Research on the path to improve the quality of teaching and care of rural kindergarten teachers under the background of smart education

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Abstract. The comprehensive revitalization of the countryside and the construction of a strong educational State are the key to and the foundation for achieving the great rejuvenation of the Chinese nation, and they are inextricably linked. To realize the new era strategic goal of a strong education nation, it is necessary to develop intelligent education through the deep integration of intelligent technology and education. At present, there are still many difficulties and shortcomings in the quality of preschool education in rural areas. How to help rural kindergarten teachers improve the quality of teaching and learning under the impetus of the wave of smart education has become a new proposition and a new task in the new era. It is found that building a new type of smart infrastructure for rural kindergartens, developing a shared service APP for rural home-based education, implementing a digital literacy enhancement program for rural kindergarten teachers, and reshaping rural kindergarten teachers' intelligent native feelings will help improve the quality of kindergarten teachers' teaching and realize the high-quality development of rural preschool education.

Keywords: stronger education, smart education, rural kindergarten teachers, quality of teaching and learning

1. Introduction

The Outline for Building a Strong Education Country (2024-2035) points out: "Promote artificial intelligence to assist educational reform and strengthen the reform of the curriculum system" [1]. Smart education is the product of the deep integration of artificial intelligence and education, a driving force for promoting the high-quality development of rural education, and a pillar for building a strong education country.

2. Analysis of the connotation of smart education

Smart education is not a simple concept of "informatization +". Supported by a new generation of intelligent technology, smart education is a new educational paradigm that realizes the integration of intelligent teaching by educational subjects and personalized development of learners through the construction of an intelligent educational ecosystem. In the current context, the term "wisdom" mostly means "intelligence and automation" [2]. The concept of "wisdom" has significant characteristics of technological empowerment, overlapping with the concept of intelligent education, but it emphasizes the overall intelligent evolution of the educational system more.

2.1. Origin of smart education

The evolutionary process of smart education in China is divided into the following three stages:

2.1.1. Informatization foundation stage: 2012-2020

In 2012, the development of educational informatization entered a fast track. China held the first national video and telephone conference on educational informatization, at which the strategic deployment of "Three Connections and Two Platforms" was proposed. In 2018, the policy level began to attach importance to smart education. The Ministry of Education issued the Action

Plan for Educational Informatization 2.0, proposing to implement the action for the innovative development of smart education and coordinate support for setting up pilot smart education demonstration zones in Xiong'an New Area and other places.

2.1.2. Emergency practice and transformation stage: 2020-2022

Affected by the COVID-19 pandemic, large-scale online teaching was carried out relying on the previous educational informatization foundation, and a platform system covering basic education, vocational education and higher education was built to ensure "suspending classes without suspending learning". During this period, a large number of online educational resources and teaching experience were accumulated, which strongly supported the subsequent development of smart education.

2.1.3. Digital strategic upgrade stage: 2022 to the present

In 2022, China's smart education entered a new stage of comprehensive acceleration. The Ministry of Education of China launched the National Education Digitalization Strategic Action, launched the National Smart Education Public Service Platform, and promoted the upgrade from educational informatization to educational digitalization. In 2024, the National Education Conference proposed to further implement the National Education Digitalization Strategy, expand the coverage of high-quality educational resources, and pay attention to the application of artificial intelligence to assist educational reform. Artificial intelligence achieved breakthrough progress in 2025, and educational digitalization moved from quantitative expansion to qualitative leap, further promoting the development of smart education.

2.2. Characteristics of smart education

With the development of the times and the rapid advancement of technology, smart education has entered our current life world and is affecting and changing people's current life and even the future world. Then, from the perspective of education and teaching, what form does smart education present? Specifically, it is mainly manifested in the following aspects:

2.2.1. Personalized learning form

The personalized learning model is the core of smart education. Aiming to meet the learning needs and interests of different students, personalized learning is a sustainable teaching model based on the individual development of students [3]. Compared with the traditional "teacher-centered" educational method, smart education highlights personalized characteristics in teaching, management, learning and evaluation. The integration of smart education into traditional education will highly combine the systematic knowledge system with fragmented learning methods, help learners make up for their insufficient original abilities, realize personalized learning and growth paradigms, and cultivate learners' higher-order thinking abilities, comprehensive innovation abilities and lifelong learning abilities.

2.2.2. Data-driven evaluation system

In the process of the human-machine collaborative teaching model, the platform conducts evaluation and feedback based on the accurate data obtained from the interaction between teachers and students and the students' learning performance, allowing teachers to timely understand the students' learning situation, improve teaching methods, change their own teaching concepts and update students' learning materials. Through the intelligent educational system, it collects teaching resources from the whole society and an international perspective, realizes "large collaborative education", supports students' continuous learning and knowledge update, so as to adapt to the rapidly changing social and working environment [4].

Smart education can maximize students' own advantages, is more participatory to mobilize students' enthusiasm, improves learning effects, and makes learning no longer a boring thing. Smart education provides students with the possibility of lifelong learning and personalized development, and also promotes the continuous reform of the educational model while greatly improving the teaching quality.

