

The application of association rule algorithm in vocational English teaching

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Abstract. English teaching in higher vocational colleges is the basic content of modern education management. Under the development trend of economic globalization, facing increasingly fierce competition in the social environment, English teaching can improve the level of international competition and cultivate more excellent technical talents for urban construction and development. Especially after China's accession to the World Trade Organization, with the continuous expansion of economic construction and cultural publicity and opening-up, how to use English education to compete on the international stage has become the focus of education scholars in the new era. Therefore, after understanding the problems and challenges faced by English teaching in higher vocational colleges, this paper, based on the basic concepts of data mining technology and association rules algorithm, mainly studies the evaluation system of English teaching in higher vocational colleges with association rules algorithm as the core, and verifies the application effect of association rules algorithm combined with practical cases, in order to provide favorable conditions for improving the quality of classroom teaching.

Keywords: Data mining; Association rules; Higher vocational colleges; English teaching; Teaching evaluation.

1. Introduction

In the rapid development of China's social economy, the market economy system is more and more perfect, especially after the entry into the WTO, Chinese enterprises have more opportunities to show their strength in the developed international markets, and truly achieve the goal of transnational business. Nowadays, international college English talents are playing a more and more important role in social and economic development. While continuing to study traditional basic education courses, the education field has intensified the educational innovation of English subject. Due to the diversified demand for English talents in the market, not only academic talents in the traditional sense are needed, but also skilled talents. Therefore, colleges and universities all over the country should establish college English course models consistent with economic construction and development in the new era after actively exploring talent training models that meet the requirements of the development of The Times, so as to truly meet the development needs of the current market environment.[1-3]

Based on the current situation of English teaching in higher vocational colleges, English teaching in higher vocational colleges has made gratified achievements since the reform and opening up, formed a teaching system with regional characteristics, and cultivated a large number of compound talents who know English and are skilled at using it for our country's modernization construction. However, from the perspective of overall development, with the continuous development of social economy and science and technology, many problems have emerged in English teaching in higher vocational colleges, the most representative of which is that the traditional education model and educational thinking can no longer meet the needs of teachers and students. On the one hand, the traditional teaching goal deviates from the actual development. English teaching in most higher vocational colleges is mainly based on student exams, but as a unique language communication mode, communicative principles are the core goals of the education system. However, at present, English teaching in higher vocational colleges will regard national exams and relevant certificates as testing the quality of English teaching, instead of organizing practical training based on professional needs and post applications. As a result, teachers and students are too focused on the

quality of English tests and gradually ignore their own English skills. On the other hand, the traditional teaching model and application method are not scientific, and there is a disjointed phenomenon with the development of the new era. English classroom teaching in higher vocational colleges should not only expand students' English language knowledge and improve their language application ability, but also guide them to establish good learning habits and gradually form the consciousness ability of independent learning and training. However, under the background that exam passing has become the mainstream consciousness of education, higher vocational colleges have gradually formed an education pattern of exam-based, teacher-centered and classroom explanation as the main body, while practical teaching remains stagnant. In terms of document spirit or article argument, no standardized education system has been formulated in combination with the long-term development of professional students. It is difficult to guide students to cope with the increasingly competitive social environment. Therefore, universities now propose to use data mining technology and association rule algorithm to optimize and innovate during the evaluation of English education management, with the purpose of mastering more valuable data information and facilitating teachers to accelerate the pace of education innovation. In this paper, after understanding the status quo and main problems of higher vocational English teaching, according to the data mining technology and the basic concept of association rules algorithm, mainly explore the association rules algorithm as the core of higher vocational English teaching evaluation system, the final experiment proves that association rules algorithm has a unique application value.[4-6]

2. Method

2.1 Data Mining

As a specific step in the process of knowledge discovery, data mining will use specialized algorithms to quickly obtain data information. It is an interdisciplinary subject that integrates multiple technologies and relies on various technologies applied in data mining, such as knowledge representation, fuzzy set theory, neural network, etc. According to the data mining flow chart shown in Figure 1 below, the specific steps involve the following points:[7-9]

