Design of English Mobile Online Education Platform Based on GPRS/CDMA and Internet

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Abstract. In order to increase the number of real-time online people on the education platform and realize the comprehensive promotion of English mobile online education, an English mobile online education platform based on GPRS/CDMA and the Internet is designed. Set up online education resource push module, mobile partner search module and English vocabulary learning module respectively to improve the hardware design of English mobile online education platform. On this basis, configure the GPRS/CDMA model, analyze the system's education needs by driving the Internet serial port, realize online education services at all levels, and combine relevant application components to complete the design of English mobile online education platform based on GPRS/CDMA and the Internet. The experimental results show that under the influence of GPRS/CDMA and the Internet system, the number of real-time online people on the education platform has significantly increased, which is in line with the practical application needs of comprehensively promoting English mobile online education.

Keywords: GPRS/CDMA model · Internet · Mobile online education · Resource push · Partner search · Network serial port · Number of people online · Educational services

1 Introduction

Learning, as a way to acquire knowledge and exchange emotions, has become an indispensable and important content in people's daily life [1]. With the gradual increase of Internet penetration, the mobile Internet era has given birth to mobile education based on personal electronic devices such as mobile phones and tablets. The network economy goes up, and the networked and mobile life habits are formed; With the rise of the middle class, people's awareness of paying has been awakened, and education demand and consumption have been upgraded; Lifelong learning and the increasing demand for knowledge in cross cutting fields promote the continuous extension of the time users need to learn. The scale of online education users has continued to expand, the market recognition of online education has gradually improved, and the requirements for the breadth and depth of online courses have increased; Users attach importance to the effectiveness of learning and constantly put forward new requirements for online learning experience [2]. Language, as an important tool for communication and understanding,

L. Yun et al. (Eds.): ADHIP 2023, LNICST 548, pp. 203–218, 2024.
https://doi.org/10.1007/978-3-031-50546-1_14

is the prerequisite for learning the latest information and advanced knowledge from countries around the world. College English education products have a strong momentum of development in China, but the research on product forms is still in its infancy. Therefore, this research takes English online education platform as a case to explore the methodology of mobile online education platform design.

Throughout the history of English education, English classes in schools are centered on teachers, textbooks and classrooms, which belong to the initial form of English education. VIPKID education system adopts a class switching teaching mode, which has the characteristics of strong feedback before class, full interaction in class, and focus on review after class. The courses include preview videos before class, summaries of important knowledge points, online real-time communication and interaction with teachers, homework completion after class, and weekly Q&A, which comprehensively plan students' preview and review, and more attract students' interest. The foreign teachers of VIPKID English are pure North American foreign teachers, which can let students cultivate in the original pure English environment for a long time, gradually complete the digestion of teaching knowledge and practice pure English pronunciation and thinking. The education system from the perspective of flow first conducted a research on the flow dimension of students' online education platform [3]. Then, comparative analysis of typical cases and user research were carried out to understand the learning needs and pain points of students' online learning, and parents' attitudes and needs to children's online learning through user interviews; Understand students' learning habits and problems in online learning through natural observation; Collect more sample data through questionnaire survey, further analyze students' online learning habits and learning experiences, and build an impact model of students' online learning willingness. However, the above two types of education systems can only carry a limited number of online people, which does not meet the practical application needs of comprehensively promoting English mobile online education.

