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CORE LITERACY OF COLLEGE COUNSELORS AND STUDENT PRIVACY PROTECTION BASED ON EDGE INTELLIGENCE AND LIGHTWEIGHT COMPUTING

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Abstract. College counselors play a key role in promoting ideological and political education in universities, serving as sponsors, implementers, and mentors for students. Their influence extends to shaping the overall development of higher education and significantly impacts the cultivation of talent. This document aims to investigate the current state of knowledge and policy implementation regarding political and ideological education in information technology universities. It also proposes strategies to enhance the role of college counselors in this area. The study demonstrates that applying an optimized growth algorithm can improve both the educational framework and the competencies of counselors, fostering stronger core values and competitiveness within universities.

Key words: Information technology; College counselors; Ideological and political education; FP Growth algorithm

1. Introduction. "We should build a good team of counselors to ensure that this team is of high quality and high standard, and that this team is succeeded by a continuous source of people," stated General Secretary Xi Jinping at the National Conference on Ideological and Political Work in Colleges and Universities [1, 2]. The sacred mission of establishing moral education falls on counselors in colleges and universities, who also organize and carry out students' ideological and political education. Additionally, counselors' core literacy abilities have a direct impact on the caliber and extent of talent cultivation in colleges and universities. [3, 4]. The core literacy of counselors is not only beneficial to the development of counselors themselves, but also provides strong talent support for the construction of college counselor team, which eventually provides a strong guarantee for the overall development and growth of students.

The National Education Conference has made it clear time and time again that every facet of education had to be delivered flawlessly. In addition to imparting technical knowledge, information technology courses ought to foster students' information literacy. Condensing cultural heritage in value shaping and using its unique classroom teaching methods to achieve coordinated education are two benefits of integrating curriculum thinking into IT courses, in addition to facilitating knowledge dissemination, value shaping, and increasing students' identification with their majors [5]. The edge computing concept was created as a reaction to the aforementioned difficulties. With edge computing, a new concept of edge—a continuum—is introduced in contrast to the cloud computing model, which uploads all traffic to the data center. Edge Computing refers to a new computing model at the edge of the network near the IoT devices, which migrates some or all of the computing tasks of traditional cloud computing centers to the device side to provide edge services nearby, meeting the key requirements of time-sensitive connectivity, real-time business, security and privacy protection [6]. Compared with the traditional cloud computing model, edge computing refers to a small "cloud" processing center close to the physical device, i.e., computing processing and storage at the edge of the network [7]. The edge computing model has the advantages of real-time data processing and analysis, high security, high scalability, and low transmission bandwidth [8]. At the same time, edge computing provides a more convenient and scalable path to expand the computing capacity through the combination of IoT devices and edge computing platform, and adding new devices has less impact on the network bandwidth demand; the IoT devices in the access network receive information, and the IoT devices give the relevant location information and data to the edge nodes for processing according to their real-time location, and the edge computing platform discovers the location of the devices with this information, and the data collected by the IoT devices are used on the local devices for data pre-processing, computing and analysis. Pre-processing, computation and analysis [9, 10]. In

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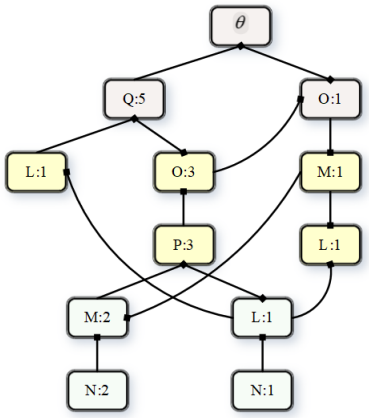

Fig. 2.1: Features of an FP tree.

the process of ideological and political education for college students, counselors in colleges and universities increasingly need to use network information media, and their core network information literacy will largely determine the effectiveness of ideological and political education.

The research and discussion on the network information core literacy of counselors can offer new theoretical perspectives and theoretical knowledge for the team construction of counselors as the main body of ideological and political education, as well as theoretical guidance and factual basis for the reform and development of Chinese ideological and political education. This is because the research is based on the characteristics of the new network media era and the fundamental purposes of the current ideological and political education in colleges and universities.

