Online Data Analysis of Rural Teachers' Professional Development Based on XML

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Abstract:

In the past, building a big data environment only opened a window for the collection of previously closed rural school teachers' data, and did not completely solve the problem of accurate support for rural teachers' ability. In this paper, first of all, by expanding the collection range of big data, building a unified data sharing standard, and establishing a professional team of big data analysis, we can ensure the standardization of data collection, sharing and analysis of rural teachers. Secondly, combining with big data analysis, we should formulate more scientific training objectives for rural teachers, establish comprehensive evaluation methods for rural teachers, and cultivate professional teams for big data analysis, so as to drive the reconstruction of rural teachers' ability evaluation system. Finally, with the help of mobile terminals to collect the training needs of rural teachers, the decision-making of rural teachers' training program should be changed from "based on limited cases" to "based on comprehensive data". This paper constructs O2O teacher training mode, which promotes the training mode and method from experience to refinement, personalization and cooperation.

Keywords: O2O, Rural School, Data Analysis, Teaching Ability.

I. INTRODUCTION

The ability of rural teachers is the decisive factor for a rural school to gain a competitive advantage in education quality [1]. At present, the typical applications such as online collaborative teaching and research, interactive teaching based on network platform, and renrentong, a teacher's online learning space, have been continuously promoted. The national teacher management system has also achieved full operation, and the big data of teachers' team has gradually formed. The construction of big data environment promotes the massive data of teachers' work and learning generated by the closed rural school system before to be recorded.

This study first studies and sorts out the national policy documents and existing relevant literature, trying to clarify the logical relationship between the precise support for rural teachers and the big data environment. On the one hand, it investigates the use of typical data platforms such as teacher management system, interactive teaching platform, continuing education platform and renrentong network learning space. On the other hand, the attitude of teachers and

managers to these platforms is investigated. According to the field investigation data, this paper analyzes the functions of big data environment in teacher management, teaching, teaching research and teacher training, and analyzes the reasons why rural teachers' ability assistance fails to achieve "precision".

II. CONNOTATION OF RURAL TEACHERS' PROFESSIONAL DEVELOPMENT AND BIG DATA APPLICATION

By carefully studying the basic information of teachers, we can have a clear understanding of the basic outline of teachers, and we can grasp the situation of teachers at all levels. It provides the basis for the macro decision-making [2].

(1) Teacher training. Combined with the basic situation of the existing teachers in the national teacher management system, as well as the educational reform for teachers' education, quantity and professional structure, the paper provides the basis for determining the direction of teacher training in the next step.

(2) Teacher resource allocation. This paper analyzes the allocation of teacher resources at all levels across the country, reasonably allocates the number of teachers according to their posts, strengthens the welfare of teachers, promotes the flow of teachers, effectively improves the unreasonable staffing of teachers, effectively improves the informatization degree of teacher management, optimizes the management process and improves the management efficiency.

(3) Teacher training content development. This paper analyzes the training progress of teachers at all levels in China, which has participated in or is participating in, so as to provide a reasonable basis for further planning of training contents.

(4) Optimize teacher service. It provides the basis for a series of activities such as the evaluation of teachers' professional titles, assessment and evaluation, the application and approval of teaching and research projects, and realizes the "one-time generation, multi reuse, one database management, mutual recognition and sharing" of teacher information, and improves the management efficiency. Internet access in rural schools has been basically popularized, and most schools have even begun to use mobile terminal teaching. At the same time, with the continuous promotion of typical applications such as network collaborative teaching and research, interactive teaching based on network platform, and Renren Tong, teachers' online learning space, a series of activities such as teaching, teaching and research, training and so on are basically digitized. These data are consistent with the number of teachers in the national teacher management system According to the interconnection, it forms the big data of the teacher team together, and describes the basic situation of each element of the whole internal system of the rural teacher team in a three-dimensional way, providing detailed basis and fundamental support for the decision-making of teacher training, teacher resource allocation, teacher training program, teacher service work, etc.

Teachers' precise teaching based on network interaction and test paper analysis based on data platform can objectively describe a series of problems in teaching. Taking the big data

platform of Extreme class as an example, the platform can continuously track the whole teaching process of each teacher, obtain very accurate teaching and student learning data, automatically generate teacher teaching evaluation reports, further analyze the teaching characteristics of each teacher, find out its advantages and disadvantages in the teaching process, and then judge what types of teaching tasks the teacher is suitable to undertake For a specific teaching task, what teaching methods should be adopted to help students effectively and improve learning effect in a relatively short time

The classroom teaching activities that are difficult to observe and describe are digitized, and visualized scales and verbal descriptions are formed, which can effectively excavate the great value of classroom teaching, and at the same time, it can be used for teachers Teaching self reflection provides data support, which is more detailed, authentic and reliable.

