Research Article

Research on the Reform and Innovation of Preschool Education Informatization under the Background of Wireless Communication and Virtual Reality

Juan Li

School of Arts, Shandong Management University, Jinan, Shandong 250357, China

Correspondence should be addressed to Juan Li; lijuan_smu@163.com

Received 1 July 2021; Revised 28 July 2021; Accepted 6 August 2021; Published 15 August 2021

Academic Editor: Raffaele Mascella

Copyright © 2021 Juan Li. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Nowadays, when various information technologies are constantly being updated, preschool children will inevitably need to use new technologies for knowledge learning. At present, preschool education informatization has begun to deploy new technologies in various colleges and universities, but there are still deficiencies. This article analyzes the significance of the combination of wireless communication and VR technology applied to preschool education for children and explores the status quo of children's participation in the use of information technology in kindergarten classrooms. Based on the problems existing in the status quo, try to use wireless communication and VR technology to improve preschool education in our country. Informatization of education proposes innovative strategies and analyzes the advantages and challenges of applying wireless communication and VR technology to the informatization of preschool education.

1. Introduction

Preschool education informatization mainly represents the preparation of various teaching aids through the use of new computer knowledge and technology in order to promote the learning effect of children and at the same time makes it easier for teachers to cultivate children's information technology sensitivity and enable them to obtain comprehensive integration ability [1].

In the context of the continuous emergence of various new information technology technologies, preschool children at home and abroad have been exposed to various electronic devices. Most children use electronic devices to perform some basic operations, such as playing games, learning small knowledge, and watching videos, but there are also many information technology devices that are not accessible to preschool children, including devices such as tape recorders and computers. When preschool children receive knowledge in domestic kindergartens, in most cases, the teacher operates the computer to play PPT to explain the knowledge to the children, and the children themselves cannot touch the computer. In developed countries abroad,

many kindergarten schools have arranged smart interactive tablets and other devices for children. Even in Florida, the tablet computer is an indispensable tool for almost every student in learning, and kindergarten teachers also like to try new technologies to teach knowledge to young children. It can be seen that the informatization of preschool education in China still needs improvement [2].

Since the beginning of this century, wireless communication and VR technology have developed rapidly. Wireless communication technology has developed the latest communication technologies and protocols other than Bluetooth and WIFI. VR technology equipment has been able to implement mobile phones, personal computers, all-in-one models, independent devices, etc. The existence and use of various forms, VR, and wireless communication technology itself are interrelated. The two technologies, as technologies generated by the progress of the new era, can help young children simplify complex knowledge and see through simulation screens that they have never seen it before or have already seen it [3]. The teaching method combining VR and wireless communication technology can bring many possibilities to preschool education, thus forming good learning habits at

the beginning of the preschool semester, cultivating great interest in learning, becoming an active learner as soon as possible, and knowing how to use it [4]. From a long-term perspective, wireless communication and virtual reality technology, as key applications for future development, require enlightenment from preschool education. The use of information technology by young children from an early age will lead to the formation of awareness of using new technology in the adult stage earlier, which also proves the significance of wireless communication and VR technology education in the early childhood stage [5].

2. Problems in the Development of Preschool Education Informatization

Although policies have repeatedly emphasized the importance of education informatization, the actual implementation is still not enough. Teachers also use videos or PPT graphics to explain the detailed analysis of difficult questions. They have not applied the latest technology in education; although, preschool education Informatization is constantly advancing, but there are still some key issues that need to be resolved [6].

2.1. No Customized Education for Preschool Children. Preschool education needs to focus on children's learning status and physical and mental health in the education process. Many children have not yet acquired an excellent learning habit at the preschool stage. However, many parents and kindergartens want to allow children to master more at the beginning stage. When children cannot accept more knowledge, they sacrifice their rest time to supplement knowledge, and it has become more and more intense. There are even many institutions that carry out elementary education in the pre-school stage [7].

In fact, the kindergarten or family in the current preschool education carrier needs a unified analysis platform for individual students' learning needs. It also needs to combine new technologies to analyze the learning situation of children and customize the learning content. There should be no blind education competitions. Otherwise, the complete informationization of preschool education will not improve the learning effect of children.

2.2. Preschool Education Information Resources Are Scarce. At present, there are still many remote areas in China that do not have information-based teaching equipment, and even computers are luxury teaching supplies. Even if they have computer equipment, they will not be used in schools. The probability of applying them to preschool education and teaching is even closer to zero. Statistics from related institutions found that the statistical comparison of informatization equipment among preschool teachers in remote villages and developed cities is shown in Table 1, and the specific visual display is shown in Figure 1.