2. FP Growth algorithm optimization. An effective approach for association rule mining is the FP-growth algorithm, which creates frequent item sets from the FP tree by exploring the tree from the bottom up. In this paper, we address the drawback of having to repeatedly traverse through the laborious item list L during the construction of the FP tree by proposing an improved algorithm based on hash tables. This algorithm implements the mapping from item name keyword to storage address and then the mapping from item name keyword to its support count. When finding the support count of an item, only its name keyword is needed, and there is no need to traverse the frequent item list L from the beginning, and the time complexity is improved from 0(n) to 0(1). The experimental results show that the improved algorithm outperforms the original algorithm, saves traversal time, and improves the mining efficiency.

The connected element items can be called linked lists, as shown in Figure 2.1.

The calculation equation of conditional information entropy divided into subsets is as Eq. 2.1:

$$Info_a(D) = \sum_{j=1}^{k} \frac{d_{1j} + d_{2j} + ... + d_{mj}}{D} Info_a(D_j) \tag{2.1}$$

$Info_a(D)$ represents the dataset D's information entropy, also known as information gain, in relation to an attribute a. $\sum_{j=1}^{k}$ represents the total of several categories or subcategories. The number of categories or subgroups in the dataset is denoted by j and k. $d_{1j} + d_{2j} + ... + d_{mj}$ denotes the relative frequency (or weight) of a particular set of j, where d_{ij} represents the number of class i or the i data point in the jgroup, and D is the total number of the entire dataset. $Info_a(D_j)$ signifies the group D_j information entropy.

Wherein, Eq. 2.2:

$$Info\,(D_j) = -\sum_{i=1}^{m} p_{ij} \log_2, p_{ij} = \frac{D_{ij}}{D_j} \tag{2.2}$$

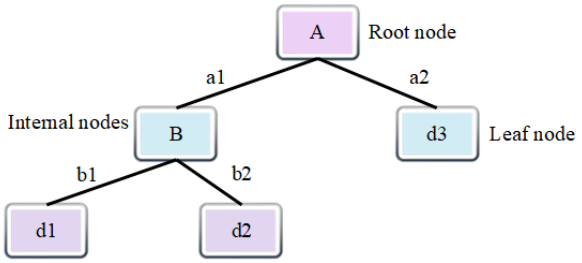

Fig. 2.2: Concept diagram of decision tree.

$Info(D_j)$ represents the dataset's uncertainty through the information entropy of D_j. $\sum_{i=1}^{m}$ is the total of all the categories (i) in the dataset (D_j), where m is the number of categories. $-p_{ij}\log_2, p_{ij}$:represents the category I partial entropy in the dataset D_j. The reason for the negative sign is that the probability's logarithm is negative and the entropy value is non-negative. $p_{ij} = \frac{D_{ij}}{D_j}$ represents the likelihood that category i will appear in dataset D_j, where

$$D_{ij}$$

is the number of samples of category i in dataset D_j and D_j is the total number of samples in dataset D_j.

Therefore, the equation for calculating the set of candidate partition points for the feature a of continuous values containing n-1 elements is as Eq. 2.3:

$$T_a = \left\{ \frac{a^i + a^{i+1}}{2} \mid 1 < i < n-1 \right\} \tag{2.3}$$

Secondly, the information gain of these dividing points is calculated as the discrete value, and the equation for calculating the information gain when processing the continuous value becomes as Eq. 2.4:

$$Gain(D,a) = \max_{t \in T_a} Gain(D,a,t) = \max_{t \in T_a} Info(D) \tag{2.4}$$

The equation for computing the split information entropy of feature a is shown in Eq2.5:

$$O_a(D) = -\sum_{j=1}^{s} (\frac{D_j}{D}\log_2) \tag{2.5}$$

When evaluating a multi category model, the accuracy, recall, F1- Measure and accuracy of a specific class will not be used to evaluate the model, but the overall accuracy of the model will be used to evaluate the staged performance prediction model. The calculation equation of accuracy rate is as Eq. 2.6:

$$Accuracy = \frac{correctClassification(testSet)}{total(testSet)} \tag{2.6}$$

As shown in Figure 2.2 and Eq. 2.7, the root node has only an out edge but no in edge.

$$\sum_{k=1}^{k} pk(1-pk) = 1 - \sum_{k=1}^{k} p^2 k \tag{2.7}$$

The evaluation indicators calculated based on the confusion matrix are shown in Table 2.1:

Table 2.1: Evaluation index of confusion matrix calculation.

