching models<sup>[3]</sup>.

#### **3.1 Immersive teaching materials**

For teaching, textbooks are important teaching tools. Under traditional teaching models, textbooks are often used as teaching tools to provide effective support and assistance to students, providing learners with a carrier for knowledge exploration and learning. Through textbooks, knowledge is internalized into explicit text, language, or images. Textbooks are also an important channel connecting textbook designers and learners, providing learners with more opportunities for knowledge transmission. The proposal of the concept of the educational metaverse has also changed the cognitive perspective of textbooks. Textbooks should not only serve as storage carriers for knowledge information, but also include the organization of content and the presentation of forms. The educational metaverse has constructed a virtual world, and with the continuous development of digital science and technology, new era textbooks can be presented through technological empowerment. In the educational metaverse, instructional designers have more ways to transmit teaching knowledge, which can be hidden in the virtual world and exposed to the auditory and tactile senses. They can transmit learning knowledge to students in a virtual social way, breaking the traditional knowledge transmission function of traditional teaching materials and enriching the chain of knowledge transmission, Teaching materials can also provide better teaching environment experiences for instructional designers.

#### **3.2 Visualization of teachers**

In the context of the information age, the popularity of online teaching is higher, and online teaching focuses more on personalized learning for learners, which provides an important technological foundation for the development of the educational metaverse. The virtual space created by the educational metaverse also provides a more creative new form for online teaching and course construction. Based on the development of artificial intelligence and big data technology, the educational metaverse can leverage the computing power of big data to explore the classroom emotional mobilization of excellent teachers in real life, and then use virtual character images and other methods to visualize them as related cartoon character images. This effectively enhances the weak interaction between teachers and students in traditional classrooms, and virtual forms of teacher-student interaction can also be constructed using audio or video methods. The educational metaverse classroom has created one open world after another, in which the existence and function of teachers are more like a bridge and link between reality and virtuality for learners, guiding them into prescribed teaching contexts and learning states. The emergence of virtual teachers can help learners quickly identify their learning goals and positioning, guide them to clarify their identity and attributes, and enhance their learning motivation.

#### **3.3 Virtualized Classroom**

Traditional classrooms are often limited by time and space limitations, and their significance lies in providing learning activities for learners, but they also have an impact on their learning outcomes. In the context of the educational metaverse, teachers will no longer be limited to classrooms and related teaching tools limited by time and space. Instead, they will customize their classroom environment in virtual scenes of the metaverse based on the characteristics of the courses that learners need to learn, unleashing their imagination and creativity, and creating more effective learning tools. The autonomous changes in the classroom environment are more in line with the characteristics of the subject that learners need to learn, and can even integrate interdisciplinary approaches to upgrade classroom teachers' autonomous virtualization. The classroom under the educational metaverse has more flexibility, not only breaking through the limitations of traditional spatial boundaries, but also magnifying the subject context, bringing visual and sensory sensations to learners, and stimulating their own curiosity and curiosity. The virtual teacher created by the educational metaverse can also create different difficulty subject environments for different learners through personalized data collection, allowing students of different degrees to better discover and explore relevant subject knowledge in the virtual space, creating a free learner's perspective, and meeting the personalized learning needs of learners.

## **4. Reflections on the Practice of Educational Metaverse**

From the perspective of learners, the emergence of the educational metaverse has brought a richer learning experience, which can effectively change the ways and means in which learners acquire knowledge, providing lower cost and higher quality learning opportunities for different learners. The ecological development of the educational metaverse is more conducive to learners unleashing their learning abilities, improving current educational inequality, and surpassing the learning situation under traditional teaching models<sup>[4]</sup>.

### **4.1 A new form of learning interaction in virtualization**

Under the traditional teaching mode, the teaching situation is often characterized by teacher questioning and student answering, which makes it difficult to effectively leverage the advantages of teacher-student interaction. However, the educational metaverse can achieve real-life interaction through virtual network images, helping learners to understand the knowledge elements more quickly. This more free communication and exchange method enhances learners' own understanding ability, breaking away from the traditional two-dimensional scenario analysis in the discussion and learning process, and elevating learners' understanding and learning ability to a three-dimensional level. This helps to deepen the knowledge level and cognitive ability of learners. Virtual models can also better help teachers and students to carry out cooperative practice, cooperative inquiry and cooperative learning, and improve students' learning ability.

### **4.2 A Virtual Interest Network for Learners**

The development ecology of the educational metaverse simulates the current teaching environment, while also introducing online content that interests students themselves. Learners themselves are in the educational metaverse and can better share common learning interests as the basis for effective processing of knowledge information, in order to construct specific learning groups. The educational metaverse has constructed a brand new teaching context, in which learning groups can eliminate social difficulties and physical differences in real life, handle interpersonal relationships more naturally, and complete collaborative tasks more efficiently. The educational metaverse constructs real-world connections in a virtual environment, and its open world characteristics better enable learners to learn and interact effectively in the community, achieving situational and knowledge construction. The educational metaverse can also build virtual learning communities, create virtual learning environments, meet the learning needs brought by many distance learners, solve some educational and learning situational problems in the internet community, and help enhance learners' learning cooperation enthusiasm.

### **4.3 Cross field communication and exchange of learners' virtualization**

The virtual image constructed by the educational metaverse can better maintain interpersonal relationships in real life, and tasks in the virtual image can use internet technology to achieve communication and exchange among learners of different races and cultures in one field. In the field of education, an intelligent language learning environment can be constructed based on the constructivist situational teaching theory. Learners can freely choose different types of virtual characters for human-machine dialogue and free dialogue, which is more helpful for learners to familiarize themselves with the target language and has significant educational effects.

### **4.4 Low cost improvement of practical education quality**

In recent years, research on the educational metaverse has become increasingly in-depth, and many simulation experiments have emerged in the field of education. These simulation experiments, with their advantages of helping learners quickly acquire knowledge at lower teaching costs, have been widely promoted and applied in various universities. Traditional simulation experiments often use mouse movements on a computer to simulate activities in a virtual world. Many students still learn practical operation steps, but do not truly experience hands-on operation. Under the educational metaverse, virtual reality immersion technology can guide learners to immerse themselves in practical operations with more detailed and refined practical steps, deepen their understanding of each step, and carry out immersive simulation learning. By directly completing relevant technical operations through physical movements, learners' practical operation abilities can be effectively improved, truly achieving the practical guidance role of simulation experiments.

## **5. Conclusion**

In summary, the current educational metaverse mainly focuses on the transmission and research of concepts, and there has not yet been a truly phenomenal product in practice that provides effective technical support for the educational functions of the metaverse. This leads to the development of the educational metaverse still in its infancy. In the field of education, many teachers and students do

not have a deep understanding of the educational metaverse and have not yet reached the level of recognition for traditional classroom education models. Therefore, research on the educational metaverse should also focus on enriching usage scenarios and increasing interaction experiences, providing new tools and directions for the development of education and teaching, and promoting effective improvement of educational quality<sup>[5]</sup>.

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