Can the Educational Metaverse Enter the Real Classroom? - From the Perspective of Frontline Teachers

Jiale Shi[1], Jiao Wang[2], Yiping Luo[3]
([1]Daqi Middle School, Beilun, Ningbo, 315800
[2]School of Information, Yunnan Normal University, 650500
[3]School of Educational Science and Technology, Zhejiang University of Technology, 310023)

Abstract: This article dissects the challenges faced and the integration strategies for embracing the educational metaverse from existing research, preparing for the new educational trend - the educational metaverse - by controlling the target direction, technical direction, teacher training direction, and ethical direction. Starting from the origin, it analyzes the reasons for the entry of the metaverse into the educational field and summarizes the three characteristics of the educational metaverse supported by current technical means. Combining the current situation of classroom teaching and the advantages of the educational metaverse, it analyzes the inevitability of the metaverse entering the classroom. Subsequently, it analyzes the four major challenges of the current stage: the pressure of college entrance examinations, the challenge of technical implementation, the limited ability of teachers, and the digital ethical risks brought by the metaverse. It prescribes the right remedy, giving strategies for integrating the educational metaverse into the classroom from the four directions of reducing the burden of college entrance examinations, technology research, teacher ability development, and rule formulation. It is hoped that in the future, while the metaverse lands in the educational field, it can overcome challenges at various levels and achieve breakthroughs at the target level, technical level, teacher training level, and ethical level to truly realize the entry of the educational metaverse into the classroom.

Keywords: Metaverse, Educational Metaverse, Education, Classroom

---

[1]Jiale Shi (Corresponding Author), born Jiale Shi, born in 1998, female, from Ningbo, Zhejiang. She is an information teacher at Daqi Middle School in Beilun, Ningbo. She holds a Level 2 teaching certificate and her main research interests include information technology teaching in junior high schools and project-based learning.
[2]Jiao Wang, born in 1998, female, from Aksu, Xinjiang. She is currently a graduate student at the School of Information, Yunnan Normal University. Her main research interests include learning sciences and the development of digital educational resources.
[3]Yiping Luo, born in 1999, female, from Shaoxing, Zhejiang. She is currently a graduate student at the School of Educational Science and Technology, Zhejiang University of Technology. Her main research interest is educational informatization.

2021 is known as the "origin year" of the metaverse, with companies like Facebook and Tencent actively laying out the metaverse industry; it is also marked by a surge of metaverse research initiated by scholars in various fields at home and abroad. In China, the research model of "metaverse + education" has attracted the attention of many scholars in the field of education. Ge Ping Liu and others from Southwest University defined the concept of the educational metaverse, refined its characteristics, and analyzed the mechanism and application scenarios of the educational metaverse (Liu et al., 2022). Following this, Su Cai and others from Beijing Normal University proposed the third way of educational system research, constructing the brand new concept of the "educational metaverse" (Cai et al., 2022). Sen Zhao and others from Hunan Normal University examined the development process, current focus, and potential themes of the educational metaverse from a holistic perspective, pointing out the future direction of the field of educational metaverse (Zhao & Yi, 2022).

With the support of theories related to the educational metaverse, scholars in China have conducted research in three directions: theoretical potential, teaching modes, and teaching scenarios under the perspective of the educational metaverse. Regarding theoretical potential, Zheng Zhong and others from Central China Normal University started from the four levels of application of the educational metaverse, exploring its application potential in situational teaching, personalized learning, gamified learning, and teaching research and training in four typical teaching scenarios (Zhong et al., 2022). Wenxiao Fu and others from Xi'an Jiaotong University confirmed that the embodied learning characteristics of the educational metaverse could lead learners to positive and active learning effects (Fu et al., 2022). Regarding teaching modes, Luli Lu and Xin Xu proposed a "chaotic teaching mode" from the perspective of the metaverse, discussing the future teaching mode of ultra-large capacity, ultra-realistic resources, ultra-immersive experience, and super-entity interaction (Lu & Xu, 2022). Regarding teaching scenarios, Ge Ping Liu and others boldly constructed an online education platform based on the metaverse, realizing the leap from theory to practice of the educational metaverse (Liu et al., 2022). Zixun Hua and Muxiong Huang integrated various technologies including artificial intelligence, virtual reality, and blockchain to build a metaverse architecture for education (Hua & Huang, 2021). Yawen Wang and others designed an educational metaverse architecture that supports experimental teaching, providing an important reference for conducting experimental teaching under the perspective of the educational metaverse(Wang et al., 2022). In addition, some scholars have voiced different opinions in the face of the advent of the metaverse in the field of education. Gang Wu and others from East China Normal University believe that the virtual environment under the educational metaverse overlooks the fundamental defect of neglecting the overall embodied practice experience(Wu & Yang, 2022). Weiqi Wang from Nanjing Normal University pointed out from the perspective of body phenomenology that there are ethical problems under the educational metaverse, such as neglect of the physical ethical role of teachers and students, and alienation of teacher-student relationships (Wang, 2022). Hui Zhang (2022), Jianying Wang (2022), Lei Yang (2022) and other scholars have all expressed concern about various ethical issues such as moral ethics, technical ethics, and digital ethics that may arise in the future development of the educational metaverse in their respective research.