Index	Equation	significance
Error rate	Error rate=l-accuracy	The probability that a positive sample is wrongly classified
False alarm rate	Prate=FP/N	The probability that negatives samples are wrongly classified into positive samples

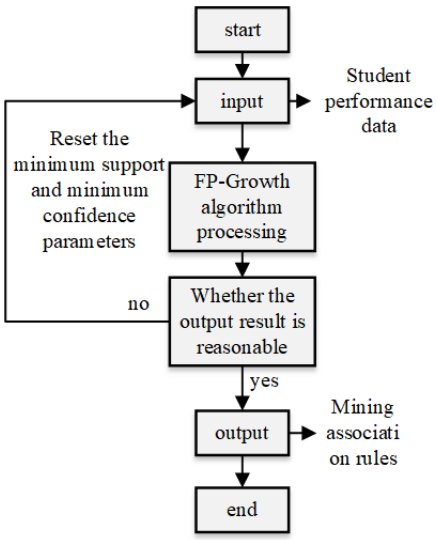

Fig. 3.1: FP Growth Algorithm Optimization.

3. Methods. The two types of scores of extracurricular training programs, the scores of scientific research practice and grade examination, and scores of dozens of subjects in the class. The key to improving the "three complete education" personality bureau [11]. The "three complete education" means to adhere to the all-round, all staff, and whole process education. The proposal of "three complete education" gives full play to the unique advantages of socialist education with Chinese characteristics and creates a pattern of education. Flow chart of improved algorithm in Fig. 3.1:

In this paper, we hope to get the association rules of specific data items, FP Growth aims to find the frequent itemset, regardless of which data item is obtained. Therefore, FP Growth is improved in two directions:

1. After improvement, frequent itemset containing specific data items can be obtained. The association rules obtained in this way are more intuitive and convenient for us to analyze the results. It is the reform and innovation of education and teaching methods. All kinds of courses tend to focus on knowledge transmission and neglect value shaping, leading to ambiguous phenomena in educational goals.
2. The curriculum are consistent in political direction, cultural direction, and values direction. Both should cultivate students' political identity and national identity in classroom teaching. Deeply mining the education data generated in the education process to obtain the corresponding knowledge system, and then using the knowledge system to continuously improve and enhance the education environment is a circular system of production, feedback, and continuous improvement. The education data mining is shown in Fig. 3.2.

4. Case study. In the experiment, we selected the Information Technology Foundation published by the Education Science Press as the teaching content to analyze one by one, explore and select the curriculum content suitable for the curriculum content [12]. Through research, it is concluded that eight contents of this textbook are suitable for carrying out ideological, as shown in Table 4.1.

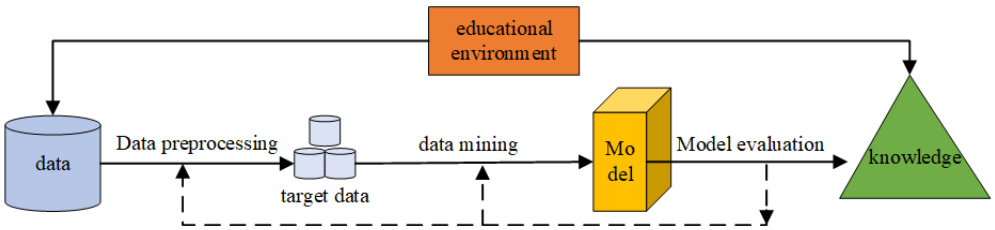

Fig. 3.2: Educational Data Mining Process.

Table 4.1: Ideological and political integration points of information technology curriculum in senior high school.

Serial No	Chapter content	Teaching method	Teaching case	Objectives of the course
1	1.2 Rapidly changing information technology		By showcasing the development process and future trends of information technology through multimedia, combined with teaching and case-based teaching methods.	Stimulate students' innovation ability
2	3.2 Programming and processing of information Lecturing method	Drill method	Show students the illegal and criminal acts of high-tech spies or hackers who steal other people's information by programming and processing	Cultivate students' technical integrity
3	3.3 Intelligent processing of information	Lecturing method Drill method	Students demonstrate the illegal and criminal behavior of high-tech spies or hackers who use programming to steal other people's information	Stimulate students' scientific interest and improve their scientific and technological ability
4	4.2 Table information processing Lecturing method	Drill method	Let students build class related data	Cultivate students' responsibility
5	5.3 Acquisition and processing of image information	Drill method and case teaching method	Make a national flag or party emblem through computer graphics software and explain the internal meaning of the national flag or party emblem	

The main model evaluation method used in this link is the tenfold cross validation method. First, divide the sample dataset into ten equal parts according to requirements, and take turns to test nine of them as training data and one as test data. Each test will yield the corresponding model accuracy. Finally, judge according to the measured accuracy of the decision tree model. The tenfold cross validation model evaluation algorithm is closely related to the setting of the number of leaves in the decision tree. The accuracy of the model varies with the number of leaves, as shown in Table 4.2. According to the table and broken line statistical graph data, when the set value of the number of leaves of the decision tree in this study is greater than 9.

