Research on the Utilization Path of Ideological and Political Education Data based on the DIKW Model

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Abstract: Aiming at the large scale and dynamic iteration, systematic and comprehensive, and multiple synergistic characteristics of the current ideological and political education data, the "Data-Wisdom" decision-making model based on the ideological and political data of colleges and universities is proposed in order to enrich the decision-making theoretical system of the existing colleges and universities and provide references for ideological and political decision-making. The core element of the "Data-Wisdom" decision-making model in colleges and universities is the organic fusion of data, computation, algorithm, and platform. Through rooting the new concept of big data ideological and political education, improving the ability of participants in ideological and political education to use big data, perfecting the mechanism of big data management, protection, and monitoring, and standardizing the use of data, the model can be used in large-scale data management. Application purposes and other suggestions, on the basis of large-scale data collection, the wisdom of big data integration is brought into play in order to solve the problem of realizing the personalized customization of ideological and political education and nurturing services, and realizing the high-quality planning and development of ideological and political education.

Keywords: Ideological and Political Education Data; DIKW Model; "Data-Wisdom" Decision Modeling.

1. Introduction

The 52nd Statistical Report on Internet Development in China (hereinafter referred to as "the Report") released by China Internet Network Information Center (CNNIC) [1] shows that as of June 2023, the average weekly online hours per capita of Internet users in China is 29.1 hours; the size of China's Internet users has reached 1,079 million; the age distribution of China's Internet users in the age of 20-29 years old is 24.5%, and that in the age of 30-39 years old is 25.6%; the education level of Internet users with bachelor's degree or above is 24.5%; and the education level of Internet users with bachelor's degree or above is 24.5%. The age distribution of Chinese Internet users is 24.5% for those aged 20-29 and 25.6% for those aged 30-39; the education level of Internet users with bachelor's degree or above is 24.5%. This shows that college students are still the main force of the Internet. General Secretary Xi Jinping emphasized that it is necessary to "understand big data, make good use of big data, and enhance the ability to use data to promote all work"[2].

The data and information of ideological and political education in colleges and universities have obviously possessed the significant characteristics of big data such as large quantity, wide variety, fast speed and high value, etc[3]. Big data also creates a new environment for the dissemination of information on ideological and political education in colleges and universities, so that the scope of the information conveyed, the speed of the conveyance and the effect of the dissemination have all undergone unprecedented changes, and the paradigm of the development of ideological and political education and the path of innovation are subject to the statute of the technicization and the choice, which requires that universities need to take a holistic approach[4]. This requires colleges and universities to need from the perspective of wholeness, diversity, correlation, dynamics, openness, equality, etc., in the five aspects of information mastery, education mode, education method, education subject and object, and education mediator, and to use more scientific and technical means of the data on ideological and political education to more comprehensively and fully excavate and release the value of the data resources of ideological and political education in colleges and universities, and to accelerate the integration and application of the data resources of ideological and political education in colleges and universities fully, and then more scientifically oriented to college students to carry out high-quality ideological and political education.

2. Overview of Ideological and Political Education Data

2.1. Connotation of Data on Ideological and Political Education Data

2.1.1. Connotation of Ideological and Political Education Data.

The ideological and political education data discussed in this paper is the ideological and political education data of colleges and universities. Through the combing of existing literature, it can be clear that in 2015 China's education officially entered the first year of big data, data began to formally serve the practice of ideological and political education data education in a more mature technical model, big data for ideological and political education from the level of theoretical thinking gradually transformed into the reality of the practical level, but also gradually from the basic connotation of the expansion to the carriers of the ideological and political education, mode, challenges and other related research, the development of its practice Its practical development is also gradually formed from the introduction stage and penetration stage to the practice stage from inside to outside and from abstract to concrete. [5][6] Therefore, regarding the connotation of the data of ideological and political education, the author would like to outline the data
of ideological and political education as an ecosystem centered on the ideological and political data produced by young college students, which includes the mining, collection, organization, storage, security protection, analysis, presentation and application of data, which is divided from other massive data, aiming to help ideological and political educators to learn more about the ideological and political education from multiple perspectives, and to learn more about the ideological and political education of young college students from different perspectives, and to help them to learn more about the ideological and political education of young college students.[7] Through continuous and standardized data collection, the purpose is to help ideological and political educators master the dynamic development trajectory mode of educational objects from multiple angles and full perspectives, grasp the formation and change rules of the ideological behavior of educational objects, and focus on the teaching of ideological and political courses, management, evaluation and other businesses and links with different data collection, so as to improve the relevance and effectiveness of the ideological and political work through more accurate judgments of the academic situation and management decisions.[8][9] It must be clear that the ideological and political education data is not equivalent to a large collection of ideological and political education data, but represents the sum of the process of value mining and effective utilization of diversified ideological and political education data resources by using big data thinking and big data technology.

