The Influence of Modern Electronic Media on the Teaching Content of Traditional Design

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Objectives: At present, most of the researches on differentiated teaching focus on the theoretical research of differentiated instruction, the demonstration of necessity of differentiated instruction, the implementation process of differential teaching, and the implementation of differentiated teaching. Methods: at present, most of the researches on differentiated teaching focus on the theoretical research of differentiated instruction, the demonstration of necessity of differentiated instruction, the implementation process of differential teaching, and the implementation of differentiated teaching. Results:This paper took computer design course as an example, mainly from three aspects: the simple Bias classification algorithm, the student's difference performance and the difference teaching. Based on the related theories, a student classification method based on Naive Bayes algorithm was proposed. Conclusion: This paper took computer design course as an example, mainly from three aspects: the simple Bias classification algorithm, the student's difference performance and the difference teaching. Based on the related theories, a student classification method based on Naive Bayes algorithm was proposed.

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With the continuous development of knowledge economy, differential teaching, as one of the new teaching methods advocated, and has new vitality in the process of education. From the point of view of teaching, the teaching of individual students can give full play to the students' different endowments. In the traditional teaching process, the differences among individuals and the differences within the individual are often ignored. The individualized development of the teaching is suppressed, and the educated students often lack creative thinking and creativity [1]. In the age of knowledge economy, this kind of creativity and creativity is a characteristic of today's talents. Therefore, school education, family education and social education all need to pay attention to the difference between students, and carry out from the perspective of individual differences[2]. As Leibniz, the German philosopher, said, "There are no two things in the world." So there are differences between students. Such as basic attributes, character, learning interest, learning style, cognitive ability and so on. In order to meet the overall development and individualized development of all the students, different teaching should be adopted in the teaching. Taking the course of computer design as an example, the gender differences show that the male students' skill operation is better than the female students [3]. The difference of interest shows that the interest of the professional students is better than that of the non-professional students. The difference of cognitive ability is manifested in

the difference of curriculum ability. Such as the speed of learning, the strength of the ability to receive, the speed of reaction, the strength of understanding, the way of perception, etc. The difference of cognitive style is manifested in the types of cognitive styles, learning environment, learning emotional elements, social elements of learning, learning strategies and so on [4].

Throughout the history of the development of education, scholars at home and abroad have a long history of research on the model of differential teaching. From the early start, the domestic Confucius put forward the "individualized" teaching method; Mo-tse put forward the "material" and "Li" teaching ideas in the process of educational practice. Foreign Socrates proposed "midwife", Platon put forward the "social needs of talented personnel. And through the excavation and training of teachers in the teaching, it can promote the development of its specialty to the maximum extent. There are also scholars who emphasize the need to implement public teaching in order to meet the harmonious development of body, virtue and wisdom [5]. Until now, teaching modes such as individualized teaching, stratified teaching and differentiated teaching advocated at home and abroad have emphasized the importance of individual difference in teaching process[6]. According to the founder of modern education theory Comenius children are classified according to the observation of character will basis and social demand from their own practice, put forward the harmonious development of talents is the school's mission and objectives. Education experts in the United States believe that "differential teaching" means that teachers make learning tasks with the needs of the students. To create a learning environment that accords with their cognition level, we should use elastic teaching grouping strategy to create a fair and equal procedure, and implement[7]. There is also a number of important information about the teaching of differentiation,such as learning atmosphere and learning interest in mining, the application of the teaching method[8].

