College English Mobile Learning Platform Based on Android Platform

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Abstract
With economic globalization, the communication and cooperation between countries are closer. As an international language, English becomes more and more popular. English communication has become a standard to measure a talent. In recent years, English learning is popularized in all levels of society and all industries. Grasping of English not only enhances the level of their knowledge, but greatly influences future career development. Nowadays, college English teaching is mainly classroom teaching. The teaching content is mainly English knowledge, focusing on cultivating students' ability to solve problems. Although the students' ability to solve problems in English can be improved, but the level of English communication is poor, not meeting the core purpose of the English class. Therefore, the traditional college English teaching mode needs to be reformed. As the trend of the current education mode development, especially the rapid development of highly flexible and functional mobile learning mode, educational information is significant to solve the problem in traditional college English teaching mode, promoting the overall development of English listening, speaking, reading and writing of college students. The college English learning platform may be developed in Android system, so as to enhance the college English teaching level.

Keywords: Android Platform, College English, Mobile Learning Platform.

1. BACKGROUND

1.1 Introduction

With the development of information technology, the amount of information presents an explosive development trend. The number of news, entertainment, advertising and scientific and technological information is increasing. Individual information reception capacity is overloaded. The era of big data has come. In this context, the way in which people receive knowledge has undergone tremendous changes. The traditional learning model mainly focuses on classroom learning, participation in learning institutions or autonomous learning. However, under the era of big data, especially with the development of mobile networks with mobile phones as core, the learning model has broken the limitation of time and space. People can learn anytime, anywhere, which also played a important role for the reform of college English teaching mode. Android is Linux-based operating system with high degree of freedom and open source, which is mainly used in the mobile terminal, open, rich features, and can meet the development requirements of mobile application developers, subject to less restriction. A well-developed APP industry chain has formed, and Android has become the user-friendly, most powerful operating system. For college English teaching, Android can meet the demand of people to independently develop mobile applications, so the college English mobile learning platform can be built in Android, which is significant to improve the teaching level of college English.

1.2 Purpose

The architecture of mobile devices has the key features in the development of software/hardware technologies: First, it is open. Mobile devices provide enough open software/hardware interfaces, enriching the markets for mobile applications and software; second, it is extensible. Through the open software/hardware interfaces, the mobile application developers and even individuals can build or replace new modules on demand to extend the functions of mobiles; final, it adopts a unified standard. At present, the complete wireless network standard has been formulated. Almost all mobile devices have to be built based on the standard wireless network, thus the mobile device is universal, effectively promoting the mobile device industry (Wang et al., 2012). The college English mobile learning platform built in Android shall have the following features: First, all kinds of information
on the Internet to broaden students access to English information channels; second, audio information to meet the diverse needs of learning; third, relevant audio and play to carry out listening training; fourth, personalized services, such as articles, management of resources, etc.; fifth, translation functions to facilitate students to check unfamiliar words; sixth, download service to save and learn resources; seventh, help, user feedback, send a bug report, visit the official website and other services (Wang et al., 2013). Due to the particularity of mobile devices, pay attention to the following issues in the development of the college English mobile learning platform: First, reduce memory consumption to ensure the normal operation of most devices; second, multi-resolution compatible for various mobile phones; third, touch-screen operation to provide diversified modes; fourth, power consumption control for long time learning; fifth, network traffic control and connection speed optimization; sixth, easy operation to ensure clear modules and functions (Sun et al., 2015).

2. EVALUATION MODEL

2.1 Fuzzy comprehensive evaluation method

Fuzzy comprehensive evaluation method is a kind of evaluation method based on fuzzy mathematics theory. It mainly transforms the qualitative indexes which cannot be reflected by quantitative indexes through the membership degree theory in fuzzy mathematics theory, and is a holistic approach to the issues studied (Su, 2016). The key characteristic of the fuzzy comprehensive evaluation method is that the result is clear and systematic, which can effectively solve the problems that the traditional analysis methods cannot solve, especially the problem of nondeterminism.

2.2 Steps of fuzzy comprehensive evaluation method

First, determine the factor universe of the subject (Liu and Zhu, 2016). There are P evaluation indexes in the hypothetical factor universe, and the factor universe can be expressed as:

\[ u = \{u_1, u_2, ..., u_p\} \]  \hspace{1cm} (1)

Subsequently, determine the rating hierarchy of discourses. Assuming that the rating hierarchy of discourses is denoted by \( v \), we have:

\[ v = \{v_1, v_2, ..., v_p\} \]  \hspace{1cm} (2)

Each level corresponds to a fuzzy subset. After establishing the rating hierarchy of discourses, the fuzzy relation matrix \( R \) needs to be constructed to quantitatively evaluate the college English learning platform and obtain the membership degree of each influencing factor so as to obtain the fuzzy relation matrix (Shen et al., 2014), as follows:

\[ R = \begin{bmatrix} R|u_1 \\ R|u_2 \\ \vdots \\ R|u_p \end{bmatrix} = \begin{bmatrix} r_{11} & r_{12} & \cdots & r_{1m} \\ r_{21} & r_{22} & \cdots & r_{2m} \\ \vdots & \vdots & \ddots & \vdots \\ r_{p1} & r_{p2} & \cdots & r_{pm} \end{bmatrix} \]  \hspace{1cm} (3)

Next, to determine the weight vector for each evaluation factor, assuming that the set of weight vectors is \( A \), we have:

\[ A = \{a_1, a_2, ..., a_p\} \]  \hspace{1cm} (4)

The elements in the set of weight vectors \( A \), that is, the degree of membership of the elements in the factor universe. Finally, to synthesize the vector of fuzzy comprehensive evaluation results and use the operator rationally, the elements of the set of weight vectors \( A \) are combined with the fuzzy relation matrix to get the fuzzy comprehensive evaluation result vector \( B \) of the evaluation object as follows:

\[ B = A \ast R = (b_1, b_2, ..., b_n) \]  \hspace{1cm} (5)
3. DESIGN

3.1 Analysis of requirements

There are three requirements for the college English learning platform: functional requirements, non-functional requirements, and constraint conditions (Xu and Tian, 2014). The functional requirement means that of the college English mobile learning platform to fulfill the requirements of the customer, which is the compulsory standard. Non-functional requirements are those features that are not explicitly required by the customer but to be used when customers use the college English learning platform, which are mainly used to enhance the education level. The constraint conditions mainly come from the law, industry, customers and the college English learning platform. The development of the college English mobile learning platform must follow the constraints (Kang, 2014). Figure 1 shows the software requirements composition.

