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Research and Application of Integrating Big Data Distributed Heterogeneous Technology in College Ideological and Political Education

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Abstract:
In recent years, with the all-around transfer of human life to the Internet, we have ushered in the era of big data. In this paper, the big data distributed heterogeneous technology is integrated into the college ideological and political education to conduct analysis and research. Valuable decisive factors are provided through big data analysis. Through the studies of the ideological and political education in the pilot schools from September to December, it is found that the overall evaluation results of classroom teaching are as follows: The excellence rate is 29.5% in September and 25.7% in December. The overall excellence rate of ideological and political education still needs to be further strengthened, but the teaching enthusiasm of young and middle-aged teachers is gradually improving.

Key words: *Big Data; Data Analysis; Ideological and Political Education; Distributed Heterogeneity*

1. INTRODUCTION

In recent years, the rapid development of the Internet has led human beings into an era of explosive growth in information volume, and the big data era of education will inevitably come [1-2]. The application of big data has provided a more scientific basis for the reform and development of education, especially the development of ideological and political education in colleges and universities [3-4]. Through the application of big data technology, the rapid collection and mining of massive data, the timely judgment and sharing, based on the accumulation of the past, analysis of the present and prediction of the future, it has promoted more scientific settings of the ideological and political education methods and curriculum in colleges and universities [5]. The big data thinking is used to identify the commonalities and associations in the specific characters of events and issues, see through the appearance to perceive the essence and crux of problems and issues, and carry out ideological and political education in a targeted and focused manner. In addition, distributed heterogeneous sharing platforms and open systems are established to facilitate more efficient and higher quality work in the ideological and political education [6-7]. Through the use of big data thinking and innovative ideological and political education, it is conducive to changing the status quo of the ideological and political education such as the traditional single means, the low efficiency and the insignificant position and driving the means and methods of the ideological and political education to be richer [8]. The information technology is fully utilized to integrate and

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analyze the projects and results of ideological and political education reports, form objective, comprehensive and more convincing big data of the ideological and political education results, and accurately judge the realistic problems present in the teachers of various courses fulfilling teaching duties and improving education quality, to achieve the effective accountability [9].

More and more applications of ideological and political education platform data in higher vocational colleges involve big data, and the attributes of these big data, including quantity, speed, diversity and so on, have presented the increasing complexity of big data [10]. Hence, the analysis method of big data is particularly important in the field of ideological and political education, which can be said to be the decisive factor in determining whether the final ideological and political education data are valuable. There are many specific big data processing methods, such as data acquisition, data import and preprocessing, data statistics and analysis, and finally data mining. In this paper, only big data statistics and analysis are discussed. In the statistical analysis and analysis of the ideological and political education platform, mainly the distributed databases (distributed computing clusters) are used carry out the general analysis, classification and consolidation, etc. of the massive data stored therein to meet the majority of the common analysis requirements. In this regard, EMC's GreenPlum, Oracle's Exadata, MySQL-based columnar storage Infobright and so on may be used for some real-time requirements, while Hadoop can be used for some batch processing or the requirements based on semi-structured data.

2. Impact of the Big Data Era on the Ideological and Political Education in Colleges and Universities

2.1 Favorable Aspects of the Big Data Era for the Ideological and Political Education Work in Colleges and Universities

In the background of the big data era, the dissemination and updating of information have become very convenient, which offers more reference data for the ideological and political education work in colleges and universities, thus providing available data as a reference for colleges and universities to carry out the ideological and political work more effectively. In the traditional ideological and political education, it is mostly implemented by instilling theories by teachers in the classroom. Such a single approach is prone to making the students have a strong aversion. On the other hand, through the reference provided by the big data, colleges and universities can make full use of the social and political hotspots and develop a more reasonable strategy for the ideological and political education combined with the own characteristics of the education at the colleges and universities. Secondly, the dissemination of big data has improved the judgment of colleges and universities. In the big data environment, there are many kinds of information. Among them, there are not only digital structured data but also a large volume of information such as web pages, videos, and pictures, etc. In the face of massive information, it is necessary to carry out scientific analysis and processing for better mining of valuable data. In an environment where information dissemination is highly convenient, students can choose the relevant information freely according to their own needs and make the information work better for them. Schools can make scientific predictions on the ideological tendencies of the students through scientific analysis of the data application by the students, master their ideological trends, and adjust their ideas and views in a timely manner to guide them in a correct direction. In this way, based on the rational analysis of big data, the judgment capacity of colleges and universities has also

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been correspondingly improved as well, so as to achieve twice the result with half the effort.