METHODS

A Student Classification Model Based on Naive Bayes Algorithm

Compared with the decision tree model, the simple Bias classifier originated from the classical mathematical theory. It has a solid mathematical basis and stable classification efficiency. At the same time, the NBC model needs little estimation of the parameters, not too sensitive to the missing data, and the algorithm is relatively simple. In theory, the NBC model has the smallest error rate compared with other classification methods. But it's not always the case. This is because the NBC model assumes that the attributes are independent of each other. This assumption is often unfounded in practical applications. This has a certain impact on the correct classification of the NBC model. The classifier structure of the naive Bayes algorithm is the A_m attribute of the leaf node m, and the root node C represents the category. Set $D=\{C,A,S\}$ as a training sample, including student class $C=\{C_1,C_2,\mathrm{K},C_i\}$ and student attribute $A=\{A_1,A_2,\mathrm{K},A_m\}$. Let $S=\{S_1,S_2,\mathrm{K},S_n\}$ represent a collection of classified students, in which S_n represents a n student. Let $X_k=\{a_1,a_2,\mathrm{K},a_m\}$ be a student to be classified, in which each a_m represents one attribute value for the pending item X_k [9].

The student classification method based on naive Bias algorithm is based on information from past students as a sample set, which is used to construct naive Bias classifier and classify students according to student attribute information. The students who are assigned to the same class are not simply judged by their achievements, but are combined with other attributes to be classified[10]. The simple Bias classification algorithm is based on the Bias theorem and uses the probability to classify the students. From the point of view of the research content of the theory of differential teaching, this paper selects 20 attributes from 5 dimensions to analyze the differences between students. Then, the probability of student class

and the conditional probability of each attribute in each class are calculated through the statistics of students' classification and the number of students in each class. These data are all priori probabilities and provide data support for the posteriori probability. Finally, we use the calculated priori probabilities to calculate the conditional probability of each class, that is, the posteriori probability. The maximum probability value of the category is selected from it, that is, the category of the new student. At the same time, the prior probabilities are recalculated and updated. This completes a process of classification.

$P(C_i)$ is set to show the frequency of the occurrence of the student class C_i in the training sample concentration, that is, the class probability. For sample data sets, each class has a different level of students. This avoids the discrimination of students. The class probability is a priori probability. For the student classification method of naive Bayes algorithm, the probability of each category is the number of samples in the training sample set, which accounts for the total number of samples. The frequency calculation of class i students in the whole sample concentration is shown in formula (1).

$$P(C_i) = \frac{Count(C_i)}{n} \quad (1)$$

The following formula (1) is described as follows: C_i represents class i class. The $Count(C_i)$ function indicates that statistics are the number of class i students in the whole set of student samples, S. n represents the total number of the entire student sample collection of S. Let $P(A_j = a_j | C_i)$ represent the conditional probability of each attribute value of a student in the category. The calculation is based on the formula (1). It is known from the sample data set that each student can only belong to one student category. The difference between students is characterized by 20 attribute values, and each attribute has different values. Different categories of students may contain different attribute values. In this case, the probability of the different values of the same attribute in the category should be calculated by the formula (2). The value is the frequency that occurs by calculating the attribute values of the middle school student's attribute value of Aj in each category. As shown in formula (2).

$$P(A_j = a_j | C_i) = \frac{Count(A_j = a_j)}{Count(C_i)} \quad (2)$$

The formula (2) shows the following: C_i represents the class i student; A_j represents the j attribute. $A_j = a_j$ indicates that the value of the first j is a_j. The $Count_{C_i}(A_j = a_j)$ function represents the number of students with the attribute name A_j value of a_j in the class i student category. The $Count_{C_i}(C_i)$ function indicates that statistics are the number of class i students in the whole set of student samples S. Set $P(X_k | C_i)$ to indicate the conditional probability of the student X_k under the student category C_i. The probability of the student's attribute condition is calculated by the formula (2). The conditional probability of the 20 attribute values of the classified student X_k in each category is looked through. Since the algorithm is based on simple Bias, it is necessary to assume that the attributes describing student differences are independent of each other. Based on this aspect, the conditional probability of classified students in category is the product of conditional probability of each attribute value of student X_k in category C_i, and the conditional probability of each attribute in each category is precalculated according to formula (2). In the process of computing, you only need to view it from the data. As shown in formula (3).

$$P(X_k | C_i) = \prod_{j=1}^{m} P(A_j = a_j | C_i) \quad (3)$$

The formula (3) shows the following: the conditional probability of a student's attribute $A_j = a_j$ when the student X_k belongs to the category i student category. The calculation is as

