In today’s era of rapid development of science and technology, people want to have more portable devices for learning and work in life and study. For this, an English learning system based on Android is proposed. This article first introduces the relevant technologies of the Android system and gives a detailed introduction according to the characteristics, architecture, development type, life cycle, network communication technology, and database technology of the Android platform and studies the functional requirements and overall architecture design of the English learning system. The detailed design and development of the user management module, online examination module, online word search module, and online video module are carried out in accordance with the functional requirements, and the detailed design and implementation methods of the user management module, online examination module, online word search module, and online video module are designed. It is tested proof that the Android-based English learning system has user learning.

1. Introduction

With the rise of China’s international cultural level, the universality and importance of English is becoming more and more prominent [1–4]. Mobile language learning is becoming more and more popular due to the rapid development of technology and the characteristics of language learning. This has become an important way for people today to learn. Mobile devices have the advantages of being ubiquitous, portable, autonomous, and timely [5–7]. The New Century "University English Curriculum Educational Requirements" covers the comprehensive quality of English culture and language application level of university students in order to continuously realize the effective improvement of university students' independent inquiry-based learning ability. We are proposing to nurture them. The data-driven teaching paradigm, also known as data-driven learning, is essentially a new teaching method in which teachers guide students to implement language learning based on big data corpora. This method was first formally proposed by Professor Tim Johns in the 1990s [1]. Currently, some national universities use the corpus data-driven educational paradigm to promote autonomous exploratory learning of English for college students, especially in English vocabulary, grammar, writing, and many other aspects. However, many academic findings on English subteaching under the data-driven learning paradigm exist, and many academic articles claimed that this educational model can facilitate student autonomy but still verification is required. Through experimental comparisons, this article mobilizes students' interest in how the data-driven learning paradigm overcomes traditional college English classrooms with less time and more educational content and postclass self-study [8–10]. Analyze how to improve the effectiveness of self-study in English. It also proves that the data-driven learning paradigm is an effective way to drive reforms in university English education. This article focuses on the study of applied English learning systems.

It is proposed that combining corpora with Natural Language Processing (NLP) can improve semantic comprehension and resolve NLP problems and challenges such as ambiguous NL and tacit knowledge. An online dictionary has applied frame semantics research to an English language corpus. “A corpus is a collection of texts used for linguistic studies that is typically contained in an electronic database with an objective that data can be conveniently retrieved by computer.” A lexical database such as FrameNet in its different language versions can be used for communicative language teaching, an approach which focuses on communicative rather than grammatical competence [11, 12].
2. Android Platform

2.1. Android’s Architecture System. The Android operating system is an open system that allows multiple applications to run simultaneously in the background. Its main features are parallel operation, network access, equality, unlimited applications, and openness. The Android system is built so that the layers can be separated from each other. The Android architecture can be divided into four layers: There are four layers to the Android architecture: the Linux core layer, the system runtime layer, the application framework layer, and the application layer. Android architecture system is shown in Figure 1.

2.2. System Development of Android. The Android system is built through giving a system call interface to Java application programs, allowing the system to provide specific functions. While developing, enhance the native C or C++ library first, then define the Java layer’s system APIs, encapsulate the required code in JNI, and then integrate the JNI and Java classes. This contains the Java classes you will need for your application. The framework and structure of the Android development system is depicted in Figure 2.

2.3. Life Cycle of Android. On the Android system, each activity has a life cycle, and the relevant method is called at the right time.

(i) OnCreate (Bundle) is called when the activity starts to do a one-time initialization action
(ii) OnStart () is called to signal the user’s current activity
(iii) onResume () is called to allow the user to interact with activities like animation and audio playback
(iv) When the program enters the background, call onPass () to save the program’s persistent state
(v) Call on-Stop () to display the user’s certain activity or communication technology and database technology
(vi) onRestart () to show the user the previously stopped action
(vii) Before destroying the activity, call onDestrty ()
(viii) To allow the activity to be saved, call onSaveInstanceState (Bundle), each instance’s current status
(ix) The onSaveInstanceState (Bundle) method is used to restore the user interface state by default

Android systems have a wide range of applications in communication and database technologies. Regarding network communication technology, Android has a total of three network interfaces: apache interface, standard Java interface, and Android network interface. When it comes to database technology, the storage technology on Android systems is divided into shared settings, files, SQLite, and networks. The shared preface is mostly used to store passwords and usernames, and it can only be utilized as a result of the Android system’s basic data types. On Android systems, the file storage method uses the FileInputStream class to perform small file and write operations and data; network is a data storage feature that must be provided on the smartphone platform.

3. The Overall Optimization Design Plan of the System

3.1. User Needs. User requirements include functional, nonfunctional, and constraint requirements. Features should be based on the reasonable needs of the user designing the system to complete a particular feature. System analysts may present nonfunctional requirements for system performance, such as system reliability, safety, scalability, and response time. In addition, there are some constraints that must be considered, such as customer constraints, legal constraints, and industry constraints.