By analyzing the big data of teachers formed by various types of platforms, we can find the basic situation of rural teachers' ability development, and further optimize the teachers' team from the aspects of pre service training and post service training. In the aspect of on-the-job training, through the comprehensive performance of teachers on the existing continuing education platform and online learning space Renren Tong, we can find the training needs of teachers, determine the appropriate training projects, and develop appropriate training courses.

III. BIG DATA TECHNOLOGY AND RURAL TEACHER DEVELOPMENT PLANNING

3.1 Training Mode based on Big Data

The definition of McKinsey Global Research Institute is: a data set which is large enough to exceed the capability of traditional database software tools in terms of acquisition, storage, management and analysis. It has four characteristics: massive data scale, fast data flow, diverse data types and low value density [3].

The strategic significance of big data technology is not to master huge data information, but to professionally process these meaningful data [4].

Big data cannot be processed by a single computer, so distributed architecture must be adopted. But it must rely on the distributed processing, distributed database, cloud storage and virtualization technology of cloud computing [5]. The basic structure of big data is shown in Figure 1.
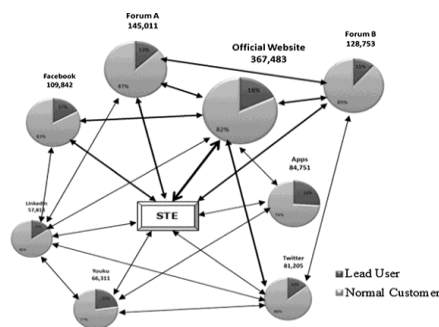

Fig 1: The basic structure of big data

The basic equation of big data evaluation index model is shown in equation 1:

$$\frac{\partial \rho}{\partial t} + \frac{\partial (\rho u)}{\partial x} + \frac{\partial (\rho v)}{\partial y} + \frac{\partial (\rho w)}{\partial z} = 0 \tag{1}$$

In this paper, thevalued k - ε model equation is expressed as:

$$\frac{\partial (\rho k)}{\partial t} + \frac{\partial (\rho k u_i)}{\partial x_i} = \frac{\partial}{\partial x_j}\left[\left(\mu + \frac{\mu_t}{\sigma_k}\right)\frac{\partial k}{\partial x_j}\right] + G_k - \rho \varepsilon - \left|2\mu\left(\frac{\partial k^{1/2}}{\partial n}\right)^2\right| \tag{2}$$

$$\frac{\partial (\rho \varepsilon)}{\partial t} + \frac{\partial (\rho \varepsilon u_i)}{\partial x_i}$$

$$= \frac{\partial}{\partial x_j}\left[\left(\mu + \frac{\mu_t}{\sigma_\varepsilon}\right)\frac{\partial \varepsilon}{\partial x_j}\right] + \frac{C_{1\varepsilon}\varepsilon}{k}G_k\left|f_1\right| - C_{2\varepsilon}\rho\frac{\varepsilon^2}{k}\left|f_2\right| + \left|2\frac{\mu\mu_t}{\rho}\left(\frac{\partial^2 u}{\partial n^2}\right)^2\right| \tag{3}$$

With the advent of the cloud era, big data has attracted more and more attention. According to the analyst team, big data is usually used to describe the large amount of unstructured and semi-structured data created by a company, which will cost too much time and money to download to a relational database for analysis.The basic structure of MapReduce is shown in Figure 2.
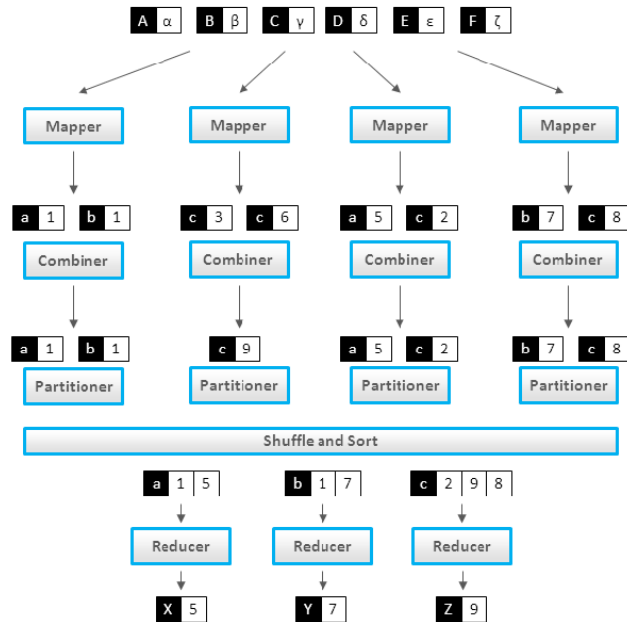
Fig 2: The basic structure of MapReduce

Big data needs special technology to deal with a large amount of data that can tolerate time effectively. Technologies suitable for big data include large-scale parallel processing (MPP) database, data mining, distributed file system, distributed database, cloud computing platform, Internet and scalable storage system.

