Design and Implementation of Analysis System based on Data Mining

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ABSTRACT

In recent years, China's investment in intelligent education and informatization is increasing, and many English intelligent education and online education platforms emerge as the times require. These platforms have changed the traditional English education mode and effectively supplemented the traditional education, but they still have some shortcomings. This paper mainly develops and completes the functional modules of College English teaching training system based on data mining technology. At the same time, the project response theory and relevant algorithms are used to design the evaluation model and practice level evaluation model of students in translation, writing and oral English, so as to realize the function of recommending appropriate exercises for students.

Keywords: Data mining; English teaching; teaching system

1   INTRODUCTION

English is the most used language in the world. At the same time, English is widely used. More than 60% of the broadcast in the world is broadcast in English, especially in academic field. Most of the high-quality journal papers and conferences regard English as official language. English education has been improving in China, but there are still great problems in College English education in China. First, the teaching method of domestic universities in class has seriously reduced the teaching efficiency of teachers. For example, teachers do not have enough energy to train and guide the spoken English pronunciation of each student and write and review the English composition of each student. Secondly, the traditional teaching method is difficult to realize the students' independent learning of English. After the students leave the course, they do not strengthen the conditions of English learning, and they can not carry out effective training, which leads to the students' learning effect not reaching the expected goal.

With the rapid progress of science and technology, the continuous development of educational informatization and intelligence, the intelligent and information-based education forms can not only greatly save teaching costs, but also share educational resources through the Internet, and the use of artificial intelligence and internet education has become an important direction of modern education development. Nowadays, more and more universities begin to pay attention to the intelligent learning platform of English, which is used as a sup plement and training means outside the daily English education in classroom. Through the intelligent English teaching platform, students can independently obtain a large number of learning and education resources and training opportunities, which plays a great role in improving the learning efficiency of students and teachers' teaching efficiency, and also makes the learning of students and teachers easier.

2   RELATED WORK

2.1   Data mining overview

A large amount of data information brings convenience to people, but also brings a series of problems, such as: the amount of information is too large, which exceeds the ability of people to master and digest: - some information is difficult to distinguish between truth and falsity, which brings difficulties to the correct use of information; The inconsistency of information organization forms makes it difficult to deal with information effectively and uniformly, which makes the traditional database technology and data processing methods unable to meet the requirements. The rapid development of Internet also makes the network resources and information extremely rich, in which information search is really like a needle in the sea. At the same time, there are many important information behind the surge of data. People hope to be able to analyze it at a higher level and further improve the utilization of information. The cur-

rent database system can effectively realize the functions of data entry, query, statistics, etc., but we can not find the relationship and rules in the data, and can not predict the future development trend according to the existing data. Lack of the means of mining knowledge behind data leads to the phenomenon of "data explosion but knowledge is poor". This leads to a new research direction: knowledge discovery database and the corresponding data mining theory and technology research. Data mining is just to solve the shortcomings of traditional data analysis methods and to analyze and process large-scale data. Data mining can extract useful information hidden behind data from a large number of data. It is used by more and more fields, and has achieved better results, which provides great help for people to make correct decisions. Kim s , sohn w , lim d proposed A multi-stage data mining approach for liquid bulk cargo volume analysis based on bill of lading data[1]. Zou h proposed Data mining and web technology-based sports development strategy analysis[2]. chen j et al. proposed Do cryptocurrency exchanges fake trading volumes? An empirical analysis of wash trading based on data mining[3]. H wang et al. proposed analysis on the medication rule of famous old tcm doctors in the treatment of cervical spondylosis based on data mining[4]. Liu g et al. proposed data mining analysis of gene prognostic markers of metastatic skin cancer based on the elastic network method [5]. Liu y et al. proposed diabetes risk data mining method based on electronic medical record analysis[6]. Ghosh s et al. proposed Hmc, an algorithms in data mining, the functional analysis approach[7]. Liu b et al. proposed The effectiveness of herbal acupoint application for functional diarrhea: protocol for a meta-analysis and data mining[8]. Yang n proposed discussion on the application of enterprise business intelligence data analysis system[9].

This paper consists of the following parts. The first part introduces the related background and significance of this paper, the second part is the related work of this paper, and the third part is data analysis. The fourth part is example analy-sis. The fifth part is conclusion.

