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A Mobile English Learning Platform Based on Data Mining and Personalized Recommendation

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SUMMARY: *Many areas have been successfully covered by data mining (DM) to date, and its application in education is also on the rise every day. However, it is used almost nowhere in online English classes. With the spread of mobile devices such as the Internet and smartphones, people's learning, work and life have all changed significantly. Smartphones have surpassed Web pages and laptops to offer students basic hardware support for anytime, anywhere, and all-around mobile learning. Mobile learning is open and unrestricted; therefore, it supports self-study. With the spread of online English classes, a large number of data on online learning have been gathered. Therefore, we need to apply DM techniques in online learning. DM technology can assist in detecting problems of online learning through data analysis. It can find problems in the online learning environment and offer suggestions for enhancing the quality of online learning. DM has been added to the new innovations in online English teaching and has received little attention. DM refers to problems in the current online English teaching that we wish to address. According to the mining results, an analysis of the present online English teaching has been conducted. Provide some references and support for the construction of an online English-teaching platform to promote the development of online English teaching. It can provide links to online teaching of other subjects as well. Based on the above investigation and calculation, the use of the English digital learning platform has increased the efficiency of learning by 26%.*

KEYWORDS: *DM, College English Teaching, English Digital Learning Platform, Personalized Recommendation*

1 Introduction

The process of learning English is relatively slow. If the students are not good at basic English in their studies and go directly to learning advanced English, then the study will be excluded and the results will be poorer. Students learning online only have a vague idea of their own English level and do not know what level they are at. Teachers need to lead the learning for the students. Online teaching will use its own knowledge and experience to offer students some independent guidance on how to learn English in steps and apply correct values to guide students.

DM is to find relevant information and knowledge in various data, and it is a deep-level

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analysis of data. Chen T believes that although data mining (DM) technology has been used extensively in recent years to this day, there are still some problems with it, such as poor-quality data, privacy protection, and integration of various data sources. As a relatively new area of research, the DM field has been studied widely [1]. Idlahcen F and others have indicated that in the field of gynecological oncology, the application of data mining and machine learning methods is necessary to obtain precise medical information about gynecological malignant tumors from large-scale clinical data, and the significance of this work has been growing with the progress of "precision medicine" [2]. Theodorakopoulos L has conducted an in-depth study of the current situation of big data management engineering and built an all-encompassing big data management knowledge system based on real cases, challenges and future research directions [3]. Farid S has many basic references for predicting stock returns based on DM [4]. Mahdi A S has studied the current situation of graph neural networks (GNN) in social media from the perspective of data mining, examined their strengths for handling graph-structured data and modeling the spread of news, and listed related technical methods, representative datasets and future research directions [5]. Mutemi A has studied the problems of computer network security, applied data mining and machine learning algorithms, and compared the actual performance of various preprocessing methods and classification techniques in intrusion detection systems [6]. Alshuaibi A systematically reviewed related studies to evaluate the roles of many data mining technologies in network attack detection and prevention, and proposed corresponding improvements to strengthen network security [7]. The above studies have provided more particular interpretations of DM. However, it is not part of the college English courses, and it does not discuss the construction of an English digital learning platform.

Various multimedia platforms in network technology can be employed to build a communicative teaching environment for English study in the network environment. Given the large volume of content and the complicated structure of college English, there will be differences in the teaching of college English. Based on students' learning abilities and the time available for class teaching, the content can be modified to ensure effective teaching and thus shows the flexibility and variety of college English teaching channels on the network link. Qi F used a data mining algorithm based on deep learning for online teaching evaluation and employed the BERT-LSTM model to analyse the sentiment of subjective assessments [8]. Teng F proposed a personalised Chinese language and literature teaching method (EF-PCL2T) based on enhanced fuzzy Apriori association rule mining and a genetic algorithm to improve students' participation and teaching effectiveness through fuzzy association rule mining and personalised teaching strategy optimisation [9]. Chen C used data mining technology to analyse the learning status of students in online English classes and built an intelligent classification model based on long short-term memory (LSTM) networks to improve the accuracy and efficiency of learning status recognition [10]. Wang N developed an English translation model based on edge computing, and through fuzzy semantic optimal control technology and reinforcement learning methods, significantly improved the accuracy and semantic similarity of translation [11]. Vallis C thinks that the educational design model for higher education needs to fully consider the cultural background and resource constraints in cross-cultural adaptation to ensure its effectiveness in different cultural environments [12]. Liu X studied the online college English teaching method based on big data learning analysis and put forward a multi-manifold learning data analysis model (MLDAM). Through classification tree learning and an iterative training process, the quality of online English teaching and student experience have been enhanced [13]. Li H put forward some problems with college English and proposed solutions to them. It was hoped that the improved computer technology could better assist in college English teaching and foster a sense of

self-study [14]. Research on the Construction of College English Digital Learning Platforms has been carried out extensively. DM is not in the list.

Because of differences in students' psychology and study habits, they perform differently when using online platforms to learn English. The network environment can extend the time and space of learning, as well as provide a larger quantity of diverse materials and teaching methods. English classes offer some choices for students at university. Students can set their own learning goals and ways to study, choose when to study, plan how they will study in terms of their own interests and strengths, as well as how well they can adapt to learning. Highly personalised learning in a network environment can greatly inspire students to learn, thus addressing the issue of providing all-round learning that is difficult to realise in face-to-face teaching.