3.2 "U-G-S" Rural Teacher Training Mode based on Big Data

The big data of rural teachers' team collects the basic personal information of rural teachers,

the content of teachers' activities generated in the process of teachers' training and research activities, and the data formed by various behavior traces of teachers, which can realize the clear description of teachers' image, and abstract the quality that excellent rural teachers should have, so as to provide reference for the training of rural teachers According to. As mentioned above, "u-g-s" rural teacher training mode is a kind of teacher training mode of "Establishing University, government, primary and secondary schools to provide integrated scientific guidance for rural teacher training". The basic goal is to improve the ability of rural teachers through local governments, normal universities and primary and secondary schools, so as to fundamentally solve the problem of rural teachers "being unable to leave, stay and teach well".

(1) The comprehensive use of big data of teachers and "u-g-s" rural teacher training mode provides a basis for the development of teacher training objectives, and constantly optimizes the training program in the process of teacher training.

(2) Optimize the selection and curriculum of directional normal students, take the teacher management system of primary and secondary schools as the data source, and analyze the basic data such as the knowledge reserve, teaching level and scientific research ability of excellent and in-service rural teachers.

(3) On the one hand, it summarizes the basic characteristics of excellent teachers who stay in rural schools, and formulates rural teachers' standards that meet the needs of rural schools, so as to provide data support for the future enrollment work, and ensure that the targeted normal students can become the teachers needed by local rural schools. On the other hand, we should adjust the curriculum system of directional normal students to provide rural teachers with more characteristic courses that meet their needs. At the same time, we should carry out appropriate rural practice activities (such as rural supporting teaching), cultivate the local professional complex of directional normal students, and increase the possibility of "staying" in rural schools. In addition, through the management system of primary and secondary school teachers, we can dynamically monitor the new situation in the process of education and teaching in rural primary and secondary schools, and constantly optimize the selection and training standards of directional normal students.

(4) Optimizing the practice process of directional normal students "U-g-s" rural teacher training mode attaches importance to the cultivation of practical teaching ability of directional normal students. Under the big data environment, through the internship management platform, normal university can obtain the regional situation and discipline requirements of the internship school in advance, so as to carry out simulation in the practice base, so that the interns can experience the practice of similar environment and corresponding disciplines in advance. At the same time, the internship base school can understand the basic situation of interns in advance and formulate the optimal internship program in advance. In addition, in the actual practice process, the directional normal students can also transmit the teaching video and other teaching materials to the school through the internship management platform. The instructor can check the students' practice situation anytime and anywhere, and guide the directional normal

students.

3.3 Big Data Monitoring

The big data of the teacher team formed by the national teacher management system and other teacher management platforms provides a reliable basis for "accurately" discovering the problems existing in the group of teachers and teachers themselves, and provides a basis for further accurate support of teachers' ability. The popularization and application of the national teacher management system has realized the "one person, one number" of teachers, laying a certain foundation for each teacher to have his own "big data samples". The system and other types of data platforms combine to gather the big data accumulated by teachers, provide a complete data sample for the analysis of teachers, and "accurately" describe the countryside. The real situation of teachers.

On the issue of improving rural teachers' ability, rural teachers' own efforts are the internal cause, but it is difficult to achieve the status of rural teachers' self-improvement. Therefore, we can increase the driving force of external factors to change this state, which can be divided into two steps: first, accurately positioning rural teachers; second, supporting them on the basis of accurate positioning. The weak ability of rural teachers is caused by comprehensive factors, including lack of opportunities for further study and small space for promotion, which need external support. In view of the large group, multi-level and complex types of rural teachers, how to find the "weak points" of rural teachers' ability, so as to make the improvement of rural teachers' ability more clear, more transparent and more targeted? Big data is a powerful tool for this "weak point" analysis.

IV. CONCLUSION

The study found that the national teacher management system is divided into two levels of management, on the one hand, it can realize the scientific management of more than 15 million teachers' basic information. On the other hand, as a basic information platform, it can form big data of teacher team together with other teacher management platforms, so as to optimize the decision-making of teacher team management. In terms of teaching, the construction of big data environment promotes the formation of "diagnostic teaching and learning" mode, so as to improve the ability of rural teachers purposefully and systematically. In terms of teacher training, the comprehensive use of big data environment and "U-G-S" mode is helpful to understand the main demands of training objects and realize personalized training.

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