Dynamic Adjustment Mechanism of Specialty Setting in Application Oriented Universities Under the Background of Big Data

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Abstract: The specialty setting and adjustment in colleges and universities are closely related to the development of local economy and society. In order to cultivate high-quality talents, colleges and universities must base on the needs of current economic development, follow the law of professional development, set up new majors and transform old majors. However, there are many defects in the dynamic adjustment mechanism of specialty setting in traditional application-oriented colleges and universities law has been unable to adapt to mass information processing. Based on this, this paper studies the dynamic adjustment mechanism of specialty setting in application-oriented universities under the background of big data. Based on the big data mining algorithm, this paper proposes a dynamic adjustment mechanism of specialty setting in application-oriented colleges and universities, and selects two majors with the same basic situation to verify the method in this paper. In the verification process, we compare the method in this paper with the traditional method. The results show that the employment rate of graduates is 63%, the employment rate of graduates is 41%, and the rate of voluntary filling is 12%. However, among the students who adopt the traditional method, the employment rate is 81%, the employment rate of graduates is 63%, and the rate of voluntary filling is 21%. It can be seen that the dynamic adjustment mechanism of specialty setting in application-oriented colleges and universities proposed in this paper is feasible under the background of big data, and this study also provides a new reference direction for the adjustment of specialty setting in colleges and universities.

Keywords: Big Data, Mining Algorithm, Application-Oriented University, Major Setting Adjustment, Experimental Comparison

1.Introduction
The establishment of dynamic adjustment mechanism of specialty setting in colleges and universities should focus on the overall improvement of the quality of higher education, create characteristic advantages, follow the laws of higher education and talent development, take the development of students and local economic and social development as the goal, and gradually form a self-regulation mechanism suitable for social and economic development through the survival of the fittest, so as to improve the quality of personnel training and promote the development of colleges and universities Sustainable development [1-2]. Reasonably plan the construction and development of specialties, and strive to achieve the structural balance and benign interaction between talent demand and training [3-4].

We know that many times, the specialty setting of colleges and universities needs dynamic adjustment [5-6]. At present, the decision-making data sources of university specialty setting adjustment are still limited, and the data collected by traditional sampling technology are limited by time, space, resources and cost are high, and the data is incomplete [7-8]. Therefore, the value and function of data development is limited. Incomplete and delayed information has negative effect on specialty setting and adjustment decision. Therefore, there are many defects in the traditional dynamic adjustment mechanism of specialty setting in application-oriented universities. In the context of big data, it is of great significance to explore a better dynamic adjustment mechanism of specialty setting in application-oriented colleges and universities [9-10].

This paper studies the dynamic adjustment mechanism of specialty setting in application-oriented universities under the background of big data. In the research, we first introduced the data mining algorithm in big data, analyzed the advantages of big data technology in the evaluation of talent training quality of specialty setting in colleges and universities, and made a certain solution to the basic situation of specialty setting and adjustment in colleges and universities in China. Secondly, on the basis of big data mining algorithm, we propose a dynamic adjustment machine for specialty setting in application-oriented colleges and universities, and verify the feasibility of this method through experiments, which can provide reference for the adjustment of specialty setting in application-oriented universities in China.

2. Related Basic Theories

2.1 Data Mining Algorithm

Statistical analysis is a commonly used data mining algorithm. Statistical analysis is based on systematic and perfect data, and uses statistical methods to combine quantitative and qualitative data with research activities related to analysis topics. Statistical analysis is an analytical method used to determine the quantitative relationship between two or more variables. A specific rule can be found from some actual data, such as establishing the deterministic or uncertain relationship between the observable factor variable \((x_1, x_2, ..., x_n)\) and the dependent variable \(Y\):

\[
Y = f(x_1, x_2, ..., x_n) + \varepsilon
\]  
\[
y = E(Y) = f(x_1, x_2, ..., x_n)
\]

Where: \(\varepsilon\) and \(y\) are random variables, \(\varepsilon \sim N(0, \sigma^2)\).

Suppose \(f(x_1, x_2, ..., x_n)\) is linear with respect to \(x_1, x_2, ..., x_n\),
\[ Y = f(x_1, x_2, \ldots, x_n) + \epsilon = \beta_0 + \sum_{i=1}^{n} \beta_i x_i + \epsilon \quad (3) \]

Therefore, since \( \epsilon \) has uncertainty, statistical analysis is to study the uncertainty relationship formula (1) through formula (2) with certain relationship. It is necessary to obtain the estimator \( \hat{y} \) of \( Y \) by calculating the estimator \( \hat{\beta}_i \) of \( \beta_i \). \( \hat{y} \) represents the prediction interval estimator of \( Y \) and \( y \).

