

Improve the Quality of Innovation and Entrepreneurship Education for Contemporary College Students from the Perspective of Big Data

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Abstract: The purpose of this paper is to study the strategies to improve the quality of college students' innovation and entrepreneurship (IAE) education from the perspective of big data. This paper first introduces the background and significance of big data and IAE education, then elaborates the connotation of IAE education, and then studies the data mining algorithm. Based on this theory, this paper takes the students' achievements in the course of IAE of a university as the source data, and then establishes the decision tree model. The results show that the application of big data technology in IAE education has a certain practical effect. By mining the data of the research object, the accuracy of the prediction of students' entrepreneurial tendency is 74%.

1. Introduction

All walks of life are faced with the impact and challenges of "big data", which also makes college education show great potential for development. "Smart education" will become the development trend of "big data" to promote the reform of college education model [1-2]. Innovation based on big data environment comes from value mining in massive data. The use of "data" to promote the development of IAE education reform injects new vitality into the cultivation of high-tech talents [3-5].

Big data has the characteristics of large data capacity; multiple data types, fast data processing and high value, and are the most advanced technology for data analysis [6]. It is a simple data set, through analysis, integration, data content value mining industry demand and social changes, the development of scientific, meticulous, strong execution of business plans, is now widely used in intelligent electrical business services, martin social public services, education services and other fields [7]. Based on big data, mining and analysis, customized information services, the service industry of technology cloud platform is widely used. According to people's big data analysis, it conforms to the purpose of scientific decision-making [8-9]. According to the requirements of improving the quality of innovative education, the decision and direction provided by big data technology are also necessary. On this basis, this study will analyze the shortcomings of IAE education for college students, and focus on designing methods to improve the quality of IAE education, hoping to provide references for the cultivation of IAE talents in universities [10].

This paper first introduces the background and significance of big data and IAE education, then elaborates the connotation of IAE education, and then studies the data mining algorithm. Based on this theory, this paper takes the students' achievements in the course of IAE of a university as the source data, and then establishes the decision tree model. The experimental results show that the application of big data technology in IAE education has a certain practical effect.

2. Method

2.1 IAE Education

IAE education is a new educational concept to cultivate students' innovation consciousness, innovation ability and entrepreneurial practice ability. It is often called "entrepreneurship and

innovation education". It goes deep into the curriculum of high school education and integrates the education of innovative ideas into the education of entrepreneurship practice. Innovation is not limited to enterprising, the status quo, open up the spirit and attitude to try, there are more creative thinking; Entrepreneurship refers to the creation of new enterprises, businesses, employment, etc. in the fields of social culture, economy, politics, etc., which means creating more action forces. They are different, but inseparable. Innovation is the essence, entrepreneurship is the core. Innovation supports entrepreneurship, which relies on innovation. Entrepreneurship is the innovation of behavior, which does not stop at certain thinking and viewpoint, but the concrete embodiment of innovation. Universities cultivate students' divergent thinking and practical ability, and cultivate creative talents necessary for national strategies.

2.2 Data Mining

Let's say the data set S has S training samples. If you assume that a field has n different values, define n different classes of $c_i (i = 1, 2, \dots, n)$ for that field. Sets s_i to the number of records in the c_i class. For a set of samples, their total entropy can be obtained according to formula (1):

$$I(r_1, \dots, r_m) = - \sum_{\log_2}^n p_i \log_2(p_i) \quad (1)$$

In the above formula, let P_i be the probability of any sample belonging to c_i , and estimate it with $\frac{s_i}{s}$. Let's say field A has v different values. While field A combines data set S into v subsets $\{s_1, s_2, \dots, s_v\}$ one by one; in the subset, s_j contains the same part of sample S , so that the subset contains the a_j value on A . If A is used as the test attribute, then the new leaf nodes derived from the corresponding nodes of the sample set S are these subsets. If S_{ij} is set to be the number of samples whose category is C in leaf S_i , then we can obtain the formula of information entropy for the segmentation of samples according to A , such as (2):

$$E(A) = \sum_{j=1}^v \frac{S_{1j} + \dots + S_{nj}}{s} I(S_{1j}, \dots, S_{nj}) \quad (2)$$

In the formula, $I(S_{1j}, \dots, S_{nj}) = \sum_{\log_2}^n (P_{ij}); P_{ij} = \frac{S_{ij}}{|S_j|}$ is the sample probability value of class C in S_i .

Finally, the information gain obtained after dividing the sample set S with attribute A is shown in formula (3).

$$Gain(A) = I(S_1, \dots, S_n) - E(A) \quad (3)$$

3. Experiment

3.1 Data Collection

In this paper, the IAE course of computer students in a university is selected as the data source, and a decision tree algorithm is constructed. The attributes of the decision tree are shown in Table 1.

Table 1. Decision tree attributes

| No | Name |
|----|-----------|
| 1 | Parent ID |
| 2 | Text |
| 3 | Url |
| 4 | Duty |

3.2 Establish the Decision Tree Model

The main parameters of decision tree algorithm used in this system are as follows:

Node minimum number of instances: refers to the number of instances contained in the node classification of the decision tree, which is 1 by default.

Pruning ratio: refers to the pruning to improve the prediction accuracy after the decision tree is generated. This parameter refers to the percentage of pruning to the original decision tree. The smaller the pruning is, the better the out-of-set prediction rate may be.