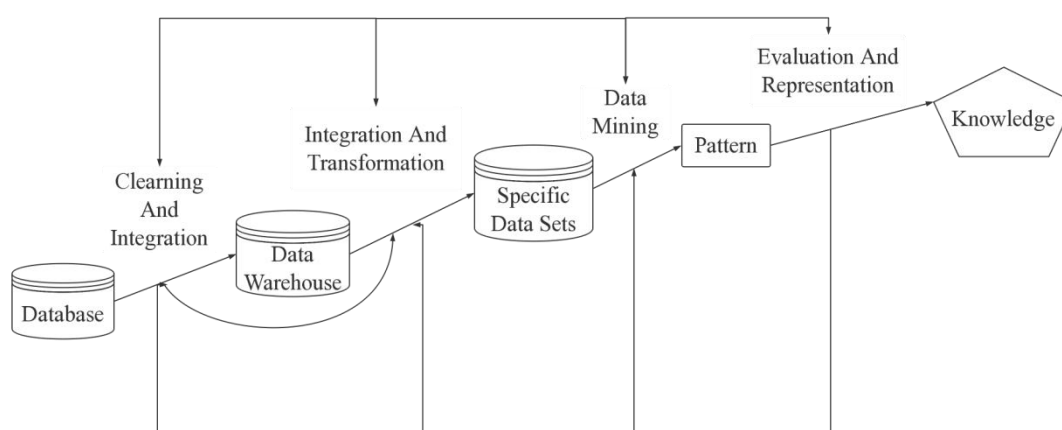


Figure 1 Flow chart of data mining

First, data selection. In the data mining for a certain problem, the main purpose of analysis should be defined, and the suitable data should be selected to facilitate the next processing; Second, data preprocessing. After identifying the original mining data, the distorted content or error information in the data set should be cleared by preprocessing to ensure that the best data mining effect can be achieved. Third, data conversion. This link is mainly to reduce the dimension of data, reduce the difficulty of data processing, and find the features of practical significance in data information, so as to reduce the problems that need to be considered during data mining. Fourth, data mining. In this stage, it is necessary to first clarify the mining task or main target, and then select and apply the appropriate algorithm according to the task, to ensure that the algorithm

application meets the basic requirements of the system users or the operating system; Fifth, model evaluation. The models discovered during data mining can be evaluated and analyzed to accurately determine whether there are redundant or irrelevant patterns. If the patterns fail to meet the customer's needs, then they need to go back to the previous stage for processing.[10-13]

2.2 Association Rules

In data mining analysis, association rule pattern is one of the most common data mining methods. In essence, association rule mining is to find the close relationship between data items, identify the set of frequently occurring attribute values from the data set, and then use these contents to create the whole process of describing association rules.

On the one hand, it is necessary to find all the trivial items set contained in the transaction database according to the minimum scale. On the other hand, strong association rules are generated based on frequent item sets and minimum reliability. The former is to efficiently find all frequent item sets in the set and provide effective basis for the performance of association rule mining, while the latter is to output specific rules according to non-empty subsets.

2.3 Teaching evaluation system

According to the accumulated experience of English teaching in higher vocational colleges, the construction of practical teaching evaluation system should focus on solving the application needs, and use B/S structure system and database-driven website technology to truly realize the system functions divided into roles. The overall system design is divided into two modules, one is the online teaching evaluation module, the other is the association rules mining module, wherein the former can effectively manage all the teaching evaluation data, such as data addition, data modification, data search, and so on, while the latter mainly uses mining technology to realize the decision support function.

