The Dilemma and Countermeasures of Rural Teachers' Professional Development in the Smart Era

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Abstract: The emergence of artificial intelligence has caused a great impact on the field of education, and the powerful natural language generation and contextual dialog capabilities have brought various opportunities and challenges to the field of education. As one of the elements in education and teaching, teachers' professional development will certainly be affected by the wave of artificial intelligence. Based on the problems in the process of rural teachers' professional development in the era of artificial intelligence, the paper sorted out the action logic of artificial intelligence to boost the professional development of rural teachers and explored the strategy of artificial intelligence to boost the professional development of rural teachers.

Keywords: Artificial intelligence; Rural teachers' professional development; Implementation path

1. Introduction

With the extensive use of computer vision, natural language processing, human-computer collaboration and other technologies in various fields, mankind has fully entered the age of intelligence.In 2017, the Central Committee of the Communist Party of China (CPC) and the State Council issued the "New Generation of Artificial Intelligence Development Plan" which focuses on AI technology as an important means to promote the development of education. [1] The concept of Artificial Intelligence (AI) was first proposed by John McCarthy in 1956, and has flourished along with the advancement of information technology such as Big Data, Cloud Computing, and the Internet of Things (IoT), and has gradually begun to integrate into all walks of life. Generative AI represented by ChatGPT has received widespread attention from all walks of life in recent years, and ChatGPT has become the fastest-growing AI application in terms of users.ChatGPT is a human-computer interaction application developed by the U.S.-based OpenAI company, which possesses excellent natural language recognition and output capabilities, and can realize the functions of question answering, content creation, and multi-language processing. and other functions. Although it has not been online for a long time, ChatGPT, as an innovative application of AI technology in the smart era, has been applied to all aspects of education and teaching. Teachers, as a key element of the teaching process, have been greatly affected by the changes brought about by smart technology to education and teaching, as well as to the professional development of teachers. The Opinions on Comprehensively Deepening the Reform of Teacher Construction in the New Era, issued by the Central Committee of the Communist Party of China (CPC) and the State Council in 2018, proposes that teachers should take the initiative to adapt to new technological changes such as informatization and artificial intelligence, and actively and effectively carry out education and teaching. [2] In July 2020, the Ministry of Education and other six departments jointly issued the Opinions on Strengthening the Construction of Rural Teacher Teams in the New Era, which called for strengthening the professional development of rural teachers, innovating the mode of teacher education, fostering high-quality rural teachers in line with the requirements of the new era, and giving play to the role of new technologies, such as 5G and artificial intelligence, to boost the role of new technologies. [3] This shows that the state is actively promoting the professional development of rural teachers empowered by artificial intelligence at the policy level. Based on the dilemma in the process of professional development of rural teachers in the era of artificial intelligence, this study constructs the accessible type of generative artificial intelligence to boost the professional development of rural teachers, combs through the logic of action of the professional development of rural teachers in the era of artificial intelligence, and explores the path of the professional development of rural teachers in the era of artificial intelligence.

2. Conceptual renewal: clarifying the basic concept of professional development of rural teachers in the age of intelligence

Teacher education in the Age of Artificial Intelligence needs to break the traditional way of thinking, deeply understand the mechanism of the impact of the Age of Artificial Intelligence on the professional development of teachers, and consciously incorporate the emerging tech-

nologies and concepts of the Age of Artificial Intelligence into the training of teacher professional development. Rural teachers are relatively lacking in technological literacy and educational concepts, and more attention should be paid to improving rural teachers' ability to teach and manage the application of intelligent technology. The deep integration of man and machine in the era of intelligence will become an inevitable trend, and the professional development path of teachers empowered by artificial intelligence will also be diversified. Lin Pandeng believes that the fragmentation of classroom teaching, school-based teaching and research and teacher training is the root cause of many problems in teacher professional development, and that the three are the basic pathways of teacher professional development practice, with internal consistency. [4] School-based teaching and research and teacher training are detached from classroom teaching, resulting in a lack of attention to the actual problems of classroom teaching and affecting the effectiveness of teacher professional development. The professional development of teachers in the era of artificial intelligence should focus on strengthening the integration of school-based teaching and research, teacher training and classroom teaching practice, and pay attention to the specific problems of classroom teaching practice in school-based teaching and research and teacher training.

In terms of curriculum teaching, most rural teachers are still stuck at the first level of traditional teaching, repeating book knowledge and lacking creativity, and there is still a big gap between optimizing teaching activities, improving classroom effectiveness, cultivating students' problem-solving ability, and realizing the achievement of the second level of teaching goals such as personalized learning and precise teaching. [5] Teachers' professional development in the era of artificial intelligence is no longer limited to allowing teachers to simply master the corresponding knowledge and skills, but more to highlight the creativity of teachers' professional activities. The unique intelligent attributes of artificial intelligence technology itself make it possible for artificial intelligence technology to replace humans in some simple activities. In the field of education, AI technology has been gradually applied to many aspects of the education and teaching process, and to a certain extent, it can replace part of the work of rural teachers, freeing them from mechanical and repetitive knowledge explanations, homework corrections and other activities; at the same time, AI technology can assist teachers in teaching decision-making, education management and other activities, further reducing the workload of rural teachers and enabling rural teachers to focus more on students and conduct systematic and in-depth reflection on the process of teaching practice, giving full play to professional creativity.