2 Application of DM in Online Learning

2.1 DM technology

Data is a type of other information material that requires a new way of processing to achieve strong decision-making, perception and other processing capabilities [15]. Many enterprises and platforms have gathered data; however, it has not been analysed. Big data processing has attracted many people's interest because the data are timely. However, it is not easy for the company and the platform to build and apply a big data platform promptly. Data mining (DM) can provide data and also obtain related information that serves as a reference for the next stage of development of online education platforms.

The Application of data mining technology in online learning is widespread and deep. For example, based on the analysis of students' learning behaviour data, specific learning patterns and interests of individual students can be identified to offer tailored learning paths and resource recommendations for all students. Learning behaviour analysis will be applied to study how often students learn, how long they study, etc. By analysing the students' learning behaviour at different times, it can be seen that most of them study at night. Change the time that the platform distributes resources and enhance students' study efficiency.

Data mining technology can be used to forecast the results of learning. Based on the previous learning data of students, a machine learning model will be built to forecast their future test results and other learning progress. For example, a deep learning model can be used to analyse the data of how far students have exercised, predict the final grades they will obtain in exams, and recommend customised learning plans or study-help classes for students who are falling behind in school.

Optimisation of course content is another type of application for data mining technology. According to the students' comments on their studies and habits after each class, we can determine how much they have learned in that class. For example, if it is determined that students spend too much time studying a particular chapter and have a high error rate in the exercises, it can be concluded that the content of that chapter needs to be revised to improve teaching efficiency.

2.2 Online learning data model

The two levels of online learning are the data processing layer and the hardware layer. The Application Layer is for a group of students of online learning platforms [16]. Big DM technology at the application layer can provide different access permissions and various functions based on specific requirements to enhance service quality. A suitable person can be used in the Data Processing Layer to analyze the student behaviour data collected by the

Application Layer through Big Data technology. By analysis and processing, hidden rules and patterns in the data can be found to explore the construction of learner models, domain models and software learning models. Increase investment in student education. The two types in the hardware configuration layer are storage devices and security devices. A good person can use high-tech equipment to operate the devices in a scientific way. The reduced power consumption of the hardware system enhances stability and fault tolerance of the system, as shown in Figure 1.

Figure 1: Data Model Analysis in Online Learning

Security and Privacy Protection for Data at the Data Processing Layer are required. Since the online learning platform has collected and used a large amount of student data, ensuring the security and privacy of this information has become a serious problem. High-end encryption technology will be used to ensure the security of student data during both transmission and storage on the platform. At the same time, a strict data access control mechanism will be established for the platform to limit access to sensitive data only to authorised staff. Regularly carry out data security checks on the platform and address any security problems that arise during such examinations promptly.

Quality analysis of the data is also required in the Data Processing Layer. To ensure that the collected data is valid and reliable, cleaning and verifying of this data need to be done on the platform. Clean the data to remove any duplicate or invalid entries, and confirm that the remaining data is both correct and consistent. Add a data-quality monitoring mechanism for the platform at a later stage and promptly deal with any fluctuations in data quality.

Another type of development for online learning data models is multi-source data fusion. Students' learning data in practice may originate from various places and ways, such as learning management systems, online forums, social media, and so on. Integrate the above multi-source data to create an all-encompassing student learning profile. For example, by integrating students' learning behaviour data from the learning management system with their discussion behaviour data in online forums, one can more accurately identify their interests in learning and any deficiencies in their learning.

2.3 Online education applications supported by data

The two types of data in the online education system are student data and teacher data. Strengthen the learning effect of students, enhance the service level of the platform, and promote all-round development of the platform. First, in the online learning environment, personalised course resource applications will be built to offer better services for students. Online learning platforms enable students to view videos selectively, and this is not the same as offline learning. Respect all the different needs for development among students. Based on the test results and the student's study progress in the program of study, recommend some

courses. Secondly, the places of the information points listed below are the main kinds of learning based on the online learning platform. Applications built for video courses mainly consist of subtitle-based jumps to video clips of interest for students. Labels and information cards are added to the course vocabulary to help students learn better. Thirdly, in order to enhance students' knowledge, knowledge cards and exercise banks are used to gradually build up their knowledge. Teachers' wisdom works aim to improve the quality of teachers' teaching. At different times, according to how well the students have learned, modify the lesson plan and raise the level of the curriculum, as shown in Figure 2.