The exploration and research of Chinese scholars in the field of the educational metaverse is deepening, but so far, few scholars have deeply thought about whether the educational metaverse can appropriately

enter the classroom of basic education in the progress of numerous domestic studies on the educational metaverse. Based on this, this study starts from the perspective of frontline teachers and combines actual classroom teaching experience to deeply think about and explore this issue. The study mainly conducts profound analysis from three aspects: the inevitability of the educational metaverse entering future real classroom teaching, the challenges faced, and the strategies to tackle them, with the aim to provide suggestions and thoughts for the entry of the educational metaverse into real classrooms at the frontline.

I. Inevitable Trend: From Metaverse to Educational Metaverse

(I) Reasons for the advent of the metaverse in the field of education

The term "metaverse" is a translation from the term "Metaverse," which first appeared in the science fiction novel "Snow Crash" (Stephenson, 1992) published in 1992 by American science fiction writer Neal Stephenson. The "Metaverse" world created in "Snow Crash" is ultimately a cyberpunk framework. Tracing back the emergence of the cyberpunk genre, it can be advanced to the creation of "Neuromancer" (Gibson, 1984) by William Gibson in 1984, that is, the concept of the metaverse was born in 1984. Until 2021, it took the metaverse decades to enter the research field of scholars at home and abroad, but it took less than a year from the "explosion" of the metaverse concept to the proposal of the "educational metaverse" concept.

Why could the metaverse quickly enter the field of education? The author believes that there are two main reasons: the lifelong development needs arising from the cultivation of "core competence" and the technological needs accompanying the emergence of "educational digitalization". Regarding lifelong development needs, in recent years, the national attention to the cultivation of students' core competencies has been increasing. The "Compulsory Education Curriculum Scheme and Curriculum Standards (2022 Edition)" issued by the Ministry of Education in 2022 even emphasizes the major direction of "letting core competence land and empowering knowledge application". The highly immersive virtual world created by the metaverse focuses on deep life experiences and life exploration, bringing new opportunities for the development of students' core competencies. In terms of technical requirements, since the Ministry of Education proposed the national educational digitization strategic action in 2022, various regions have started the practice of educational digitization transformation. The application of the metaverse in education forms an ideal space for digital learning through the construction of immersive learning environments, realizes the intelligent extension of teaching and learning scenarios, and is expected to empower the transformation of educational digitization.

(II) Characteristics of Classroom Teaching in the Context of the Educational Metaverse

The educational metaverse essentially refers to the extended application of metaverse technology in the field of education. It creates an immersive, disruptive traditional teaching activity place for educational participants, and generates a shared, diverse, personalized teaching mode. Based on the perspective of classroom teaching, this study summarizes the following characteristics of the educational metaverse.

1.Highly interactive teaching environment

The strong interactivity of the metaverse is reflected in its ability to reshape the social relationship system interwoven with reality, where users can personalize their image and generate unique identity markers, and then carry out all-round social interaction with friends (Han, 2023). The strong interactivity of the metaverse comes to education, breaking through

the real environment constraints of the teaching place, transforming into a teaching relationship system that is distinct from the real teaching place and overlaps with the real teaching place. In this highly interactive teaching system, there can be all-round teaching interactions between teachers and students, among students, and even among teachers.