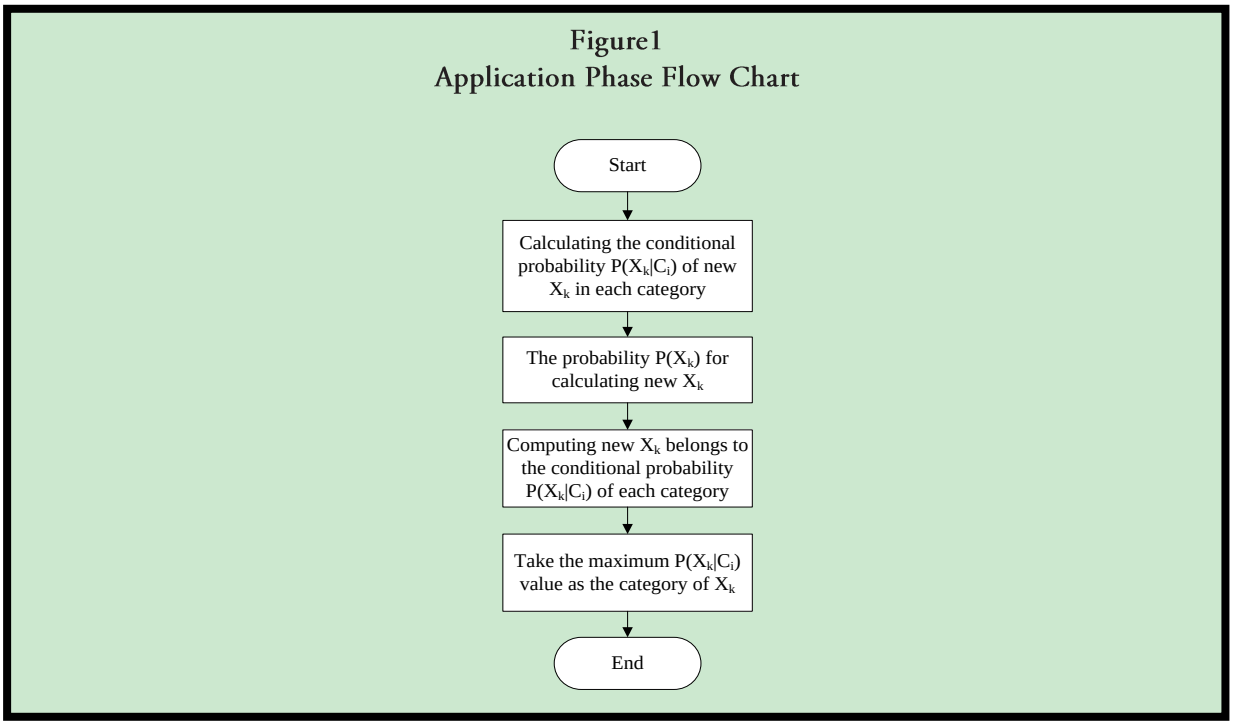
shown in the formula (2). m represents the number of attributes that describe student differences. X_k represents a student to be classified. Let $P(A_j = a_j)$ show the probability of the student attribute A_j when the value is a_j. The value is in the whole set of samples, describing the proportion of the number of students with the j attribute of the student difference value of a_j in the number of all the samples. The calculation is as shown in the formula (4).

$$P(A_j = a_j) = \frac{Count(A_j = a_j)}{n} \quad (4)$$

The formula (4) shows the following: the $Count_{C_i}(A_j = a_j)$ function represents the number of the values of the j property as a_j. n represents the total number of the entire student sample collection of S.