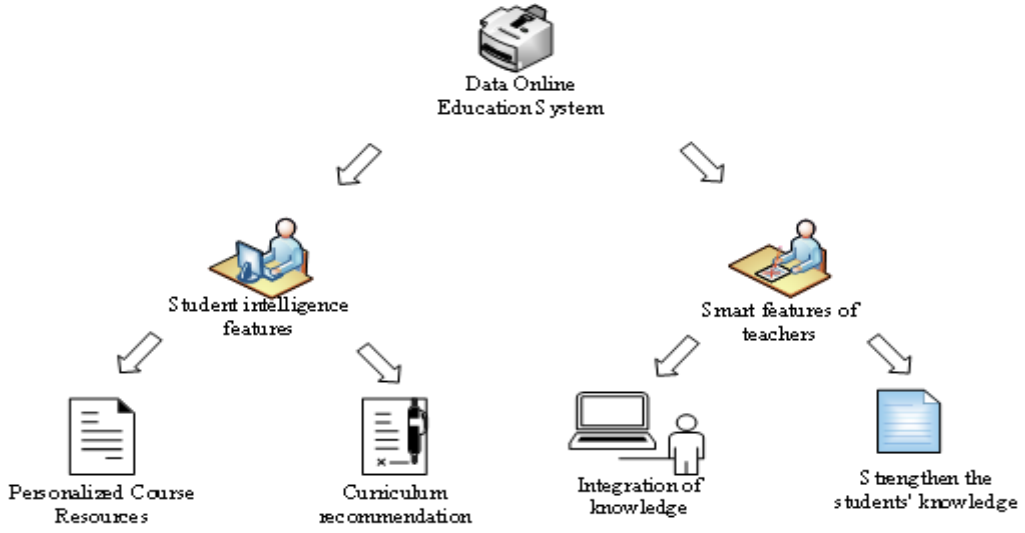

Figure 2: Online Education Applications Based on Data

Intelligent Tutoring Systems are the direction of development for data-supported online education applications. By observing how students study and learning their knowledge at the same time, intelligent tutoring systems can provide customised support and feedback for individual learning. For instance, when students have difficulty with a certain knowledge point, the intelligent tutoring system can automatically offer related learning materials and exercises, provide detailed problem-solving suggestions and feedback based on the students' answers, and so on. The Learning Path in an intelligent tutoring system can be adjusted according to the students' progress, enabling them to study at their own pace.

Support for social learning is also included in the data-driven online education application. Analyze students' interactive behaviour in the learning community to recommend suitable group-learning partners or discussion topics for students on the platform, and promote interaction and collaboration among students. Based on the students' learning interests and current learning ability, the platform will automatically create learning groups and distribute different discussion tasks for these groups. Thus, students can learn from and help one another in the group to enhance their own learning.

Teacher professional development is also a necessary part of the data-supported online education application. Analyze teachers' teaching behaviour and students' learning feedback to offer teachers some suggestions and training resources for improving their teaching. For example, based on the feedback that students have given about the various modes of teaching, we can offer some improved teaching methods and approaches for the teachers. The platform can also offer teachers some online training courses and teaching materials to help improve the quality of their teaching over time.

3 The construction of the English digital learning platform

3.1 Mobile learning and English study

Mobile learning has overcome the limitations of time and space in traditional teaching [17] and can be flexibly carried out by students in their free time or during fragmented periods of time; it is particularly suitable for college students with a busy course schedule. Smart terminals are available to all students; they will provide different levels of content according to individual study progress and interests, adjust the learning path accordingly, and leverage the instant-response functions of mobile platforms to access necessary materials and feedback in time for better learning results.

However, there are also serious problems in actual application. On the one hand, the device screen is small and the operating area is limited; therefore, it cannot be used for long-term reading or continuous task completion. On the other hand, if there is network instability, resource loading may be interrupted and the continuity of learning will be compromised. Some mobile learning resources also have loose structures, fragmented content and lack of systemisation; therefore, problems such as unclear learning goals and knowledge gaps may easily occur.

Therefore, in the construction of an English digital learning platform, one needs to consider all sorts of factors simultaneously, such as interface interaction, content organisation and network optimisation, strengthen multimodal integration and task chain design, and enhance the user experience. In the future, immersive technologies such as augmented reality (AR) and virtual reality (VR) will be gradually introduced to create a real context, and in combination with artificial intelligence, dynamic learning-path recommendation will be achieved to enhance the relevance and effectiveness of learning.

3.2 Establishing a multimedia network assisted teaching model

Multimedium network-assisted teaching mode can be used to enhance the efficiency and interest of teaching in college English classes. Add multi-media materials to the teaching process, such as videos, sounds and animations, and provide various types of targeted language input resources both inside and outside the classroom to enhance the interactivity and intuition of learning.

Specific applications include: uploading standardised listening materials and oral practice tasks to the online platform for students to arrange their own study time and conduct repeated training; using voice interaction tools to realise online oral dialogue and instant feedback to improve students' actual expression abilities; in writing teaching, the platform supports essay submission, online correction and tracking of feedback to help students identify problems and continuously improve their writing performance [18].

To ensure the quality of teaching, periodically assess how well the students are learning through improvements in their grades, learning behavior, etc. Based on the evaluation results, teachers can dynamically adjust the structure of the content and task difficulty, and update the teaching resource library to enhance the pertinence and practicality of platform resources for continuous teaching optimisation.

(3) The Basic Functions of Building an English Mobile Learning Platform

To better support mobile English learning activities, all functional modules of the system should be developed to cover teaching management, learning resource collection, collaborative learning, system security, etc.

Teaching management should be added to the platform; that is, course information release and notification push functions need to be implemented for teachers to ensure that students

are promptly aware of changes in teaching. The learning resource module needs to offer functions for content publication, downloading and offline access to meet the personalised learning requirements of students and support fragmented time usage. As the main users of the platform, the learning behaviour of students needs to be supported at the system level. Function modules of the platform should include online courses, phased tasks and exercises, and personalised resource recommendations and learning suggestions based on students' behaviour data and learning progress to improve the efficiency of knowledge assimilation.

Support multiple forms of interaction on the platform and provide corresponding functions. In addition, introduce team collaboration for students, a real-time discussion area, group project management tools, and a question-and-answer channel with records of both student-teacher and student-student questions and answers to improve the timeliness and relevance of teaching feedback. In terms of the user interface, the platform should use a modular navigation model to display classified content and simple operation paths clearly; support themes, interactive modes, etc., and meet the various usage habits and visual preferences of different users.