3. Practical dilemmas of the quality of teaching and care of rural kindergarten teachers

In the new-era educational development pattern, improving the quality of teaching and care of rural kindergarten teachers has become a strategic focus for building a strong education country, a key support for the high-quality development of education, and a core proposition for the revitalization of rural education. The urgency of this demand stems not only from the top-level design at the national strategic level, but also from the actual gap between urban and rural educational development, and is more reflected in the multiple dilemmas of teachers' professional development.

3.1. Imbalanced resource supply

"Compared with urban areas, the social and economic development of rural areas has a certain gap. The unbalanced economic development and the existence of the urban-rural dual structure lead to the uneven distribution of educational resources between urban and rural areas in China" [5]. The China Rural Education Development Report 2019 points out that the investment in training funds for the professional development of rural teachers is seriously insufficient, accounting for only 2.93% of the public funds, which is lower than the 5% of public funds required by national policies, and the investment in rural schools in the western region is even lower [6]. The shortage of training funds for rural teachers makes it more difficult for rural kindergarten teachers to receive professional training. Only a very small number of excellent teachers are eligible for training, which causes the polarization of rural kindergarten teachers and seriously restricts the professional development of teachers. The educational concepts of rural kindergarten teachers cannot be updated in a timely manner, their teaching methods lack professionalism, and it is difficult to guarantee the quality of teaching and care in kindergartens.

3.2. Dilemma of home-kindergarten co-education

Rural parents of young children are forced to work outside for a long time due to the needs of life. Between 2010 and 2020, the number of floating population in China increased by 154 million. The accelerated development of population migration and urbanization means that more individuals and families in China have joined the wave of migration [7]. The separation of parents and young children makes it difficult to grasp the development dynamics of young children, leading to the disconnection between family education and kindergarten education. At the same time, the main caregivers of left-behind young children are grandparents with low educational level, whose educational cognition is backward, and their parenting methods are still at the level of persuasion followed by scolding. Secondly, the educational level of rural kindergarten teachers is generally low, and their professional knowledge reserve is insufficient. A single teacher is difficult to meet the diverse educational needs, and the efficiency of traditional home-kindergarten communication methods is low, so home-kindergarten co-education falls into a dilemma.

3.3. Digital literacy gap

The Ministry of Education issued the educational industry standard Teachers' Digital Literacy, which clearly defines the digital literacy that teachers need to possess from the perspective of smart education, and points out the problem that rural kindergarten teachers are insufficient in information literacy [8]. Due to the backward economy in rural areas and the low educational level of teachers, rural teachers show behaviors such as "rejection and lack of understanding" in terms of ideological attitude, reserve of knowledge related to educational technology and application of technology in teaching practice, so they cannot keep up with the informatization and intelligence of current social development. How to help rural kindergarten teachers improve their teaching and care capabilities through smart education and promote the quality improvement of rural preschool education has become an urgent problem to be solved.

3.4. Cultural identity crisis

Local sentiment reflects a bond between individuals and places emotionally, and is a reflection of the human-land connection. The local sentiment of kindergarten teachers is manifested in their high attention to the actual development of rural areas, people and rural young children, and internalizing this attention into a mission to revitalize rural preschool education. The lack of local sentiment among rural kindergarten teachers will lead to a psychological state of low self-identity. If rural kindergarten teachers have a strong sentiment for the countryside, their enthusiasm for rural preschool education will be relatively high, and their self-identity will be strong; on the contrary, if their local sentiment is weak, they will lose the motivation to develop rural preschool education.

4. Implementation paths of smart education to help improve the quality of teaching and care

With the support of smart education, the paths to improve the quality of teaching and care of rural kindergarten teachers have become more diversified. How to form a positive interaction mechanism between technological empowerment and educational reform through different dimensions such as infrastructure upgrading, co-education model innovation, digital literacy training and local cultural reconstruction has become the key to solving the problem.

4.1. Build a new type of intelligent infrastructure for rural kindergartens

The state should increase financial investment in the development of rural education. In this context, promote the application of a new generation of information technologies such as 5G, big data, cloud computing and artificial intelligence in rural areas. Educational management departments, kindergartens and intelligent platform development institutions should work together to build a special platform for the exchange and sharing of teaching experience designed for rural kindergarten teachers. Through this platform, provide teachers with rich online courses, professional technical training and practical opportunities. Experts give online lectures on the platform, and rural kindergarten teachers can learn professional knowledge about preschool children through the lectures, so as to realize the co-construction and sharing of high-quality classroom resources, thereby updating educational concepts, changing educational concepts, optimizing teaching content, and reducing the gap in educational resources between urban and rural areas. Rural preschool teachers can initiate discussions on the platform about the questions they encounter in the teaching process, and experts and teachers can express their views on the questions by leaving messages and finally give solutions. Secondly, using VR and AR to break the limitations of time, space and scenes makes it possible to develop cross-regional teachers' professional communities. Excellent famous teachers in economically developed areas can conduct real-time on-site classroom demonstrations for rural kindergarten teachers. Rural preschool teachers can also receive online guidance from famous teachers and experts through the network during classes. At the same time, intelligent data will conduct an overall analysis of the class, evaluate the level of teachers' professional development, and select personalized training materials that meet the teachers' needs for rural kindergarten teachers based on the evaluation data. In addition, rural kindergartens should also introduce Artificial Intelligence (AI) teachers. In the classroom, AI teachers serve as assistants to teachers, making up for the deficiencies of teachers in the classroom and forming a new type of smart classroom with human-machine collaboration.

