

# Problems and Countermeasures of Practice Teaching in Preschool Education under the Background of 5G Era

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**Abstract:** 5G has made an important breakthrough in the field of education. Practical teaching plays a very important role in the training of professional talents. It is an important teaching link for students to transform knowledge into skills. In the 5G era, the problems existing in the practical teaching of preschool education are more prominent, and the extensive application of 5G technology in the field of education makes teachers and students face huge challenges. This paper takes the 5G era as the research background and uses relevant information technology to put forward corresponding solutions to the current problems faced by the practical teaching of preschool education.

**Keywords:** 5G, preschool education, practical teaching

## 1. Introduction

As a new type of mobile communication network, 5G should not only solve the interpersonal communication, provide users with more immersive extreme business experience such as augmented reality, virtual reality, ultra-high definition (3D) video, but also solve the problem of people and things, things and things communication, and meet the needs of mobile medical, car networking, smart home, industrial control, environmental monitoring and other Iot applications. Ultimately, 5G will penetrate into all sectors of the economy and society and become a key new infrastructure to support the digitalization, networking, and intelligent transformation of the economy and society. With the promotion and popularization of 5G technology in China, 5G intelligent technology is increasingly widely used in the field of education in China. The integration of information technology and preschool education professional practice teaching in the 5G era has become an inevitable requirement to comply with the modernization of education and the development of teaching informatization. This paper discusses the existing problems, challenges and construction strategies of practical teaching in the context of "5G+ preschool education", in order to arouse relevant discussions.

## 2. 5G technology and practical teaching of preschool education

### 2.1 Overview of 5G technology

5G uses a new service-oriented architecture to support flexible deployment and differentiated business scenarios. 5G adopts full-service design, modularizes network functions, supports on-demand call, and realizes function reconstruction; the service description is easy to realize the capability opening, which is conducive to the introduction of IT development strength and the play of network potential. 5G supports flexible deployment, based on NFV/SDN, realizes hardware and software decoupling, and realizes control and forwarding separation; Cloud networking of common data centers, flexible deployment of network functions, efficient resource scheduling; Support edge computing, cloud computing platform sinks to the edge of the network, support application based gateway flexible selection and edge diversion. Network slicing is to customize a logically independent network by selecting specific features and functions from a network. It enables operators to deploy multiple logical networks with different functions, features and services to serve their respective target users. Three types of network slicing are defined. That is, enhanced mobile broadband, low time delay, high reliability, and large connection Iot.

5G international technical standards focus on meeting flexible and diverse Iot needs. On the basis of

OFDMA and MIMO technologies, 5G uses a flexible new system design to support three major application scenarios. In terms of frequency bands, different from 4G support for low and medium frequency, considering the limited resources of low and medium frequency, 5G supports both low and medium frequency bands, of which low and medium frequency meet the needs of coverage and capacity, and high frequency meet the needs of capacity enhancement in hot areas, 5G has designed a unified technical solution for low and medium frequency and high frequency, and supports the basic bandwidth of 100 MHz. In order to support high-speed transmission and better coverage, 5G uses LDPC, Polar's new channel coding scheme, and large-scale antenna technology with stronger performance. In order to support low latency and high reliability, 5G uses technologies such as short frames, fast feedback, and multi-layer/multi-station data retransmission.

## ***2.2 Practical teaching of preschool education***

The practical teaching of preschool education can be divided into broad sense and narrow sense, and the narrow sense of practical teaching mainly refers to the students' concentration in kindergarten to carry out education learning activities [1]. The broad sense of professional practice teaching of preschool education mainly includes all the practical activities that all pre-service students participate in, including visits, practices, internships, course practice, extracurricular activities and other practical activities that students concentrate on. This paper discusses the professional practice of preschool education in a broad sense.

### ***2.2.1 Connotation of practical teaching ability***

Ability refers to the outstanding quality of an individual when completing a task or goal, which is closely related to the efficiency of individual activities. Practical ability is one of the forms of ability, but also a component of individual quality. As for the definition of practical ability, the academic circles have different views. Philosophy interprets it as the probability or level of achieving specific practical activities. According to psychology, this ability refers to the psychological characteristics that an individual needs to handle practical problems smoothly under the premise of mastering relevant skills or technologies. The viewpoint of pedagogy is that the individual's ability to deal with various practical problems is the practical ability. For teachers, practical teaching ability refers to the professional quality that each teacher should have. If the term is explained based on the cultivation of kindergarten teachers, it can be simply summarized as the ability of kindergarten teachers to guide or guide children in an appropriate way according to specific teaching situations during the practical teaching in kindergartens by virtue of their own professional knowledge, so as to form a positive influence and enable them to develop comprehensively.