Ensure the security and privacy of the data in the system at the same time. Encrypt transmission and use access control and identity authentication mechanisms in the platform to prevent leakage of user information and comply with data privacy regulations. The Structure of the Platform should also be scalable and maintainable. Modular Design and Standard Interface Reservation can be used to support later additions of intelligent evaluation, AI recommendations, or multimodal resource expansions. Add a log management and performance monitoring module for the back-end of the platform to ensure that it can run stably over a long period and support updates and improvements to the system. As shown in Figure 3, the four modules of the system are: teaching content management, user behaviour tracking, interactive communication and security management; they form a complete closed-loop support system.

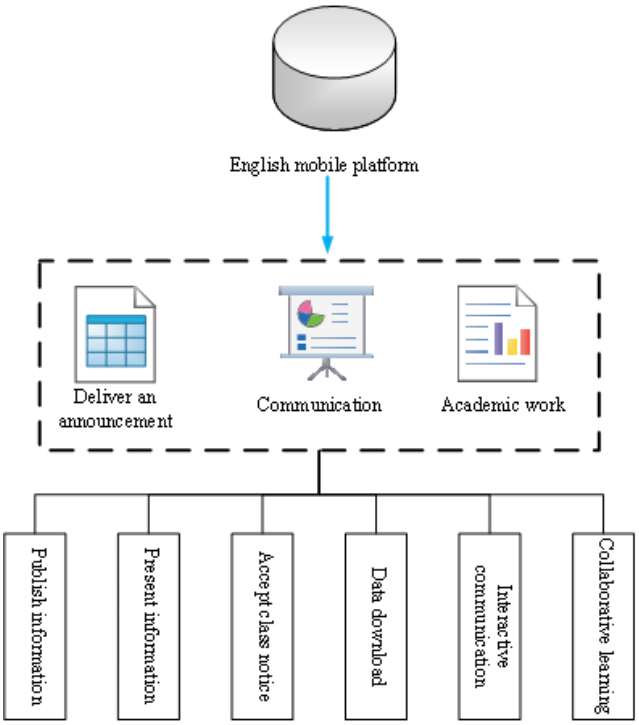

Figure 3: Basic Functions of Building a College English Mobile Learning Platform

4 Application design of DM and personalized recommendation in English learning platforms

4.1 Integration and Design of Generative Learning Resources

During learning, students' confusion, emotions, and ideas about the questions they have all become learning materials and growth paths. Big data technology can be used to view and process students' efficient learning resources, and these resources are organised into test question banks [19]. Teachers can use big data analysis technology in the actual Design process. Productive learning resources in a learning environment have collected various media and channels to provide a foundation for subsequent analysis and data processing. Teachers can use the above channels to learn about the students' studies. Offer specific solutions to certain problems, design teaching plans, and create a more participatory simulated voice-communication environment for English learning. It can help make the learning of English more authentic and boost students' English learning abilities.

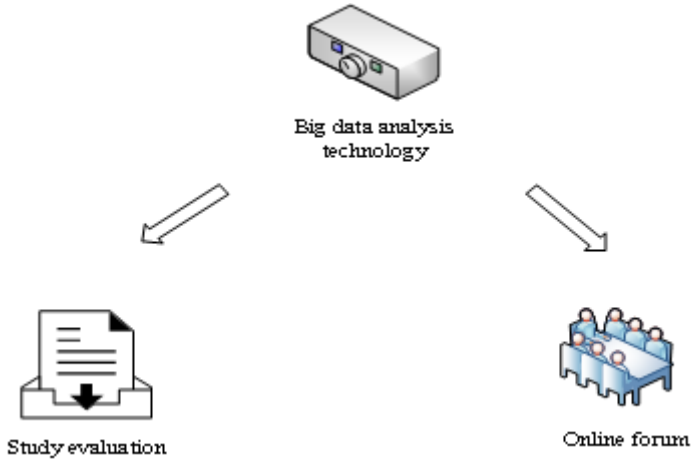

Figure 4: Mining and Developing Preset Learning Resources

Develop a flexible system for adding new generative learning materials. Regularly add exercises, cases and explanations based on the staged learning data of students to strengthen training and make personalised recommendations in areas where students have accumulated misunderstandings or weak knowledge points. For example, if the platform detects that multiple students frequently have problems such as structural confusion or redundant expressions in their English writing, it can push corresponding writing case analyses and modification suggestions.

In the practice of a particular university English teaching platform, teachers regularly organise students' study notes and discussion content to form a list of frequently asked questions and a library of answers, and use them as one of the platform's resources for students to consult and refer to at any time. Thus, the students better understood the writing tasks and improved the quality of their works.

4.2 Relevant learning resource retrieval and linking services

In addition to the loaded and generated learning resources, all relevant learning materials can be obtained by targeting searches for learning objectives and plans [20]. When creating the corresponding learning resource modules in the college's public English teaching resource area, network technology support should be used. The best English course resource database

for colleges and universities in China has been combined with the English online forums of all these colleges and universities. It has created a large amount of related and extensive data, accurate classification records, a strong learning resource search service, semantic exchange, learning resource analysis, etc., as shown in Figure 5.