2.2. Negative Aspects of the Big Data Era for the Ideological and Political Education Work in Colleges and Universities

First of all, big data has broken the traditional way of ideological and political education and shaken the subjective status of teachers. In the traditional ideological and political education at colleges and universities, due to the limitation of time and place, most of the education is carried out through the classroom teaching, seminars, talks with individual students and other methods. These educational methods are direct, and feedback is relatively timely. However, with the spread of big data, students can obtain information data through the Internet, QQ, WeChat, Weibo and other ways, which poses a challenge to the traditional situation where teachers take the lead in the access to data information. The students can communicate with the teachers without restriction, which has further enhanced their subjective position. This makes the traditional ideological and educational education method inconsistent with the current state of data dissemination, thus affecting the exertion of its educational function. Secondly, the spread of big data has posed a threat to the establishment of the correct values in students. Big data has enriched the students' knowledge and allowed them to access information anytime, anywhere. But at the same time, in the vast amount of big data information, faced with various data, it is difficult for the students to make rational judgment choices. If they are not careful, the students can get lost in their thoughts. The “Pseudo thoughts” mixed in the rapid data dissemination have brought about different degrees of impact on the political concepts, ideological tendencies and responsibility ethics of the students. Sometimes, there may even be ill-intentioned people who make use of the communication platform to spread adverse information, making the students feel doubtful, uneasy and other emotional fluctuations. As college students are still in the process of forming their outlook on life and values, they are highly flexible. Under the influence of adverse data, it can pose a threat to the formation of their correct values.

Driven by information technology, big data has become the primary development trend at the current stage. In addition, with the development of technology, it has been further developed in the longitudinal and deep direction. Hence, this is an inevitable development trend. As the main force of socialist construction, carrying out ideological and political education on college students can not only provide direction guarantee for social development in the future but also consolidate the socialist development theory in China. Therefore, in the background of big data, developing innovative and efficient ideological and political education work approaches has become very necessary. In the next section, we mainly use the data collected to carry out data analysis and mining.

3. DATA STATISTICS AND COMPARATIVE ANALYSIS

The data source is the data based on the ideological and political education sharing platform of higher vocational colleges. The distributed heterogeneous database is used to store, manage and process the data, that is, the data acquisition, data import and pre-processing are carried out first. In the next section, statistics and comparative analysis are carried out on the data of the pilot schools from September to December.

3.1 Summary and Comparative Analysis of the Overall Evaluation of Classroom Teaching

The summary and comparison chart of the overall evaluation of classroom teaching in ideological and political education is shown in Figure 1 as the following. The overall evaluation results of classroom teaching are as follows:

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Excellence rate is 29.5% in September and 25.7% in December; "Good" is 63.2% in September and 69.9% in December; "Fair" is 6.8% in September and 4.4% in December; "Poor" is 1.1% in September and drops to 0.0% in December. The results show that compared with the data in September and December, the number of teachers who are rated excellent in teaching quality is decreased by 3.8 percentage, the number of teachers who are rated good is increased by 6.7 percentage points, the number of teachers who are rated fair is decreased by 2.4 percentage, and no teacher is rated poor in December.

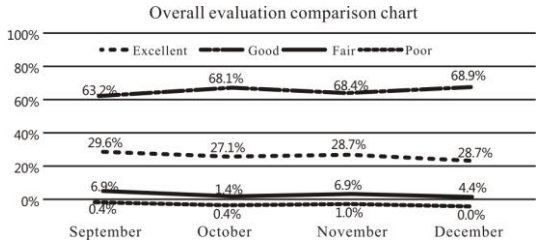

Figure. 1 Summary and comparison chart of the overall evaluation of classroom teaching

$$A_i=B_i/(\sum B_i)\times 100\% \quad (1)$$

In the above equation, Ai stands for the percentage of the i type evaluation result, and Bi stands for the total amount of the i type evaluation result.