Through the analysis of institutional statistics, it is found that the surveyed kindergarten classes are equipped with corresponding information equipment, and the types of information equipment are also relatively rich. The average ratio

of various corresponding characteristic devices has reached 0.6. Among them, the deployment rate of smart boards in preschool education places in remote areas is lower than only 0.05. The urban preschool education places are fully equipped, and all the equipment related to informatization teaching is available. It can be seen that preschool education in remote areas still lacks informatization equipment, and they need to solve the problem of lack of equipment through new information technology equipment [8].

2.3. Lack of Practical Ability Training for Preschool Education Information. Preschool education children are in the early stages of brain development and need to use hands to promote brain development. The current information-based teaching allows children to sit and listen without the opportunity to actually operate. This form of education is useful for cultivating children's hands-on ability not enough. After distributing the questionnaire survey, the author found that children in China have almost no opportunity to operate the equipment in person. Most of them are observing kindergarten teachers to operate the equipment. When the proportion reaches 0.916 and the proportion is 0.068, children can use technology products by themselves. The specific situation is shown in Table 2 and Figure 2. At present, the kindergartens where various preschool education institutions are located have different amounts of teaching materials (computers, cameras) and different teaching methods, so that children's participation in preschool education is different, and the final acceptance of children's knowledge is also different. It can be seen that the cultivation of children's hands-on ability is also related to the teaching path of kindergarten teachers and the equipment resources contained in it. In the end, the information teaching in kindergartens should be able to increase children's hands-on ability [9].

3. The Informatization Innovation Strategy of Preschool Education under the Background of Wireless Communication and Virtual Reality Technology

The current young children are growing up at a stage of rapid leap in information technology. The preschool education for young children cannot be the same as the traditional education in the past. It is the future education development trend to consider the introduction of new technologies in the preschool education. The introduction of digital technologies such as information technology will also have a positive impact on the development of children throughout their lives. Related scientific investigations have found that the latest information technology equipment in preschool education will bring beneficial factors to children's brain development and at the same time promote the cultivation of children's hands-on ability, logical thinking, and creative thinking. This section provides some strategies to solve the current problems in preschool education informatization and at the same time provide suggestions for the rational use of wireless communication and VR technology in preschool education informatization.

TABLE 1: Comparison of preschool education informatization equipment in remote villages and cities.

Device name	Unit ratio	Computer	Broadcasting	Smart board	Touch screen	Projector voice	Recorder	Television
Remote area	Amount	4	126	6	105	111	112	129
	Percentage	3%	95%	5%	79%	85%	86%	97%
City	Amount	12	20	20	20	20	20	20
	Percentage	100%	100%	100%	100%	100%	100%	100%

FIGURE 1: Comparison and visualization of preschool education informatization equipment in remote villages and developed cities.

TABLE 2: The use of technical equipment in preschool classrooms.

Organization	Unit ratio	Children operate by themselves	Children operate occasionally	Children only see teachers
Kindergarten	Times	0	9	121
Kindergarten	Percentage	0	6.83%	91.66%

3.1. Build a Child Learning Analysis Platform Based on VR and Wireless Communication Technology. Aiming at the problem that preschool children fail to achieve customized education, wireless communication and VR technology can be introduced, and then the big data technology in the application of wireless communication technology can be added to the problem-solving system, through wireless communication, VR, and big data technology. Data and other technologies are combined to build a children's learning data analysis platform. The platform can use big data to crawl informatized teaching materials from the Internet and provide teachers with more teaching suggestions through the best materials crawled to achieve the improvement of teachers' ability. In addition, after children use VR and wireless communication technology products, they can understand the development level of children in various aspects more accu-

rately according to the platform background data statistics. Through the learning data analysis of children operating VR devices, they can summarize the problems that children have in learning; so as to later, it can be customized to supplement the knowledge of the child.

3.2. Introduce VR and Wireless Communication Equipment. In fact, just a VR all-in-one machine can make up for all the shortcomings of scarcity of preschool education. You can see different realistic pictures during the class and learn different knowledge. You do not need to see actual objects or use other expensive equipment to simulate. This effectively solves the resource problem. Currently, companies such as Baidu have launched VR all-in-one machine, and its products have been used in a variety of scenarios and industries, such as VR industrial parks, training, party building, laboratories, and K12 classrooms. Through these cases, it can be found that the equipment has been applied to the preschool education industry. The price of the device is also more suitable for school introduction. A VR all-in-one machine can solve all resource problems. With the continuous development of technology, one all-in-one device can also be customized and developed to connect multiple VR head-mounted simulated eyes. It solves the problem of insufficient coverage.

