



Analysis of the Development of Online Courses Based on Cloud-Assisted Entrepreneurship Training Model

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ABSTRACT

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Entrepreneurship training is an important way to cultivate innovative and entrepreneurial talents. Traditional entrepreneurship training has limitations, such as geographical limitations and insufficient teaching staff. With the continuous development of internet technology, cloud-assisted entrepreneurship training mode has gradually become a new type of education method. This article explores how to develop online courses in this model to improve the efficiency and effectiveness of entrepreneurship training. This article first introduces the concept and characteristics of cloud-assisted entrepreneurship training, then elaborates on the design principles and development process of online courses, and finally verifies the feasibility and advantages of this model through case analysis.

Keywords: Cloud Computing, Embedded Training, Student's Entrepreneurship

1. Introduction

At present, the problem of Reemployment of the unemployed and difficulty employment for college students are the primary work that the government needs to solve, especially with the outbreak of the first global economic crisis; the issue of employment pressure has become one of the most important tasks of the Chinese government in safeguarding people's livelihood and promoting the development [1]. At its core, the party central committee catered to The Times' demands in this particular historical period. In line with the requirements of The Times, the relevant policies of "promoting employment through entrepreneurship" were introduced to encourage the unemployed and college students to start their businesses [2]. The main way to solve employment is to promote employment through entrepreneurship; therefore, to improve the success rate of entrepreneurs and avoid the risk of failure, training before starting a business is an inevitable choice for every entrepreneur [3]. The author was mainly responsible for business training and guidance, combining with oneself in the

actual process of entrepreneurship training work, meeting a lot of problems and confusion at the same time because he was early in the fields of information technology and computer skills training, how to maintain oneself at the experience and method of effective professional skill training work migrated to entrepreneurship training work and made entrepreneurship training work has further highlight. The author embarked on the practical problems, and under the support of national and locally relevant policies, he carried out this research work. This study took into account such national policies and the era background of "cloud service", and was carried out in combination with its own actual work [4]

2. The State of the Art

According to the survey, since 2006, Google has cooperated with IBM to integrate several universities worldwide into "cloud computing" [5]. For example, Arizona State University, one of the largest universities in the United States, with 65,000 students, is undergoing a "transformation." After repeated assessment, the school decided to adopt Google's Gmail service, thinking Google's professional services are more secure for the safety of 60,000 students than the school's technology department and can save \$500,000 yearly for school system maintenance funds [6]. In China, Shanghai Normal University first tried to transfer education technical postgraduate courses to the Google collaboration platform and achieved satisfactory teaching results. China Education Technology Association began to select successful cases of "cloud computing auxiliary teaching" in the national education sector in 2009. In 2009, "cloud computing" changed the pattern of global IT development and education informatization development in China. In April 2009, some scholars and graduate students participated in the teacher training activity of "advanced class of cloud computing auxiliary teaching" organized by the teaching and research office of the Guangzhou Tianhe district education bureau [7]. Since then, the discussion activity of "cloud computing auxiliary teaching" in China has opened a new historical chapter, and the network course auxiliary teaching in China has taken an epoch-making step [8]. Some scholars said, "Education informatization in China has gone through the development process of computer socialization service from computer-aided teaching in the 1980s to cloud computing-aided teaching in the 21st century. The change in science and technology has changed the teaching environment and methods. The most fundamental change is the change of education concept, which is the sublimation of the cloud in people's minds.

3. Methodology

3.1. Local Weighted Regression Algorithm of the Entrepreneurial Success Rate Evaluation System

Locally weighted linear regression belongs to the type of parameter learning algorithm; specifically, only connecting the points around the prediction point will have a relatively large impact on the prediction point, while the points far away from the prediction point will not significantly impact the prediction point. Given that linear regression is an unbiased estimate of the minimum mean square error, there is a certain probability of underfitting. The local weighted linear regression is selected to add partial deviation in the process of actual estimation so that the prediction mean square error can be reduced. Let's say \underline{M} is an $M \times n$ matrix, where all the elements are in the domain K , the real or the complex domain. So, there is a decomposition that makes:

$$M = U \Sigma V^* \quad (1)$$

Where U is $m \times m$ order unitary matrix; Σ diagonal matrix is positive semi-definite $m \times n$ order; V^* , the conjugate transpose of V , is an $n \times n$ unitary matrix. Such decomposition is called singular value decomposition of M . Σ diagonal elements on Σ_i , which i is the singular value of M . The common practice is to order singular values from large to small. So Σ can be determined only by M (Although U and V are still uncertain). Attribute cost performance ratio refers to the ratio between the reduction of misclassification cost and the test cost, the cost performance of attribute A_i $\cos t_ratio(A_i)$ is defined as:

$$\text{cost_ratio}(A_i) = \frac{Mc - (n \times FP - (FP * \sum_{i=0}^r n_i - FN * \sum_{i=r+1}^n p_i))}{\text{TestCost}(A_i) + 1} \text{TestCost}(A_i) + 1 \quad (2)$$

$\text{TestCost}(A_i)$ Represents the attribute A_i , the denominator plus one is to take the cost of the test, So the denominator is $\text{TestCost}(A_i) + 1$. The denominator represents the reduction in the misclassification cost caused by the selection of attribute A_i , and the Mc represents the misclassification cost when the attribute is not selected as the split attribute. Assuming I has different property values, it can be divided into N sub-nodes when splitting (Node1 , Node2 , ..., NodeN) There are P_i positive examples and n_i negative examples in the Node_i of these sub-nodes. Let r sub-nodes be positive example nodes, and then $(n-r)$ are negative example nodes.

The determinants of prediction precision of multiple linear regression models are R test composite correlation coefficient r and priority fit R^2 . Started with a linear regression function for calculating the regression coefficient, then calculated the prediction model and the predicted value; finally, according to the predicted and actual values of the dependent variable Y , the matching R and R^2 are calculated, and the precision of the model is judged by its value. The specific calculation process of the prediction model of multivariate linear regression algorithm is as follows: Convert the array into a matrix and convert the independent variable X and the dependent variable Y into a matrix to provide variables for the calculation of Python's *numpy* library. Based on the regress function of linear regression, the multiple linear regression coefficient ws is calculated. Combined with the independent variable matrix X , the dependent Y matrix predicted the regression coefficient. The regression square sum is obtained with the specific mean value of training samples and the predicted value of training samples. The residual sum of squares is obtained using the predicted dependent variable Y matrix and the actual dependent variable Y matrix. Then, it is used to define the prediction error. The regression and residual square sum are used to calculate the goodness of fit R_a and the complex correlation coefficient R to verify whether the model can meet the requirements of the discipline. The flow chart of multiple linear regressions is as follows:

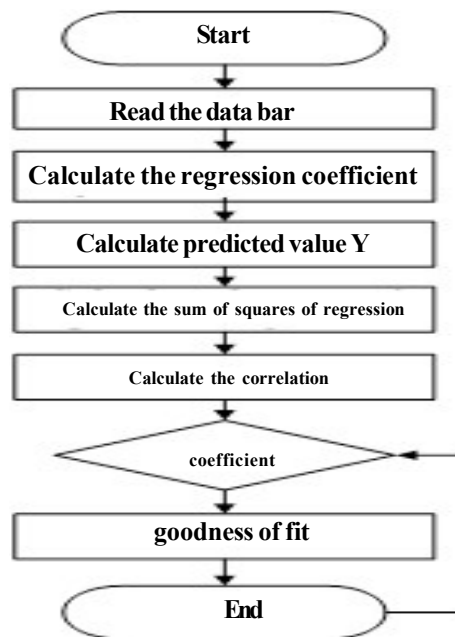


Figure 1. Multivariate linear regression algorithm flow chart

This module gives an overall introduction to the SIYB network course. Entrepreneurship is a major trend in the development of today's society. Entrepreneurship is beneficial to widen the