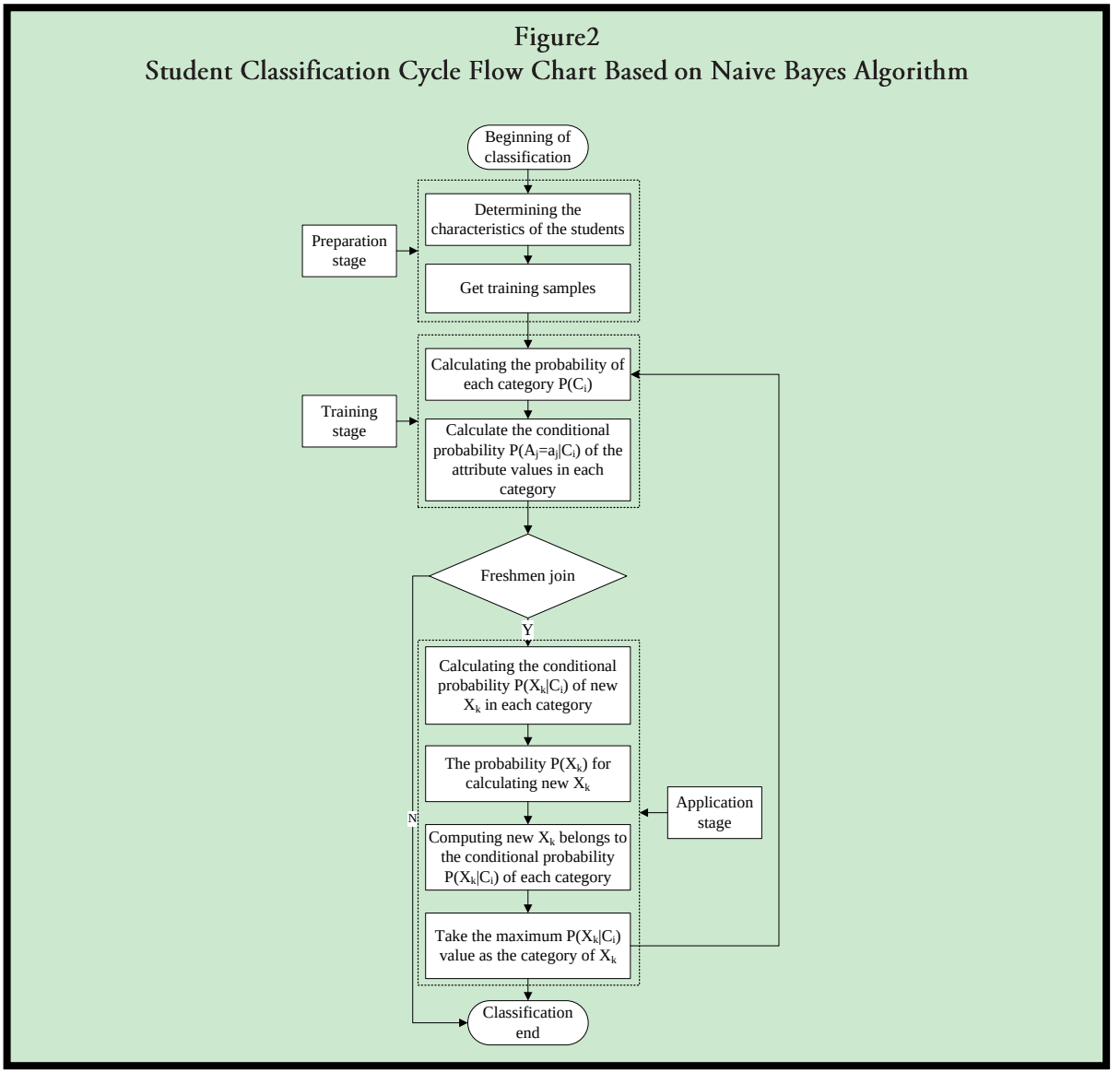
Student Classification Process Based on Naive Bayes Algorithm