2.Highly immersive teaching activities

Scholars such as Jining Han from Southwest University have analyzed 15 metaverse social interaction platforms, and have categorized and found that these platforms often use VR headsets, VR all-in-one machines, and mobile-based VR tools to carry out metaverse social interactions, allowing users to be highly immersed in the activities in the metaverse world (Tian & Wang, 2023). When the metaverse enters the field of education, teaching activities designed based on the above tools can undoubtedly immerse students in classroom teaching.

3.Comprehensive and Precise Teaching Evaluation

In traditional teaching evaluation modes, due to insufficient exploration of teaching data, issues such as "overly subjective evaluation", "overly simplified content of evaluation", and "qualitative evaluation" can easily arise. The feedback bias caused by these evaluation problems may consequently affect the teacher's judgment of the effectiveness of classroom teaching and students' misdiagnosis of their own abilities.

The educational metaverse, however, monitors massive data throughout the entire cycle and process, presenting the teaching subject and its teaching activities in a data-driven manner (Sang, 2023). Based on this, the most comprehensive activity verification and the most precise interaction data can be obtained for a comprehensive and precise teaching evaluation, avoiding the occurrence of teaching evaluation bias.

II.Meeting the Opportunity: The Inevitability of Real Classroom Teaching Embracing the Education Metaverse

(I) The Development Direction of Real Classroom Teaching

The central government has made comprehensive deployments on the reform and development of basic education, and the revision of compulsory education textbooks is centered around several major directions such as "emphasizing curriculum education", "implementing the development of the five educations", and "developing core competencies". At the same time, educational informatization, as an important part of national informatization construction, has become the future direction of educational development. How to accelerate the process of educational informatization? It is an inevitable path to transform the education model using information technology. Chinese scholar Tongju Wang introduced the metaverse into primary and secondary school classrooms with the "three-teacher classroom" teaching model, and teaching practice has proved that the education metaverse can assist in the transformation of the education model and promote educational informatization (Wang, 2023). This educational metaverse is the application of the metaverse in the field of education, a virtual integrated educational environment shaped by emerging information technology.

(II) The Advantages of the Educational Metaverse in Real Classrooms

So, does the educational metaverse help to promote the future development of real classrooms? This article will analyze the advantages of the educational metaverse from the perspectives of national policies, capital commercial investment, and the advantages of the new generation of information technology, and explore the feasibility of the educational metaverse in carrying out educational and teaching work.

1.National Policy

As a sub-track of the new digital infrastructure, the Metaverse has received attention from all walks of life as soon as it was introduced. Shanghai, China, took the lead and released the "Shanghai Action Plan for Cultivating the 'Metaverse' New Track (2022-2025)" in July 2022, proposing to make the Metaverse-related technology and development an important part of the "14th Five-Year Plan". In just over two months from early 2023 to February, 17 provincial and municipal governments have successively released plans for the construction of the Metaverse. Among them, Shanghai and Suzhou have emphasized encouraging support for the development of educational scenario demonstration projects in the Metaverse. The high level of attention at the national level has become the stepping stone for the Metaverse to enter the field of education.

2.Capital and Commercial Investment

The Metaverse's entrance into the public eye from the capital circle, venture capital circle, and internet circle, would not be possible without the power of capital. As the education Metaverse industry integrates popular digital innovative technologies, it is inevitably the "hot cake" in the eyes of capital to march into the field of education, especially when information technology in the current field of education is lackluster. In 2022, Sina VR and Liepin Company released the "Metaverse Talent Development White Paper", reflecting the current situation where a large number of talents have entered the field of Metaverse development in China, providing talent support for the development of the educational Metaverse. In November 2021, Kaiyuan Education, a listed company in China, revealed that it was developing Metaverse courses, and its stock price rose for several consecutive days, which is a reflection of the capital's attention to the field of the educational Metaverse and the ample financial support in this field. As an educational enterprise with rich experience in the game field, NetDragon has already realized the VR development of standard experiments covered in primary and secondary school textbooks, and is about to impact real classrooms with products related to the educational Metaverse. This is an important moment for the development of the educational Metaverse, providing actual resource support for its development.

3.Technological Advantages

The Metaverse refers to a digital world parallel to the real world, mapped and expanded through six major supporting technologies such as AR and VR (Zhu et al., 2023). The composition of its related technologies is shown in Figure 1. Based on these technological advantages, Zhongsheng Li and others have explored the seven-layer model of online education Metaverse, which includes technologies such as the Internet of Things, big data cloud computing, 5G/6G, AR/VR (Li et al., 2022). These technologies work together to eliminate the isolation of various related objects in different learning scenarios, virtualize the details of reality, convert related objects into interface standards and on-demand cloud services, and construct a highly interactive and immersive education Metaverse world that can continuously innovate and improve intelligently.