GPRS is the English abbreviation of General Packet Radio Service. It is a new bearer service developed from the existing GSM system. Its purpose is to provide GSM users with packet data services. GPRS allows users to send and receive data in the end-to-end packet transfer mode without using the network resources of circuit switching mode. Thus, it provides an efficient and low-cost wireless packet data service. The theoretical bandwidth of CDMA can reach 300Kb/s, and the current actual application bandwidth is about 100Kb/s (bidirectional symmetric transmission). TCP/IP connection is provided on this channel, which can be used for Internet connection, data transmission and other applications [4]. CDMA wireless data communication system provides users with a high-speed, always on, transparent data transmission virtual private data communication network. Mainly aimed at the application of power system automation, industrial monitoring, traffic management, finance, securities and other departments, the CDMA network platform is used to realize the transparent transmission of data information. At the same time, considering the networking needs of various industry departments, the virtual data dedicated Internet is realized on the network structure. The current CDMA mobile network can support a variety of colorful data communication services, so the mobile data communication system based on CDMA network can fully meet the communication requirements of various data applications. In order to solve the problem of

fewer people online in the VIPKID education system and the education system from the perspective of flow, an English mobile online education platform based on GPRS/CDMA and the Internet is designed. According to the online education resource push module, mobile partner search module and English vocabulary learning module, the application module of English mobile online education platform is constructed to improve the learning interest of learners. On this basis, configure a GPRS/CDMA model, combine it with internet serial port driver to achieve interconnection with the internet, analyze learners' educational needs, and complete the design of an English mobile online education platform.

2 Application Module Design of English Mobile Online Education Platform

The design of the application module of the English mobile online education platform needs to improve the real-time connection between the online education resource push module, the mobile partner search module, and the English vocabulary learning module. This chapter will study the specific design method of each component structure.

2.1 Online Education Resource Push Module

The online education resource push module is responsible for extracting English mobile online education information and normalizing it. Through the mining and analysis of learners' learning data, such as learning duration, frequency, learning motivation, viewing the detailed usage proportion of words and other data as input, the education platform host can locate learners' learning style through clustering algorithm.

The definition of student learning style feature vector in the online education resource push module meets the principles shown in Table 1.

Table 1. Characteristic vector of students' learning style

Index	Interpretation	Value type
Learning duration	Average browsing time per word in the past week	Float
Number of words	Average number of words learned per login in the past week	Int
Browsing method	In the past week, expand to view the proportion of detailed usage of words	Float
Login frequency	Number of user logins in the past week	Int
Learning motivation	User's motivation to use the selected software	Int

When different features are arranged together, due to different expressions of features, the online education resource push module needs to normalize the data and map it to the range of - 1–1, so that indicators of different units or scales can be compared and weighted.

For example, Formula (1) traverses every data in the feature vector of English mobile online education, and subtracts the sample mean first $\overline{W}$, divide the difference by the sample variance E, you can easily standardize data through formulas. The essence of data normalization is a linear transformation, which will not change the numerical ranking of the original data, but can improve the performance of English mobile online education data.

$$q = \frac{W' - \overline{W}}{E} \tag{1}$$

W' Represents the standard value of the English mobile online education feature vector provided by the online education resource push module.

After the online education resource push module obtains the user's learning style feature vector, it can use GPRS/CDMA and the Internet to divide the data points with "similar" characteristics in the data set into a unified category, and finally generate multiple learning styles. Using GPRS/CDMA and Internet, the steps are to select randomly χ As the initial cluster center, the distance between each educational resource object and each sub cluster center is calculated (usually using Euclidean distance), and each object is allocated to the nearest cluster center [5]. Cluster centers and objects assigned to them represent a cluster. Each time a sample is allocated, the cluster center of the cluster will be recalculated according to the existing objects in the cluster. This process will be repeated until a certain termination condition is met - when no objects are reallocated to different clusters, or the cluster center of no cluster changes again, the sum of error squares is locally minimum.

The solution of the cluster center coefficient of the online education resource push module meets the following expression:

$$R = \sum_{\alpha=1}^{+\infty} \frac{|\beta q - \overline{y}|^2}{(\delta - 1)^2 \times \sqrt{\chi}} \tag{2}$$

Among them, α cluster parameters representing English mobile online education information, β represents the recalculation coefficient of online education information samples, $\overline{y}$ represents the average value of educational information samples, δ indicates the cluster information marker coefficient of English mobile education data.