4.2. Develop a shared service APP for rural home-kindergarten co-education

Kindergartens use digital technology to develop a smart APP serving parents. Kindergarten teachers can share the daily status of young children on the APP in real time, allowing parents of left-behind young children to understand the daily life of their children across regions and enhancing the interaction between teachers and parents. In addition, kindergarten teachers use the APP to establish electronic portfolios to record the daily learning content and every bit of progress of each child on a weekly basis. Through this method, parents can be guided to review the week with their children on weekends, achieving the effect of "5 + 2 > 7". Furthermore, parents can understand the importance of preschool education for the development of young children and change their attitude towards rural kindergarten teachers, so as to improve their "teacher orientation". Parents can also learn relevant parenting videos on the APP, improve their original parenting methods, and lay a solid foundation for the growth of young children. At the same time, parents can write down their questions on the APP, and AI teachers will work with the kindergarten teachers to respond. Teachers of the class will communicate with parents in a timely manner according to their questions and even change the way of communicating with young children and the teaching mode. The development of the smart APP not only solves the problem of asymmetric educational information under the limitation of time and space, but also reconstructs the home-kindergarten education community through technological empowerment, and finally realizes a positive cycle of the innovation of family parenting methods and the improvement of the quality of teaching and care in kindergartens.

4.3. Implement a digital literacy improvement program for rural kindergarten teachers

"Some people have a rejection attitude towards various forms of smart education, and the fundamental reason is that they have not generally recognized the educational nature and instrumental nature of smart education" [9]. To reverse this phenomenon, it is necessary to systematically train rural kindergarten teachers on the concepts and application of smart education in a planned way to improve their information and educational literacy. Invite educational technology professionals to rural areas to carry out targeted offline guidance on information technology for teachers of different age groups, starting from solving the actual needs of kindergarten teachers, so that rural kindergarten teachers can proficiently use intelligent platform tools for intelligent retrieval of educational resources, artificial intelligence teaching tools, display tools for cross-time and space training, and intelligent tools for serving parents, and cultivate the ability of rural teachers to carry out personalized teaching using new technologies. Rural kindergarten teachers should have the awareness of actively cultivating digital literacy. Rural teachers are not only participants in digital professional development, but also learners of digital knowledge. They should improve their digital literacy from multiple angles and in depth, and fully realize that smart education empowering rural education can not only effectively reshape the inherent instrumental value, but also form educational value with local characteristics [10].

4.4. Reshape the intelligent local sentiment of rural kindergarten teachers

Local sentiment is the inner emotion of rural teachers and the core force for them to stay in the countryside and dedicate themselves to rural education [11]. To reconstruct the intelligent local sentiment of rural kindergarten teachers, it is necessary to provide exogenous support in policies, guarantee teachers' rights and interests and development space, and set up "Rural Preschool Education Contribution Award" and "Smart Preschool Education Pioneer Award" to make teachers feel a sense of identity with the cause of preschool education. Rural kindergartens can carry out digital activities such as "Rural Teachers' Seminar Live Forum" and "Rural Preschool Education Online Studio". Teachers gather together to exchange their insights on rooting in the countryside and discuss educational concepts and methods suitable for the countryside. Relying on intelligent technology, it not only connects the emotions of rural teachers, revives their local sentiment, but also allows them to learn from each other's professional skills and make unremitting efforts for the development of rural education. Rural kindergarten teachers are inheritors of excellent local culture. Integrating local cultural elements into the kindergarten-based curriculum helps rural young children develop a love for the countryside from an early age. Modern technology helps rural kindergarten teachers take the initiative to build a bridge between themselves and the countryside. Only by actively participating in the construction of rural revitalization and striving to improve the quality of teaching and care can they feel the long-lost sense of belonging deep in their hearts. With this deep affection for the hometown, preschool education can take root deeply in the rural land, absorb rich nutrients and thrive.

Smart education empowers rural preschool education and dynamically combines with the education and teaching of rural kindergartens. At the same time, building a digital intelligence platform through modern intelligent technology empowerment and constructing a smart education community through multi-party linkage will promote the improvement of the quality of rural preschool education. Furthermore, it will play a major role in realizing the development plan of rural revitalization and promoting the high-quality development of rural education to embark on a new path of rapid development. These measures help to bridge the gap of unfair educational development, greatly promote the ecological reform of smart education in rural kindergartens, and especially play an indelible role in improving the quality of teaching and care of rural kindergarten teachers. With the support of modern technology, rural preschool teachers will eventually move towards a path of a new generation of teachers with digital intelligence literacy with more professional skill development and diversified and modern educational concepts. They will cultivate generations of young children with vitality and innovative spirit, and strive for the grand ideal of building a strong education country.

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