On the one hand, young and middle-aged teachers have made relatively rapid progress. They have studied the teaching materials carefully, worked conscientiously with a strong sense of work responsibility, and prepared the teaching plans of each lesson properly. They have explained clearly the contents from the course import to the connections and differences of the knowledge, from the key and difficult points to the problems that are prone to occur in the students in a well-arranged and adequately organized manner.

On the other hand, the teaching level and teaching ability of young teachers have been improved significantly. Some young teachers who have just started their teaching career are selected for training by the colleges in recent years. Young teachers are encouraged to practice in enterprises and give public classes, demonstration classes, lectures, and other teaching and research activities in various departments. Hence, their teaching level and teaching ability have been significantly improved. From an overall perspective, they have not only attached great importance to the teaching work but are also highly enthusiastic and committed. They prepare lessons and study the textbooks carefully. They are familiar with the contents of the textbooks and teach the students with flexible methods. They can fully mobilize the enthusiasm of the students and are unanimously praised by students.

3.2 Summary and Comparative Analysis of Evaluation Grade by Item

(1) Summary and comparative analysis chart of the evaluation grade of teaching attitude is shown in Figure 2 as the following.

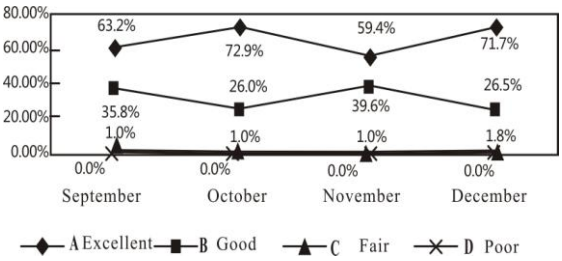

Figure. 2 Summary and comparison chart of the evaluation grade of teaching attitude

$$E_i=F_i/(\sum F_i)\times 100\% \quad (2)$$

In the above equation, Ei stands for the percentage of the i type evaluation result, and Fi stands for the total amount of the i type evaluation result.

According to the trend of changes in Figure 2, it can be known that in the aspect of the evaluation on teaching attitude: The excellence rates in September and November are slightly reduced because in September the school has just started, and the teachers are not fully prepared for teaching. Some teachers and students have not truly concentrated again on work and study. In

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November, the teachers have to prepare for the sports meetings organized by the college, which has dispersed their energies. In addition, school inspection fails to keep up and is not properly carried out. In October and December, the excellent rates are improved, which suggests that the teachers have made improvement in the compliance with the teaching discipline, preparation for lessons, serious teaching, classroom organization, classroom discipline and other aspects. At the same time, the college has also enhanced the intensity of inspection. No teachers are rated fair in all four months, and there is only one teacher who is rated poor in the evaluation.

(2) Summary and comparison chart of the evaluation grade of teaching content is shown in Figure 3 as the following.

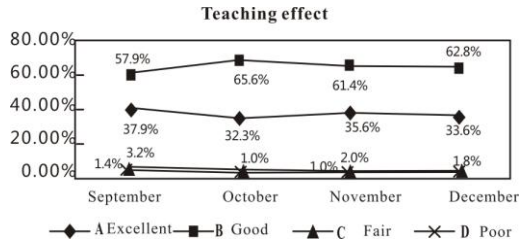

Figure. 3 Summary and comparison chart of the evaluation grade of teaching content

Equation 2 is used for calculation, and Figure 3 can be obtained. From the trend of the changes in the results, it can be seen that according to the trend of changes in Figure 3, in the aspect of the evaluation on the teaching content: The excellence rate in September is the best, that in October is relatively low, excellence rates in the two months of November and December are basically the same; the "Good" is increased by 4.2 percent or so in October; the "Fair" from September to December is 3.2%, 1.0%, 2.0%, and 1.8%, respectively; the "Poor" from September to December is 1.1%, 10.%, 10.% and 1.8%, respectively. This suggests that most of the teachers can understand the concept of the teaching content relatively well, with accurate definition and prominent teaching focus. They have explained profound issues in simple language and taught the difficult and doubtful contents clearly. Most of the teachers can link the theory with practice and enrich the contents of textbooks. There are still some young teachers who fail to grasp the key and difficult contents accurately, and the integration of theory with practice is insufficient.