2.2 Advantages of Big Data Technology in Talent Training Quality Evaluation of Specialty Setting in Colleges and Universities

With the help of the Internet platform and deep integration with the field of education, a new ecological development is being formed. Students and employers are the main body of evaluation. With the help of mature information transmission network and high-tech data, and according to the relevant parameters of talent training quality in professional environment, the degree of coincidence between students' vocational skills and enterprises is evaluated, and the normalized dynamic monitoring is established. The main risk is identified and corresponding countermeasures are taken in case of crisis. The specialty of colleges and universities is optimized according to the degree of risk. The content of education makes the personnel training more adapt to the needs of society and market, and realizes the sustainable and healthy development of professional talents.

3. Experimental Ideas and Design

(1) Research ideas
In this paper, first of all, we understand the basic situation of specialty setting and adjustment in China's application-oriented universities, and analyze the problems existing in the specialty setting and adjustment in China's application-oriented universities, so as to provide a theoretical basis for the study of this paper. Secondly, on the basis of data mining algorithm, we propose an application-oriented university specialty setting dynamic adjustment machine, and through experiments, the feasibility of this method is verified.

(2) Experimental design
This paper selects two different majors (A major and B major) as the research object. The difference between the employment rate and the filling rate of the two majors in 2019 is relatively small, but both are not up to the standard. We will make dynamic professional adjustment for the two majors, in which major A adopts the traditional method for adjustment, and major B adopts the dynamic adjustment mechanism based on big data proposed in this paper for professional adjustment, and carries out data return visit in 2020 to re evaluate the employment rate of these two majors And fill in the rate of investigation and statistics, comparative analysis of its data changes, to provide data support for this study.

4. Analysis of Research Results

4.1 Analysis of the Problems Existing in Specialty Setting of Application Oriented Universities
This paper analyzes the situation of specialty setting in China's application-oriented universities, and analyzes and summarizes the problems in the specialty setting of colleges and universities, as shown in Figure 1.
It can be seen from Figure 1 that there are some common problems in specialty setting in application-oriented colleges and universities in China. Therefore, this paper summarizes them. The lack of overall comprehensive planning for specialty setting accounts for 17.5%, and the disconnection between specialty setting and social demand accounts for 22.1%. The maturity of new specialties is slow, Fast metabolism accounted for 25.7%, vague positioning problems accounted for 11.3%, and professional transformation was difficult, accounting for 23.4%. This is analyzed in detail below.

(1) There is a lack of overall comprehensive planning for specialty setting in colleges and universities

In order to adapt to the trend of specialty application, the University tends to become a comprehensive university and construct a full range of scientific disciplines. However, in the process of school planning, it has lost its own characteristics and discipline advantages, which directly leads to the graduates in the region. The structural contradiction of employment makes the overall quality and advantage of employment decline.

(2) Professional setting is out of line with social needs

Some colleges and universities have not carried out preliminary research on specialty setting, and have no understanding of the overall situation of the whole province or similar colleges and universities, resulting in serious repetition and serious social demand saturation; some colleges and universities arrange majors according to teachers, which seems very reasonable, but if they set up without understanding the social needs, it will also lead to the employment problems of the students trained; Some colleges and universities set majors according to social needs, but due to the lack of foresight, after three or four years, the specialty with strong demand may be neglected.

(3) The new specialty is slow in maturity and metabolized too fast

With the continuous rise of emerging industries, social development has a growing demand for integrated and innovative talents. colleges and universities are speeding up the pace of keeping up with the market. In recent years, new majors have been continuously added to match the market demand and career development. For example, due to the arrival of the era of big data and the rapid development of the Internet industry, the demand for data technology has soared. In recent years, hundreds of universities across the country have added data science and big data technology majors. When new majors are set up in application-oriented colleges and universities, the preparation time is relatively short, the teaching staff is relatively weak, and the allocation of resources is also relatively tight. Most of the new majors are close to the forefront of social development needs. The new majors have a short history of running schools, and the recognition degree between students and parents is not as good as that of mature old majors. For many years, the voluntary rate and registration rate have been low.

