Corpus has important application value in English teaching, which can provide a new way for English teaching, help to improve the quality of English teaching, and play its role in the cultivation of students’ English literacy. This study proposes the educational service platform based on embedded intelligent systems and cloud computing to analyze the practical teaching application measures of English corpus. The traditional translation assistance system has the problem of unbalanced frequency distribution of some markers, which can be solved by the embedded intelligent system and cloud computing service. According to the comparison results, the designed educational service platform is obviously superior to the traditional teaching assistance system, the frequency distribution of the annotated words in the corpus is uniform, the translation efficiency is high, and the translation accuracy is accurate. This paper helps students’ learning to avoid the solidification of students’ thinking mode of language learning, which makes learning more flexible and improves learning efficiency. This research will highlight the dominant position of students in the English teaching classroom, truly implement the concept of quality education into teaching practice, and promote the sound development of English teaching.

1. Introduction

Long before the advent of computers in the 1930s, some linguists had begun to build non-machine-readable corpora of a certain size and to conduct artificial word frequency statistics. With the development of computer and IT technology, corpus construction became simpler. In the 1990s, large machine-readable corpora such as BNC and Bank of English were established and put into practical use, attracting many linguists to devote themselves to corpus linguistics research [1]. China has also built many learner corpora, such as the Chinese Learner English Corpus (CLEC), the China English Education Corpus (CEEC), the Chinese Learner Spoken English Corpus (COLSEC), and the China English Student Spoken Corpus (SWECL). The establishment of corpora is no longer the patent of experts, and some language researchers have also established small and medium corpora. Nevertheless, there are still many problems in the construction of corpus. The size of a corpus determines whether it is representative [2]. As a general language resource, a corpus often represents an infinite totality. By today’s standards, a corpus of 1 million words is too small, and no matter how broad it is, its representativeness has limitations. Traditional corpora are mostly synchronic, static, closed, and usually released publicly in the form of compact discs [3]. Although the Brown corpus has a history of more than 50 years, it is far from representing the English of the 21st century. Therefore, the update of the corpus has become a big problem. Just as the language itself is dynamic, the corpus should also be dynamic, which can have constantly updated and expanded. The separate construction of corpora has resulted in a situation of noncommunication, repeated construction, and isolated development. Furthermore, due to issues such as copyright and funding, most corpora are still in the hands of a few. There is no resource sharing among the corpora, resulting in a lot of waste of labor and material resources.

Mobile learning is learning that is supported by handheld mobile technology or that takes place across a variety of contexts or locations, including classroom learning and
augmented reality learning that support the use of personal mobile devices, or learning that combines fixed and mobile technologies across different locations [4]. In 2022, China Mobile's 2022 work conference proposed the construction of a world-class “power building” in the digital economy [5]. The connotation and extension of mobile learning are constantly deepening and extending, and mobile learning based on the Internet, information, and communication technology has become an inevitable product of the development of the times. The traditional teaching and learning models have undergone earth-shaking changes. Learners are no longer restricted to traditional classrooms and one-way input from teachers. The wireless communication technology in western developed countries started earlier, and the research types and directions of mobile learning are more diverse than domestic applications. The research fields involve primary and secondary education, higher education, social education, distance education, and Resource Search Method of Mobile Intelligent Education System [6]. In 2015, Beijing Normal University's “Mobile Course APP Generator” is a mobile course online development and APP online generation tool for ordinary first-line teachers. In 2022, a resource matching model of intelligent education was carried out in China [7]. Of course, e-books will not completely replace paper textbooks but will serve as an important supplement and auxiliary tool for paper textbooks. Judging from the comprehensive academic papers, although the domestic research on mobile learning started late, the number is increasing year by year, and the research field is constantly expanding [8]. There are many basic theoretical studies, but the depth is not enough, and there are many repetitive discussions. There is less research on mobile learning-related terminal equipment and Internet crosstechnology. There are many researches on the development of curriculum resources, but few practical applications.