labourer for employment and create more jobs for society and realize the individual value of the labourer, creating an atmosphere of innovation and entrepreneurship in the whole society and promoting social and economic development in a sustained, rapid and healthy way. China is a developing country with a long-term oversupply of the labour force. The task of employment is arduous; the problem of reemployment of laid-off and unemployed people is especially serious. Many measures have been taken in various places to solve the problem of re-employment of laid-off workers; among them, encouraging the workers, especially the laid-off and unemployed, to find their own jobs and start their businesses has become an important measure to solve the problem of employment and re-employment. Zhangjiagang City has realized the importance of raising people's awareness of entrepreneurship and entrepreneurial ability in this era. With the government's strong support, our Labour and Social Security Bureau and relevant departments vigorously advocate employment as the foundation of people's livelihood; entrepreneurship is the concept of high-level employment. With the strong support of relevant departments, we will strengthen publicity guidance and skill training to fully stimulate society's entrepreneurial enthusiasm. Given the actual situation in our city, we adjusted our training strategy promptly, and carried out "education (GYB) of entrepreneurship awareness" for the new growing labor force with a certain foundation and college students, stimulate entrepreneurial enthusiasm; Start your own business (SYB) training for people with a certain amount of money and intention to start their own business; for those who have already started a business, conduct "improve your business (IYB)" training; We will increase the training of entrepreneurial ability in skills training programs suitable for individual operation and encourage them to start their businesses. This network course fully tests the rate to our city to carry out the current situation of entrepreneurial training and integrating various training programs; the teaching goal of this online course is to "teach you how to start a business, help you develop a business and help you find a job".

3.2. Training Procedures and Strategies

The first step is to evaluate you as an entrepreneur, tell you what a business is, what the basic qualities and requirements are for starting a business, and let you measure your suitability for starting a business. The second step is to set up a good business idea for yourself and tell you if you are suitable for starting a business. What do you want to set up enterprises? Do you have any specific ideas? If not, how do you discover and develop your business idea? At the same time, according to their start-up plans, they formulate action plans for starting enterprises, such as applying for loans, applying for business licenses, etc. The fourth step is to start a business and understand that there is much management work to be done when the business is organized. The learning content of this module is mainly in the form of Google Presentations files, giving full play to the advantages of the Google collaboration platform and then you're going to give your carefully designed lecture notes to cadets in the form of Google Presentations. Google Presentations is a PowerPoint presentation that Google added to its free browser-based office suite of Google Docs. Google Docs costs no one a penny compared to the \$400 price tag for a legitimate version of Office. It runs on most browsers and doesn't need to be downloaded, installed, or patched. At the same time, when using Google Presentations, with the help of multiple computers, the same slide can be edited simultaneously by multiple people, which fully reflects the economics, interactivity and collaboration of this network course. This module mainly provides students with the download function of relevant materials.

Teaching strategy refers to the teaching process to achieve a specific goal based on the subjective and objective conditions of teaching, especially the student's reality, to choose the teaching order, teaching program, teaching organization, teaching methods and teaching media's overall consideration. SIYB entrepreneurship training adopts a constructivist participatory teaching strategy. Participatory learning is an important teaching strategy in the teaching theory of Zhankov constructivism. Zankov's participatory learning theory thinks that constructive learning requires students to have various opportunities under different scenarios to construct knowledge, apply knowledge, and make students masters of teaching activities, responsible for their success or failure of active participation. The participatory training strategy for the SIYB entrepreneurial training involves learning by actively participating in teaching activities and helping students learn from the problems they will be having when they start a business. By using participatory training strategies, students can become more focused on learning and learn how to apply new knowledge. The teaching methods of SIYB entrepreneurial training based on participatory

training strategies are as follows: The Lecture method is to teach the course content, supplemented by questions and answers. One advantage of the lecturing method is that it is fast, effective, and flexible, allowing teachers to modify or adjust the training content in class. SIYB training games are designed specifically for startups and businesses. They are a special form of role-playing. SIYB game is a very good dynamic learning tool. It creates a simulated environment for students to feel the enterprise's decision-making process and results.

4. Analysis and Discussion

In this experiment, we used the comparative experimental model of the same group. I took the mid-term assessment results of the entrepreneurship training of the control and experimental groups as their pre-test. The trainees' names and scores before and after the test are shown in appendices 8 and 9. A single sample *T*-test is conducted on the data with spss3.0 software. The processing results are shown in Table 1 below. It can be seen from the table that the average score of the control group is 72.4 points, the average score of the experimental group is 71.2 points, and the average score of the experimental group is slightly lower than that of the control group. On the standard deviation of, the control group was 7.8459, and the experimental group was 6.7254, which indicates that the scores of the control group are relatively scattered compared to the experimental group. The scores of the experimental group are relatively concentrated.