![Software Requirements Composition](image)

**Figure 1. Software Requirements Composition**

According to the software requirements specification, the college English learning system based on Android mainly adopted the C/S architecture. There are multiple functional modules, including the foreground and the background.

3.1.1 Tasks

In recent years, many excellent home-made smart phone brands have developed rapidly. The prices of smartphones have dropped significantly. Almost all college students own one or even several smartphones. To surf the Internet, access to information and learning via smartphones is a key part of college student daily life, and master of English is key for modern college students. This study designed a college English mobile learning platform based on Android which is widely used in smartphones, benefiting from openness, convenience and richness of Android platform, to improve the mining and sharing of college English teaching resources. It provides a good platform for independent study and achieves audio, visual and even tactile multimodal teaching. This makes college English self-study more vivid and stimulates students' enthusiasm for learning (Sun and Hou, 2014).

As mobile English learning software, it adopts C/S architecture, while the UI interface is provided by the Android system. Use Tomcat to build the server. MySQL Database is used. In this mode, users only need to download the client in the website or the application store and install it on the phone, and then register the ordinary password in the webpage. Users and administrators are set by sources. Ordinary users and member users are set by the levels of services. Ordinary can use free resources in the mobile learning platform, and all available features are open to ordinary users. For member users, better services can be provided through topics or learning experience reports,
etc. The administrator's identity is special. Its main function is not to browse or use resources, but to manage the resources and users in the learning platform to ensure that the learning platform can play its due role (Tian et al., 2014).

3.1.2 System functions

The system functions of college English learning platform include two parts: foreground functions and background functions. The foreground functions refer to register, sign in, online examination, memorize words online, online consultation, translation, video learning, etc. The background functions refer to information management, user management, resource module management and system management.

First, the user management: for better user management, build a complete user management system. Ordinary users, member users and administrators are set. Ordinary users have all the basic functions in the college English learning platform. Member users can enjoy high quality personalized services after paying regular fees. Administrators need to systematically manage the learning platform, delete wrong information resources, and timely upload related resources to ensure the normal operation of learning platform.

Second, the online exam: After years of development, our country has formed a complete English examination system: English Level-1, Level-3, Level-4, Level-6, professional Level-4, professional Level-8, IELTS, TOEFL, GRE and so on. Different students have different levels of English learning, therefore, it is necessary to provide English papers with corresponding difficulty. The questions come from the past exam, or the appropriate review materials, exercises, online questions or self-prepared questions. After the examination is over, the online examination system will provide the correct answer so that the student can correct his mistake. For member users, questions analysis can also be provided for comprehensive services (Wang and Zhang, 2014).

Third, memorize words online: the word is the basis of English learning, no matter what kind of learning methods, the learning of words is the core. In our country's English examination system, different grades have different requirements for students' vocabulary amount and difficulty. Corresponding vocabulary should be provided for different difficulty levels, and each vocabulary should be marked with degree of difficulty. Meanwhile, vocabulary pronunciation should be provided to ensure that students can master the correct pronunciation during learning (Wu, 2014).

Fourth, online consultation and translation: Android system is closely linked with Google. The map, mail, search, etc. provided by Google have become the key contents of Android system. Therefore, Google's online consultation and translation functions can be chosen as the consultation and translation module in the college English earning platform (Chi, 2017).

3.2 Overall design

Figure 2 shows the overall structure of college English learning platform:

In general, the college English learning system based on Android is mainly divided into two parts: foreground and background. The foreground functions include online examination, memorize words online, online consultation, online translation, online video learning, online communication and user management. Ordinary users and member users are set, providing customer registration, customers login, data modification and release comments. Background functions mainly include English information management, English category management, user management, administrator login and system management. The system management includes parameter setting and notice release.
4. FUNCTIONAL FRAMEWORK

4.1 User management system

Figure 3 shows functional framework for user management system.

Figure 3. Functional Framework for Common Users or Member Users

The functions for ordinary users or member users mainly include register, sign in, modify personal data, modify password and password retrieval.

Figure 4. Administrator Function Model
The administrator's function is special, mainly including sign in, view user and delete user. In addition, administrators assume the obligation to routinely manage and maintain mobile learning platforms and educational resources (Ren and Ma, 2016).

4.2 Online examination system

There are many modules and data tables in the online examination system. The questions mainly include listening, reading, word bank, cloze test, translation and writing. Each kind of question has certain change. The corresponding database can be designed according to the change.

4.3 Online search system

In the college English learning platform, the online consultation mainly includes word search and storage of new words. The online consultation system is built to link with the consultation database. The query vocabulary, vocabulary related information and voice is linked with SQLite database to provide better services for college students. In the online consultation system, the student enters a word in the input box and presses OK. The online consultation system uploads the word information to the server. The server obtains the relevant information. If it can find the corresponding word, it will feed the relevant information back to the college English learning platform for students to view. If the word is not found, the word entered by the student is incorrect or not in the database (Yang et al., 2017).

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