In this paper, based on Naive Bayes algorithm and probability formula, a student classification method based on Naive Bayes algorithm is proposed. The whole process of classification is divided into the stages of preparation, training and application. The first stage is the preparatory stage. It is necessary to complete the determination of the key attributes, the design of questionnaire, the collection of data and the preprocessing of the data. In the process of naive Bayes based student classification, we first need to combine the theory of differentiated instruction and analyze what attributes are displayed by student differences. Which attribute can scientifically and reasonably classify the students effectively, complete the classification in the real sense, and avoid the single attribute as the classification standard. Then on the basis of the key attributes, the questionnaire was designed and the questionnaire was issued to the students. Then the key information of the students is collected. The data are preprocessed to deal with the data format that is in line with the method used in this method. Then it is the application stage. This stage is the basis of the previous two stages and is applied to the classifier trained in the second stages. At this stage, we need to input students' information to be classified, use the constructed classifier to classify students, and draw the mapping relationship between the categories of students to be classified. In this stage, we use formula (3) and (4) to calculate the conditional probability of the students to be classified under each student category, the probability of the students to be trained in training samples, and the conditional probability of the students to be classified. Finally, we calculate the largest class probability of the students to be classified in the class of students, that is, the category of the students to be classified. At this point, a classification ended. The application of the student classification method based on Naive Bayes algorithm is shown in Figure 1.



In Figure 1, the classification results of this stage are scientific and reasonable. No one's participation has avoided the influence of human subjectivity on the classification results. The general classification is the classification of students who are not in contact with the freshmen or teachers. This also shortens the time of familiarity between teachers and students in the teaching process, so that teachers can predict students' needs in advance without contact with students. This is helpful to the implementation of differential teaching. Since this method is an iterative process, after classifying a student to be classified each time, we need to use the formula (1) and (2) to retrain the data in the sample set to update the constructor. With the continuous expansion of the size of the sample, the constructor is more scientific and accurate. The whole cycle process of the student classification scheme based on the naive Bayes algorithm is shown in Figure 2.

Figure2
Student Classification Cycle Flow Chart Based on Naive Bayes Algorithm



RESULTS

Application Effect of Classification System

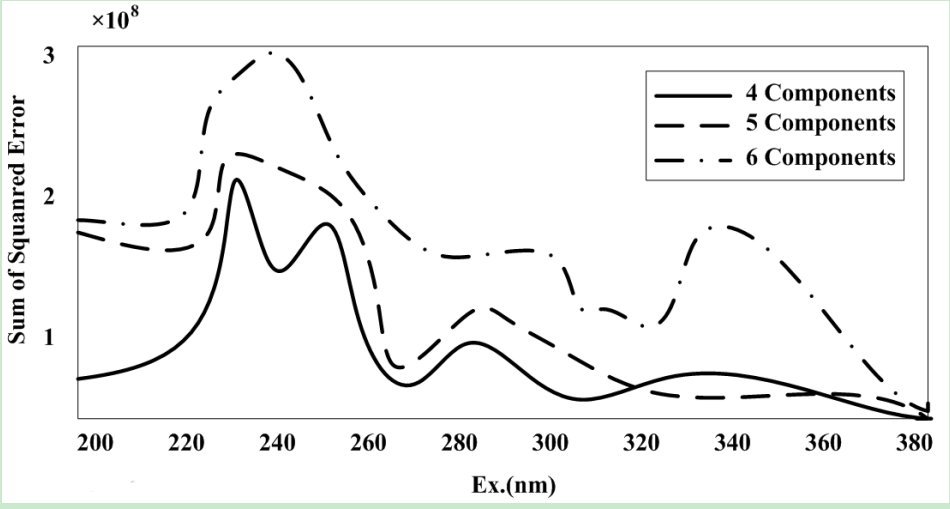
The data of this system are derived from a higher vocational and technical college. The information of 292 students, taking computer design courses as an example, was collected through questionnaire survey and access to archives (questionnaire survey, as shown in Appendix 1). The data of 200 students from 2015 levels are used as experimental samples to construct classifiers. Under the guidance of experienced teachers, these students are divided into 3 classes. The data information of 46 students at level 2016 is used for validation of the model. The collected data is stored in the above storage format. Part sample student information is shown in Table 1.