III. Overcoming Obstacles: The Challenges of Introducing the Education Metaverse into Real Classrooms

This paper argues that the education Metaverse faces numerous challenges that it must overcome before it can enter the classroom.

(I) Reality Pressures: The Many Obstacles Behind College Entrance Exams

Today, as we advocate for holistic education and focus on students' overall development, college entrance exams and the accompanying exam-oriented education "kidnap" a large amount of students' time and energy. Taking the junior high school entrance

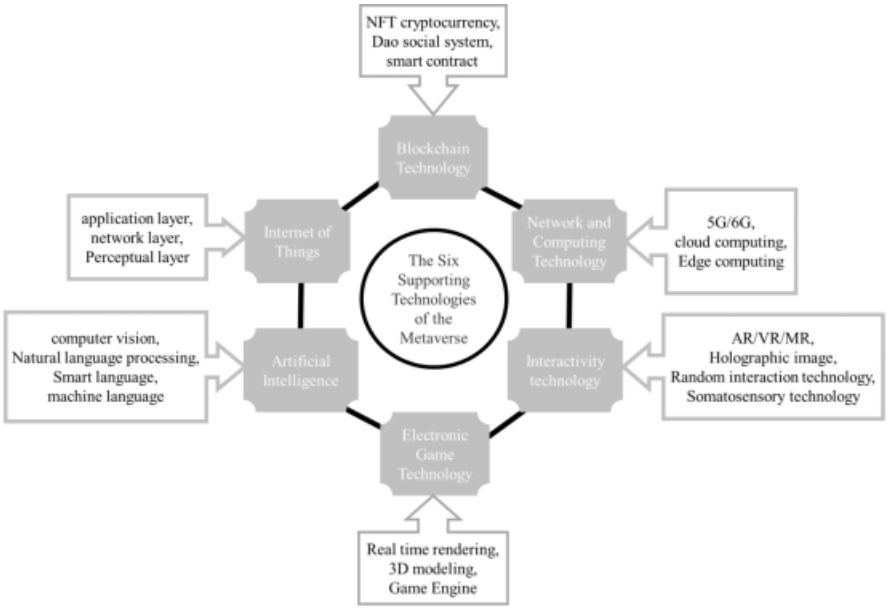

Figure1 Composition diagram of the six supporting technologies in the metaverse

exam as an example, most of a student's time in school is "divided" by related subjects, from morning reading after arrival at school, to the "golden four classes" in the morning, and then to after-school tutoring programs. All are primarily focused on teaching subjects for entrance exams, including Chinese, mathematics, English, science, history and society, and physical education. Most of the class time is spent learning knowledge related to these exam subjects. And in order to ensure efficient teaching, the classroom teaching model is still mostly "teacher-centered", using lecture-style teaching methods to impart subject knowledge to students in the fastest way possible. Behind the entrance exams are the complexity of middle school knowledge, the tension of teaching time, the heaviness of coursework, and the teaching reality where grades triumph over everything else. This means that even if the Metaverse enters the education field and reaches the real classroom at this stage, it could be abandoned as an entertainment product due to its strong interaction and immersive experience.

(II) Technical Challenges: Currently in the Exploratory Stage of the Education Metaverse

The implementation of the education Metaverse cannot be separated from the support of digital innovation technologies such as 5G network technology, cloud computing, VR/AR, Internet of Things, digital twins, and blockchain. These digital innovation technologies are the underlying technologies that drive the development and application of the education Metaverse, but some of these technologies still have issues in their application.

1.5G Network Technology Has Not Truly Become Widespread

At present, issues like incomplete coverage of 5G base stations and poor 5G signal reception due to outdated equipment in some neighborhoods mean that 5G network technology has not truly become widespread domestically. In the practical application of the education Metaverse, problems with network communication caused by 5G network technology can affect the application of the education Metaverse and, consequently, the overall effectiveness of teaching.