(3) Summary and comparison chart of the evaluation grade of teaching method is shown in Figure 4 as the following.

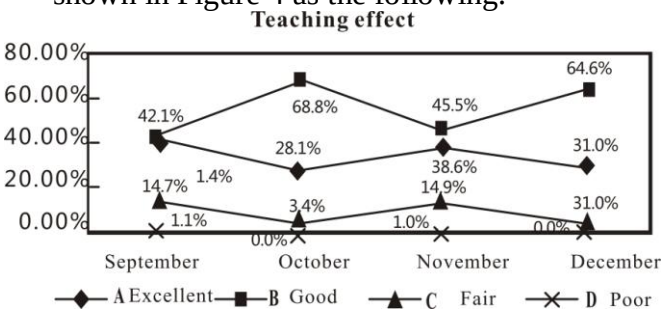

Figure. 4 Summary and comparison chart of the evaluation grade of teaching method

Equation 2 is used for calculation, and Figure 4 can be obtained. From the trend of the changes in the results, it can be seen that in the aspect of teaching methods: According to the trend of changes in Figure 4, it can be known that the "Excellent" in October is 14 percentage lower than that in September. In early November, the Office of Educational Administration held a meeting for all teachers, expecting that all teachers could teach students in accordance with their aptitude and enhance the aspects of teaching methods and interaction between the teachers and students. Hence, the "Excellent" in November and December is slightly increased; the "Good" is the best in October and December and the lowest in September; the "Fair" in October is 3.1% and 4.4% in December when the teaching method control is the best. The average of four months with the "Poor" rated is 0.4% for each month, which is normal. The overall evaluation is as follows: Most of the teachers can teach in accordance with the aptitude of students during the classes and improve their teaching methods and the interaction between the teachers and students. The reduction in the "Excellent" rate suggests that they still have to work harder in

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highlighting the aspect with the students as the center.

(4) Summary and comparison chart of the evaluation grade of teaching ability is shown in Figure 5 as the following.

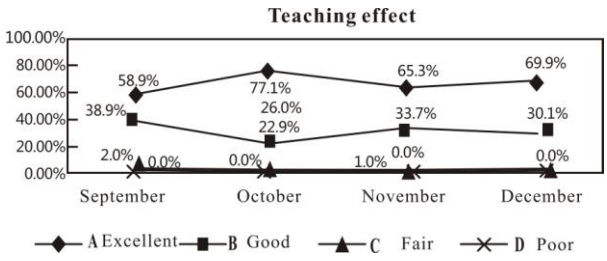

Figure. 5 Summary and comparison chart of the evaluation grade of teaching ability

Equation 2 is used for calculation, and Figure 5 can be obtained. From the trend of the changes in the results, it can be seen that in terms of teaching ability: According to the trend of changes in Figure 5, it can be known that the "Excellent" in October is increased by 18.2 percentage from September, and it is basically the same in November and December; the "Good" in October is 16 percentage lower than that in September, and it is basically the same in November and December; the "Poor" is 2.1% in September and 1.0% in November. This suggests that most of the teachers have improved their basic skills in teaching, language appeal, classroom management and other aspects.

(5) Summary and comparison chart of the evaluation grade of teaching effect is shown in Figure 6 as the following.

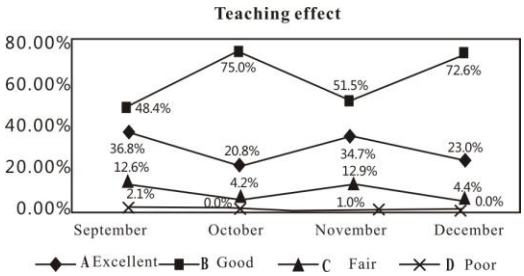

Figure. 6 Summary and comparison of the evaluation grade of teaching effect

Equation 2 is used for calculation, and Figure 6 can be obtained. From the trend of the changes in the results, it can be seen that in the aspect of teaching effects: According to the trend of changes in Figure 6, it can be known that the "Excellent" is the highest in September and the lowest in October; the "Good" is 75.0% in October and reaches the highest point of 72.6% in December, respectively; the "Fair" in October and December is 4.2%, which is the lowest; the "Poor" is 2.1% in September and 1.0% in October. The reduction in the "Excellent" suggests that some of the teachers have poor interaction with the students. Their PPTs are not well prepared (too few pictures and too many texts). The students are not interested in learning, not active in thinking, and the effect is not good.