Table1
Sample Student Information

Student number / attribute	1	2	3	4	…	200
A1	0	0	1	0	…	1
A2	2	1	2	0	…	1
A3	2	0	3	0	…	1
A4	2	2	0	1	…	1
A5	2	0	2	1	…	0
A6	0	0	1	2	…	0
A7	2	2	1	2	…	0
A8	1	0	1	1	…	1
A9	0	0	0	0	…	1
A10	1	4	0	1	…	2
A11	1	3	2	1	…	2
A12	1	1	0	1	…	3
A13	1	0	3	0	…	0
A14	2	2	2	2	…	1
A15	4	7	8	8	…	6
A16	2	0	2	2	…	1
A17	2	1	2	1	…	2
A18	4	3	3	4	…	1
A19	3	1	3	3	…	3
A20	1	0	2	3	…	4

The classifier is constructed by using the sample data of 200 students collected in the system. Under the guidance of teaching experienced teachers, these students are divided into three categories, which are 62, 67 and 71. Using the above formula (1) (2), the conditional probability $P\left(A_j = a_j \middle| C_i\right)$ of the three class student and the student category probability $P\left(C_j\right)$ are obtained. The probability of class and the probability of partial attribute of the three class of students are shown in the chart below.

Figure3
The Probability of Student Categories



Through the research on the method of measuring check differences to students as the main body, and made reference from hoeks and Hua Guodong scholars' different survey content, combining with education and educational psychology related data were selected in 20 properties in 5 dimensions to describe an individual student. Then the questionnaire is used to collect data. The data collected are data from past and annual students. At the same time, the teachers of the past students are consulted, the teaching experiences of these teachers for many years and the evaluation information about the past students have been taught. Then the collected student information is preprocessed by 20 attributes. The characteristic attribute sets are determined according to the specific situation of the students, and the attributes of each characteristic are properly divided. Then the teachers who are experienced in teaching and are familiar with the students classify the students in classification to form a set of training samples, that is, the class C of the students. A number of students are included in each category C_i. Each student difference is described by the characteristic attribute set A. The above work is to prepare for the student classification based on the naive Bayes algorithm. This is the only part of the entire classification process that needs to be completed. The quality of the output results will have a great influence on the construction of the student classifier. The character attributes and the quality of training samples are the prerequisites for constructing the student classifier.

Table2
The Conditional Probability of a Student's Partial Attribute

Attribute name	Attribute code	Class of students	Number of students	Conditional probability
A1	0	First kind	30	0.484
A1	0	Second types	24	0.463
A1	0	Third types	32	0.507
A1	1	First kind	43	0.516
A1	1	Second types	38	0.537
A1	1	Third types	33	0.493
A2	0	first kind	29	0.339
A2	0	Second types	24	0.463
A2	0	Third types	23	0.380
A2	1	First kind	20	0.226
A2	1	Second types	19	0.224
A2	1	Third types	26	0.282

Analysis of Teaching Effect of Differential Classification Teaching Based on Naive Bayes Algorithm

After the end of the teaching, this article uses the method of questionnaire and contrast experiment to analyze the teaching effect from two aspects. On the one hand, the experimental class is compared and analyzed before and after the experiment. The teaching effect of the experimental class before and after the differential classification teaching based on Naive Bayes algorithm was analyzed. On the other hand, the experimental class was compared with the control class. Based on Naive Bayes algorithm, the experiment group implemented differentiated teaching based on Naive Bayes algorithm and control group, and implemented the teaching effect of group based teaching based on task driven teaching method. The experimental data are shown in Figure 4.