2.1.2. Characteristics of Ideological and Political Education Data.

Big data technology, as a revolutionary force to promote the innovation and development of ideological and political education models, methods and means, must conform to the characteristics of the times, in order to maintain the sense of the times and attraction in the wave of big data. Ideological and political education is a process of information dissemination and educational dialogue, and it is a process of thought exchange and behavioral interaction among "real people", including two-way transmission of information, knowledge and spirit. In this process, it will inevitably produce a large amount of data and information in different forms and carriers, such as text, charts, sound and video, etc., with preservation value for scientific research, teaching and management, so it must have the following three characteristics: firstly, it is huge in scale and dynamic iteration. Ideological and political education will be the ideological and behavioral data of college students as "accurate knowledge of people" material, due to the complexity of people's internal ideological characteristics and external behavioral manifestations, every moment in the generation of a large number of brand-new data material, the need for high-speed, massive, intelligent big data processing system, capable of collecting and storing the vast amount of data, and the ability to acquire and collect data. It can also maintain real-time update and dynamic storage of data acquisition and collection, realizing the seamless integration of decentralized ideological and political education resources. Secondly, it is systematic and comprehensive. To a certain extent, the data of ideological and political education has eliminated the "data barriers", including the basic information data of educational objects, dynamic behavior data and multi-dimensional data generated by the process of teaching and management, realizing the cross-boundary nature of the data sources, and providing ideological and political educators with growth reports on the growth of educational objects in a more comprehensive and systematic way. Report. The third is multifaceted synergy. Based on the practice of ideological and political education, the subjects are often diversified, including decision makers, managers and users, and these diversified subjects cooperate and coordinate with each other in the process of ideological and political education, i.e., based on the common goal of "cultivating morality and educating people", the different subjects effectively participate, communicate and collaborate with each other according to the changes in the objective conditions and specific tasks in the collaborative and supportive environment, so as to realize the growth of each subject in a more comprehensive way. Participation, communication and collaboration, to realize the aggregation of personnel and synergy of each subject. The fourth is to use the platform as a carrier. In order for data to better realize the business value, there must be a flexible, efficient and scalable data service platform as support. Ideological and political education data take the platform as a carrier to better realize the basic functions such as resource collection and integration, data modeling and analysis, result visualization, user interaction, information retrieval and screening, etc., and to help educators in ideology and politics to build a timely, flexible and customized platform for specific educators according to the actual needs of their own work. Personalized configuration of data systems and service platforms for specific educating services, so as to realize the personalized customization of educating services for ideological and political education, and achieve high-quality planning and development of ideological and political education [10] [11] [12].

3. DIKW Model

The DIKW model, also known as the knowledge hierarchy, information hierarchy, knowledge pyramid, etc., is a hierarchical model composed of four basic concepts: Data, Information, Knowledge, and Wisdom, which clearly depicts the transformational relationship among the four concepts of the DIKW, among which "the original observation and measurement obtains data, the relationship between analyzing data obtains information, and the summarization of information forms knowledge. The DIKW model generally assists research and analysis through the following steps: the first step is to obtain the data through original observation and measurement; the second step is to analyze the relationship between the data, and the second step is to analyze the relationship between the data, and the second step is to analyze the relationship between the data, and the second step is to analyze the relationship between the data. The first step is to obtain data through primary observation and measurement; the second step is to analyze the relationship between the data to obtain relevant information; the third step is to process the information and apply the information in action to generate knowledge; the fourth step is to apply the knowledge gained through communication and self-reflection to solve problems, enriching and expanding the knowledge to generate wisdom.