3. Difficulties in the professional development of rural teachers in the smart era

3.1 Insufficient motivation for self-development of rural teachers

Some rural teachers do not have a high sense of their professional identity and lack enthusiasm for education. Rural teachers According to the data released by the Ministry of Education in 2023, as of 2022, China's rural compulsory education bachelor's degree or above full-time teachers have 76.01% [6], but in the rural areas of the central and western regions there are still about 80% of the rural teachers have the will to mobility and attrition, which is mostly a group of teachers with bachelor's degree and above education background [7]. Behind this low sense of professional identity is the declining status of rural teachers in the teaching force and the diminishing recognition of rural teachers due to the widening gap between urban and rural areas, and as the sense of professional value and social status of rural teachers continues to diminish, their strong idealistic beliefs about teaching are often difficult to maintain and gradually become absent. With the continuous development of urbanization in Chinese society, the status and development of the countryside are facing great challenges. In this context, the professional value of rural teachers has become more of an endowed value. [8] Rural teachers' teaching work in the countryside should be more about transferring knowledge and culture, but in the reality of rural teaching work, rural teachers still regard teaching work as a tool for earning a living, and the significance of teaching is more inclined to the specific "work remuneration", and the spiritual level of the gain is minimal. In addition, the countryside is also facing a serious shortage of teachers, in this situation, rural teachers often take on several jobs, and the long-term repetitive and heavy work makes rural teachers' enthusiasm for work declining. As a result, it is difficult for rural teachers to get the internal motivation for professional development from their teaching work. At the same time, due to the widening gap between urban and rural areas, more and more parents aspire to "quality education" in the city, and continue to send their children to urban schools, the loss of students in rural schools, rural teachers in the case of the continuous decline in the number of students, the sense of professional identity, sense of professional value is declining. The shaking of rural teachers' ideals has become an important obstacle to their professional development.

3.2 Lack of information technology application ability

With the continuous development of science and technology, emerging technologies emerge in an endless stream, technology in the impact on various industries, in the field of education also released new kinetic energy. Through the use of conventional educational technology, not only can greatly change the shape of educational teaching activities and reshape the space of educational teaching activities, but also objectively extends the teacher's educational teaching ability, has a systematic and comprehensive impact on the field of education, and promotes the comprehensive reform of the field of education. [11]

Intelligent era requires teachers to have a certain level of information technology application ability, including a certain understanding of the Internet, artificial intelligence and other technologies, and rural teachers often lack in this area, the degree of understanding of artificial intelligence and other new technologies is not enough, and even more lack of the ability to use intelligent technology. The current rapid development of information technology, related knowledge is also constantly updated, for rural teachers, the frequency of updating technology in the era of intelligence makes it difficult for them to keep up with the pace of the times, most of the rural teachers' knowledge base has been detached from the latest technology, this too large a degree of technological gap, making it difficult for rural teachers to regain a grasp of the direction of development, which in turn creates a vicious circle, and the emergence of new technologies is often accompanied by the emergence of new teaching models, and the emergence of new technologies is often accompanied by the emergence of new teaching models. The emergence of new technologies is often accompanied by the emergence of new teaching modes, in this vicious circle, rural teachers are difficult to adapt to the emerging teaching modes of the intelligent era, coupled with the lack of appropriate teaching facilities in most rural schools, both from the theoretical and technical levels, the ability of rural teachers have yet to be developed.

3.3 Deficiencies in resources and teacher training

In terms of teaching resources, rural teachers, due to the long-term low backwardness of the region, the lack of professional development resources, compared with urban areas, rural schools usually lack the necessary intelligent teaching facilities and technical support, most of the schools are still the traditional teaching equipment for teaching, so even though most of the rural teachers have received higher education and have some contact with some advanced teaching theories, they have a theoretical foundation but can not put it into practice under such a lack of equipment. Under such a lack of equipment, it greatly limits the possibility of rural teachers to try more teaching methods, resulting in their theoretical foundation but not being able to put it into practice.

In terms of teaching training, training is an important means of upgrading rural teachers' teaching skills and promoting their professional development. As there is often a lack of professional teacher training institutions in the regions where rural teachers live, it is difficult for them to receive systematic training, so it is difficult for rural teachers to systematically improve their professional ability in education. Even if there are training opportunities, most of them do not have scientific training programs. The current conventional "take-it-all" "mechanical copy" type of rural teacher training is difficult to meet the individual needs of teachers. [9] The training content and methods ignore the differences between individual teachers, and cannot be personalized for different teachers to carry out training, it is difficult to achieve good training results, which also directly leads to the rural teachers in the lack of intelligent technology. In addition, rural teachers have very few opportunities to participate in academic seminars and exchanges. Due to the geographical limitations of the countryside and the lack of funds, it is very difficult for rural teachers to communicate with other outstanding peers to gain teaching experience and understanding of current educational concepts. The lack of advanced educational concepts and understanding of the use of artificial intelligence and other technologies also greatly limits the professional development of rural teachers.