### ***2.2.2 Composition of practical teaching ability***

Practical teaching ability involves a variety of abilities, kindergarten teachers need to master the basic practical teaching ability, but also to develop practical ability and core practical ability. With the continuous growth of kindergarten teachers, these three abilities will gradually form a complete system of correlation. Basic practical teaching ability refers to the basic ability that kindergarten teachers should have when they carry out teaching activities smoothly, such as the ability to communicate with others, communicate, observe children and so on. When kindergarten teachers carry out teaching practice activities, they must master core practical abilities to achieve the expected results, including but not limited to creating a good educational environment, observing and studying children, organizing and carrying out teaching work or games, etc. During practice teaching, kindergarten teachers need to realize individual value and carry out innovative teaching with their own practical ability, which is reflected in decision-making ability, innovation level and information processing ability [2]. The key to the formation of the above three abilities is that the subject should carry out action participation and practice reflection, during which it is necessary to pay attention to the detailed scenarios of individual knowledge formation and ability acquisition, and more importantly, it is necessary to emphasize the importance of practical teaching ability in pre-service education, so as to improve the training efficiency.

## **3. The main problems existing in the practice teaching of preschool education**

In the information age, the development of 5G has impacted the traditional education and teaching ecosystem, making the limitations of traditional education and teaching more obvious. As an important part of vocational education, practical teaching activities, its existing problems are more prominent.

### ***3.1 The comprehensive ability of teachers is not strong, and it is difficult to be competent for practical teaching***

According to the emerging new technology and the trend of future development, the roles of teachers are divided into citizen, leader, learner, collaborator, facilitator, designer and analyst. This means that in the era of 5G networks, teachers must use technology to help themselves grow, but also use technology to help students grow. However, from the actual situation, the situation is not optimistic, and most teachers in higher vocational schools generally have problems that their ideas lag behind the pace of 5G technology development, the application ability of information technology does not match the requirements of 5G intelligent technology, and the integration ability of education cannot keep up with the speed of artificial intelligence development. All these shortcomings of teachers hardly help them to become facilitators, designers and analysts.

### ***3.2 Students' knowledge system is incomplete and it is difficult to integrate into practical activities***

The cultural foundation of students in independent colleges is generally poor. This is the difference between the education system of China and the developed countries in the West, so the knowledge system of the students enrolled by independent colleges is not comprehensive on the whole. In addition, independent colleges and universities in China are generally employment-oriented and give priority to skill training, which further aggravates the incomplete knowledge system of students in independent colleges and universities. With the arrival of the 5G era, school students are required not only to have superb production practical skills and cutting-edge knowledge of the industry, but also to have the intelligent literacy required in the era of digital intelligence, such as data literacy, artificial thinking, man-machine collaboration and the use of intelligent technology for innovation, entrepreneurship and creation. In particular, it should be noted that the intelligent technology and knowledge required in the 5G era is not only the need for future education work, but also the ability to study and participate in activities at school. Whether it is to adapt to the current popular flipped classroom teaching mode or to engage in future practical work, it all puts forward the requirements of information literacy in the 5G era for college students to effectively participate in practical teaching activities. However, due to the incomplete knowledge system of college students, it is difficult to integrate them into practical activities.

### ***3.3 The form of practice is not flexible and it is difficult to meet the needs of individual practice***

The practical teaching of preschool education mainly includes social practice, curriculum practice, curriculum probation, graduation education, practice and so on [3]. Course internship is usually interspersed between the first and second grades, social practice is carried out in the holidays, and internship is generally arranged in the third grade, and the Ministry of Education stipulates that the time of post practice is not less than 6 months. The content mainly includes the observation of daily routine management of preschool education institutions and the simulation training of nursing skills. Whether it is short-term practice on campus or on-the-job practice for up to 6 months off-campus, its practice forms are relatively rigid, which is difficult to meet the requirements of personalized practical teaching for students, and practical methods and means cannot keep up with the pace of development in the 5G era. At present, the practice teaching of preschool education is mainly carried out in the classroom in the school, the practice means and form are single, and the situation that there are many students and few teachers makes it difficult for teachers to guide all students, and the practice teaching is only a form. In addition, the problem of off-campus practice is also more prominent. Although many schools have implemented the "double teacher type" co-training and co-education method combining on-campus practice guidance teachers and off-campus practice guidance teachers, it is difficult to make synchronous guidance due to time and other reasons.

