

Research On the Operation of Network Ideological and Political Education Platform Based on Big Data Integration

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Abstract

As the main position of ideological education for college students, universities undertake the most solemn and sacred mission. In the modern university teaching activities, the network platform is used to effectively expand the coverage and operation and maintenance space of ideological education, which greatly promotes the ideological education of contemporary college students to play a better role, and at the same time promotes the formation of a good campus cultural environment and educational atmosphere. Firstly, this paper discusses the role of network ideological education platform for college students, and then discusses the challenges faced by network ideological education in universities. Finally, on this basis, this paper puts forward the effective operation analysis of the network ideological education platform. The education big data integration platform architecture including data source layer, data acquisition layer, data storage layer, data integration layer and data access layer is designed. Then, the big data technology is introduced, the learning analysis system with Hadoop as the core is designed, and the network ideology education platform based on big data integration is constructed.

Keywords: *Big data integration, Network ideological education platform, Effective operation*

I . Introduction

With the upgrading of computer technology and the continuous extension of network, China has quietly entered the era of big data. The popularization and application of the network has brought a certain degree of influence to different levels of society. In this context, in the process of promoting ideological education in universities, the emergence of the era of big data has brought great influence to the current ideological education in universities [1]. Ideological education in the era of big data is slowly extended to Internet ideological education, which is also the demand of the development of the times and an inevitable trend. Therefore, we must firmly grasp the trend of the times and put the construction of network ideological education system in colleges and universities into practice [2].

As the basis of Internet teaching, the network platform needs to process a large amount of user operation information efficiently and in real time, meet the diverse needs of different users, and collect and store high-quality teaching or learning resources. The construction of network teaching platform needs the support of hardware and software resources. However, the economic situation and educational resources of different regions in China are quite different. Some developed regions have sufficient teaching resources and advanced hardware equipment, which can build high-quality network platform. In this paper, big data integration is applied to the construction of network ideological education platform, which can reasonably recommend better teaching resources and curriculum arrangement for students.

II . The Role of Network Ideological Education Platform for College Students

A. Multi-Form Exchange of Ideological Information

In a specific sense, the process of ideological education is the flow of ideological information. College students' network ideological education is an interactive process of ideological exchange through the interaction of

ideological information between subject and object. In the two-way communication, the ideological education information flow between educators and college students is more immediate and rapid, and the communication between them is more extensive and profound, so that educators can have a more comprehensive and true understanding of the ideological reality of college students' individual study, life, employment, emotion and other aspects. And find and solve the wrong ideological symptoms, and actively guide the individual thinking and behavior of college students to the track of healthy development.

The relationship between the subject and object of ideological education is in a state of network format. Each subject and object of education is a node in the grid, and the communication between them is an intricate information flow network formed by taking each node as the center. Therefore, when the subject and object of ideological education carry out many-to-many network communication through the network ideological education platform of college students, the identity boundaries of the subject and object of ideological education are gradually blurred. When the two sides discuss one or several hot topics in a completely equal status, the subject of ideological education can actively integrate into the transmission of information and strengthen the communication and exchange with the object of education through its profound knowledge, incisive analysis, humorous language and unique insights.

B. Instant Communication Across Time and Space

In the network ideological education platform for college students, the transmission of ideological education information breaks through the limitation of time and space, and the subject and object of ideological education can communicate freely and instantly in different time and space, which enhances the flexibility of time and space expansion of communication, thus ensuring the effective communication between ideological educators and college students.

On the one hand, because the mobile network or wireless network has covered every corner of the campus, college students can instantly publish or receive ideological education information in dormitories, classrooms, playgrounds and even off campus; On the other hand, because most of the micro-network tools have developed into international communication tools, not only educators can realize remote ideological education information transmission and emotional exchange with some college students studying abroad, but also some college students can transmit ideological education information with these international students, thus promoting instant communication and exchange among peers or groups.