FIGURE 2: Proportion of operation technology equipment for preschool children.

3.3. Enhance Children's Hands-On Ability through VR Technology. VR and wireless communication technology can drive children to perform hands-on operations through immersion. Through the simulation of hands-on screens, children can climb mountains, swim, and pile wood in various sports and hands-on operations created by VR. In order for students to fully experience the real scene, it is necessary to integrate preschool education courses with VR technology, so that children can fully participate in activities and improve children's hands-on ability.

In addition, research has shown the shorter the time for young children to operate and use information technology. After children have been interacting with each other for a period of time using VR devices or electronic screens, encourage them to do another nontechnical activity. Therefore, teachers need to be able to control the various resources and learning modes provided by teachers. And it is necessary for teachers to limit the time, type, and form of children's technical use, as far as possible to prevent the occurrence of learning tasks that cannot be completed or even out of control and at the same time ensure healthy learning time for children.

4. Analysis of the Advantages and Challenges of the Integration of Wireless Communication +VR Technology and Preschool Education

At present, more than a thousand schools have been equipped with VR classrooms and laboratories. In the future, there will be more schools using wireless communication and VR technology. Compared with traditional information-based teaching, it has advantages and also brings many challenges.

4.1. Advantage

4.1.1. Improve Children's Comprehension Ability. Some scholars have found that if only pictures or texts of relevant

courses are provided, the effect of preschool education children's acceptance of knowledge can only reach 10%, and under the combination of video and PPT, the acceptance rate of children reaches 30%. When using VR and wireless in the teaching mode under the combination of communication technology, the acceptance rate of children is 70%, and we can infer from the data that it can improves children's comprehension [10].

4.1.2. Relieve the Confinement of Space and Time. For some historical scenes or demonstration teaching of extinct animals, conventional video playback effects are not realistic enough, and the impression of children in preschool education is not deep enough. Using VR and wireless communication technology cannot only simulate extinct animals such as dinosaurs but also detect dead animals. Go back to the historical scene. And many dangerous scenes can also be directly simulated, such as deep-sea exploration, experience the vastness of the sea next to sharks and whales, so as to realize the restoration of real scenes that cannot be achieved by traditional teaching methods, so that children can learn without specific restrictions on space and time, and also allow preschool education Children in middle school have a deeper understanding of the corresponding species and cultivate interest in subjects [11].

4.1.3. Reduce the Cost of Preschool Education. Through VR and wireless communication technology combined with preschool children's experimental teaching, VR methods can be used to replace traditional real object experiments. For example, chemical reaction experiments often waste materials after completing one time, while under VR and wireless communication technology, children can play repeatedly VR images continue to experiment to solve irreversible situations and reduce costs, which solves the irreversible situation that the material cost.

4.1.4. Improve Children's Interest and Motivation. Preschool children's brains are still in the early stages of development, and their ability to reason and understand things is not enough, but after a period of teaching by parents and relatives, they have the ability to independently carry out learning activities and then use wireless communication. The immersive experience of VR technology can further enhance the hands-on ability of children in preschool education and effectively enhance children's learning interest through visual and auditory stimulation [12].

4.2. Challenge. For preschool informatization education.. VR and wireless communication technology can bring a lot of beneficial factors, and it could also have an adverse effect on the growth of young children. Through analysis, the author found that children may have the following educational challenges under the application of wireless communication and VR technology [13]. At present, VR and wireless communication technology is mainly used in preschool education with the following challenges.

First, there are many ways to apply VR and wireless communication technology. If there is no fixed teaching standard guidance, teachers will not be able to teach effectively.

Second, the environment is more likely to cause certain adverse effects on young children. Excessive exposure to VR and wireless communication technologies may develop some negative effects, causing young children to mix reality with virtual.

Again, if young children are accustomed to the vivid experience and convenient knowledge brought by VR and wireless communication technology, they will no longer seriously think about the meaning behind the scenes they see. For example, after seeing dinosaurs, they feel accustomed to them and do not think about the development history of dinosaurs. This may affect children's own creative thinking and eventually lead to children's loss of creativity. This is a scenario that preschool education does not want to see.

Finally, children's single participation in VR and wireless communication technology may have a certain adverse effect on the child's body. Specifically, it may be manifested in obesity due to obesity, due to indulging in playing VR games and sedentary sitting, and vision loss due to long-term focus on the screen.