With the convening of the National Learner Corpus Symposium, more language learners have begun to pay attention to the sharing and construction of corpus resources. The establishment of a fully open corpus network education service platform has become the goal and development direction [9]. The main contributions of this work are as follows. Users can use mobile devices to quickly access the website and get data feedback, and mobile phones can successfully complete various operations such as online retrieval and statistics. Therefore, online corpora are suitable for mobile learning, especially for mobile learning of languages. The design of the online corpus website is all plain text display, which is more suitable for mobile phone users to learn. The development trend of online corpora in the future is cloud corpus with more powerful computing functions and faster response. Therefore, based on the interdisciplinary and practical application, this paper discusses the exploration of mobile learning and cloud computing service platform based on online corpus. Interdisciplinary corpus is a hotspot in the field of computer and linguistics, and its characteristics such as fast retrieval speed, high precision, massive corpus, and online availability make it suitable for mobile learning. The recent works are shown in Table 1. The application of corpus-based mobile learning in English learning is a specific case application discussion and a new attempt.

2. Materials and Methods

Embedded systems generally refer to non-PC systems, equipment, or equipment that has computer functions but is not called a computer. It is a public computer system that is application-centric, can be reduced in software and hardware, and complies with the comprehensive and strict requirements of the application system on performance, reliability, cost, size, and power consumption [10, 11]. The embedded system integrates the application software and hardware of the system, like the task mode of the BIOS in the PC in Figure 1. It has the characteristics of small software code, high automation, and fast response speed. Embedded system is mainly composed of embedded processor, related supporting hardware, embedded operating system, and application software system. It is a “device” that can work independently.

The operating system controls how application programming interacts with the hardware. Common embedded English learning devices include handheld PDAs, mobile Internet access, computer learning software, iFLYTEK learning machines [12]. The service architecture of embedded intelligent system and cloud computing education service platform mainly includes three important parts, which are the service hierarchy structure, database structure, and internal management structure.

2.1. Educational Service Platform. Many domestic colleges and universities are equipped with multimedia classrooms, and foreign language teaching in colleges and universities has also entered the multimedia classrooms. However, these teachings are not network-based teaching; they are only useful for demonstrating some sample essays such as PPT. In the process of English learning, many teachers still use the traditional teaching mode, which are the teachers impart knowledge, and after, students submit homework. Teachers invest a lot of time and energy to review. It is difficult for students to improve their English proficiency. Therefore, how to improve students' foreign language proficiency has always been a major problem for teachers [13, 14]. Based on the traditional cloud computing service structure including physical layer, unified resource layer, platform layer, and application layer, the education service platform is composed of a series of service functions in a hierarchical structure. The five layers shown in Figure 2 are supply chain layer, data integration layer, data layer, service and platform layer, and application layer.

<table>
<thead>
<tr>
<th>Number</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Construction of educational service platform</td>
</tr>
<tr>
<td>2</td>
<td>Construction of cloud database</td>
</tr>
<tr>
<td>3</td>
<td>Experimental testing and analysis</td>
</tr>
</tbody>
</table>
Today’s foreign language teaching should be aware of opportunities, learn from advanced teaching experience at home and abroad, and combine China’s national conditions to create a new English teaching model that conforms to the information age. If English teaching still follows the traditional teaching mode, it will be in trouble and it will be difficult to effectively improve the teaching level. The reform of English teaching should increase the training of students’ output ability from the perspective of teaching ideas and reduce the input-based teaching methods for students. In terms of teaching content, we should shift from emphasizing English skills to both skills and content. From the teaching form, the traditional English teaching should be turned to the computer-assisted English teaching mode. Some educational service systems based on corpus and cloud computing technology have emerged in China and have been concerned and recognized by more college experts and teachers.

2.2. Cloud Database Structure. The education service platform database is the core of the entire sharing system. Its internal data can be divided into three categories according to different types, uses, and permissions, which are common data, protocol data, and private data.

2.2.1. Common Data. Common data include the data information of the self-built online corpus of each member unit, the user’s evaluation, and opinion on the corpus, that is, the data related to the corpus contributed or purchased by all the member units [13]. Common data have low access rights, and general users can call common data, so the frequency of use is high.

2.2.2. Protocol Data. Agreement data refers to the proof of agreement reached by each member unit with a third party through the cloud computing network management.
system, including the patent approval certificate and order agreement of each member unit. Protocol data is often used to record and determine the interaction among coconstructed universities, system users, and corpus resource distributors, which has certain legal effects [15].

2.2.3. Private Data. Private data is the private data of system users, including registration information and permission levels. These private data are stored independently in the cloud environment with high restrictions on access rights.