2.Cloud Computing and Other Computation Technologies Have Data Security Issues

Underlying technologies such as cloud computing, which forms the computational basis for

the education Metaverse, currently face data security issues like user data leakage and personal privacy breaches. In the practice of the education Metaverse, issues brought by computational technology could lead to data theft and personal information leakage for teachers, students, and other participants in educational activities.

3.High Prices of Interactive Devices, Making Large-Scale Introduction Difficult

Various interactive technologies, including VR/AR technology, have become mature through continuous testing and maintenance. At this stage, there aren't many problems with their stable application in classroom teaching. However, due to the limited number of high-quality interactive device manufacturers, the production quantity of these devices is low. This supply-demand discrepancy has resulted in high prices for these devices. Facing expensive interactive devices, it's impossible to introduce them on a large scale. The lack of fundamental equipment directly leads to difficulties in the construction stage of the education Metaverse.

4.IoT Application Technology is Lagging

As one of the key technologies for the intelligence of the education Metaverse, the Internet of Things (IoT) technology currently suffers from the absence of core technology, an imperfect standard regulatory system, and lagging technological developmen (Chu, 2016). Naturally, these issues will also affect intelligent interaction in classroom teaching within the context of the education Metaverse.

Therefore, the education Metaverse is still in its initial exploratory stage. To enter the application stage of the education Metaverse at this stage, it is necessary to solve various problems existing in the underlying digital innovation technologies.

(III) Teacher Capability: The Problem of Insufficient Ability Required by the Education Metaverse

Different from traditional classroom education, teachers under the context of the education Metaverse are required to have the ability to construct and apply teaching scenarios, create and organize teaching resources, organize teaching activities, and innovate in practice. It also proposes new requirements for teachers' role transformation, professional development, and professional ethics (Xu et al., 2022). However, current teachers do not have the ability to control all aspects of education Metaverse products. Firstly, teachers lack sufficient information literacy. With the advent of the education Metaverse, whether it is the construction and application of teaching scenarios, the creation of teaching resources, or the ability to conduct teaching research under virtual teaching situations, most teachers currently do not have enough information technology foundation and teaching research capabilities to solve teaching problems under the context of the education Metaverse. Secondly, teachers' situational teaching abilities need to be improved. The education Metaverse emphasizes teaching in a virtual world, while the current teaching environment for teachers is mainly physical classrooms. When the education Metaverse arrives, the current abilities of teachers are not sufficient to cope with the creation of immersive virtual teaching scenarios. Finally, teachers' ethical boundaries for issues in the virtual world are not clear. The virtual world constructed by the education Metaverse also has many ethical issues, such as the protection of personal privacy. However, these ethical issues are different from those in the real world, and current teachers do not have relevant experience in dealing with these issues.

(IV) Ethical Risks: Ethical Issues in the Virtual World Await Definition

Most current research on the education Metaverse is positive and forward-looking, but could the implementation of the education Metaverse bring negative effects? Many scholars have discussed the ethical risks brought about by the application of

the education Metaverse. This article believes that the application of the Metaverse to education could bring various ethical issues, such as blurring the line between teachers and students, and teenagers becoming addicted to the virtual world. For students who are at a critical stage of physical and mental development, these ethical issues that come with the education Metaverse pose significant risks. Before the application of the education Metaverse, educators must pay special attention to the ethical issues behind the education Metaverse and find effective solutions.

IV. Refining: Strategies for Classrooms to "Accept" the Education Metaverse

Every challenge brings an opportunity. Currently, we are in the early exploration stage of the education Metaverse, and we can see the enormous educational potential beneath the education Metaverse from research conducted by scholars both domestically and internationally. To ensure that education can "accept" the Metaverse, this research will elucidate several strategies for education to evade related risks and challenges, and embrace the entry of the education Metaverse into the classroom.

(I) Reduce the Burden of College Entrance Examinations and Encourage the All-round Development of Students

The college entrance examination, as a selective examination, is exceptionally competitive. Behind the competition lies the excessive academic burden on students and the neglect of other abilities beyond the primary cultivation of intellectual abilities. However, under the education Metaverse, teaching activities are carried out in an innovative mode within a smart environment. The diverse resources it covers support a variety of teaching activities, and teaching concludes with intelligent evaluation.

The operation mechanism of the education Metaverse can promote the all-round development of students. However, students' time and energy are limited. The entry of the education Metaverse into the classroom, while helping students to develop in all aspects, also takes up the time students used to prepare for the college entrance examinations. Therefore, the first step for the education Metaverse to enter the classroom is that the state must make changes, issue relevant policies to reduce the burden of the college entrance examination on students, so that students have sufficient time and energy to experience the education Metaverse and achieve all-round development.