	N	Mean	Std. Deviation	Std. ErrorMean
Control group before the test	30	72.400	7.8459	1.4325
Pretest of the experimental group	30	71.233	6.7254	1.2277

Table 1. One-Sample Statistics

Independent sample T-test is used to test whether there is a significant difference in the mean or central position of two independent populations represented by samples from two independent populations. A T-test of independent samples was conducted for the experimental and control groups. The test results are shown in Table 2 below. There was no significant difference between the experimental and control groups due to the significance level of $p=0.539$ and $p > 0.05$. In this way, the experimental and control groups can be basically identified as parallel groups.

Control group - experimental group	Levene's Test for Equality of Variances			Equality of Means		
	F	Sig.	1	df	Sig.(2-failed)	Mean Difference
	1.152	0.288	0.618	58	0.539	1.167

Table 2. Independent Samples Test

After yearly 6 months of experiments, the final assessment result of entrepreneurial training was taken as the result of their post-test to test the application effect of the SIYB entrepreneurial training network course in teaching practice. The assessment results and students' names are shown in appendixes 8 and 9. SPSS 3.0 was used to conduct a single sample T-test on the post-test results.

	N	Mean	Std. Deviation	Std. Error Mean
Control group before the test	30	73.4667	9.00089	1.64333
Pretest of the experimental group	30	74.9333	7.60188	1.38791

Table 3. One-Sample Statistics

The results of the treatment are shown in Table 3. It can be seen from the table that the average score of the control group is 73.5, the average score of the laboratory group is 74.9, and the test group is slightly higher. From the standard deviation, the control group is 9.00, and the experimental group is 7.60. This indicates that the scores of the experimental group are relatively concentrated compared with those of the control group, and those of the control group are relatively scattered.

A t-test of independent samples was conducted for the experimental and control groups. Since $P=0.498$ and $P > 0.05$ were significant, there was no significant difference between the experimental and control groups. Test results show that the difference between the experimental group and the control group after the overall level difference is not significant. To further analyze the results of the experimental group after the experiment, it was best to use the normal optimization (90-100), good (75-90), middle (60-75), and difference (0-60) standard to group performance and the degree of deviation and kurtosis and normal distribution curve from spss3.0, see figure 2.

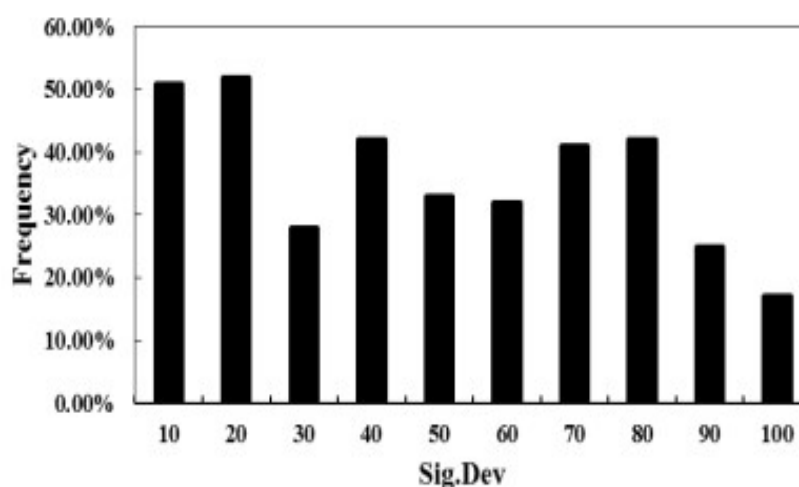


Figure 2. The standard distribution curve of post-test results in the experimental group

On the other hand, compared with the traditional Apriori algorithm, the Apriori algorithm with a sensitive non-frequency-set filtering matrix has many advantages in mining efficiency. There are 142,917 transactions in the employment information database, 589 items in 322 categories, and the accuracy of the entire data set is 99.84%, with fewer abnormal points. The average transaction length is 269. The goal is to select the interest attribute. Because of the impact of the "dimensional disaster", it also makes it harder to excavate the high-dimensional data, so choose the Apriori algorithm and price sensitive to the frequency set filter matrix Apriori algorithm comparison, analysis of their performance in the high-dimensional data record. With the increase of data dimension, high dimensional index structure performance decreases rapidly.