The method used is to first sort the data and then group the data according to this parameter, with each group of data replaced by the average value of that group.

4. Discussion

4.1 Experimental Results and Analysis

The application of the success factor analysis module was carried out. Through repeated experiments, the parameter was set as the proportion adopted to group at least the number of instances of leaf nodes and pruning. One sample is taken from the data set as the test set, and the remaining sample is taken as the training set. For the experimental platform, the decision tree algorithm provided by encapsulation is used to train the model in the environment. The results of the model are shown in Table 2 and Figure 1.

Table 2. Experimental results

| | Before pruning | | | After pruning | | |
|------------------|----------------|---------------|----------|---------------|---------------|----------|
| | Error rate | Branch number | Accuracy | Error rate | Branch number | Accuracy |
| The training set | 8 | 27 | 92 | 11 | 23 | 89 |
| The test set | 33 | 27 | 67 | 25 | 23 | 74 |

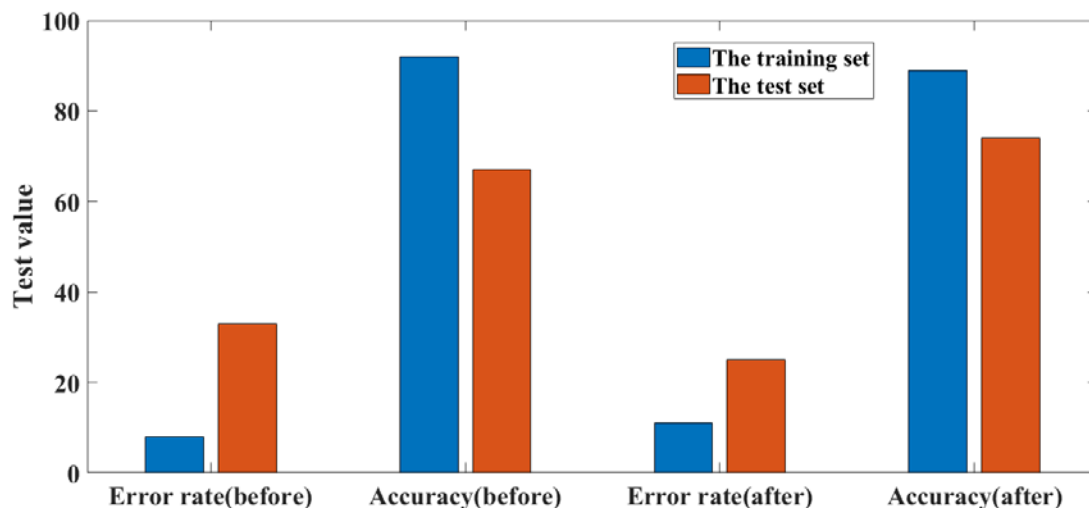


Figure 1. Experimental results

As can be seen from table 1, the accuracy of the model in predicting students' entrepreneurial tendency is 74%, which better predicts the actual situation. The reason it is not too high may be that the limited amount of data makes it difficult to cover all the hidden knowledge and rules.

4.2 Suggestions on Improving the Quality of College Students' IAE Education

(1) Change the concept of IAE education

Change innovation concept of entrepreneurship education, entrepreneurship education is not confined to the innovation of transfer theory, in particular, in the process of normal education, teacher on the one hand, collect the latest education resources, the use of big data technology update

education content.

(2) Carry out the concrete application of big data technology

Process of college students' personal growth, knowledge level, interest in activities has certain influence to the entrepreneurial success; big data technology acquisition can take advantage of the university student's daily data analysis and mining. From the consideration on the amount of students' abilities and interests, organizational innovation entrepreneurship students entrepreneurial teams, provides the design reference, the real insight into the professor to guide college students entrepreneurship helpful guidance, flexible adjustment scheme the contents of the personalized teaching entrepreneurship for college students, promoting the development of innovative entrepreneurship education effectively.

(3) Establish a big data application system for IAE education

The main function of the analysis, mining and visualization layer is to use the big data technology to analyze the entrepreneurial market direction, and to dig out the needs of the most valuable commercial innovative products in the large end user group. The database is a technical method to meet user requirements. The main function is to analyze and make statistics on all the data related to the innovation of entrepreneurship education through the big data platform. The statistical results directly and indirectly study the evaluation on the quality of education of IAE, so as to ensure the comprehensive, objective and accurate realization of the evaluation results in the background of high quality. The main function of the service layer is to combine with the merger and abolition of resources. It decides to support the merger and abolition efficiency among various resources including teachers, students, enterprises, managers and universities, information sharing promotion, policy promotion, technology transfer and the popularization of enterprise innovation, entrepreneurship education reform proposals and project management.

Conclusion

In the education of IAE, the application of a large amount of data technology, its value is mainly through the data to drive IAE education reform, optimize the direction of IAE education, through data mining and analysis to find the demand for innovative products in the market, effectively improve the success rate of IAE projects for college students. To college students as the object of this study, the analysis of entrepreneurial education innovation, combined with college students of the relationship between the big data entrepreneurship education innovation, from the concept and technology application system of constructing three angle, through the path to improve the quality of big data horizon entrepreneurship education innovation - the "data driven innovation" the idea of "entrepreneurship", technical guidance and system construction, implementing big data technology to construct the basis of application specific system idea; IAE education is applied to the construction and practice of a large number of data application systems to promote the improvement of concepts and the update of technologies.

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