(II) In-Depth Technological Research: Undertake Education Metaverse "Infrastructure" Work

The entry of the education Metaverse signifies its transition into the stage of widespread adoption. At this stage, the technological aspects of the education Metaverse must meet certain standards, ensuring the stable application of underlying digital innovation technologies in classroom teaching. Firstly, it is essential to establish a solid communication infrastructure for the education Metaverse. The 5G network technology must achieve full coverage and maintain good signal reception to ensure stable communication. Secondly, the fundamental computation of the education Metaverse needs to be stable and secure. For example, issues related to data security, such as data loss and privacy breaches, must be effectively addressed in cloud computing technology. Thirdly, efforts should be made to regulate and reduce the prices of interactive devices, including VR/AR devices, and ensure that schools are equipped with a complete set of interactive devices, thus making material preparations for the integration of the education Metaverse into classrooms. Fourthly, it is necessary to address the challenges related to logical flow and resource generation, aiming to achieve smooth logic and diversified resources in the educational Metaverse. Lastly, the issue of certification

mechanisms should be addressed. In the education Metaverse, all participants enter the parallel digital space with virtual identities. It is essential to consider how to identify and differentiate digital identities of teachers, students, and educational administrators, and ensure the clarity of the teacher-student boundary. These issues require careful consideration and improvement of certification mechanisms supported by blockchain technology.

(III) Develop Teacher Capacities to Adapt to Education Metaverse Teaching

Classroom teaching relies on teachers' organization and guidance, even when the teaching environment transitions from the real world to the virtual world. In the context of the education Metaverse, teachers require support from information technology to facilitate classroom teaching. Teaching in a virtual world also necessitates the support of situational teaching abilities. Furthermore, teachers need problem-solving and adaptability skills to address unexpected situations that may arise in the virtual world. Therefore, as the education Metaverse enters the classroom, teachers' information literacy, situational teaching abilities, and skills in addressing and adapting to issues in the virtual world need to be developed. How can teacher capacities be developed? This study suggests that a comprehensive plan for developing teacher capacities in the era of the education Metaverse can be implemented from three perspectives: the national level, school level, and individual teachers themselves.

1.National Development Layout for Teacher Training

At present, the exploration of education Metaverse is in its initial stage in China. As a new phenomenon that changes teaching environments and teaching models, the education Metaverse brings advantages such as more realistic teaching scenarios, more engaging teaching activities, and more diverse teaching evaluations. However, it also presents significant challenges for teachers. In the face of these challenges, the national government must take the lead in designing a development layout for teachers' relevant capacities. Firstly, the government can engage in top-level design by issuing guiding documents for teachers' development in the era of the education Metaverse. These documents will provide clear directions for teachers to develop their information literacy, situational teaching abilities, and other relevant skills. Secondly, the government can issue policy documents to encourage teachers to engage in educational Metaverse-related research activities. This will promote the development of teachers' teaching abilities and technological skills in the context of the education Metaverse, thus facilitating the positive development of education Metaverse application, teaching practices, and scientific research. Lastly, the government can establish research institutions dedicated to education Metaverse at the provincial, municipal, and county levels. These institutions will provide support for schools to implement education Metaverse teaching.

2.Centralized Training Organized by Schools

As the "main battlefield" of education Metaverse, schools must mobilize all teachers to participate in learning and applying the education Metaverse. In terms of "learning," schools should actively create an atmosphere for the education Metaverse, such as organizing technology experience activities related to the education Metaverse, conducting training on educational Metaverse concepts, technologies, and teaching methods. This will encourage teachers to become interested in understanding, learning, and applying the education Metaverse. In terms of "application," schools should encourage teachers to boldly use the education Metaverse in their teaching. This can be achieved by organizing observation lessons using the education Metaverse and conducting educational Metaverse teaching research competitions. These activities will provide teachers with

opportunities to enrich their teaching methods and experience educational Metaverse teaching activities, ultimately achieving the goal of bringing the education Metaverse into the classroom.