C. Grasp the Changing Trend of College Students' Thoughts and Emotions

College students' thoughts and feelings are not constant, but constantly changing with the changes of the environment. All kinds of ideological information released and transmitted by college students on various micro-network tools involve their life, study, emotion, employment and other aspects of the situation and feelings, which contains the undercurrent of college students' thoughts [4]. Therefore, in the platform of ideological education for college students, educators can dig out the ideology and psychological motivation behind them through the words or pictures and videos released and transmitted by college students, so as to grasp the ideological trends of college students instantly and comprehensively, and then take targeted measures to carry out ideological education.

III. Challenges Faced by Ideological Education on the Internet in Universities

In the era of big data, ideological education in colleges and universities has ushered in a new opportunity, and at the same time, it is also facing new challenges and pressures. Mainly reflected in: the dispersion of data value, the infinity of data volume, the rapidity of data dissemination and the diversity of data sources, etc., which make the university network ideological education face higher requirements and greater challenges in terms of effectiveness, technicality, timeliness and sensitivity.

A. The Construction of Campus Big Data Platform Lacks Openness

Most of the existing campus education big data platforms are based on the campus network construction of our school, which lacks contact with the outside school and has a single data sample collection source. As an open network platform, big data integration has real-name registered users of teachers and students in most universities in China, and the activity track of these users in the classroom is a rich source of big data. Compared with the closed campus network, the openness of big data integration is more in line with the sharing spirit in the Internet era, and it can also give full play to the application value brought by massive data.

B. Pay More Attention to Theory Than Application

Domestic research covers all aspects of online ideological education or big data, and there are many beneficial explorations on the combination of online ideological education and big data. However, the existing research results mainly focus on the subject-object relationship, basic principle, method innovation, individual value and development trend of network ideology education, but the practical application research of combining network ideology education with big data still stays at the stage of current situation analysis, path thinking, implementation mode, etc., and the application platform construction has not been carried out in depth [5].

C. Network Ideological Education and Big Data Have Not Been Effectively Combined

At present, in the process of network communication, network ideology education only takes the network as a platform and carrier of ideological education, or draws lessons from some ways and methods of network communication in content. But in essence, the same content is pushed to all audiences from the perspective of communicators.

If the concept of big data is introduced into university network ideological education, according to the online reading and browsing data of college students, their reading preferences are analyzed, and then the interesting content with ideological education value is directionally pushed for them to read, so as to realize the big data of network ideological education interface.

IV. Analysis on the Effective Operation of Network Ideological Education Platform

A. Establish the System Architecture of Network Ideological Education Platform for Big Data Integration

With the continuous progress of educational data collection technology, the total amount of educational big data will increase exponentially. These massive educational data must be stored by cheap and expandable data storage facilities, which not only support highly structured data storage, but also support a large number of complex data types such as logs, texts, pictures and videos [6]. Educational big data includes not only behavioral data captured by online learning platform, but also psychological data analyzed by emotion recognition technology and speech recognition technology, as well as physiological index data collected by eye tracker and smart bracelet. Aiming at these multi-modal educational data, this layer takes semantic technology as the core, and establishes the global schema based on semantic technology by means of entity and attribute extraction, entity association recognition and data schema mapping.

On the basis of full analysis of users' needs of network platform, different platform development teams design the capabilities of online education platform according to different design concepts, because there are significant differences among various platforms. At present, most online teaching platform systems choose B/S architecture, and the example of B/S architecture platform system is shown in Figure 1.



Fig.1 Example of B/s Architecture Platform

The system structure of online ideological education platform has three levels, namely, network level, data level and application level.

(1) Network layer

It is used to build the access port of the network platform system, so that different platform users can enter the platform via the Internet and complete teaching, learning or system management tasks.

(2) Data layer

The data layer is used to store the data information of the system and provide corresponding services.

(3) Application layer

In the application layer, a variety of servers work in coordination, so that system administrators can perform related operations on the high-level data layer. Users access the online ideological education platform through PCs and mobile terminals. When users register accounts, log on to the platform, learn online or browse teaching resources, the system will sort out the corresponding instructions of different operations, process the instructions, feed back the processing results to the control system, and finally display them on the platform interface [7-8].