In the English mobile online education platform, the application idea of the online education resource push module is to divide the given data information sample set into multiple cluster organizations, so that the points in the cluster are as close as possible, and the distance between clusters is as large as possible.

It can be seen from the above contents that the module can acquire and push the Learning styles feature vector of learners through GPRS/CDMA and Internet technology. This mobile network based technology can achieve fast and real-time data transmission and push, and ensure that learners can obtain educational resources suitable for their Learning styles in time.

2.2 Mobile Partner Search Module

The realization of the mobile partner search function of English mobile online education platform is an extremely complex achievement. It needs to customize a unique learning

scheme for learners, and constantly modify it according to the changes of users' internal dynamic development factors, such as the improvement of learners' cognitive level, so that it can adapt to learners' personalized needs. At present, common search modes include association rule based search, collaborative filtering search, hybrid search, etc.

Among them, collaborative filtering search is the most classic type of search algorithm, which is mainly divided into three types. The first is user based collaborative search, the second is item based collaborative search, and the third is model based collaborative search. The first two algorithms are similar. The first is to find the similarity between users and find out the resources learned by similar learners to recommend to target learners, which can help learners with different professional backgrounds and even different abilities to recommend learning resources [6]. The second algorithm calculates the similarity between different resources, predicts the score of similar resources with high similarity according to the target learner's score of existing resources, and recommends several similar resources with the highest score to users. However, the diversity of this recommendation is obviously poor, and it is generally applicable to small recommendation systems. The third type, model-based collaborative search algorithm is the most mainstream collaborative search type at present. It uses the idea of machine learning to model and solve the problem of association between learner characteristics and resource characteristics, mainly using clustering algorithms, classification algorithms, matrix decomposition, neural networks, and cryptic semantic models.

The complete mobile partner search module structure is shown in Fig. 1.

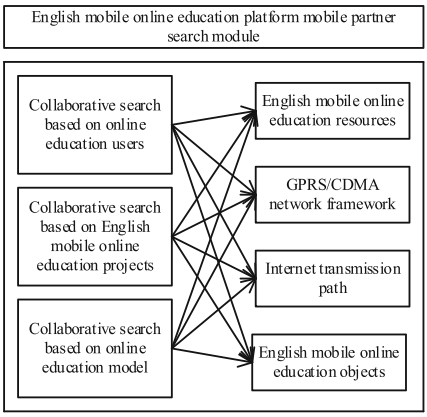

Fig. 1. Structure of mobile partner search module

The essence of the collaborative search mechanism of the mobile partner search module is "collaboration and mutual assistance". The system takes other users' English education data information as a reference, and uses it as a judgment basis to infer the new users' state and learning tendency. Judging from real life experience, the platform host can give the assumption that similar high learners who collect new word lists have similar English vocabulary and learning ability [7]. So for mobile online education system, the application value of collaborative search mechanism is reflected: mining

learning partners for users can recommend the new words collected by learning partners to each other, and improve the learning efficiency of users.

With the increase of the number of people using the education platform and the accumulation of the data volume of English mobile online education resources, a well-designed mobile partner search module can not only save unnecessary storage space, help managers effectively store and manage data, but also help improve the software computing speed and reduce the occurrence of software failures. In the process of database design, it is necessary to fully understand the inevitable relationship between entities and follow the one-to-one design principle to reduce the occurrence of maintenance problems.

The mobile partner search module can discover learning partners with similar learning interests and tendencies to learners through collaborative search mechanisms, promote mutual assistance and cooperation among learners, provide functions such as recommending new words among learning partners, and improve learning efficiency and interactive experience.