Figure 5: Associative Learning Resource Retrieval and Linking Services

In order to enhance the resource acquisition efficiency of students in the English learning platform, the system will add semantic search and personalised recommendation functions. Students can express their specific needs in natural language, such as "practice writing sentence patterns of the subjunctive mood", and then, based on semantic understanding technology, the system will identify keywords and learning objectives to connect with relevant resources precisely and enhance the relevance and accuracy of search results.

Based on the learning behaviour records, historical click paths and task completion status of students, the recommendation module generates user profiles and dynamically recommends resource content that suits their current learning stage and interests to reduce the frequency of invalid searches and improve platform stickiness.

At the same time, the system organises and tags all learning materials. Resources are divided and organised according to attributes such as language skills (e.g., listening and speaking), types of knowledge (e.g., grammar and vocabulary), difficulty levels, and content formats (e.g., audio, video, text), and are assigned multiple label indexes for conditional filtering and quick positioning to reduce students' resource selection effort.

The platform can integrate resources from different systems to combine high-quality resources of school teaching platforms, digital libraries, open course libraries and English social communities. Students can get information from several places in one window and do their studies conveniently; at the same time, the platform will be more comprehensive.

4.3 Personalized recommendations

In their study, students are always eager to use all available educational resources that suit their learning styles and will enhance the effect of learning. Personalized recommendation refers to actively promoting learning resources based on students' basic information, preferences and needs to help students select suitable learning resources, thus reducing the problem of blindness in choosing learning materials due to an incomplete knowledge system and improving learning efficiency.

Most of the mobile learning systems at present still list the course learning materials statically. Students have different professional backgrounds, and therefore also different ways of thinking in their studies, preferences for learning, and learning requirements; thus, their demands for learning materials are diverse. However, the list of learning materials and the order of learning activities students see when they visit are generally the same; thus, students need to choose learning materials independently. The design of the system did not take into account the individual differences and preferences of the students, and as a result, it was not possible to actively push personalised knowledge to improve their learning efficiency.

To improve the effect of personalised recommendations, optimisation of the personalised recommendation algorithm needs to be carried out. Combine algorithms for collaborative filtering and content-based recommendation to improve the accuracy and relevance of recommendations, etc. At the same time, deep learning technology can be used to investigate students' learning behaviours and preferences more deeply and improve the recommendation results further.

The other type of personalised recommendation is a user feedback mechanism. Gather students' feedback data on how satisfied they are with the recommended materials and how often they use them, etc., to improve the algorithm for suggestions. For example, if students are not very happy with a certain kind of recommended material, the system can change the recommendation plan to reduce the promotion of that type of material.

More precisely, some custom recommendations are also provided by all kinds of data. For example, according to the students' learning progress, recommend learning resources that are suitable for their current level; based on the students' interest preferences, recommend related learning content; and based on the students' learning styles, recommend learning resources that match their learning styles. Multiple dimensions of personalisation can be used to address the various learning needs of individual students more precisely, thereby enhancing academic performance.

5 Construction of the collaborative filtering algorithm in the English digital learning platform

Recommendations are made according to the similarity of objects or students. Y is a student and P is a project. The number of students Y and P are denoted by i and j, respectively. Student Y's assessment of item n is recorded as m, and this is generally the assessment information directly shown to the student. Finally, the results of the algorithm are used to score the system. Pearson correlation coefficient is:

$$sim(u,v) = \frac{\sum_{i-1}(y_{ij} - y_i)(y_{ij} - y_j)}{\sqrt{\sum_{i-1}(y_{i,j} - y_i)^2} \cdot \sqrt{\sum_{i-1}(y_{i,j} - y_i)^2}} \quad (1)$$

$$sim(u,v) = \frac{y_i}{\sum_{ij} y^2} \left| y_{ij} - y_i \right| \tag{2}$$

Cosine Similarity is:

$$sim(u,v) = \cos(u^i, v^j) = \frac{u \cdot v}{\left\| u^i \right\| \cdot \left\| v^j \right\|} = \frac{\sum_{i-1} (y_{ij} - y_i)(y_{ij} - y_j)}{\sqrt{\sum_{i-1} (y_{i,j} - y_i)^2} \cdot \sqrt{\sum_{i-1} (y_{i,j} - y_i)^2}} \tag{3}$$

$$sim(u,v) = \sum_{i-1}^{j} \sum_{j-1}^{i} y\left(y_{uv} p \middle| (i_1 j_n), p^2\right) \tag{4}$$

Cosine Similarity is Biased. In order to correct for the bias, the following formulas have been derived for correcting cosine similarity:

$$sim(u,v) = \frac{\sum_{n-1} (y_{mn} - y_n)(y_{mn} - y_m)}{\sqrt{\sum_{n-1} (y_{nm} - y_n)^2} \cdot \sqrt{\sum_{i-1} (y_{mn} - y_m)^2}} \tag{5}$$

$$sim(u,v) = \frac{\sum_{i \in 1} y_{mn} y_m}{\sum_{i \in 1} y_{mn}} \tag{6}$$

$$sim(u,v) = \sum_{i \in j} y_{mn} \tag{7}$$

The function calculation of the collaborative filtering recommendation algorithm for students after similarity calculation is as follows:

$$Y = \frac{1}{P} \sum_{i-1} y^2 \tag{8}$$

$$Y = \frac{1}{\sum_{i-1} \left[sim(y, y^i) \right]} \sum_{i-1} sim(y, y)^2 \cdot y \tag{9}$$

$$Y = y_{ij} + \frac{1}{\sum_{i-1} \left[sim(y, y^i) \right]} \sum_{i-1} sim(y, y)^2 \cdot (y_{ij} - y_i) \tag{10}$$

$$Y = \sum_{i-1}^{j} y\left(y_1 \middle| 0, p_i^2\right) \tag{11}$$

The first aggregation function is a simple average. Filter-based methods are used to find the past behaviour of target students, learn about the articles they like in more depth, and obtain preference information. Find students in the system with similar interests to the current student. Formulas and algorithms are used to find the similarities among students.