The information technology course in senior high school belongs to the basic course of compulsory education. The basic courses mainly cultivate the common foundation for students' lifelong development and adaptation to the future society. It is not only an independent discipline branch, but also the basis for the development of all disciplines.

Information technology is a basic course in middle schools. If students correctly understand the knowledge points of information technology, the final evaluation should be conducted through the actual process, and guide students to learn how to use information technology to solve practical problems. The ideology and politics of education require the standardization of theory and practice. In fact, ideology can also be combined

Table 4.2: Accuracy of Decision Tree Model.

Leaf number	3	4	5	6	7	8	9	10	11	12
Accuracy	0.628	0.751	0.826	0.822	0.847	0.851	0.872	0.891	0.908	0.906
Leaf number	13	14	15	16	17	18	19	20	21	22
Accuracy	0.909	0.911	0.916	0.914	0.918	0.927	0.928	0.924	0.925	0.927
Leaf number	23	24	25	26	27	28	29	30	31	32
Accuracy	0.923	0.923	0.931	0.928	0.943	0.943	0.938	0.936	0.939	0.939
Leaf number	33	34	35	36	37	38	39	40	41	-
Accuracy	0.947	0.938	0.941	0.935	0.938	0.943	0.943	0.946	0.943	-

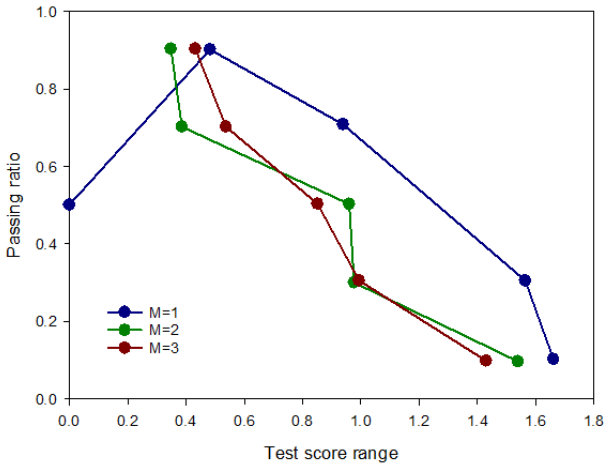

Fig. 4.1: Impact of test scores on final scores.

with politics, education and moral education [13]. Through skill learning, let students accept ideological and political education imperceptibly. When the same manuport and mi Confidence are set for the algorithm before and after improvement, the running time of the algorithm before improvement is 9 times that of the algorithm after improvement, which is quite time-consuming, and the number of association rules obtained is 3 times that of the algorithm after improvement, but most of them are redundant rules without specific items. On the contrary, the improved algorithm not only runs fast, but also obtains association rules with specific items, The results are more intuitive and easier to analyze. An eight-chapter chapter test paper is provided for the course on the Wisdom Tree online education and learning platform. The influence of test scores in each chapter on final scores is shown in Fig. 4.1.

The majority of political and ideological educators likewise primarily employ the brainwashing and spoon-feeding methods of instruction. While the ideological and political courses are less closely related to the students' reality, the practical teaching form is overly simplistic, the practical teaching link is relatively weak, and the social hotspots are subject to special education, but they are taught strictly in line with the teaching material system, with few social practical activities arranged in a way that is closely related to the students' reality and the teaching content.[14]. Alert notification industry is separated into active alert notification and passive alert notification. The active early warning notice is that the system automatically forecasts the learning state of pupils at this level every.

5. Conclusion. People's focus on education has steadily grown as society has advanced, and counselors' standing has risen along with it. The state has released pertinent policy guidelines, numerous colleges and universities have established platforms for counselor team creation, and the state and colleges and universities have increased their support for the counselor team. As a result, strengthening counselors' fundamental traits

not only contributes to college students' success and well-being but also effectively boosts the efficacy of work pertaining to political and ideological education and encourages students to move toward becoming "a new man of the times who will take on the great responsibility of national rejuvenation." The strengthening of counselors' core traits will have a favorable impact on kids' progress and healthy life.

Data Availability. The experimental data used to support the findings of this study are available from the corresponding author upon request.

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