3.Teachers' Proactive Adaptation

Teachers are the key to implementing education Metaverse teaching. Firstly, teachers must embrace the education Metaverse and be willing to learn the necessary skills for teaching, such as actively acquiring knowledge about relevant technologies, teaching methods, and ethical considerations in the virtual world. Secondly, teachers should be willing to change traditional teaching methods and actively learn the teaching methods in the education Metaverse, mastering new technologies and teaching models supported by the education Metaverse. Thirdly, teachers should improve their information literacy and develop their abilities to acquire and develop teaching resources, create teaching scenarios, establish situational roles, and apply various technologies in teaching activities. Lastly, teachers should proactively learn various typical teaching cases of the education Metaverse to broaden their knowledge and grasp various instructional organizational forms applicable to the education Metaverse.

(IV) Establishing Rules to Mitigate Ethical Risks in the Education Metaverse

In the virtual world of the education Metaverse, all participants engage in educational activities using virtual digital identities. Throughout this process, various ethical issues may arise that differ from those in the real world. In order to address these ethical risks, it is necessary to establish relevant rules and regulations before introducing the education Metaverse into the classroom. These rules will govern the behavior of participants in the virtual world of education.

1.Clearly Define the Boundaries Between Teachers and Students

In the education Metaverse, unlike the real world, both teachers and students participate in educational activities using digital identities. During this process, there is a possibility of teachers behaving unethically and students showing disrespect towards teachers and the classroom. These phenomena can significantly impact the progress of educational activities. Therefore, it is essential to establish clear boundaries between teachers and students, ensuring that all participants understand that virtual and real worlds follow the same rules and regulations. This will help maintain a proper teaching order in the education Metaverse.

2.Control Students' Online Time in the Virtual Space of the Education Metaverse

Many students who face high-stakes exams are in their adolescence, a stage where self-control may be relatively weak, and they are more susceptible to the influence of novel external stimuli. The virtual environment created by the education Metaverse offers a better sense of immersion, interactive activities, and realistic experiences compared to traditional classrooms. With the support of various digital innovative technologies, the education Metaverse enhances the learning experience, immersion, and enjoyment. However, it also carries a higher risk of internet addiction. To address this concern, it is crucial to strike a balance in education Metaverse teaching. Parents should actively monitor their children's learning activities, schools should regulate students' online presence in the education Metaverse, and society should raise awareness about the dangers of internet addiction, encouraging students to engage in real-world activities during their free time. A collaborative effort from families, schools, and society is necessary to prevent students from developing internet addiction within the education Metaverse.

As the education Metaverse is still in the exploratory stage, many scholars in China have primarily focused on theoretical exploration. The ethical risks associated with the education Metaverse

will need to be continuously identified and addressed during its practical implementation.

V. Conclusion

As an emerging concept that entered the public eye in 2021, the education Metaverse holds many directions worth exploring in the future. In the current stage of education in our country, whether it is the policy advocating the "deep integration of information technology and education" or the recent hot topic of "Internet + Education," the greatest change in education has been the transition from traditional blackboards to interactive electronic whiteboards. However, the integration of information technology into education has remained superficial. This research recognizes the arrival of the education Metaverse as a departure from the "empty talk" and provides support for achieving the true integration of information technology and education. As William Gibson stated in Neuromancer, "The future is already here — it's just not evenly distributed." The education Metaverse has quietly permeated our lives in various ways. However, the underlying digital innovation technologies still need further exploration, the regulations governing the virtual world are not yet complete, and only a small number of people are familiar with the education Metaverse. This keeps classroom teaching in the education Metaverse as a "concept." We look forward to the day when policies, institutions, and pioneers can lead us to overcome these limitations and enter the world of the education Metaverse, bringing about a great transformation from the real to the virtual in classrooms.

References

Cai, S., Jiao, X., & Song, B. (2022). Opening Another Door to Education: Application, Challenges, and Prospects of Education Metaverse. Modern Educational Technology, (01), 16-26.

Chu, C. (2016). Research on the Development of Internet of Things Technology and Industry in China. Electronic Manufacturing, (10), 80. doi:10.16589/j.cnki.cn11-3571/tn.2016.10.071.

Fu, W., Zhao, W., & Huang, H. (2022). Empirical Study on Embodied Learning Efficacy in the Field of Education Metaverse. Open Education Research, (02), 85-95. doi:10.13966/j.cnki.kfjyyj.2022.02.009.

Gibson, W. (1984). Neuromancer. Ace Books.