3.1. Data Layer (Data, D)

Data is at the lowest level in the DIKW model. The core of the data of ideological education in the context of big data is mainly focused on the data generated by the network trajectory of educational objects. Under the premise of protecting personal privacy, we adopt the methods of manual
search and technical detection to timely and accurately obtain the data on the network concern trends of the education targets, not only to collect the regular data on the current affairs, entertainment, sports and society that the education targets are concerned about, but also to carefully sort out the colored data such as "black, grey, and yellow" in some of the network terminals contacted by the education targets; not only to obtain the data on the focus and hotspots, but also to grasp the data generated by the network trajectory of the education targets. Data; not only to obtain the relevant focus, hot data, but also to grasp the false data that induces the education object to pay attention to personal interests; not only to pay attention to the garbage data that weakens the education object's sense of enterprise, but also to be alert to the trap data hidden in the curiosity and novelty information. At the same time, according to the degree of attention of the educational target's network trend, we also need to dynamically and synchronously carry out the initial classification and sorting in the process of obtaining data and information, including: the distribution trend of various types of data in the educational target group; the negative impact of various types of data on the educational target group and individuals in the first time; whether there is a tendency of high-frequency data and information at a certain stage, and so on.[13]

3.2. Information Layer (I)

Information is at the second level of the DIKW model. Information will be organized and structured data generated by the education object directly reflects the education object's way of thinking, ability to understand and interests, so colleges and universities need to "keep the right" on the basis of the education object's circle of friends, chat groups, WeChat, cell phone clients and other social platforms that are easy to publish data to focus on, and strive to grasp the "data flow" in the first time. Pay attention to the social platforms such as friend circles, chat groups, WeChat public numbers, mobile phone clients and other social platforms that are easy to publish data, and strive to grasp the "data flow" at the first time. Especially during sensitive periods, important festivals, large-scale activities and other special times that are likely to cause ideological fluctuations, psychological imbalances and emotional upheavals among education targets, we pay more attention to the information released by education targets, so as to accurately grasp the direction of data flow. In addition, in response to sensitive issues in the ideological field that are likely to cause concern among education targets, we analyze and judge the flow of data.

3.3. Knowledge Layer (K)

Knowledge is at the third level in the DIKW model. Knowledge is information processed in an individual's mind, which are proven personal concepts that enhance an individual's ability to take effective action, so this level focuses on improving students' ideological and political literacy.[14] Specifically, it is necessary to grasp the basic movements of students on the basis of recording their study and life trajectories, network access, software use, consumption data, preferences, etc., relying on the automated decision-making ability of algorithms, mining regular content, adding targeted and personalized cultivation elements, and enhancing the sensitivity of college students to data and information to ensure that students are able to realize the application of value and secondary utilization of data, and better realize the goals of ideological and political education guidance and self-quantification of college students' subject.

3.4. Wisdom Layer (Wisdom, W)

Wisdom is at the highest level of the whole model. Ideological and political education data in colleges and universities will no longer be based on the one-way output of the traditional paradigm, and has been upgraded to a comprehensive ecological network of college and university ideological and political education data. The education model, education method, education subject and object will be based on a more standardized interface structure and business collaboration process among each other, forming a digital education system and building a database of ideological and political education data. On the intelligent education medium, through the digitization-driven autonomous operation mode, we will build a territory-wide ideological and political education resource integration and digital service platform, complete the generation and cohesion of the "thought cloud", frame the thought cloud environment, create the thought cloud space matrix, integrate the thought cloud platform, connect the thought cloud resources, and reach the thought cloud service. We try to answer the question in order to give full play to the maximum value of big data in ideological and political education in colleges and universities, and realize the high degree of integration of the two.

4. "Data-Wisdom" Decision-Making Model for Universities based on the DIKW Model

The core element of the "Data-Wisdom" decision-making model of colleges and universities is the organic integration of data, computing, algorithms, and platforms, and on the basis of large-scale data collection, the integrated wisdom of big data is brought into play to solve the problem of realizing the personalized customization of ideological and political education and human education services, and realizing the high-quality planning and development of ideological and political education, and development.