4. Teachers' professional development strategies in the age of intelligence

4.1 Application of new technology to strengthen the beliefs of rural teachers

Ideal beliefs of rural teachers are crucial to their own development and teaching results, the ideal beliefs of rural teachers are gradually fading, and the application of new technologies to reshape the ideal beliefs of rural teachers in the era of intelligence is imperative.

First of all, through the use of data analysis and intelligent recommendation, the teacher can master the situation of each student, so as to realize the precise control of students and personalized teaching, strengthen the teacher's teaching confidence and enhance their teaching beliefs. In addition, the professional identity education of rural teachers can be strengthened through online teaching platforms, applying virtual reality technology to produce digital educational resources such as video images with rural characteristics, so as to let rural teachers experience professional inculcation in an immersive environment, stimulate rural teachers' sense of responsibility and dedication, and sort out the correct outlook on the profession and values. Secondly, to build an open and shared online teaching resources sharing platform, so that teachers can more conveniently obtain high-quality teaching resources from the Internet, and at the same time can provide a platform for teachers in various places to communicate, which not only saves time for lesson preparation, but also improves rural teachers' sense of social existence in communication, thus further strengthening their sense of identity. Moreover, through the automated management of student information by intelligent technology, assisting teachers to carry out teaching tasks can greatly reduce the workload of teachers, and in the absence of rural teachers' manpower, rural teachers can better complete their teaching tasks, enhance their sense of self-efficacy, and also have more energy for their own professional development.

4.2 Application of Intelligent Technology to Strengthen Rural Teacher Training

As an important way to improve teachers' professional skills, the application of intelligent technology to strengthen teachers' professional

training is crucial to the development of rural teaching and teachers themselves.

First of all, through the establishment of the teacher teaching platform can greatly enhance the opportunities for rural teachers to receive training, to a large extent, can solve the situation of insufficient training opportunities for rural teachers, and online learning is not subject to the constraints of time and space, teachers can learn at any time, improve the convenience and flexibility of learning, and at the same time, enhance the professional satisfaction of rural teachers. The application of intelligent push technology can realize the precise push of teaching resources, recommend different learning contents for teachers with different needs, and realize personalized learning. Secondly, VR and AR technologies can also be used to create an immersive learning experience for rural teachers, creating a more intuitive learning environment and enhancing the effectiveness of teacher training. In addition, an intelligent diagnosis and feedback system can be established to assess the ability of rural teachers, recommend different learning plans for different teachers through the conclusions of the assessment, and provide targeted training for each teacher's deficiencies, so as to realize the personalization of teacher training and greatly enhance the efficiency of teacher training. In general, the use of intelligent technology can not only improve the efficiency of teacher training, but also enhance the professional identity of rural teachers in the process of retraining, which has a great role in promoting the development of rural education.

4.3 Increase policy support for teacher development

The external power of teacher professional development mainly comes from the government's policy system support. Although the country in recent years has introduced a series of policy documents to support the revitalization of rural education, but also in the rural teachers' professional development has made good achievements, but one-nine did not solve the problem fundamentally, so there is still a need to strengthen policy support.

First of all, we should strengthen the treatment of rural teachers, to ensure the implementation of relevant policies. To improve the social status of rural teachers, it is necessary to promulgate a series of policies from the national policy level, from improving teachers' salaries to improving teachers' welfare subsidies and other complete related policies. Although a series of policies have been introduced in recent years to strengthen the treatment of rural teachers, the actual situation has fallen far short of expectations. Due to a lack of funds and a lack of supervision, the implementation of many policies has been insufficient, resulting in failure to achieve the expected results. Policies related to the professional development of rural teachers should continue to be improved, and new policies for the professional development of rural teachers in the age of intelligence should be updated according to the current situation and in the light of the actual situation of rural schools, so as to avoid being detached from reality.

Secondly, the incentive system for rural teachers should be optimized to ensure the development of rural teachers. The first step is to optimize the title evaluation system. The appraisal of rural teachers' titles should be based on comprehensive consideration of the actual local situation, and a certain degree of policy favoritism should be given in relative terms. Secondly, we should improve the mobility mechanism between urban and rural teachers, mobilize the enthusiasm of rural teachers, clearly stipulate the mechanism of urban and rural teachers' rotation, and motivate rural teachers to improve their professional ability.

Local education administrative departments should focus on rural teachers when formulating relevant policies, and effectively protect the rights and interests of rural teachers' professional development.[12] Within the scope of adjustability, more resources should be tilted towards rural areas in order to promote the development of rural teachers.

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