Figure4
Comparisons of the Data Before and After the Experiment in the Experimental Class

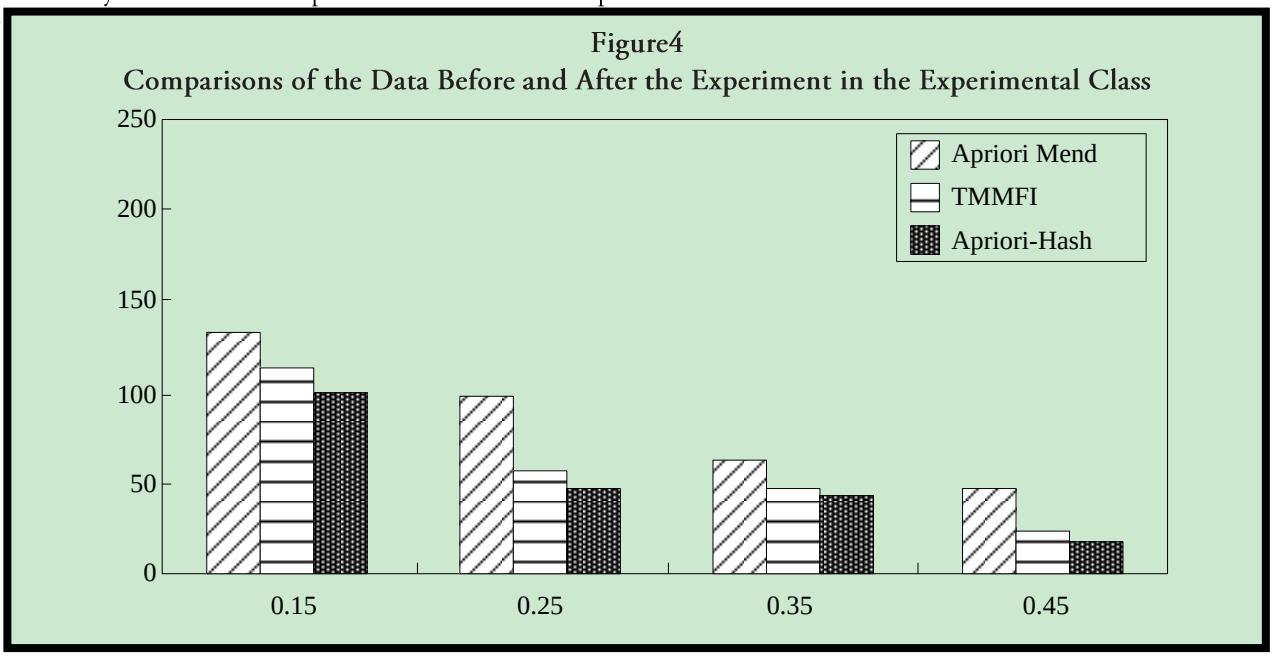


Figure 4 shows the data survey and comparison of the same class before and after the implementation of the differential classification teaching based on the naive Bayes algorithm. The front side is a survey of the group teaching based on the previous task driven teaching method. The back side shows the investigation of the differential classification teaching based on the naive Bayes algorithm. The horizontal axis indicates the main information of the questionnaire survey, and the longitudinal axis indicates the corresponding data.

DISCUSSION

With the continuous development of knowledge economy, differential teaching, as one of the new teaching methods advocated, has new vitality in the process of education. From the point of view of teaching, the teaching of individual students can give full play to the students' different endowments. In the traditional teaching process, the differences among individuals and the differences within the individual are often ignored. The individualized development of the teaching is restrained, and the educated students often lack creative thinking and creative ability. In the age of knowledge economy, this kind of creativity and creativity is a characteristic of today's talents. In this paper, the student classification method based on the simple Bias algorithm was used as a sample set of past students, which was used to construct a simple Bias classifier. Students were classified according to the information of the students' attributes. The students in the same category are not only judged by the criteria of achievement, but were combined with other attributes and classified by comprehensive evaluation. Based on Naive Bayes algorithm, a student classification system and Naive Bayes algorithm was designed and implemented based on Naive Bayes algorithm which can enhance the students' ability to cooperate.

Human Subjects Approval Statement

This paper did not include human subjects.

Conflict of Interest Disclosure Statement

None declared.

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