4.1. Reconstruct the Capability of Ideological and Political Big Data with Ideological and Political Education Data as the Core

The underlying structure of the "Data-Wisdom" decision-making model of colleges and universities is the ideological and political education data. With the deepening of the informationisation construction of colleges and universities, the data resources of ideological and political education are getting richer and richer, which mainly contain different types of data including the basic information of college students, learning information, economic information, growth information, life information, health information, and so on.[15] In order to build a "Data-Wisdom" decision-making model for ideological and political education data on the basis of this ideological and political education data, through data collection, analysis and mining, based on big data analysis tools to deal with multi-source and heterogeneous data collection problems and unstructured data processing problems, to build various types of standard databases. Ideological and political education data resources are shown in Table 1:
### Table 1. Data Resources for ideological and political education data

<table>
<thead>
<tr>
<th>Form</th>
<th>Element</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Information</td>
<td>Name, age, gender, ethnicity, place of origin, admission information</td>
</tr>
<tr>
<td>Learning Information</td>
<td>Academic Achievements, Training Programs, Research Achievements, Library Borrowing Data, Forums and Lectures</td>
</tr>
<tr>
<td>Economic information</td>
<td>Scholarship, Grant, and Loan Information</td>
</tr>
<tr>
<td>Growth Information</td>
<td>Social practice, work-study, clubs, further studies, employment</td>
</tr>
<tr>
<td>Living Information</td>
<td>Access Control Data, Internet Data, Dining Data</td>
</tr>
<tr>
<td>Health data</td>
<td>Psychometric data, physical data</td>
</tr>
</tbody>
</table>

### 4.2. Utilizing Distributed Computing Power to Grasp the "Data Flow" in Time.

Due to the huge volume of Ideological and political education data calculation, close and complex inner connection, uneven distribution of data value density, the most suitable tool for processing information in the "Data-Wisdom" decision-making model of colleges and universities is cloud computing with "distributed and on-demand computing power" and powerful computing power, which realizes distributed data storage and data analysis, thus providing effective support services for instant decision-making. [16] Therefore, the most suitable tool for processing information in the "Data-Wisdom" decision-making model of universities is cloud computing with "distributed and on-demand computing power" and powerful computing power, which realizes distributed data storage and data analysis, thus providing effective support services for immediate decision-making. The most common way to analyze the "data flow" of ideological and political education. Affairs is to carry out the "user image method". User profiling is to reflect students' data characteristics, behavioral diagnosis, and demand prediction attributes by analyzing the social attributes, preference characteristics, and other dimensions of ideological and political education data. The categorization of user profiling is shown in Figure 1 below:

#### Figure 1. The categorization of user profiling

### 4.3. Automated Decision-Making by Means of Algorithms to Realize the Guidance of Ideological Education.

Algorithm as the core of the whole university "Data-Wisdom" decision-making model processing, analysis, through the dynamic data of the user profile, behavioral characteristics, etc., fully explore the value of the data, from the beginning of the input data, through the engine conversion, to the output of the energy in the data, and then to provide decision-making services, the neural network, deep learning, machine learning, advanced cognitive analysis, robotics process automation. Focusing on neural networks, deep learning, machine learning, advanced cognitive analysis, and robotic process automation, we take the three dimensions of economic situation, learning situation, and mental health as examples, build precise identification paths, realize the visualization of user profiles, accurately grasp the law of students' growth and development, accurately identify the state of mind of students at a specific stage and make a prediction of future short-term ideological characteristics and behavioral trends, and accurately identify the actual needs of students are precisely identified, and the timing of parenting is grasped, so that the quality of parenting work can be improved and the efficiency increased. The path of precise ideological identification is shown in Figure 2:

#### Figure 2. The path of precise ideological identification

### 4.4. Relying on the Support Capability of the Thought Cloud Platform to Realize Precise Ideology

The core focus of the thought cloud platform should be centered on management, analysis and application. Cleaning, analysis, management, prediction, association, grouping of precise ideological data, so as to refine valuable decision-making information, and finally accurately customize the goal of educating people, educating people, educating people,
educating people, educating people, educating people, and in all aspects of educating people, focusing on details and careful implementation, realizing the transformation of the mode of educating people in colleges and universities, and optimizing the effect of educating people to the greatest extent possible. However, it is worth noting that, always adhere to the goal of establishing morality and seeking truth from facts as the core, we must constantly adjust and improve the assessment system in the light of the actual situation, so that after the precise implementation of the policy through the monitoring and evaluation, and continuously follow up the effect of the precise implementation of the policy to test the risk of the ideological and political work process, and the effect of parenting to carry out dynamic judgments, feedback and adjustment to improve the user image model, through the user image model to establish a warning mechanism for the student's status. Through the user image model to establish the student status warning mechanism, dynamic monitoring model and timely triggering recognition warning, so that the ideological and political work is timely, accurate and effective, so that the accurate ideological and political system based on the student's image to form a dynamic cycle, and effectively improve the quality of parenting.[17] The framework diagram of the path of realizing the dynamic feedback of precise ideology and politics in colleges and universities based on user image is shown in Figure 3:

![Figure 3](image)

**Figure 3.** The framework diagram of the path of realizing the dynamic feedback of precise ideology and politics in colleges and universities based on user image

Based on the above four types of elements, the "Data-Wisdom" decision-making model of universities can realize the transformation of data into evidence that can be used for decision-making. The operation program of the "Data-Wisdom" decision-making model based on big data is shown in Figure 4.

![Figure 4](image)

**Figure 4.** The operation program of the "Data-Wisdom" decision-making model based on big data

5. **Suggestions for a "Data-Wisdom" Decision-making Model for Universities**

People-oriented is always the basic goal of ideological and political education, the development of big data to the ideological and political education subject to bring opportunities but also brings certain challenges, the current difficulties of the university "data - wisdom" decision-making model is mainly focused on cognitive dilemmas, technological dilemmas, mechanism dilemmas and ethical dilemmas. Therefore, the following principles should be adhered to throughout the whole process; not only to maintain "technological sensitivity" but also to avoid "technological superstition", and not only to grasp the "theoretical feasibility" but also to focus on the "practical feasibility"; the "Data-Wisdom" decision-making model in universities should also be adhered to. "Practical feasibility" should be emphasized at the same time.[18][19]

5.1. **Rooting a New Concept of Ideological and Political Education in Big Data**

The use of big data in ideological and political education should be rooted in the mode of "big data + ideological and political", and establish a new concept of big data ideological and political education. Adhere to the overall leadership of the Party on ideological and political education, adhere to the moral education of people as the fundamental task, and determine the new concept of data as an important basis. By recording students' learning and life trajectories, network access, software use, consumption data, preferences, etc., we can master the basic movements of students, excavate content with regularity, enhance the sensitivity of college students to data information, ensure that students can realize the application of the value of the data and the secondary use of data, and better realize the goal of ideological and political educators' guidance and college students' subjective self-quantification. At the same time, through the monitoring of the data platform and the high-energy warning of dangerous communication, colleges and universities can discover and correct problems in time. On the one hand, colleges and universities can publicize students' awareness of network safety and precautionary awareness, guide students to surf the Internet correctly, and regulate students' network behaviors; on the other hand, colleges and universities can monitor real-time network public opinion and grasp students' hot topics through the data platform, and timely respond to and correctly guide college students to participate in the joint construction of a healthy campus network environment, so that students can study and live in a healthy network environment, and in order to New concepts to help promote new leadership in ideological education.

5.2. **Enhancing the Ability of Participants in Ideological and Political Education to Utilize Big Data**