### ***3.4 Practice evaluation is not scientific, and it is difficult to achieve effective practice evaluation***

The practical teaching evaluation of preschool education is mainly carried out by teachers' grading and submitting practice reports, which is a kind of verification and cognitive evaluation. This single evaluation method lacks the support of process data and is difficult to conduct effective evaluation of students. We know that the practice of preschool education in preschool education institutions focuses on students' ability to use theoretical knowledge to solve practical problems, such as problem analysis, method selection and strain ability, and evaluate their ability level in the practice process of preschool education institutions through these aspects [4]. However, at present, the evaluation of preschool

education practical ability is mainly carried out through the way of teachers' scoring and students' writing practice reports, emphasizing the sorting and elaboration of students' observation of preschool education institutions, mainly the result evaluation. This method is divorced from the real environment, and cannot accurately evaluate students' practical education ability, and cannot achieve the purpose required by preschool education practical teaching.

#### **4. Challenges encountered in professional practice teaching of preschool education in the 5G era**

##### ***4.1 The 5G era requires rapid improvement of teachers' comprehensive capabilities***

The comprehensive ability of teachers directly affects the practical teaching effect supported by network intelligent technology in the 5G era. Teachers are faced with more and more challenges in the smart education of big data and artificial intelligence development in the 5G era. The rapid and multi-directional development of professional teachers requires practical instructors to pay attention to the cultivation of abilities required by the future education form. At the same time, we should pay attention to improving data literacy. Through 5G smart education platform and AR immersion practical training, practical teachers can improve the comprehensive ability of teaching, research and learning, so that their personal professional skills can match the development requirements of the 5G intelligent era. Under the background of network and intelligence in the 5G era, teachers need to make full use of technology to meet the personalized requirements of students for practical teaching. To ensure the efficient and complete implementation of practical teaching, so that teachers and artificial intelligence each play their own advantages, have the ability to integrate and effectively use, to achieve the purpose of improving the teaching effect.

##### ***4.2 The 5G era requires students to have a more comprehensive knowledge system***

As digital native residents of students, they are used to obtaining the required information in the network, and the integration of preschool education practice teaching and 5G intelligent technology ADAPTS to the diversified demands of preschool education students. In the information age, students are exposed to the ocean of information and face the environment of information iteration all the time, which naturally produces diversified knowledge needs, and they are eager to acquire more comprehensive knowledge. In the 5G era, the integration of advanced technologies such as intelligent technology and VR technology with practical teaching can make full use of the characteristics of intelligent big data to push accurate knowledge to students, and make use of the characteristics of VR's multi-level, multi-dimensional and multi-field information transmission and strong sense of information experience to explore more effective educational resources and expand the breadth and depth of practical teaching content. Meet the diverse content needs of independent college students.

##### ***4.3 The 5G era requires more flexibility in practice forms***

The integration of pre-school practical teaching and 5G technology meets the needs of individual learning in independent institutions. With the popularization of information technology, the way of communication, learning and life of independent college students have undergone profound changes. With the development of 5G technology, high-speed networks make the use of electronic products a better experience, so that students have a broader vision, and the personalized and diverse characteristics of learning needs are more obvious. To achieve personalized learning services, the first condition is to obtain learners' speech, emotion and other physical data. VR technology supported by 5G technology has the characteristics of immersion, multi-perception, autonomy, interactivity and so on. On the one hand, big data under 5G technology can truly present the practice process of teachers on students, and artificial intelligence technology can visually analyze the data to analyze the different needs of students, and teachers can make personalized practical guidance according to the data. On the other hand, students can also determine the learning goals and content according to big data technology and their own learning habits, personality hobbies and ability level.