5. Conclusion

It is not only kindergarten teachers, family education, social education, and self-education that all affect the development of children. It is the general trend for children to participate in the use of information technology and kindergarten information technology education, and the informatization of the preschool education industry is also imperative, the application of wireless communication and virtual reality technology to the informationization of preschool education will realize a complete change in the way of preschool education and finally cultivate children who are qualified in moral, intellectual, physical, and artistic.

The application of wireless communication and VR technology has a significant positive impact on children's under-

standing of the world, raising interest in class, cultivating knowledge, and knowledge of various subjects. Applying wireless communication and VR technology to children's informatization teaching can enable children to have a deeper understanding of things and the laws of development of things and also enable them to understand the world in many aspects, angles, and directions. This article mainly regards the use of wireless communication and virtual reality technology in preschool education informatization as the theme, based on specific conceptual definitions, preschool education informatization status quo, and problem exploration, and the specific use of wireless communication and virtual reality technology in the preschool education informatization environment carries out comprehensive analysis and research to prepare a good theoretical analysis and practical research foundation for the use of wireless communication and VR technology in preschool education.

Data Availability

Data sharing not applicable to this article as no datasets were generated or analyzed during the current study.

Conflicts of Interest

The author declared no potential conflicts of interest with respect to the research, authorship, or publication of this article.

Acknowledgments

This paper is the periodic research results of "Research on the practice of Mixed Teaching Mode Based on Micro Video" (Project No. 21JX068), a teaching research project of Shandong Province in 2021. This paper is the periodic research results of "Exploration and Practice Research on the Improvement of College Students' Core Literacy Based on PAD Teaching Mode" (Project No. 21JG144), an education and teaching reform research project of Shandong Province in 2021. This paper is the periodic research results of "Research on the practice of vocational enlightenment education for 3-6-year-old children" (Project No. 21SC010), a educational science research project of Shandong Province in 2021.

References

- [1] X. Mei, "Research on higher education informatization construction promoting education and teaching reform and innovation," *Shaanxi Education (Higher Education)*, vol. 6, pp. 65-66, 2021.
- [2] J. C. Ge and C. Qi, "Cultivation of informationized teaching ability for normal students of preschool education major," *Journal of Anshan Normal University*, vol. 23, no. 2, pp. 61-65, 2021.
- [3] Z. Juanran and L. Juan, "Exploration of the reform and construction of practical teaching informatization of preschool education specialty," *Science and Technology Vision*, vol. 11, pp. 14-15, 2021.

- [4] Y. Wei, Z. Yufeng, and H. Wenyuan, "Feasibility study on the integrated development of "VR + preschool education"," *Journal of Weifang University*, vol. 20, no. 4, pp. 116–120, 2020.
- [5] D. Youjun, "Analysis of vocal music teaching reform in higher vocational colleges in the information age—an example of preschool education major of Lanzhou vocational and technical college," *Voice of the Yellow River*, vol. 18, pp. 37–38, 2015.
- [6] H. Lan, "Research on the informationization of dance teaching in preschool education major," *Journal of Ningbo Institute of Education*, vol. 21, no. 1, pp. 21–22, 2019.
- [7] L. Yang, T. Chunyu, and C. Wang, "Promoting higher vocational preschool education curriculum reform practice exploration with information technology——taking "social education for preschool children" as an example," *Future and Development*, vol. 43, no. 11, pp. 14–17, 2019.
- [8] A. Dun, "The teaching status and strategy analysis of preschool education professional courses," *Journal of Heilongjiang Teachers Development College*, vol. 39, no. 1, pp. 54–56, 2020.
- [9] P. Shuai, "The application of information technology in preschool education professional print teaching," *Art Education Research*, vol. 8, pp. 95–97, 2021.
- [10] C. Yan, "A brief discussion on the teaching and research of new era kindergarten facing educational informationization," *Western Journal*, vol. 6, pp. 116–118, 2021.
- [11] J. Zongzhen, "Preschool education information technology innovation and application research——comment on "basics and application of preschool education information technology"," *Science and Technology Management Research*, vol. 40, no. 24, p. 263, 2020.
- [12] Y. Ma, "Current status and prospects of preschool education informatization research," *China Educational Technology and Equipment*, vol. 15, pp. 66–69+79, 2020.
- [13] L. Xueping, "Educational informatization enhances the information literacy of kindergarten teachers," *Digital Communication World*, vol. 10, pp. 238–239, 2020.