2.2   Significance of data mining research in CAI

In the process of using computer-aided teaching system, especially the computer-aided examination and test system, a lot of information will be generated, such as the knowledge points information of the course in the test questions; Students will have errors and practice time information when they practice; Students will leave their study time, chapters, etc. records when they study. The relationship between the knowledge points in this chapter can be found by the correlation analysis based on the record of teachers' class time and the students'

chapter practice. With the progress of teaching, the determination of this kind of partial order relationship can be extended to the knowledge points of the course. With this kind of partial order relation, the system can infer the part that students really don't grasp in the knowledge points that are wrong in the practice. According to this, the system can send the relevant learning materials to students for convenience of learning; The system can extract the questions that students are not mastered and interested in according to the error information and learning records of the students in the previous practice; Through the analysis of the current students' practice, we can use classification to predict where the students are prone to error in the chapter after the course, so as to remind teachers to pay more attention to these contents in class; The analysis of students' examination records by using constraint based association rules can evaluate the teaching quality of a teacher, or draw the teachers' attention to some problems in teaching.

In a word, the application of data mining technology in computer-aided teaching system can not only improve students' learning enthusiasm, improve their learning environment, but also play a good role in improving teachers' teaching level. It is necessary to apply data mining technology to the computer-aided teaching system to ensure the teaching quality and improve the teaching level of teachers, and also the only way for the computer-aided teaching system to develop intellectually and individually.

3   DATA ANALYSIS

3.1   System overall design

In order to develop the system quickly and efficiently, and meet the requirements of students and teachers as much as possible, the system adopts c/s architecture to design. The overall task of the development of College English teaching training system is to realize the goal of teachers and students to complete teaching tasks and self-training through the system. Therefore, the system design is divided into two parts: teacher end and student end.

The teacher side mainly includes teaching and practical training, which is divided into three parts: curriculum management module and homework management module to view the students' completion. The student side includes teaching and training modules. The corresponding functions are composed of seven parts: course selection module, course management module, homework completion module, review module of approval results, student level evaluation module, practice level evaluation module and student practice recommendation

module. The core of this system is to improve the teaching efficiency of teachers and improve the learning efficiency of students[8]. In the training module provided by the system, teachers can share the courses designed and edited by themselves and practice into the server database through the system. After completing the daily teaching tasks, students can obtain the training resources provided by other teachers on the server through the system training function, and carry out the self selection and training, and the system recommends the corresponding level of training to assist the students to train, Thus, we can improve ourselves from all aspects and achieve good learning effect.

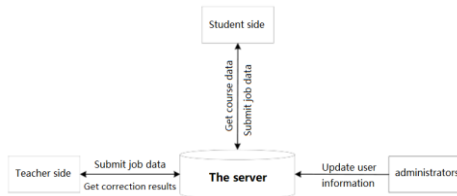First, the data transmission model is introduced, as shown in Figure 1.

Fig. 1. Data transmission model

The teacher side of the system is the provider of teaching resources and training resources. The server is responsible for the storage of information and provides the function of marking. The students are the users of course assignment data and marking service, and the administrator is the user information manager of the server side.

3.2   Teacher side teaching module

In the College English teaching and training system, the teaching module of the teacher side is one of the core functions of the system. On the one hand, in the traditional teaching method, teachers need to buy the topic or design the topic through word when they arrange the teaching assignment, and then print and distribute it to each student. The whole process is complex and extremely time-consuming, which greatly reduces the teaching efficiency of teachers, and also brings heavy burden to teachers. On the other hand, after the students finish their homework, all the homework should be submitted to the teacher, and all the homework should be corrected by the teacher[9]. Due to the teacher's limited energy, it is impossible to conduct detailed review and guidance for each student's homework, which leads to the students' training and learning can not achieve the ideal effect. The teaching module designed in this system is designed based on the daily teaching behavior of teachers, which can reduce the workload of teachers as

much as possible without affecting the teaching quality, making the operation of the system more suitable for teachers' teaching activities [10]. The specific functions are shown in Fig 2.
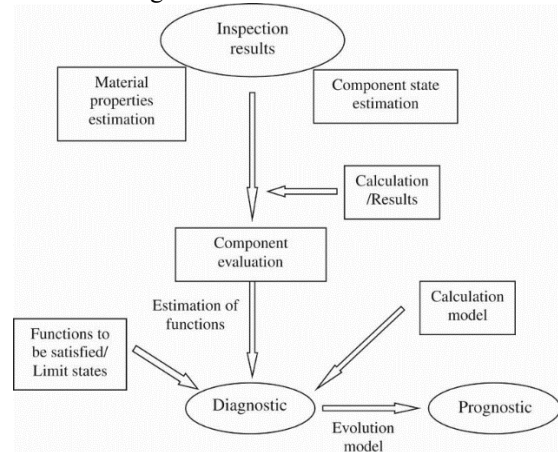