Participants in ideological and political education refer to all the people involved in the ideological and political
sessions. Under the background of big data, college students are highly dependent on cyberspace and digital technology, which profoundly affects their thinking mode, behavioral mode, lifestyle and many other aspects. Academic results have shown that the new era portrait of college students is characterized by a new identity that blends the real and the virtual, a new cognitive mode of distributed cognition, a new thinking mode of "relevance", a new interaction mode of pluralism and flattening, and a new development mode of inseparability of man and machine. Therefore, on the basis of fully respecting and protecting the rights and interests of students, we should effectively safeguard the basic rights of students such as the right to privacy and the right to know, and cultivate the sense of autonomy of college students in big data, i.e., cultivate college students to look at problems rationally and rely on real and valid data to make informed judgments and reasoning, so as to truly promote the free and comprehensive development of college students. In the face of the new characteristics of students, it is necessary to further strengthen the awareness of big data, collaborative cooperation, openness and sharing, criticism and self-criticism, data security, and innovation of ideological and political education workers in colleges and universities, [20] so as to enhance the ability of participants in ideological and political education to use big data. To cultivate the big data awareness of ideological and political education workers in colleges and universities, on the one hand, it is necessary to overcome the boundaries of traditional cognitive thinking, and on the other hand, it is necessary to focus on grasping the combination of experience and data analysis. In the application process, attention should be paid to grasping the real and effective data, protecting students’ information security, carrying out the combination of big data and the ideological and political education work of college students in a planned and purposeful manner, and firmly grasping the core right of ideological and political education work.[21]

5.3. Improvement of Mechanisms for the Management, Protection and Monitoring of Big Data and Standardization of the Use of Data Applications

While ideological and political education utilizes big data to break the "information silos" of various departments in educating people, issues such as human rights ethics, ethics of responsibility, and ethics of privacy should not be underestimated. A sound big data management mechanism is the fundamental guarantee for the use of big data in ideological and political education.

Big data management mechanism is the basic system that data collection, management, transmission and utilization should comply with, need to have clear rules and regulations on data collection system, storage system, processing system, security system, responsibility system, need to do regular automatic backup of all data, send a person in charge of organizing and archiving discs, and the system administrator needs to be in accordance with the scale of the set period of time for the collection and archiving of special data information, to ensure comprehensive collection and modeling of universality and specificity. Ensure comprehensive collection and modeling of universality and specificity, while also ensuring smooth articulation and synergy.[22]

The big data protection mechanism is an important barrier to safeguard personal information, which aims to protect the information security of individuals and the overall network environment security. For how to protect student data, it can be done by setting confidentiality levels and permission applications, signing data confidentiality agreements on the basis of the confidentiality level of the student's information data authorization through the setting of confidentiality levels, with reference to the student's wishes, by the administrator and the student's joint authorization to form a two-channel protection barrier. At the same time, the security testing and daily supervision of the data platform need to focus on security scanning, including dynamic scanning and static scanning, using professional development and testing tools, employing professional management personnel to better solve the problem of insufficient knowledge reserves and platform security assurance, and to build a secure firewall for student data protection.[23]

The purpose of data monitoring is to effectively clean up the network environment and standardize network use behavior. The monitoring mechanism needs to start from both the government and universities. Relevant government departments need to do a good job of coordinating and supervising the work, and innovate network security technology, improve the supervision management system, set up a specialized big data education supervision department with coordination and comprehensive law enforcement capabilities, and give it new political functions and management tools.[24] In the process of using big data for ideological and political education, colleges and universities should effectively supervise the behavior of ideological and political education departments and educators in collecting and using students' data; pay attention to and control the risk of big data infringing on the privacy and freedom of college students; and publicize the source of the data and the statistical method of the data, so as to ensure that the data are real and effective.

Data in colleges and universities contain great value, and to promote the open sharing and innovative development and utilization of data in colleges and universities, and to fully explore the value of data in colleges and universities, it is always necessary to adhere to the main position of human beings. The "Data-Wisdom" decision-making model of colleges and universities needs to establish an evaluation system suitable for local characteristics and the actual situation of colleges and universities, including the evaluation of students' ideological and political education, the education of ideological and political educators, the use of big data systems, and the utilization of data value. The effect of ideological and political education for students should not only refer to students' performance in school, but also to their overall performance, even throughout their lives. Students can also realize the sharing of experience and data through the display of results and feedback exchanges, stimulate each other's innovative and competitive spirit in the process of interactive competition, and promote each other's growth. At the same time, it must be clear that the technology itself can not set the standard of criticism, nor can it judge the students' information right or wrong through independent analysis, and the setting of judging standards for the evaluation mechanism of the data should refer to the measurement opinions of each subject to ensure that the comprehensive evaluation of the promotion of big data is reasonable and reasonable, and ultimately, in the process of constantly adjusting and deepening the use of big data in the ideological and political education of college students, to realize the scientific
advancement and professional cultivation.

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