# Meta-universe in the field of physical education literature review

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***Abstract:*** *This paper explores the field of physical education in the field of meta-universe by means of literature and logical analysis. This paper analyzes the expansion of physical education curriculum resources by MR Technology and virtual reality resources in the development of the meta-universe, and promotes the development of physical education through the combination of the meta-universe sports space and virtual space, so as to realize the purpose of teaching interaction and co-promotion between teachers and students. The meta-universe can not only be used in subject teaching, but also can be used in the meta-universe to establish a shared community and better build a meta-universe community. It is not only necessary to pay attention to the application of the discipline field, but also to pay attention to the research and application of the meta-universe in other fields, which will be used in a broader field of application.*

***Keywords:*** *Metaverse; The field of physical education; MR Technology; Virtual space*

## 1. Metaverse

### 1.1. Metaverse related concepts

The word "Metaverse" is the latest buzzword under the super imagination of the technology and Internet industry. The term "Metaverse" was first used in Neil Stephen's 1992 science fiction novel Avalanche. It means that the user puts on the headset and eyepiece to find the connected terminal, and realizes the interaction of the online world, and everyone can have their own "avatar" to live and work in the virtual world in the way of virtual dopes. In computer-simulated virtual Spaces parallel to the real world, people communicate and entertain themselves through their avatars. Stephen used the term to describe a virtual reality-based successor to the Internet, The "2020-2021 Meta-Universe Development Research Report" issued by Tsinghua University said that the meta-universe is a new virtual-real integration of Internet applications and social forms generated by integrating a variety of new technologies. It provides immersive experience based on expanding reality technology, generates a mirror image of the real world based on digital twin technology, and builds an economic system based on blockchain technology. The virtual world and the real world are closely integrated in the economic system, social system and identity system, and each user is allowed to produce content and edit the world [1].

The word Metaverse is composed of Meta, which represents transcendence, and Verse, which represents the universe. It means "beyond the universe", which means that the metaverse is a new world with higher dimensions that transcends the real world. It is an Internet application and social form that integrates various new technologies to link and create and map and interact with the real world. It is a digital living space with a new social system. The Wikipedia definition of the metacomes is "metacomes". Later called posthumous universe, metaphysical universe, meta-realm, hypersensory space, virtual space, is used to describe a future persistent and decentralized online three-dimensional virtual environment. The meta-universe is a virtual world and survival vision that starts from a game platform, is based on digital currency, and is deeply involved in human life supported by a series of simultaneous emergence of digital technology and hardware technology [2]. The essence of the meta-universe is an artificial virtual world, the driving force of which is that the function center of the Internet has changed from information to people, and people's increasing demand for interaction drives the continuous progress of media technology. The conditions for the emergence of the meta-universe are the high development of information technology and the high prosperity of social civilization, and the all-round reform of society [3]. The meta-universe is a technology-driven virtual world that may evolve into a new form of human social life in the future. The simple geographic meta-universe refers

to the integration form of Internet elements which relies on the Internet, information technology, virtual simulation technology and digital technology.

### 1.2. The universe and physical education

The meta-universe is defined as the master of digital technology, and the scope of its exploration is rapidly expanding from finance to the field of education [4], and sports teaching and digitalization are inevitable together [5]. Since the term "educational meta-universe" was introduced, universities and scientific and technological enterprises have devoted themselves to the construction of educational meta-universe [6]. Many educational scholars have discussed the educational meta-universe from the perspectives of technology and space. From the perspective of technology, the educational meta-universe is mainly a new form of digital education created by various digital technological means, and it is a technology set that technology exerts a vertical effect on the field of education. From the perspective of space, the education meta-universe is described as a new type of education system in the future, a new virtual education space composed of the interaction of real elements and virtual elements [7].

The integration between the meta-universe and physical education has brought unprecedented opportunities for innovation and potential for change to physical education. First of all, the physical education teaching space of the meta-universe is a virtual digital world composed of various technologies, not a single technology can complete the construction of the physical education of the meta-universe. Similarly, the specific mechanism of meta-universe physical education is also based on the synthesis of various technologies, so that meta-universe physical education has mechanism advantages in the production and creation of resources, embodied cognition and experience, and building an open learning community platform. The meta-universe provides a highly realistic virtual environment for physical education. Through advanced virtual reality technology, the meta-universe can simulate various sports scenes and actions, allowing students to have real sports experience in the virtual world. This immersive experience can stimulate students' interest in learning and improve their enthusiasm to participate in sports activities.

Secondly, the meta-universe provides abundant teaching resources for physical education. In the meta-universe, teachers can obtain a large number of physical education resources, including teaching videos, action demonstrations, training plans and so on. These resources can be customized according to the needs and abilities of students, making the teaching more in line with the actual situation of students and improving the teaching effect. In addition, the meta-universe can also provide intelligent evaluation and feedback mechanism for physical education. Through data analysis and artificial intelligence technology, Metacom can monitor students' athletic performance in real time and provide targeted advice and feedback. This can not only help teachers better understand the learning status of students, but also allow students to timely understand their own sports performance and shortcomings, so as to better adjust their training plan. However, the application of the meta-universe in physical education also faces some challenges. For example, the high cost of technology, limited penetration of equipment, and real feelings in virtual reality environments still need to be further addressed. At the same time, teachers need to constantly learn and master new teaching methods and skills when using the meta-universe technology to teach.