With the increase of data records, algorithm costs time also surged. It takes 149000 milliseconds to reach the time of 100,000 records, and the running time of the improved algorithm is 53,000

milli seconds. For details, see Figure 3, a time comparison diagram of different record number mining algorithms. We also obtain the conclusion that for the time of the algorithm in different dimensions, the two kinds of algorithms are different at different minimum support, and the ratio between them is different. The memory size used by the algorithm before and after the improvement has also changed. Compared with traditional algorithms, the improved algorithm has obvious advantages in memory usage under different support levels. The differences below 12 dimensions are relatively small. Above 12 dimensions, the differences between them will be widened. By 24 dimensions, traditional Apriori algorithm may occupy 100% of the computer memory, thus causing the system to process slowly or even crash. On the contrary, the improved algorithm accounts for 64% of the memory, and the machine runs normally.

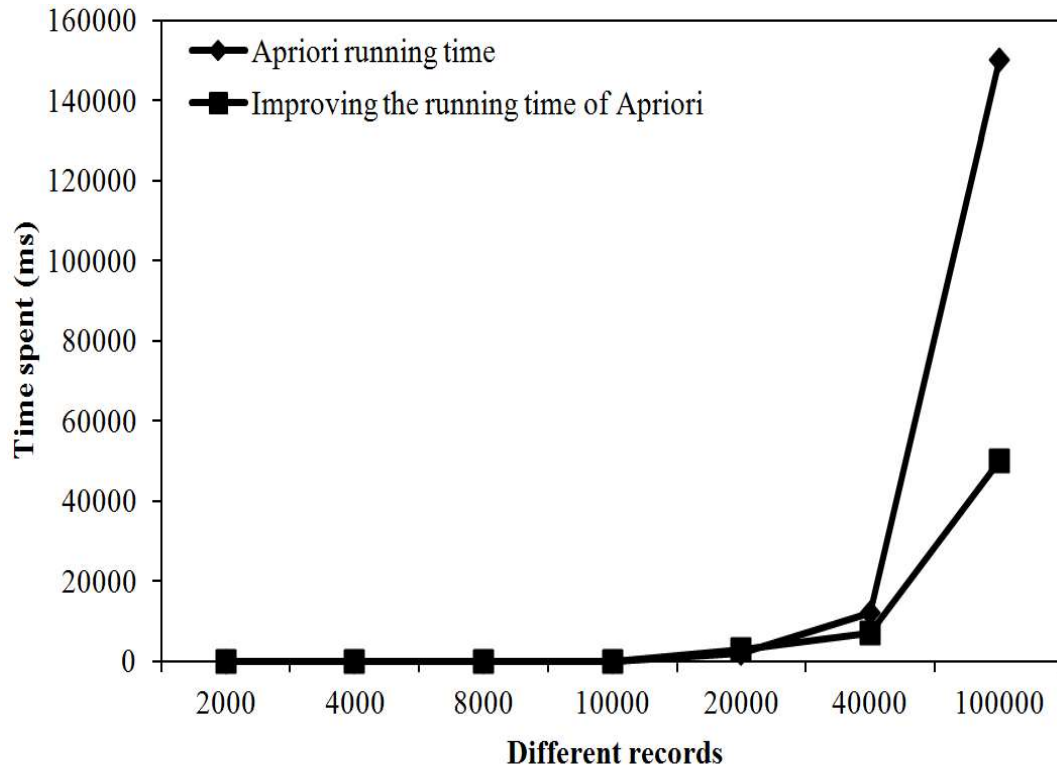


Figure 3. Time comparison diagram for different record number mining algorithms

5. Conclusion

Above all, it is possible to build an SIYB start-up online course and apply it to practical start-up training. Using the cloud services platform to assist in teaching is feasible, and a lot of data has verified its effectiveness. Of course, this is only a beneficial attempt by Zhangjiagang City to develop a training mode of entrepreneurship training based on modern education technology, and it is not the only way. We hope that through this study, we can provide a reference for education workers engaged in relevant entrepreneurial training and promote better entrepreneurial training in the future. The main result of this study is that a platform was set up, two experiments were carried out, and a training mode was innovated, which helped a group of entrepreneurs to start businesses successfully. A platform: designed and built SIYB entrepreneurship training network course platform, and carried out effective SIYB entrepreneurship training. A training mode: expand SIYB entrepreneurship training to a "cloud service" platform, and form a new SIYB entrepreneurship training mode with Zhangjiagang characteristics. Finally, adopting the new SIYB entrepreneurial training model has helped many students in Zhangjiagang City embark on a successful entrepreneurial journey.

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