2.3 English Vocabulary Learning Module

In the English mobile online education platform, the English vocabulary learning module will generate more meaningless symbols and function words for the processing of education resource information, so it is necessary to remove stop words, stem extraction, word form restoration and other operations first. First, use Internet functions to segment English mobile education text data, and process the information into the smallest unit that can be processed by computers. Secondly, the NLTK package is also used, in which the list of stop words is used to remove function words (conjunctions, prepositions, articles, etc.) and punctuation marks from the corpus. The implementation logic is very simple. Define an empty list and traverse the text list with good word segmentation. If the word does not exist in the disabled word list, append is added to the empty list [8]. Then, the education platform host uses the Porter stemming tool to extract the same stem from different morphisms of English words. Finally, use the WordNetLemmatizer function to restore the morphology. Just make clear the data structure of the incoming function of the English vocabulary learning module. When these steps are implemented using GPRS/CDMA language, importing packages and calling functions can be easily implemented.

The specific structure model of English vocabulary learning module is shown in Fig. 2.

In order to fully promote English mobile online education, the design of English vocabulary learning module must also ensure the similarity between vocabulary information. Similarity is a basic calculation in mobile online education and teaching information promotion. The key technology is mainly composed of two parts.

Simultaneous Formula (2) can express the similarity relationship between lexical information as:

$$U = (\phi|\Delta O|)^2 - \frac{1}{\varphi^2}\sqrt{\gamma \times R} \tag{3}$$

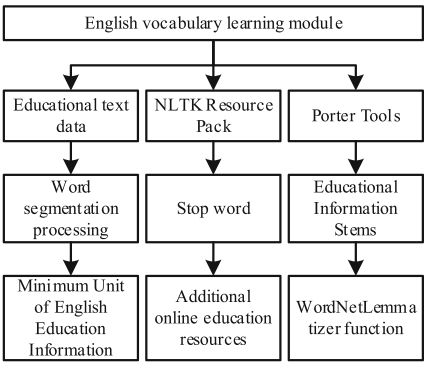

Fig. 2. Structure model of English vocabulary learning module

where, ΔO it represents the unit cumulative amount of English mobile online education information, ϕ indicates English vocabulary learning parameters, φ indicates the empty list definition coefficient in the module unit, γ represents the sampling coefficient of English mobile online education information.

Vocabulary is the brick and wood of a language and the most basic and key link of language learning. In the face of thousands of words, it is difficult to effectively master English words by rote without guidance of learning strategies. Referring to various theories of vocabulary memory, the contents that users may pay attention to when reciting vocabulary can be divided into: phonetic symbols, Chinese definitions, example sentences, phrase collocation, pictures, video clips, roots and affixes, similar words, etc.

This module processes and optimizes the information of educational resources by removing Stop word, Stemming, Lemmatisation and other operations to reduce the impact of meaningless symbols and function words. Extract the smallest computer processable vocabulary units, improve the quality and effectiveness of learning resources, and classify the content that learners are interested in. By providing diversified learning strategy guidance, help learners to master English words more effectively and improve vocabulary learning efficiency.

3 Realization of Online Education Service

On the basis of hardware modules at all levels, configure the GPRS/CDMA model, and complete the analysis of relevant education needs by driving the Internet serial port, so as to realize the application of English mobile online education platform based on GPRS/CDMA and the Internet.

3.1 GPRS/CDMA Model Configuration

The network header of the online education platform [9] GPRS/CDMA model follows all end-to-end headers (for example, the authentication header, if presented in clear text), which is followed by a networked IP packet. The sender encapsulates the original IP packet into the ESP, at least uses the sender's user ID and destination address to locate

the correct security association, and then uses appropriate encryption transformation. If host based key generation mechanism is used, all sending users on a given system have the same security association for a specific destination address. If no key has been established, the key management mechanism will generate an encryption key for the connection session. This process will occur before the ESP is used. Thereafter, the (encrypted) GPRS/CDMA model ESP is encapsulated into an unencrypted IP packet as the final payload. If strict red black segmentation is performed, the optional payload and the address and other information in the plaintext IP header may be different from the values contained in the original packet (which has been encrypted and encapsulated now).

The configured English mobile online education platform GPRS/CDMA model is shown in Fig. 3.