##### ***4.4 The 5G era requires more scientific practice evaluation***

The purpose of teaching evaluation is to check the teaching results and adjust the teaching process and teaching objectives according to the feedback results. In the 5G era, 5G technology promotes the intelligent and in-depth development of online education. The evaluation subject is not only students

and teachers, but also integrates multi-subject teaching evaluation, which integrates student evaluation, teacher evaluation, education administrator evaluation and teaching system evaluation and teaching environment evaluation [5]. With the help of cloud computing, big data technology and other technologies, multiple evaluation models can be realized, and multiple teaching evaluation models can support students' personalized development. In terms of evaluation criteria, it is necessary to pay attention to the expansion of various elements. The results of teaching evaluation are not only used for feedback and accountability, but also help to establish an ecological assessment system and promote the improvement of practical teaching quality.

## **5. Countermeasures for the development of practical teaching of preschool education enabled by 5G era technology**

### ***5.1 Improve teachers' technical level based on 5G technology***

Improving the technology application level of practical guidance teachers, especially the improvement of the software and hardware use level of big data technology and VR virtual reality supported by 5G technology, is the premise of improving the practical teaching quality of preschool education. Educators are educated first, and as practice instructors, they need to constantly learn and constantly explore ways to improve the application level of 5G technology in order to ensure the effective implementation of practical teaching. On the one hand, it is necessary to increase the ability of practical guidance teachers to use 5G technology, "If you want to do a good job, you must first sharpen your tools." Mastering the use of modern educational technology software and hardware supported by 5G technology is the guarantee for the effective completion of practical teaching, such as the specific use of hardware facilities such as VR experience chair, VR interactive all-in-one machine and data touch screen in the venue, and familiar with its operating procedures and processes. On the other hand, if you are only familiar with the hardware and do not understand the operation of the software, then the hardware will become a pile of scrap metal, so in addition to familiar with the hardware, but also familiar with VR virtual reality software, for example, VR course theme display software, VR course scene reproduction software, VR course interactive teaching software and other software use methods should be familiar.

### ***5.2 Take the network as the platform, integrate resources through multiple channels, and realize resource sharing***

5G technology is used to build an Internet resource sharing platform and establish a virtual practice teaching system for preschool education. First of all, according to the training requirements of preschool education professionals, the practical curriculum objectives are formulated, the practical teaching content is perfected, and the virtual practical curriculum system is built. And use 5G information technology to build a virtual preschool education classroom, create a rich classroom environment, and exercise the adaptability of preschool education students. For example, in the virtual practice classroom, VR virtual three-dimensional space can be built to simulate the real education scene, and the corresponding practical tasks can be arranged according to unexpected situations. Secondly, the creation of the virtual sharing platform needs to unite the local education administration departments, preschool education institutions, and schools to form a joint force to achieve the goal of resource sharing. This can effectively reduce repetitive labor, save human resource costs, and more importantly, form a data collection, sorting, feedback, and improvement mechanism with the help of big data technology supported by 5G technology, so as to ensure the formation of a standardized, unified, safe and controllable, interconnected resource base.

### ***5.3 Build multiple and dynamic evaluation models supported by big data***

The smart teaching model under 5G technology can use big data and intelligent technology to build a dynamic and diversified evaluation system. The evaluation subject includes teacher evaluation, student evaluation, and student evaluation includes self-evaluation and other evaluation. The evaluation methods include formative evaluation and summative evaluation. The evaluation includes students' mastery of knowledge, their ability to analyze problems, their ability to explore knowledge, their ability to learn independently and their ability to cooperate with others. In the smart teaching model, students are the subject of evaluation. The practical activities that students participate in include in-class and extra-class, on-campus and off-campus, online and offline, and the big data intelligent technology in

the 5G era can collect the data of students' participation in practical activities [6]. Teachers can understand the practical activities of students according to the collected data and adjust the teaching activities in time.

## 6. Conclusion

At present, with the rapid development of new generation intelligent technologies such as mobile terminals, big data, Internet of Things, and cloud computing, education has entered the era of intelligence, and smart teaching mode has become a new teaching mode. Intelligent teaching with 5G technology can enable students to continuously improve their self-ability while using modern teaching equipment, and become talents needed for social development, which is in line with the concept of talent training in higher education. 5G technology provides students with a new practical teaching experience. Relying on 5G technology and using VR technology to create a practice environment with a "sense of invasion, presence and interactivity", the use of intelligent perception system and intelligent devices to create a simulation environment closely related to preschool education activities, so that students can get real career scene experience, realize real content can be perceived, interactive and touchable, and quickly realize zero docking with the job. This kind of vocational experience effectively stimulates students' learning motivation and improves their practical operation ability, so as to achieve the purpose of rapid improvement of practical teaching effect.

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