(4) The self orientation of colleges and universities is vague
Application oriented universities are different from traditional universities, and the direction of specialty setting should also be different. However, in recent years, each application-oriented university has the trend of chasing hot majors. In this process, they deviated from the original teaching orientation and ignored the educational conditions and resources of the school itself. This will inevitably lead to the school's lack of characteristics in personnel training, or lead to the lack of special skills of students, but also affect the long-term development and reputation of the school.

(5) Professional transformation is difficult
The adjustment of specialty layout in colleges and universities is followed by the resource transformation of the original specialty. The specialty orientation should be supported by the orientation of the college and consistent with the overall strategic goal of the university. After decades of school running, application-oriented private undergraduate colleges and universities have explored and determined the school running orientation with school development characteristics. The adjustment of specialty layout is bound to highlight some key majors and promote the transformation of some old majors. The adjustment of professional transformation puts forward higher requirements for the positioning and development of professional groups in the college, and also puts forward greater challenges for the teachers of transformed majors.

4.2 Dynamic Adjustment Mechanism of Specialty Setting in Application-Oriented Universities under the Background of Big Data
(1) Using big data to carry out professional dynamic adjustment
Colleges and universities can rely on the websites of various governments, industries and enterprises to establish a professional dynamic adjustment big data analysis system, quantify the dynamic adjustment indicators of majors, and collect, capture, classify and summarize all kinds of strategic planning and demand information released by the government, industry and enterprises. This paper collects and summarizes the data of professional teaching, students' learning, employment and government regional development strategy, industry development planning, enterprise talent demand and technical demand, finds out the relationship between specialty setting and regional development strategy, industry development planning, enterprise technology demand and talent quantity demand, finds out new rules, and establishes data relationship model., Through the big data display platform, the analysis results of professional dynamic adjustment are displayed, providing powerful data decision-making basis for professional dynamic adjustment.

(2) Implement professional early warning mechanism
Each school must establish a professional early warning mechanism, and on the basis of clear warning conditions, regularly announce the early warning majors. Give "early warning" (warning) to professional suggestions meeting one of the following conditions.
1) Last year, the first voluntary enrollment rate was less than 12%;
2) First, the voluntary enrollment rate was less than 15% for three consecutive years;
3) The first employment rate of graduates is less than 72%;
4) The employment rate ranked the last three places in the whole school for three consecutive years;
5) More than 50% of the students applied to change majors;
6) The result of professional evaluation is unqualified.

4.3 Comparative Analysis of Survey and Return Visit Results
In order to analyze the feasibility of the dynamic adjustment mechanism of major setting in application-oriented universities under the background of big data, this paper selects two majors in our university whose employment rate and filling rate are not significantly different as the objects for experiment. A return visit survey is conducted one year later. The results are shown in Table 1 and Figure 2.

Table 1. Comparison of professional employment rate and filling rate in colleges and Universities
As can be seen from Table 1 and Figure 2, the situation of the two majors selected in this paper is basically the same. Before the adjustment, the employment rate of major A is 51%, the counterpart employment rate of graduates is 35%, the voluntary filling rate is 7%, the employment rate of major B is 50%, the counterpart employment rate of graduates is 33%, and the filling rate of aspiration is 7%. Then the two majors were adjusted, and a year later, the data were revisited again. The results showed that the employment rate of major a was 63%, the counterpart employment rate of graduates was 41%, the voluntary filling rate was 12%, and the employment rate of graduates in specialty B was 81%, 63% and 21% respectively. From the results of the follow-up visit, it can be seen that the dynamic adjustment mechanism of specialty setting in application-oriented colleges and universities under the background of big data can effectively improve the employment rate and filling rate of University majors.

5. Conclusions
This paper studies the dynamic adjustment mechanism of specialty setting in application-oriented universities under the background of big data. This paper holds that the construction of the dynamic adjustment mechanism of applied undergraduate colleges and universities should closely focus on the local economic construction, take the social demand as the guidance, fully combine the comprehensive characteristics of disciplines, majors, teachers, information, culture and geographical location of colleges and universities, actively expand the survival and development space of higher education and consolidate the development achievements of higher education with the development opportunities of the new era, Finally, it will enhance the ability to serve the economic and social development and
provide strong scientific and technological support and intellectual security for economic and social
development.

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