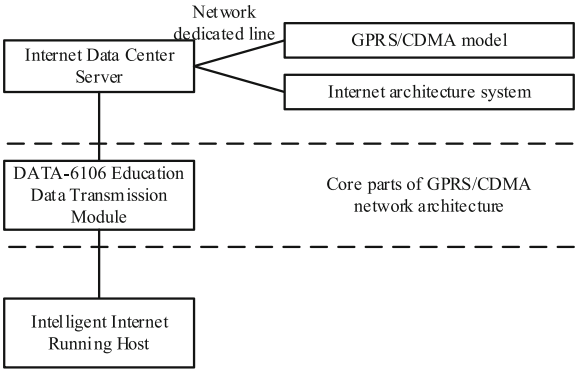

Fig. 3. GPRS/CDMA model

The configuration of GPRS/CDMA model meets the following process:

Step 1: Set the header of English mobile online education resources

$$p = \dot{I} \times \sqrt{\frac{1}{U}} \tag{4}$$

$\dot{I}$ It represents the real-time transmission characteristics of English mobile online education resources.

Step 2: IP based processing of online education data

$$A = \frac{(\lambda - 1) \cdot p}{\sum_{\varepsilon=1}^{+\infty} f \times |\hat{d}|} \tag{5}$$

λ Represents the IP distribution coefficient of English mobile online education information in the GPRS/CDMA network system, ε represents the IP processing parameters of online education resources, $\hat{d}$ the distribution characteristics of English mobile online education information in the GPRS/CDMA network system, f represents the transmission vector of online education resources in the GPRS/CDMA network.

Step 3: GPRS/CDMA model configuration conditions

$$F = \left| \frac{\iota_{\max} - \iota_{\min}}{\kappa} \right| \cdot \sqrt{\left(\tilde{g}^2 A\right) + \overline{\tilde{h}}^2} \tag{6}$$

$\iota_{\max}$ Indicates the maximum value of key distribution parameters, $\iota_{\min}$ represents the minimum value of key distribution parameters, κ ESP node application parameters representing English mobile online education information, $\tilde{g}$ it indicates the segmentation characteristics of English mobile online education information in GPRS/CDMA, $\overline{h}$ it represents the unit transmission average value of English mobile online education information in GPRS/CDMA.

The GPRS/CDMA model of online education platform maps an English mobile online education information IP address domain to another IP address domain when carrying out network address translation (NAT), usually to realize the mapping of an internal local IP address and an external global IP address. NAT is an important way to solve the IP address shortage of English mobile online education information and ensure the internal network security. To access the online education platform, you must have a legal IP address to realize the interconnection between GPRS/CDMA model and the Internet.

3.2 Internet Serial Port Driver

In order to meet the operation requirements of the GPRS/CDMA model, the English mobile online education platform sets two asynchronous serial ports at the same time when driving the Internet serial port. The serial port 1 is connected to the industrial control equipment, and the serial port 2 is directly connected to the wireless port in the English vocabulary learning module.

Serial port drive refers to the configuration of baud rate, data bit, stop bit, verification mode, working mode and selected clock of the serial port. The specific driving process is shown in Fig. 4.

When the Internet sender is ready to output English mobile online education data to the receiver, it activates the RTS signal. If the receiving end is ready to receive data, it will activate the CTS signal. Before receiving the signal that CTS is activated, the sending end cannot send data. In this way, the receiver actively controls the reception of data to prevent buffer overflow.

The main idea of Internet serial port driver is that "the receiver" controls "the sender" to prevent the sender from sending data too fast to receive. In order to facilitate the promotion of English mobile online education resources in a wide environment, the Internet serial port provides LCP [10]. LCP is used to automatically reach an agreement on encapsulation format options, handle changes in packet size, detect looped back links and other common configuration errors, and terminate links. Other optional equipment provided are: authentication of the same unit ID in the link, and decision when the link function is normal or the link fails.