B. Storage Architecture Based on Data Lake

In the traditional sense, data integration is mainly aimed at structured data. The main way is to load the structured data stored in multi-source database into data warehouse after ETL processing, and establish data analysis topics to extract useful knowledge from it. The integration method based on data warehouse is very effective when facing a small amount of traditional structured data. However, under the big data environment, semi/unstructured data and real-time streaming data increase rapidly, which makes the traditional data integration storage architecture need to be adjusted adaptively.

Based on the current usage scenario of unstructured data storage, where network ideological education resources account for a large proportion, the storage resource pool design meets the storage requirements of multi-service-level, multi-data type and multi-service mode, and has a storage system with multiple access modes and multiple architectures. Service levels include [9]: Online high-performance storage and near-line large capacity. Data types include structured data, semi-structured data and unstructured data. Service modes include: infrastructure storage service and cloud storage service. Access methods include: data block, file and object. Storage architecture includes: traditional SAN storage architecture and optical-magnetic fusion distributed storage architecture.

The storage source of storage rack mainly includes SAN storage, distributed NAS storage and object storage, which complement each other to provide access to different types of data. SAN storage array is mainly for database server systems of key applications, providing high performance, extremely low latency, stable and reliable storage services; Online storage of massive structured and unstructured data gathered by data lake computing resource server, big data platform and cloud platform; Provide scalable, secure and persistent storage services.

According to the massive resources, the background analysis is carried out, and the knowledge map is constructed, so as to provide intelligent and personalized learning services based on educational resources. The system collects and preprocesses educational resources by using the educational big data storage model, and then sends them to Hadoop cluster for analysis. Finally, the analysis results are obtained by MapReducer model processing. The process principle of storage and analysis is shown in Figure 2.

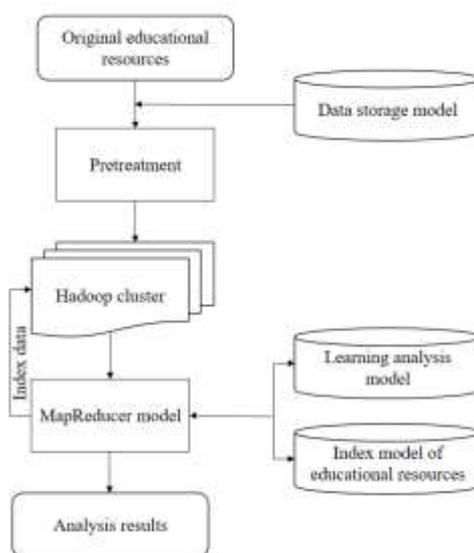


Fig.2 Storage and Analysis Process of Educational Resources

The open services provided by the network ideological education platform based on big data integration mainly include massive data access and data analysis services, and the open services are provided in the form of educational SaaS and educational PaaS.

C. Learning Analysis Distributed Computing System

The learning and analysis distributed computing system architecture based on Hadoop shown in Figure 3, in which the learning and analysis distributed computing system is the key part of the whole service architecture, and mainly uses Hadoop technology ecology to realize the processing and storage of educational big data. This distributed storage and computing model supports horizontal and linear expansion. With Hadoop as the core, a complete big data ecosystem has been formed, including common utilities, distributed file systems, analysis and data storage platforms, and an application layer responsible for managing distributed processing, parallel computing, workflow and configuration management.

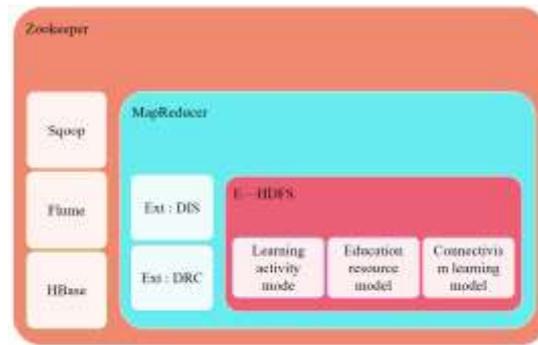


Fig.3 Hadoop-Based Distributed Computing System Architecture for Learning and Analysis

Sqoop is an Apache open source framework tool for data conversion between SQL and HDFS. Relational database and Hadoop complement each other. For all kinds of education systems, relational data still occupy an important position, so SQOOP may be used to make full use of these data.