3.3 Summary and Comparison with Teaching Plans, Lesson Plans and Attendance Records

From Figure 7, it can be seen that the teachers with teaching plans for the ideological and political education are increased by 9.5 percentage in October compared with that in September. It remains relatively well in November and December. The teachers with teaching plan have increased by 13.8 percentage in October compared with that in September. There is a slight fluctuation in November and December, which is normal. The teachers with attendance records remain relatively well for 4 months. This suggests that the teachers have attached increasing great importance to the preparation of teaching plans, lesson plans, attendance records and other teaching materials.

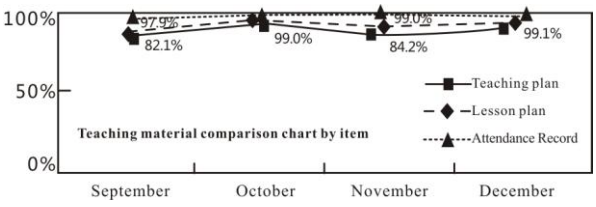

Figure. 7 Comparison chart with teaching plans, lesson plans and attendance records

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3.4 Inspiration for the Ideological and Political Teaching

1. Establishment of a database based on the network

Big data requires a large amount of data and materials as the foundation; while the data samples in this paper are relatively few. Hence, in order to carry out ideological and political education research more effectively, it is necessary to lay a solid information foundation for the establishment of an ideological and political database at colleges and universities. At present, student databases and school educational administration systems based on the information of students have been basically established at various colleges and universities. In the student database, the basic information of students has been included, which has greatly facilitated the data inquiry on the students.

2. Formation of a teaching model with the complete evaluation system

The traditional ideological and political teaching contents at colleges and universities may involve teaching attitudes, teaching contents, teaching methods, and other aspects. However, it still fails to mobilize the enthusiasm of young and middle-aged teachers, especially the young teachers, nor can it help improve the efficiency of ideological and political education at colleges and universities. In order to stimulate the interest of students in learning and mobilizing the enthusiasm of teachers better, improving the evaluation system of the ideological and political education is an effective way.

3. Enriching the content of ideological and political education in colleges and universities

The original ideological and political teaching contents at colleges and universities mainly focus on the teaching materials, which aim at improving the ideological consciousness of the students and helping them establish the correct values of life. On the other hand, the generation and application of big data require that the ideological and political teaching contents should be combined effectively with the characteristics of the times and social development, that is, the emphasis on the teaching of the students' social practice ability. In this way, new channels and new contents of ideological and political teaching can be opened up at colleges and universities, which can effectively provide theoretical guidance for college students on employment and help college students get through the lost period, thus better exerting the value and significance of ideological and political education at colleges and universities.

4. CONCLUSIONS

In this paper, the distributed heterogeneous data storage is used to carry out research on the ideological and political education at the pilot schools from September to December based on the big data analysis. It is found that the overall evaluation results of classroom teaching are as the following: Excellence rate is 29.5% in September and 25.7% in December. The overall excellence rate of ideological and political education still needs to be further strengthened, but the teaching enthusiasm of young and middle-aged teachers is gradually improving.

It is imperative to improve the scientific nature of the ideological and political education mechanism by analyzing the big data of the ideological and political education sharing platform, improving the farsightedness and scientific decision of the ideological and political education at present. In the context of the big data, we should make full use of the big data innovative ideological and political education concepts and systems. Hence, it is necessary to apply the innovative work concept based on big data, promote the ideological and political education to adapt to the situation in the information age, and strengthen the thinking habits and work concepts of “based on facts & figures” further. At the same time, it is necessary to promote, direct and supervise the construction of a big data platform from

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the institutional framework and establish a sharing and open utilization mechanism for database resources. We should make full use of the information technology to integrate and analyze the projects and results of various types of reports on the ideological and political education and to form objective, comprehensive and more persuasive big data on the results of ideological and political education.

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