In this paper, Apriori frequency algorithm is used for application processing, which mainly contains two basic properties: on the one hand, any subset of a frequent item set must be a frequent item set; On the other hand, the superset of all infrequent item sets must be infrequent item sets. This algorithm uses a hierarchical sequential search loop to complete collection mining. By scanning the database first, accurately calculating the support degree of all item sets and clarifying frequent item sets, and then using the iterative method to quickly find a new frequent item set until no new frequent item sets are produced. For all frequent item sets, an association rule is generated if the confidence cannot fall below the minimum confidence threshold for all of its non-empty subsets. The description process of this algorithm is shown in Figure 2 below:[14-15]

Input: Transaction database d , minimum support threshold min-sup ;
outult : Result = {Frequent itemsets in the transaction database are extremely supportive}
Result: = {}; $k := 1$;
C_1 : = All 1- itemsets
While ($C_k \neq \emptyset$) do
Begin
Generate a counter $\text{compk}[I]$ for each item set of C_k : = 0.
For ($i = 1$; $\leq D $; $i++$)
Begin If i -th record ($\text{TID} = i$) Support the j -th k -item set in C_k
Then $\text{Compk}[j]$: = $\text{Compk}[j] + 1$
End
L_k : = [All phase sets in C_k with support greater than min-sup]
Support Retention of Frequent Itemsets in L_k
Result: = $\text{Result} \cup L_k$

$C_{k+1} = \{ \text{All } (k+1)\text{-itemsets satisfy all itemsets whose subsets are in } L_k \}$
$K = k+1$
End do

Figure 2 Description flow of Apriori algorithm

In essence, teaching evaluation refers to the systematic detection and assessment of English teaching in higher vocational colleges according to certain teaching objectives and standards, to evaluate the actual teaching effect and the degree of realization of teaching objectives, and finally to effectively improve after value judgment, so as to improve the teaching level of professional teachers and the training quality of outstanding talents. This paper uses the algorithm to construct the structure of the student teaching evaluation system as shown in Figure 3 below:

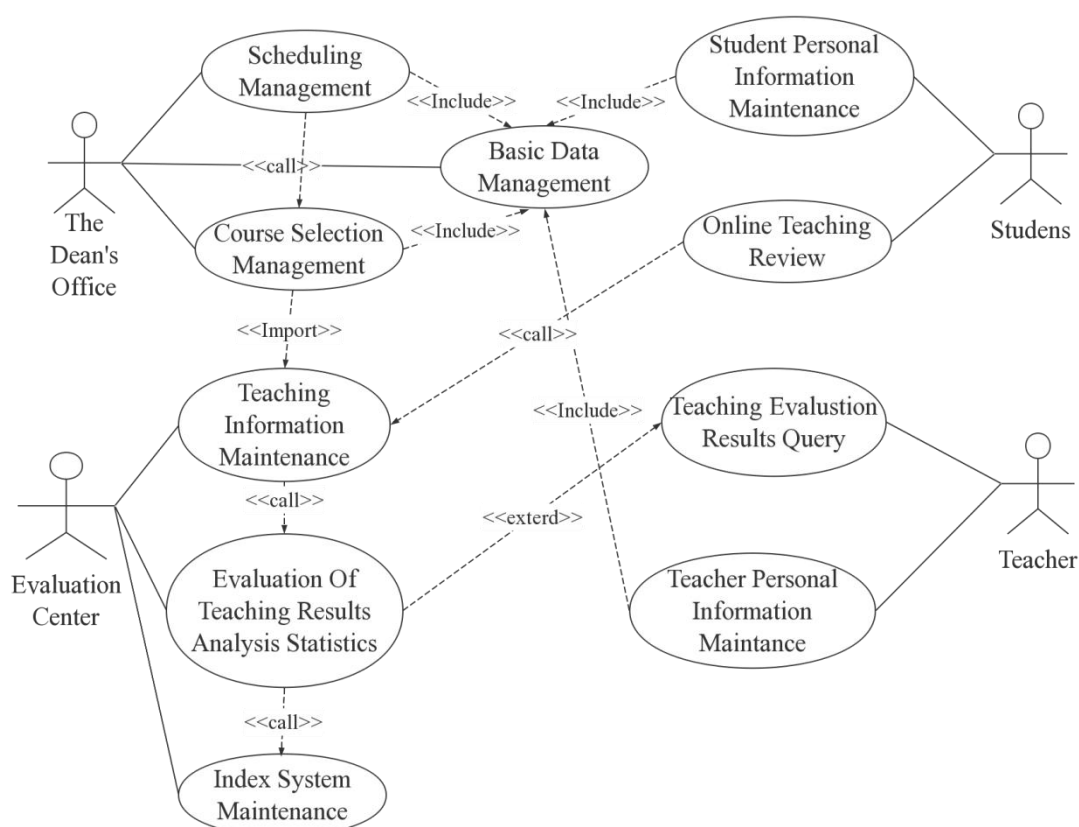


Figure 3. Structure of student evaluation system

According to the above figure, the overall design includes several modules, such as course arrangement management, course selection management, maintenance of teaching evaluation information, analysis and statistics of teaching evaluation results, maintenance of index system, maintenance of student personal information, online teaching evaluation, query of teaching evaluation results, maintenance of teacher personal information, etc. These contents are mainly controlled and processed by four system users: students, teachers, academic affairs Office and supervision and evaluation center, which can truly meet the requirements of teaching evaluation in different situations.

3. Result analysis

After clarifying the structure of student evaluation system and application algorithm, this paper takes the English teaching situation of a vocational college as beautiful, arranges professional teaching supervisors to attend lectures, and distributes professional students the teaching quality evaluation form of teachers, randomly selects 200 percent of the teacher's teaching quality

evaluation form. The evaluation information is sorted out according to the six factors of number, age, gender, professional title, educational background and rating score. Part of the information is shown in Table 1 below:

Table 1 Basic information of teaching evaluation

number	gender	age	professional title	academic degree	give marks
10001	man	27	assistant	undergraduate course	82
10002	woman	38	associate professor	doctor	95
10003	man	54	professor	master	93
10004	woman	41	associate professor	undergraduate course	91
10005	man	29	lecturer	master	92
10006	woman	37	associate professor	undergraduate course	93
10007	man	26	assistant	master	91
.....				

In order to discretize data and information, gender, professional title and educational background should be effectively specified according to the actual situation required for calculation, and the correlation between various elements of teaching staff and teaching quality should be analyzed. Taking teaching evaluation scores as an example, data mining technology and association rules previously analyzed are used to focus on the characteristics of teachers with good classroom teaching effects, in which M represents male and W represents female respectively. The titles are Z1 for teaching assistant, Z2 for lecturer, Z3 for associate professor, and Z4 for professor. E1 represents undergraduate degree and E2 represents master degree respectively. Based on this, 50 eligible records are obtained by searching the original database according to the program written. These contents are regarded as the data set of the research. Among them, the classroom teaching evaluation scores above 90 points are shown in Table 2 below:

Table 2 evaluates data sets with scores up to 90

category	M	W	A_1	A_2	A_3	A_4	Z_1	Z_2	Z_3	Z_4	E_3	E_4
number of people	26	24	4	10	22	14	4	8	30	8	28	22

Through the mining and analysis of the above data information, it can be found that the association rule algorithm plays an important role in the evaluation of English teaching in higher vocational colleges. On the one hand, it can accurately judge the relationship between the information it has mastered and the quality of classroom teaching. On the other hand, it can provide decision-making support information for teaching departments and facilitate professional teachers to actively carry out classroom teaching. Ensure that students are consistently in good learning condition. Therefore, in the face of the continuous improvement of higher vocational English teaching requirements, relevant departments and professional teachers should pay attention to the optimization and innovation of technical algorithms in the field of artificial intelligence, gradually change the traditional monotonous and boring teaching thinking, in order to contribute to talent training and social development in the new era.

4. Conclusion

To sum up, English teaching in higher vocational colleges is the basic content of talent training in modern society. On the basis of learning from foreign teachers' teaching experience and evaluation methods, professional teachers and college leaders should use data mining technology and association rule algorithm to build a brand new classroom teaching evaluation system and make full use of the large amount of data collected by the evaluation system. In this way, we can master

more valuable contents in the integrated analysis, and actively improve the traditional English teaching mode in higher vocational colleges, so as to orderly carry out practical education and improve the quality of classroom teaching.

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