Flume is a distributed, reliable and highly available massive log aggregation system, which supports customizing various data senders in the system for collecting log data and providing simple data processing function. Its main goal is to transmit real-time log data from applications to Hadoop HDFS system. Therefore, all kinds of unstructured learning process data, learning logs and website access logs can be processed by this system.

E-HDFS framework is the foundation of educational big data storage management, which is accessed based on streaming data mode, including learning behavior mode, educational resource mode and connectionist learning model. HBase is a system database, also based on Hadoop, which is an open source distributed storage system. Because of the diversity of educational data structure, HBase is suitable for storing unstructured data.

D. Ensure Data Security with Technologies Such as Blockchain

As a new decentralized, secure and reliable storage technology in the era of big data, blockchain technology has been highly valued by the state, enterprises and scientific research units. The emergence of blockchain technology provides new opportunities for the open sharing and data circulation of educational big data.

The application of blockchain technology to the integration of educational big data can not only realize decentralized, point-to-point data sharing, but also ensure that the owner of educational data has control over the data in terms of data security and privacy, and can flexibly share the data with trusted third parties. With the support of blockchain technology, data security and privacy issues can be better solved.

V. Conclusion

The construction of network ideological education platform for college students is a positive response to the national informatization construction, and it is also an internet teaching technology adopted to better improve the ideological education level of contemporary universities and realize the effective enhancement of educational effect. From the perspective of big data integration, this paper proposes to build an intelligent digital education service architecture based on learning and analysis technology by using Hadoop technology ecology. The main goal of this scheme is to solve the problem of gathering, storing and obtaining massive educational information, expanding on-demand analysis and visual presentation of analysis reports, so as to provide support for intelligent digital education services. At the same time, combined with big data analysis and processing technology, more suitable learning resources are recommended according to students' learning characteristics, and a student-centered teaching mode is realized, which can effectively enhance students' learning experience. In the process of carrying out network ideological

education under the background of big data era, the use of education linkage mechanism can obviously improve the effect of ideological education and greatly promote and help students' quality.

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References

- [1] Caiwei. Research on the Construction and Function of Network Ideological and Political Education Platform in Colleges and Universities. *Caiwei*, vol. 038, no. 002, pp. 102-104, 2019.
- [2] Zhang Gang, Lv Peng. Influence and Application of Wechat Public Platform in the Network Ideological and Political Education. *Journal of Xianyang Normal University*, vol. 034, no. 004, pp. 110-112, 2019.
- [3] Yang Y . On Detecting Abnormal Access for Online Ideological and Political Education. *International Journal of Distributed Systems and Technologies*, vol. 12, no. 2, pp. 35-45, 2021.
- [4] Yu H . Application Analysis of New Internet Multimedia Technology in Optimizing the Ideological and Political Education System of College Students. *Wireless Communications and Mobile Computing*, vol. 2021, no. 4, pp. 1-12, 2021.
- [5] Xinglong D U . Research on the Ideological and Political Education Service Platform Based on the Campus Network Environment. *International English Education Research: English Version*, no. 3, pp. 12-15, 2019.
- [6] Xin Lingling, Chang Jianing, Liu Tong. Research on the construction of network ideological and political education system based on the network community in colleges and universities . *Education and Teaching Forum*, vol. 000, no. 024, pp. 33-34, 2019.
- [7] Xin Lingling, Chang Jianing, and Liu Tong. "Research on the construction of network ideological and political education system based on the network community in colleges and universities." *Education and Teaching Forum* 000.024(2019):33-34.
- [8] Ou H . Research on Ideological and Political Education of Higher Vocational College Students"" Network Groups in the New Era. *A Summary of Educational Theories*, vol. 001, no. 003, pp. 64-69, 2018.
- [9] Diaojing. Education Research and Thinking on Network Ideological and Political Education in Private Vocational Colleges. *Journal of Zhejiang Communications Vocational and Technical College*, vol. 020, no. 001, pp. 64-69, 2019.