To sum up, the combination of meta-universe and physical education teaching has great potential and advantages to bring students a more immersive and personalized learning experience. With the continuous progress of technology and the expansion of application scenarios, it is believed that the meta-universe will play an increasingly important role in the future physical education.

## 2. Review of research status at home and abroad

### 2.1. Domestic research status of the meta-universe in the field of physical education

Through the search of CNKI, it is found that the domestic research on the meta-universe is mostly concentrated in communication economy, computer, news communication, sports, control engineering and other disciplines. The research finds that relying on the meta-universe technology will provide a new platform for the sports media industry, sports news communication, and sports teaching mode, and innovate the development of the sports industry.

As the latest form of Internet development, the meta-universe is bound to bring new development to physical education and more fields. "Guo Jianghao" scholar pointed out that in the context of the social heated debate triggered by the meta-universe and the expanding scope of coverage, the theme of academic research is "education meta-universe", and continues to derive "future education", "education new infrastructure", "digital identity", "application scenarios", "learning meta-universe", etc., thus, the exploration of the educational meta-universe has become the consensus of the current education community [1]. In the context of the meta-universe, the future development of sports will be based on the application of a new generation of information technology such as extended reality technology, digital twin technology, blockchain technology, cloud computing, data mining, artificial intelligence, etc., to form a new form of sports that integrates real sports space and virtual sports space. The future development of sports in the meta-universe environment is based on the collection of the application of a new generation of information technology to form a new form of sports that integrates real sports space and virtual sports space, which is the enrichment and expansion of sports application scenarios [8]. Through the combination of physical space and virtual physical space in the meta-universe, the purpose of teaching interaction and mutual promotion between teachers and students is realized.

The meta-universe connects the virtual world with the physical world, including the network, hardware terminals and users, and has a profound impact and change on the economy, culture, education and lifestyle of the future society. MR(Mixed reality) technology is the advanced version of visual virtual reality technology and augmented reality technology, and is the primary form of the meta-universe. With the continuous enrichment and improvement of the application of MR(mixed reality), the traditional education and teaching methods will be greatly impacted, the teaching environment will be upgraded, the learning efficiency will be improved by leaps and bounds, and the learning resources will be rapidly expanded. Teachers at all levels can use mixed reality technology and resources to supplement the original teaching system, so that the mixed reality learning environment can be widely applied to the teaching of various disciplines. This is the basic idea of the meta-universe teaching. In the meta-cosmic context, physical education and teaching will be one of the beneficiaries of the technological development of mixed reality learning environments. Through the advanced teaching mode under the concept of motion meta-universe, we can reach a higher teaching level and contribute to the development of education and The Times [9].

### 2.2. Research status of meta-universe in sports field abroad

Through consulting, it is found that the study of the meta-universe in foreign countries first appeared in 2000. Compared with the literature on the meta-universe in China, it is found that the study of the meta-universe in foreign countries is earlier than that in China, and the hot spots in the study of the meta-universe in foreign countries can be roughly divided into: Meta-universe in the ontology research, in education, teaching and online learning research, in the field of games, film research, research in the social field, in the business field and other fields of application and impact [10].

VR virtual reality technology is an emerging human-computer interaction technology, which brings users a variety of near-real experience, and has extremely broad application prospects in many fields such as education, medical care, retail, and games [11]. The meta-universe has a great impact on the field of education due to its immersive interactive scene combining virtual-reality. To solve the problem of how to build a community sharing high-quality educational resources, this paper first analyzes the characteristics of the meta-universe community of education, then designs the framework structure of the meta-universe community of education, and finally puts forward the challenges and strategies faced by the meta-universe community of education [12].

### 2.3. Review of relevant research at home and abroad

Domestic research on the meta-universe in the field of physical education started late, but in recent years has shown a rapid development trend. Domestic scholars mainly focus on the application of meta-cosmic technology in physical education, the innovation of physical education teaching model and the development of physical education industry. Through the application of meta-universe technology, the domestic physical education field has realized the innovation of teaching methods, improved the teaching effect and enriched the teaching resources. At the same time, the meta-universe technology also provides new opportunities and challenges for the development of the physical education industry. But there are still some shortcomings in domestic research. First of all, the scope of research is relatively limited, mainly focusing on the application of technology and teaching innovation, lack of deep impact of the meta-universe in the field of physical education. Secondly, the research

method is relatively simple, the lack of interdisciplinary comprehensive research, it is difficult to fully reveal the mechanism of the meta-universe in the field of physical education.