$$Y=\sqrt{\frac{1}{|P|}\sum_{i\in j}\left(y_{m1}-y_{n2}\right)^2} \tag{12}$$

$$Y=\frac{1}{|p|}\sum_{n\in 1}^{n}\left(y_{n1}-y_{m2}\right)^2 \tag{13}$$

$$sim(u.v)=\min\frac{1}{2}\|p\|^2+y_{uv}\sum_{m,n=1}^{n}\left(y_{UV}\right) \tag{14}$$

In actual practice, it is often the case that different students have the same evaluation for the same item. However, the scores are not the same.

$$sim(u,v)=\frac{\sum_{i=1}\left(y_{uj}-y_{vi}\right)\left(y_{ui}-y_{vj}\right)}{\sqrt{\sum_{i=1}\left(y_{ui}-y_{vj}\right)^2}\cdot\sqrt{\sum_{i=1}\left(y_{vj}-y_{ui}\right)^2}} \tag{15}$$

Calculate the similarity of students, and then build a neighbourhood set based on this similarity.

$$Y_{uv}=\frac{\sum_{1\in mn}p_{mn}y_m}{\sum_{1\in n}py_{mn}} \tag{16}$$

$$Y_{uv}=\sum_{1\in n}p_{mn}y_n \tag{17}$$

$$Y\left(p\middle|y^2\right)=\sum_{n=1}^{m}p\left(y_1\middle|0,p_n^2\right) \tag{18}$$

Finally, based on the quantity of recommended requirements, suitable projects will be recommended to the students and thus the entire recommendation process will be concluded.

6 Combine the collaborative filtering algorithm with the actual application results

In order to learn more about the structure of traditional English courses and students' evaluations of these courses, surveys and interviews were conducted with teachers and students at four general universities. The four schools are A, B, C and D. The four components of the content in the questionnaires are generally divided into course identification, teaching methods, learning conditions and the teaching methods used by teachers. Based on the above four contents, the deficiencies in students' needs for the current English curriculum teaching were identified. The size of the sample is 400 people, and the results of the survey are shown in Table 1.

Table 1: Direction of improvement for students in the current English curriculum teaching.

	A	B	C	D
curriculum identification	56%	68%	51%	47%
teaching methods	49%	53%	64%	52%
teaching devices	44%	61%	67%	49%
Learning situation	53%	59%	48%	53%

Among them, the direction that students need to improve in the current English course teaching is: curriculum identification, teaching methods, teaching devices, and specific statistics of the learning situation, as shown in Figure 6.

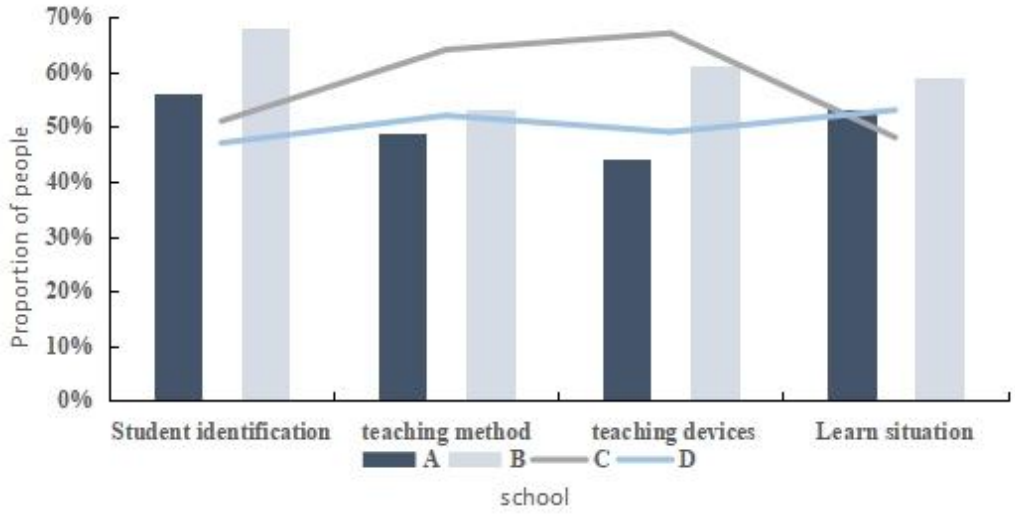

Figure 6: The Directions of Improvement for Students in the Current English Curriculum Teaching

As shown in Figure 6, there are still many problems and methods in English teaching courses in the classroom. It has not used modern classroom teaching. This mode of teaching is teacher-centred and develops students' English-speaking skills through communication and other skills. This old-fashioned way of teaching cannot provide outside stimuli for students in college English classes. It only introduces the process of learning English and fails to address the actual application circumstances for English learners. Teachers frequently use the same teaching methods. Therefore, the students are unable to learn well and are thus not achieving good academic results.