Fig. 2. Teaching module at the teacher end

3.3   Teacher training module

In traditional English teaching, due to the lack of environment conditions of language communication and the bad influence of traditional teaching mode based on class, students' enthusiasm and learning effect are not ideal. Therefore, this system solves this problem by designing the training module. In the teacher training module, teachers publish the training courses and exercises designed by themselves to the server, which is the resource of the students' training practice, which creates conditions for the students to carry out targeted training. The specific functions are shown in Figure 3:
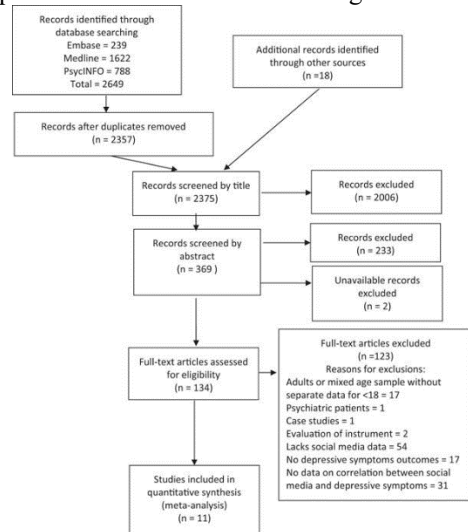

Fig. 3. Teacher training module

3.4   Ttudent teaching module

Students as the implementation object and main body of teaching activities, the system according to the behavior characteristics and habits of students in daily learning, design and develop student teaching module. Through this module, students can get corresponding training and guidance, and effectively consolidate the review teaching results.

In daily teaching activities, the reasons for students' low learning efficiency and poor teaching effect are: under the traditional education mode, teachers teach to a large number of students in class, and students are in a passive position in daily teaching activities for a long time, which leads to poor learning enthusiasm, However, teachers do not have too much time and energy to make one-to-one guidance for students, so that the teaching effect is relatively poor. The teaching module of the student end is designed according to the students' learning habits. The goal is to provide students with a convenient way to complete their homework, and provide students with good guidance through the homework intelligent marking system. The structure of student teaching module is shown in Figure 4
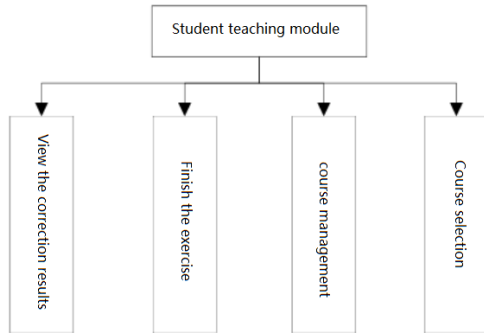

Fig. 4. Student teaching module

3.5   Ttudent training module

The purpose of the design of student-side training module is to provide students with the conditions of autonomous learning. Generally speaking, after completing daily teaching tasks, students need to consolidate what they have learned by completing some exercises. Through the student training module, students can get the training courses and assignments shared by all teachers. According to their own situation, students can choose the corresponding training courses for training. Through the training module for students to create conditions for autonomous learning, to a certain extent, mobilize the students' learning initiative, effectively improve the students' learning efficiency. The specific functions are shown in Figure 5
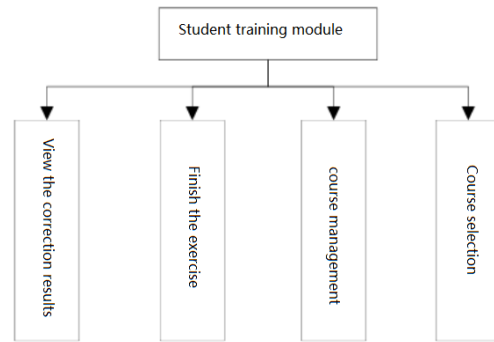

Fig. 5. Student training module

4   EXAMPLE ANALYSIS

Based on social needs, this paper studies the research and effective connection methods of middle and senior vocational English teaching. Due to the gradual improvement of the education system, knowledge education at all levels has received due attention and attention. Based on the social development and social needs of globalization, exploring the effective connection mode of English Teaching in secondary and higher vocational colleges has become one of the urgent problems to be solved in the direction of current educational research. Improving the English application ability of senior high school and higher vocational students based on social and market needs is one of the effective ways to enhance their competitiveness in the talent market.

$$\|\Delta u_{k+1}(t)\|_\lambda \le \breve{\rho}^2 \|\Delta u_{k-1}(t)\|_\lambda + \frac{1-\breve{\rho}^2}{1-\breve{\rho}} m_5 d \le \cdots \le$$

$$\breve{\rho}^k \|\Delta u_1(t)\|_\lambda + \frac{1-\breve{\rho}^k}{1-\breve{\rho}} m_5 d$$