Foreign scholars not only pay attention to the application of meta-universe technology in physical education, but also pay attention to explore the impact of meta-universe on the mode of physical education, the industry of physical education and the international exchange of physical education. Foreign research has made remarkable achievements in the application of virtual reality technology, the construction of educational resource sharing community and the innovation of knowledge sharing mode, which provides new ideas and directions for the development of physical education.

To sum up, the research on the meta-universe at home and abroad is in the initial stage of development, but there are some differences between foreign research and domestic research. Compared with domestic research, foreign research has more advantages in depth and breadth, and the continuity and coherence of foreign research are also better than domestic research. Although the research on the meta-universe has attracted attention again in China since July 2021, on the whole, the research on the meta-universe has attracted more attention in China. There is still a certain gap between domestic and foreign studies on the meta-universe, which is not only reflected in the starting time and author group, but also in the research field and research depth. Therefore, China should pay more attention to the meta-universe and strengthen the research on the related fields of the meta

## 3. Conclusions

With the renewal of technology, the universe of virtuality and reality will gradually change from point to surface, from shallow to deep, and truly enter our life, production and consumption. This will bring unprecedented influence and changes to the whole field of sports in the future, and the future development of sports will usher in a new era in the integration of virtual and real space. As the hottest scientific and technological concept at present, the meta-universe is in the embryonic state and the initial stage of development, but it is likely to become the manifestation and main entrance of the next generation of Internet. The sports industry will also usher in a new stage of development, but it still needs breakthroughs in digital technology, artificial intelligence and other aspects to promote the in-depth application of technology in various fields such as sports, sports competitions, sports education, and sports media. The development of the meta-universe in the field of sports is still in the exploration stage, restricted by the development of the current technical level, there are still certain practical application limitations and promotion stages. Through the real experience emotion brought by the meta-universe teaching method, students can obtain a variety of perceptual or rational understanding of objective things, and it is easier to stimulate students' image thinking and creative thinking. The meta-universe physical education teaching mode conforms to the learning concept of modern science education, makes full use of modern science and technology, and provides a new platform for modern physical education teaching method. As the development trend of the new generation, the meta-universe will inevitably involve many fields and have a significant impact on various fields, and will also be applied to a broader field. Therefore, on the basis of paying attention to the meta-universe, China should not only pay attention to the in-depth study of the meta-universe in the field of disciplines, but also pay attention to the research and promotion of the application of the meta-universe in more fields.

## References

*[1] Guo Jianghao. Connotation, Application and Prospect: Research on Online Physical Education towards "meta-universe" [J]. Journal of Hebei University of Physical Education,2023,37(01):11-20.*
*[2] Yuan Yuan, Yang Yongzhong. Towards a meta-universe: the mechanism and logic of a new digital economy [J]. Journal of Shenzhen University (Humanities and Social Sciences Edition), 2022, 39(01):84-94.*
*[3] Fang Lingzhi, Shen Huangnan. The change of technology and civilization: a study on the concept of the meta-universe [J]. Industrial Economics Review,2022,No.48(01):5-19.*
*[4] Yu Guoming, Geng Xiaomeng. Meta-universe: The future ecological picture of media society [J]. Journal of Xinjiang Normal University (Philosophy and Social Sciences Edition),2022,43(3): 110-112.*
*[5] Guo Jianghao, Hu Ti. Toward "Meta-universe Physical Education" : Conceptual characteristics, functional Perspective and scene application [J]. Modern Educational Technology, 2019,33(03):27-35.*
*[6] Wang Jianying, Zhang Hong. The Meta-universe: Generative Singularity and realistic Challenge of future education [J]. Inner Mongolia Social Sciences,2022,43(04):193-200.*

*[7] Yang Yang, Chen Li. Social hot discussion of the meta-universe and rational thinking of "Internet + Education" [J]. China Audio-visual Education,2022(8):24-31+74.*

*[8] Huang Qian, Wang Huanqing, Li Shaopeng. Logical reconstruction and Practical Prospect of the future Development of Sports -- Starting from the concept of the meta-universe [J]. Journal of Xi 'an University of Physical Education,202,39(02):129-135.*

*[9] Liu Hongyu. Exploration and Prospect of Physical education Teaching Model based on "meta-universe" environment [J]. Exploration of Higher Education,2022,No.225(01):75-79.*

*[10] Zhang Xia-Heng, Li Xiang. Foreign research status, hot spots and enlightenment in the field of meta-universe [J]. Industrial Economics Review,2022,No.49(02):199-214.*

*[11] Wang Chuang,Zhao Sensen,Wang Lijun. P-2.3: The Development of Virtual Reality Technology and the Origin of the Metaverse[J]. SID Symposium Digest of Technical Cca shut, 2022 does (S1).*

*[12] Ye LIU, Wei CHENG, Yan LI, Yimeng YIN, Huijie SUN. Research on the construction of educational community from the perspective of metaverse[J]. Big Data Research, 2023, 9(1): 78-86.*