In order to examine the impact of the English digital learning platform on students, this paper conducted a questionnaire survey and tests at four comprehensive universities to assess the recognition and evaluation results of the university students for the construction of the English digital learning platform. The particular results are as follows.

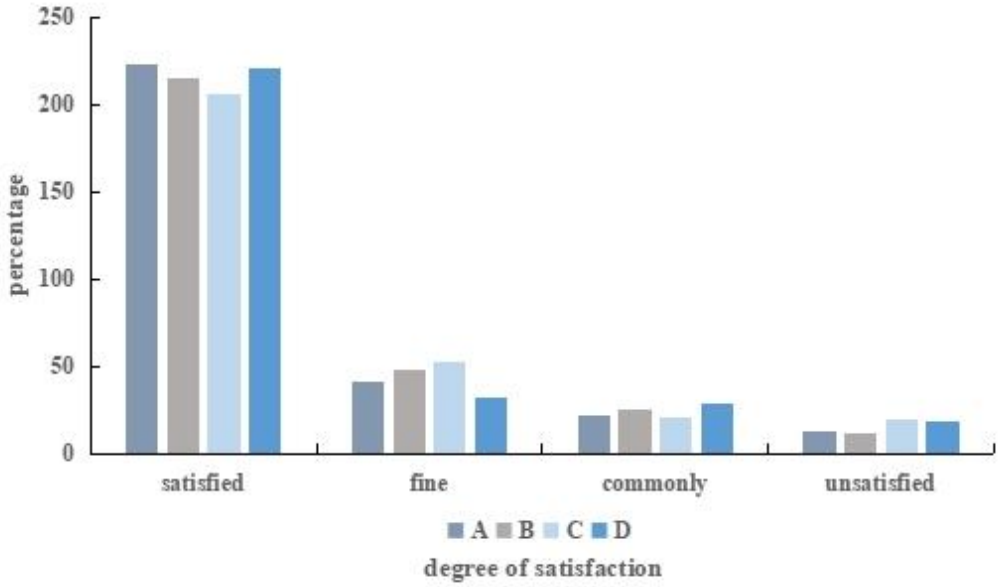

Figure 7: The effect of English Digital Learning Platforms on Students' Learning of English

As shown in Figure 7, the students of the four colleges and universities still have a relatively high degree of familiarity with the English digital learning platform, and most of them are satisfied. Among them, the students at School A and School D were the most satisfied with the English digital learning platform. There were only a few students with low satisfaction and disinterest. E-learning had both a larger quantity and a better quality of learning content. Traditionally, the teaching model for college English has been teacher-centred; students have only learned English through observation of their lessons. Online courses have been free of this defect. It has abundant learning materials and ways of teaching, so students can lead the English-learning effort.

A survey on the satisfaction of a general university under the two teaching models was conducted, and the results are presented in Figure 8.

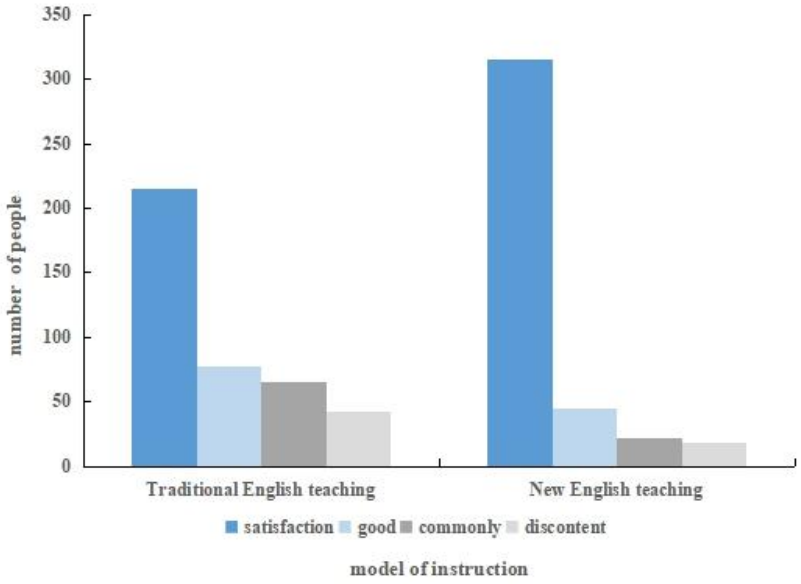

Figure 8: Comparison between Internet teaching and traditional English classroom teaching

Compared with the two English teaching models, traditional English is relatively old-fashioned, and students have a low and fluctuating sense of recognition for traditional teaching.

The Growth of all things has a process. Figure 9 and Figure 10 show the specific statistics of the comparison of students' curriculum identification, teaching methods, teaching devices and learning conditions in the new English teaching model and the traditional English teaching model under the college English digital learning platform in 2021 across the four comprehensive colleges and universities.