3.2. Optimized Design Scheme. The overall design plan outlines the overall structure of the system, the overall technical architecture, front-end and back-end processes, and more. Depending on the needs of the user, the structure of the entire system is mainly divided into two parts, front and back, and the front contains modules such as user login and registration, online examination, and word translation. Behind the scenes, it mainly plays management roles such as English data management, user management, and system management. We also perform other management tasks. The system’s overall technical architecture is built on the MVC hierarchical design model, which designs and divides related layers into model layers (models), view layers (views), and control layers (controllers). The UI interface provided by Android is used to design the view layer, Servlet technology is used to control the layer, and JDBC drive methods are used to access the database. Figure 3 shows the overall technical architecture of the system.

4. Optimized Method of “English Language and Literature” Teaching Management System Module Based on Android

4.1. User Management Module. User management includes many features that are primarily divided into user management and administrator management. User management includes registration, login, and information changes, and administrator management includes logins, queries, and user changes. The flow charts of the front-end system and the user use case diagram [11]. Capturing the management sequence after the administrator enters the system. Figure 4 shows a user management sequence diagram.

The system login interface should be created with two input boxes, a username, and a password, depending on the user’s login needs. One will also need to create three buttons: one for login, one for registration, and one for secret searching. Vertical lines must be used for usernames and username input boxes, as well as passwords and password
Figure 1: Android architecture system.

Figure 2: Android development system structure.
4.2 Online Test Module. This module occupies a very important position in the whole system, mainly English test, TOEFL, IELTS, and professional title English. There are additional submodules and data tables in this module. When creating a submodule, you must create the database according to the test type. A design rendering of a common question type is shown in Figure 5.

4.3 Online Word Search Module. This module has two basic functions: querying words and saving new words. The online word search module also requires a database design to ensure the storage of word search records and new words. When the user enters a new word to search in the search box and then clicks OK, the remote server parses the new word sent in the form of a string, and if a new word is found in the database, that word is found. If the word is not found in the database, it indicates that it cannot be searched. The query interface of this module consists of five parts: entering words, confirming transmission, saving data, returning to the previous level, and displaying search results. Figure 6 shows the effect diagram of the query interface.

4.4 Online Video Module. Video, test, and other modules are included in this module. This module contains the database design and stores the video information on the server because the video information is stored. Users choose the learning approach that best meets their needs while legally entering modules such as English MVS and English movies. You may acquire all the information about the learning technique supplied by simple corresponding learning method. Select the module by clicking on it. When the user clicks on the relevant video, a data request is sent to the remote server, and when the remote server receives the request, the corresponding video is played in accordance with the request. A request error will be displayed if the request cannot be accepted correctly or if the video contains an error. Figure 7 shows the main interface of the online video module.

5. System Testing and Implementation

System testing is the main way to verify the normal operation of your system. Below is a system test and analysis with a real application. Use this system to take an online English exam.

Step 1. Students open the “English Online Start Answering System,” enter the homepage, view the exam news, and enter the “User Login Interface.”
Step 2. Students enter their name, exam ID, and password in the “Login Interface” to enter the “Exam Module Home Page.”

Step 3. Students select the grades they want to test in “Select Exam Page” and enter the “Exam Page.”

Step 4. Students take the exam at the “Exam Interface.” After answering the question, press “I want to submit a document.”

Step 5. Students inquire about the test score via the Score Query Module.

Table 1 compares the traditional pretest and posttest scores and shows the improvements in this regard. Students and teachers both understand the need of system testing. It can basically meet the design criteria of building a test question bank, randomly generating test questions, and submitting test answers online in terms of system test operational effectiveness. This help to realize computerization and automation of English test in addition to minimize the burden of English test and enhance test efficiency.

6. Conclusion

This article focuses on creating a basic and effective English test response system with a user-friendly interface and reliable features. The following are the system’s design innovations:

(i) English test rooms have been intelligently and automatically placed

(ii) Implement real-time English education monitoring and control student learning situations

(iii) The English test safety assurance method has been upgraded, and test sheets can now be generated at random according to difficulty level, eliminating the complex phenomena of running numerous tests on the same machine

(iv) Encrypt the candidate’s data and score to prevent tampering or destruction by human

Many features of the English exam can be met with the current system design; however, there are certain problems, such as the code is not simple enough that the system cannot be utilized across platforms, the database design, and so on. It needs to be improved. Continuous upgrades and gradual system enhancements are required for follow-up.

Data Availability

The datasets used and analyzed during the current study are available from the corresponding author upon reasonable request.

Conflicts of Interest

The author declares no competing interests.

Authors’ Contributions

The conception of the paper was completed by Neng Wan, and the data processing was completed by Neng Wan. Neng Wan participated in the review of the paper.
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