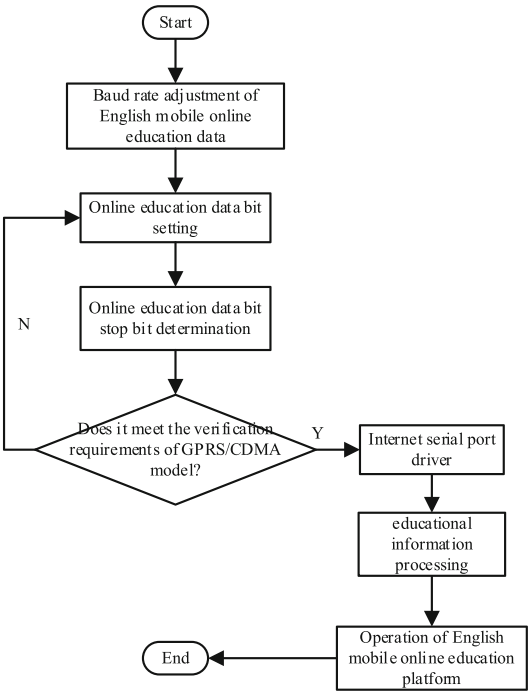

Fig. 4. Flow Chart of Internet Serial Port Driver

The solution of the Internet serial port driver expression meets the conditions shown in Formula (7).

$$G = F \times \left. \frac{\sum_{\mu=1}^{+\infty} \vec{k} \cdot \vec{j}}{\sum_{-\infty}^{+\infty} v \cdot L'} \right|_{v \neq 0} \tag{7}$$

Among them, μ indicates the education link connection parameters in the Internet environment, $\vec{k}$ represents the English mobile online education information transmission vector in the receiving end of the education platform, $\vec{j}$ represents the English mobile online education information transmission vector in the education platform sender, L' represent the response characteristics of English mobile online education information in LCP nodes, v represents the driving coefficient of the serial port of the education platform.

The English mobile online education platform Internet establishes communication through point-to-point links. Each end of the PPP link must first send LCP data packets to set and test the data link. The peer can be authenticated only after the link is established. Then, PPP must send NCP packets to select and set one or more English mobile online education information network layer protocols. Once each selected network layer

protocol is set, data packets from each network layer protocol can be sent on the Internet link.

3.3 Education Demand Analysis

With the support of GPRS/CDMA and the Internet, the demand analysis of English mobile online education platform consists of functional requirements and feasibility requirements.

(1) Analysis of functional requirements of education platform

The user roles of English mobile online education platform are divided into learners and managers. The main functions of learners include: personal information maintenance, uploading corpus, completing tests, vocabulary learning, vocabulary comments and likes. The main functions of the administrator are to review the corpus and user comments, update the thesaurus, publish tests, recommend learning partners, recommend new words, etc. [11].

The function demand analysis expression of the education platform is:

$$Z_1 = \left(\theta_1^2 \times \left|\frac{G}{\dot{l}_1}\right|^2\right) - \varpi_1 \hat{X}^2 \tag{8}$$

θ_1 Represents the user role definition coefficient of English mobile online education platform, $\dot{l}_1$ represent the functional response characteristics of the education platform related to user roles, ϖ_1 represents the real-time upload parameters of English mobile online education information, $\hat{X}$ represents the functional evaluation vector of the online education system.

(2) Feasibility demand analysis of education platform

At the application level, using GPRS/CDMA and the Internet to learn words at any time and anywhere has become a recognized way for the young generation. However, the new word recommendation function in the current mainstream mobile phone software for memorizing words is virtually non-existent, the language data is old, and the source is single. Therefore, the market for memorizing words has been unsatisfied by the old user needs, and the application prospect is broad. At the technical level, with the development of natural language processing technology, with the help of python toolkits such as Gensim and NLTK, you can easily achieve functions such as word segmentation, keyword extraction, word vector training [12]. At the same time, the improvement of computer computing power also provides hardware support for the use of machine learning or even deep learning algorithms to achieve the recommendation function.