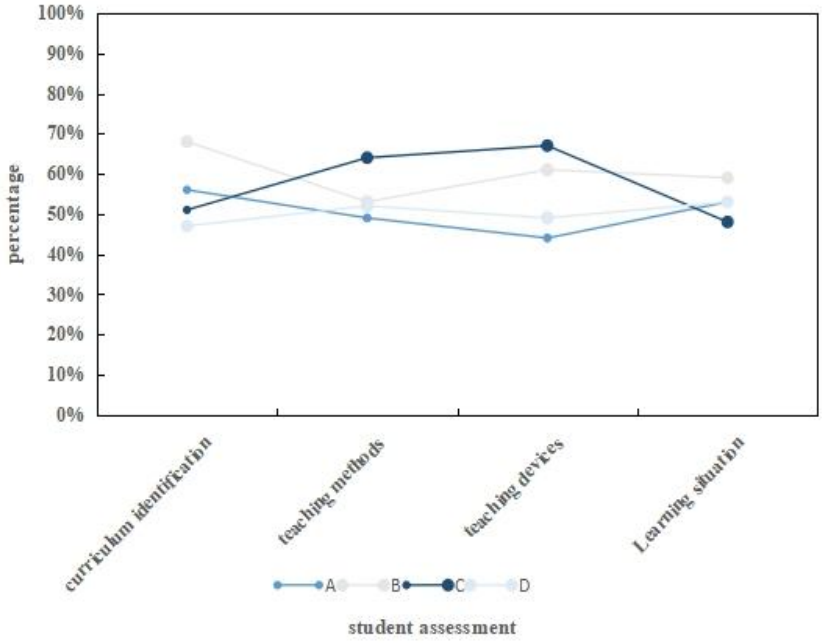

Figure 9: Traditional English Teaching

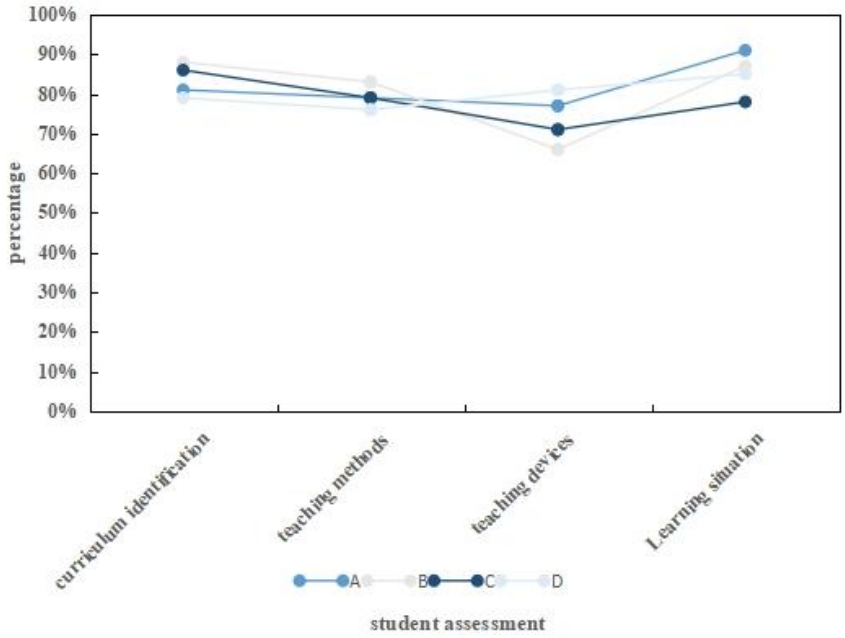

Figure 10: New English teaching mode

As shown in Figures 9 and 10, in 2021, the students of these four colleges and universities felt that their enthusiasm for class was rising, and the general trend was also one of continuous growth. Students at B and C colleges and universities had a low recognition rate of teaching methods. It is possible that the new way of teaching English is not yet familiar to the students.

7 Conclusion

Combining mobile learning (ML) and data mining (DM) technology in the field of online training for colleges and universities has been done. Data mining technology can be used to explore students' learning behaviour in the classroom more deeply, such as how often they consult information points, which learning paths they choose, and how long they study. Based on the above data analysis, we can help students learn the course materials more effectively and provide teachers with relevant information to enhance the quality of their teaching more precisely. With the rapid development of the Internet and the widespread use of 4G mobile networks, many people have come to use smart mobile phones to obtain information at present. Given the large-scale network resources, personalised mobile learning has gradually gained acceptance and popularity among more and more learners as a new mode of study. Digital Learning Platform (DLT) technology can be used to study how much learners are actually using these online platforms. Many colleges and universities have used online learning platforms to implement teaching reform and improve the quality of education this way. Although the functions and designs of the online learning platforms in the various colleges and courses are somewhat similar, many deficiencies still need to be rectified. For example, the personalised recommendation function of the platform, the diversity of learning resources, and the friendliness of the user interface all need to be improved further to better meet the learning demands of all students.

In addition, the e-learning platform based on the digital learning platform will also need to address more technical problems in the future implementation and development. For example, how to ensure the security and privacy of data during processing of a large volume of student personal information; how to enhance the stability and response speed of the platform to meet high demands for concurrent access; how to further optimise the personalised recommendation algorithm for higher accuracy and relevance of recommendations; and how to incorporate new technologies such as artificial intelligence (AI), virtual reality (VR), and augmented reality (AR) to provide students with more diverse and immersive learning experiences. The solutions to these technical problems will directly impact the user experience and teaching efficiency of the platform, promote continuous development and innovation in the field of network training for colleges and universities, and in short, mobile learning combined with data mining technology has introduced new opportunities and challenges for network training in colleges and universities. Continuously optimise and enhance the digital learning platform to meet the evolving learning needs of students better, improve teaching quality and learning outcomes. In the future, with continuous progress in technology and deeper applications, we are beginning to believe that personalised mobile learning will be one of the trends in education, offering students a more efficient, convenient and customised learning experience.

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