(1)

$$(E(t) - M_2 C)\Delta \dot{x}_{k+1}(t) = f(t, x_d(t)) -$$

$$f(t, x_{k+1}(t)) + B\Delta u_k(t) - (\Gamma_{p1}C + M_1 C +$$

$$M_2 C)\dot{x}_d(t) + \Gamma_{p1}C\dot{x}_{k-1}(t)$$

(2)

$$\Delta x_{k+1}(t) = \int_0^t P^{-1}(\tau)(f(t, x_d(\tau)) -$$

$$f(t, x_{k+1}(\tau)))d\tau + \int_0^t P^{-1}(\tau)B(\tau)\Delta u_k(\tau)d\tau -$$

$$\int_0^t P^{-1}(\tau)\left(B(\tau)L(\tau)\dot{C}(\tau) +\right.$$

$$\left.B(\tau)L(\tau)C(\tau)\right)\Delta x_{k+1}(\tau)\, d\tau - \int_0^t P^{-1}(\tau)\, d_{k+1}(\tau)$$

(3)

However, from the two-stage teaching objectives, English Teaching in secondary and higher vocational colleges aims to improve students' English communication ability. As a part of the curriculum system of graduate education, how to make a clearer positioning and corresponding reform to increase its contribution to graduate training is a problem worthy of in-depth thinking.

Like other courses, they serve the overall training objectives of postgraduates and are the basis of professional and career development. Therefore, Graduate English education should be directly related to the cultivation of students' professional and vocational ability, and serve students' professional learning and professional development. Graduate English teaching should adapt to graduate students' knowledge, cognitive ability and thinking level. Academic English for graduate students is a language course based on professional content.

We should encourage teachers with "dual expertise" who can truly and independently combine professional teaching and language teaching to engage in academic English Teaching for graduate students. In addition, in order to systematically carry out relevant teaching methods and linguistic research, exchange teaching materials and experience, scientifically guide teaching, and focus on the long-term planning and development of the curriculum. They must not only be proficient in academic English theory and practice, but also have discipline and professional depth, heavy teaching workload and more investment in teaching materials.

"Academic English has gradually become an important part of English Teaching in the field of higher education. Therefore, it must not only comply with the global cutting-edge development trend of language teaching, but also be adjusted according to different teaching contexts and students' needs," he said. Instead of entering the technical level of specific teaching materials and teaching methods at the beginning, we should first consider the overall teaching concept of the whole course. Teaching thought is the overall thinking to achieve the teaching goal. How to achieve the teaching goal to the greatest extent is the basic requirement to determine the design idea. As a part of teaching design, English teaching thought should include a brief analysis of teaching objectives, the selection and organization based on teaching objectives, the selection and matching of teaching materials and the composition of teaching links.

5   CONCLUSION

With the wide application of computer aided instruction system in recent years, more and more attention has been paid to the defects existing in the traditional computer aided instruction system, For a while, all kinds of new technologies have been applied to computer aided teaching system. In this paper, data mining technology is applied to English teaching system, and a complete set of process is given, which provides a scientific method for the development of computer teaching system to intelligent and personalized direction.

REFERENCES

[1]   Kim S , Sohn W , Lim D , et al. A Multi-stage Data Mining Approach for Liquid Bulk Cargo Volume Analysis based on Bill of Lading Data[J]. Expert Systems with Applications, 2021.

[2]   Zou H . Data Mining and Web Technology-Based Sports Development Strategy Analysis[J]. Arabian Journal for Science and Engineering, 2021.

[3]   Chen J , Lin D , Wu J . Do cryptocurrency exchanges fake trading volumes? An empirical analysis of wash trading based on data mining[J]. Physica A: Statistical Mechanics and its Applications, 2021(8):126405.

[4]   H Wang, Zhu Z , Wang P , et al. Analysis on the Medication Rule of Famous Old TCM Doctors in the Treatment of Cervical Spondylosis Based on Data Mining[J]. Journal of Clinical Medicine Research, 2021, 2(1).

[5]   Liu G , Li C , Wei W , et al. Data Mining Analysis of Gene Prognostic Markers of Metastatic Skin Cancer Based on the Elastic Network Method[J]. Mathematical Problems in Engineering, 2021.

[6]   Liu Y , Yu Z , Yang Y . Diabetes Risk Data Mining Method Based on Electronic Medical Record Analysis[J]. Journal of Healthcare Engineering, 2021, 2021(6):1-11.

[7]   Ghosh S , Lu Y , Nowicki T . HMC, an Algorithms in Data Mining, the Functional Analysis approach[J]. 2021.

[8]   Liu B , Yan B , Jiang H , et al. The effectiveness of herbal acupoint application for functional diarrhea: Protocol for a meta-analysis and data mining[J]. Medicine, 2021, 100.

[9]   Yang N . Discussion on the Application of Enterprise Business Intelligence Data Analysis System[J]. Electronic research and Application, 2021, 5(4):4.

[10] Liu Dongmei, design and implementation of measurement business management analysis system based on data mining [D]. Tianjin: Tianjin University, 2015