The feasibility demand analysis expression of the education platform is:

$$Z_2 = \varpi_2 \hat{X} \cdot \left(\frac{\dot{l}_2}{\theta_2} G\right) \tag{9}$$

θ_2 Indicates the promotion demand parameters of English mobile online education platform, $\dot{l}_2$ refers to the keyword extraction coefficient of English mobile

online education data, ϖ_2 represents the word vector training coefficient of English mobile online education data.

Formulas (8) and (9) are used to derive the operation expression of English mobile online education platform based on GPRS/CDMA and the Internet as follows:

$$B = \frac{\sqrt{\vartheta \cdot \left(\frac{Z_1}{c_1} \cdot \frac{Z_2}{c_2}\right)}}{\tilde{m}^2 \cdot \left(\sigma^2 - 1\right)} \tag{10}$$

where, ϑ represents the upload parameters of English mobile online education information corpus based on GPRS/CDMA and the Internet, c_1 represent the response coefficient of education service related to functional requirements, c_2 represent the response coefficient of education service related to the feasibility demand, $\tilde{m}$ it represents the response characteristics of English mobile online education services in PRS/CDMA and Internet systems, σ represents the real-time operation vector of the online education platform.

In the process of learner learning, the education platform continuously collects learner behavior data, converts these text and numerical real-time data into learner characteristics and resource characteristics [13], and sends them to the server to calculate the similarity between feature vectors. When helping learners begin to memorize words, the system calculates the similarity between user characteristics according to the learner capability model, matches learning partners for users, and recommends the vocabulary in the learning partner's vocabulary list to new users. Improve the efficiency of memorizing words by predicting which words are unfamiliar to the user in advance.

4 Example Analysis

In order to highlight the practical differences of English mobile online education platform based on GPRS/CDMA and the Internet, VIPKID education system, and education system from the perspective of flow, the following comparative experiment is designed.

4.1 Experimental Process

The specific implementation process of this experiment is as follows:

- Connect the Windows host and the 12th generation 12490F processor on demand, and build the experimental environment required for the connection of the education platform.
- Input the executive program of the English mobile online education platform based on GPRS/CDMA and the Internet into the Windows host, record the specific number of real-time online people in the network system under the effect of the platform, and the results are experimental group variables.
- Input the executive program of the VIPKID education system into the Windows host, record the specific value of the number of real-time online people in the network system under the effect of the platform, and the results are the first control group variables.

- Input the executive program of the education system from the perspective of heart flow into the Windows host, record the specific value of the number of real-time online people in the network system under the effect of the platform, and the results are the variables of the second control group.
- Statistic the variable data obtained, and summarize the experimental rules.

4.2 Principle and Preliminary Preparation

The real-time online number can be used to describe the promotion ability of the network host to English mobile online education. Without considering other interference conditions, the more real-time online number, the stronger the promotion ability of the network host to English mobile online education.

The following table records the specific models of the selected equipment components in this experiment (Table 2).

Table 2. Selection of Experimental Equipment

Project	Experimental equipment	Model and name
1	Teaching promotion host	Windows host
2	Teaching data processor	12th generation 12490F processor
3	Response chip	DS3231MZ + SOIC-8 real-time clock chip
4	Teaching task server	LM393 DIP8 inline server
5	Response device	AP LME49720 AD827/712
6	Client terminal	STM32F103 LQFP100

In order to ensure the fairness of the experimental results, the connection forms of equipment components in the experimental group and the control group are always consistent during the experiment.

4.3 Data Processing

This experiment takes 6 h as the total duration of the experiment, and records the real-time number of online people every 1 h. The specific experiment is shown in Fig. 5.