Han, J., Liu, G., & Wang, S. (2023). Characteristics and Development Directions of Socialized Interactive Learning in the Metaverse. Modern Distance Education Research.

Hua, Z., & Huang, M. (2021). Architectural Structure, Key Technologies, and Experimental Research of Education Metaverse. Modern Distance Education Research, (06), 23-31.

Li, Z., Liu, S., & Lou, S. (2022). Exploration of Online Education Metaverse Modeling in the New Information Environment. Computer Education, (09), 189-195. doi:10.16512/j.cnki.jsjjy.2022.09.043.

Liu, G., Gao, N., Hu, H., & Qin, Y. (2022). Education Metaverse: Features, Mechanisms, and Application Scenarios. Open Education Research, (01), 24-33. doi:10.13966/j.cnki.kfjyyj.2022.01.003.

Liu, G., Wang, X., Gao, N., & Hu, H. (2021). From Virtual Reality to Metaverse: A New Direction for Online Education. Modern Distance Education Research, (06), 12-22.

Lu, L., & Xu, X. (2022). From "Blended" to "Chaotic": Exploring Future Teaching Models from the Perspective of Metaverse—A Case Study of the Curatorial Course in the Cloud Exhibition Hall of East China Normal University. Library Tribune, (01), 53-61.

Sang, L. (2023). Empowering Education with the Metaverse: Cognitive Logic, Mechanisms, and Practical Pathways. Research in Higher Education Engineering, (02), 122-127+189.

Stephenson, N. (1992). Snow Crash. Bantam Dell.

Tian, A., & Wang, Y. (2023). Technological Potential, Real Challenges, and Overcoming Dilemmas in Metaverse-Supported Educational Services. Journal of Hangzhou Normal University (Social Sciences Edition), (02), 51-58+77. doi:10.19925/j.cnki.issn.1674-2338.2023.02.005.

Wang, J., & Zhang, H. (2022). Metaverse: The Singularity and Real Challenges of Future Education. Inner Mongolia Social Sciences, (04), 193-200. doi:10.14137/j.cnki.issn1003-5281.2022.04.025.

Wang, T. (2022). Construction and Pedagogical Application of Metaverse Space in Primary and Secondary Education. Modern Educational Technology, (11), 15-23.

Wang, W. (2022). Ethical Considerations of Education Metaverse Application from the Perspective of Phenomenology of the Body. Contemporary Educational Science, (04), 27-34.

Wang, Y., Yan, L., Wang, C., & Wang, G. (2022). Exploring Experimental Teaching in the Field of Education Metaverse. Research in Higher Education Engineering, (04), 96-101.

Wu, G., & Yang, F. (2022). Metaverse and the "Material Turn" in Educational Activities: Old Stories and New Realities. Nanjing Social Sciences, (04), 135-142+160. doi:10.15937/j.cnki.issn1001-8263.2022.04.015.

Xu, J., Wang, J., Zhong, Z., Zhang, G., & Feng, S. (2022). Challenges and Coping Strategies for Teacher Development in the Era of Education Metaverse. Open Education Research, (03), 51-56. doi:10.13966/j.cnki.kfjyyj.2022.03.005.

Yang, L., & Zhu, D. (2022). Education Metaverse: Utopian Imagination and Techno-Ethical Reflections of Future Education. Journal of Yunnan Normal University (Philosophy and Social Sciences Edition), (04), 73-83.

Zhang, H., & Hu, Q. (2022). Rational Examination of the Empowerment of Metaverse in Online Education. Jiangsu Higher Education, (07), 30-36. doi:10.13236/j.cnki.jshe.2022.07.004.

Zhao, S., & Yi, H. (2022). Education Metaverse: Current Focus, Potential Themes, and Future Directions. Academic Monthly of Education, (06), 3-11+18. doi:10.16477/j.cnki.issn1674-2311.2022.06.013.

Zhong, Z., Wang, J., Wu, D., Zhu, S., & Jin, S. (2022). Analysis of Application Potential and Typical Scenarios of Education Metaverse. Open Education Research, (01), 17-23. doi:10.13966/j.cnki.kfjyyj.2022.01.002.

Zhu, S., Xie, H., & Wan, M. (2023). Exploring the Development of Remote Interpreting from the Perspective of the Metaverse. Journal of Beijing International Studies University, (02), 60-73.