It can be seen from the analysis of Fig. 5 that the number of real-time online people in the experimental group kept a numerical trend of first rising and then stabilizing, and by the end of the experiment, the maximum number reached 225. The number of real-time online people in the first control group kept increasing, and by the end of the experiment, the maximum number reached 105, a decrease of 120 people compared with the maximum number of the experimental group. The number of real-time online people in the second control group remained stable first, and then increased. By the end of the experiment, the maximum number reached 75 people, which was 150 people lower than the maximum number of the experimental group. This is because the design platform pushes education information in real time through the online education resource

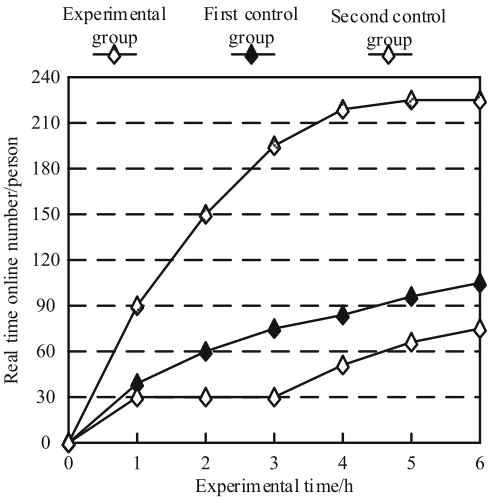

Fig. 5. Real time online population

push module, uses the mobile partner search module to ensure the learning efficiency of learners, and improves the quality of learning resources based on the English vocabulary learning module.

To sum up, the conclusion of this experiment is:

(1) The application of the VIPKID education system and the education system from the perspective of flow is not enough to improve the real-time online population of the education platform, so these two types of systems cannot effectively guarantee the ability of the network host to promote English mobile online education.
(2) Compared with the VIPKID education system and the education system from the perspective of flow, the application of the English mobile online education platform based on GPRS/CDMA and the Internet has achieved a significant increase in the number of real-time online people, which meets the actual application needs of improving the network host's ability to promote English mobile online education.

5 Conclusion

The above research aims to solve the defects of traditional word memorizing software such as outdated language data, low accuracy of personalized recommended words, and low sense of social participation when users recite words, assist users in professional language learning, rapidly expand vocabulary, and more importantly, learn professional related practical vocabulary, so that users can apply what they have learned. Aiming at the problems of poor learning efficiency and low interest of learners, the application module of English mobile online education platform is designed, which is composed of online education resource push module, mobile partner search module and English vocabulary learning module. By combining the GPRS/CDMA model and internet serial port driver to achieve interconnection, and analyzing the teaching needs of learners, the

design of an English mobile online education platform is completed. The main work and research results of this paper include:

(1) Sort out the development history and current situation of online education and intelligent recommendation technology at home and abroad, sort out the functions of mainstream English word reciting software, and investigate the market share of word reciting software.
(2) Based on the support of learning theory, from concrete to abstract, from low-level to high-level teaching objectives, build a learner capability model. Based on the classification of learning styles in the existing literature, a new vocabulary learning learning style model is proposed according to the results of questionnaires, interviews and market research. This research enriches the existing relevant theories, provides theoretical support for the user modeling process of the online education platform, and improves the recommendation effect of the word reciting software.
(3) Based on the demand survey and previous literature research, an intelligent recommendation model is built for English vocabulary learning, which fully describes the process design of each function module of the word reciting software, and builds the design framework of the platform system.

In addition, there are many directions that can be improved in the research, including:

(1) The preliminary investigation and experimental sample data are insufficient, so large-scale data testing cannot be carried out, and the reliability and validity of the experimental conclusions are difficult to guarantee. It can further expand the scope of the experiment, collect data to verify the accuracy of the system's recommended new words and the effectiveness of the learning style classification model.
(2) The functional design needs to be gradually improved or updated in practice. For example, the word message function belongs to but one-way, other tourists/users can only praise high-quality comments, and can add the mutual evaluation function; At present, the review form of words is only designed to read the new word book, and the review form is mainly browsing. You can refer to the review function of the existing word reciting software to improve it.

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