2.3. Internal Management Structure. The overall status management module of the system reflects the operation overview of the entire education service platform cloud computing education service platform. Through the workflow engine, the user information management module, metadata management module, corpus management module, API management module, and billing information management module are integrated together. It constitutes a workflow system for the daily operation of the education service platform in Figure 3. The administrator controls the workflow of the education service platform and the operation process of the entire cloud computing education service platform according to the overall situation.

The user information management module provides unified authentication to realize service security. The education service platform provides a unified user pass for all users of each cloud service center, enabling users to achieve crossdomain login and identity authentication in each cloud service center. The system administrator has the highest, which can comprehensively maintain and manage the system [16], management, such as adding or deleting data information in the education service platform database, changing user passwords, modifying user information and user permissions, and auditing and restoring data information. Coconstruction members have the right to upload or edit data information, while ordinary users only have the right to browse, retrieve, and download.

The management module adopts metadata to organize, manage, and maintain the database of the education service.

Table 2: Different types of words.

<table>
<thead>
<tr>
<th>Type</th>
<th>Words</th>
<th>Meaning (Chinese pinyin)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contrasting words</td>
<td>On the contrary</td>
<td>Xiāngfàn</td>
</tr>
<tr>
<td></td>
<td>But</td>
<td>Dànshì</td>
</tr>
<tr>
<td></td>
<td>However</td>
<td>Rán’ěr</td>
</tr>
<tr>
<td>Expository words</td>
<td>And then</td>
<td>Jin’ěr</td>
</tr>
<tr>
<td></td>
<td>To another thing</td>
<td>Dui lǐngwài yì jiān shì</td>
</tr>
<tr>
<td></td>
<td>However</td>
<td>Rán’ěr</td>
</tr>
<tr>
<td>Inferential words</td>
<td>As a result</td>
<td>Jiéguò</td>
</tr>
<tr>
<td></td>
<td>Therefore</td>
<td>Yíncl</td>
</tr>
<tr>
<td>Thematic inflection</td>
<td>Anyway</td>
<td>Wúlùn rúhé</td>
</tr>
<tr>
<td></td>
<td>By the way</td>
<td>Shùnbiàn</td>
</tr>
<tr>
<td></td>
<td>Incidentally</td>
<td>Ǒurán</td>
</tr>
</tbody>
</table>

Its main functions are batch processing and importing metadata, metadata format storage management, information verification, etc. The corpus management module is used to manage the authorization of the corpus subscribed by the educational service platform and allow the authorized users to query or obtain the relevant corpus resources [17]. Education service platform can provide Open API, and some corpus resource distributors will also provide some Open API. The API management module provides a unified API hosting service center for these APIs from different sources, so that each member can call them conveniently [18]. The network corpus provided by the corpus resource distributor usually needs to share with a fee, and the billing module can count the user traffic and calculate the related costs.

3. Result Analysis

3.1. Test Preparation. The computer operating system used in the test is the common Windows 10, and its related
configuration is 4G graphics card, 1 T high-speed solid-state drive, and Intel chip motherboard B75, and the processor is a quad-core Core i7, 3.7 GHz high-frequency performance. The constructed English corpus system based on human-computer interaction is used as the main test system, and the English translation auxiliary system based on the corpus of the education service platform is used as a control, and the above computers are used for testing.

3.2. Test Objects. In the test, four types of markers were selected as the test objects, namely, contrastive markers, expository markers, derivation markers, and topic change markers. The specific vocabulary selected is shown in Table 2.

The test uses the statistical software SPSS 17.2 to perform statistical analysis on the data, to count the total number of discourse markers used in the two auxiliary systems, the types of markers used, and the frequency distribution of the use of each type of discourse markers.

3.3. Test Results and Analysis. The test results obtained by SPSS statistical software are shown in Table 3.

This paper observes the test results of four different types of words, respectively. In the auxiliary system based on the education service platform, the test results of the contrastive words show that the “on the contrary” has the lowest frequency ratio, which is 1.6, and the frequency ratio of “but” is 53.4. The analytical test results show that “to another thing” has the lowest frequency of 3.9, and “in addition” has the frequency of 34.8. The results of the inferential word test show that “as a result” has the lowest frequency of 22.3, and “hence” has the highest frequency of 40.2. In the test results of topic change markers, the marker incidentally has the lowest proportion, and the “anyway” has the highest proportion, which is 41.7.

In the assisted translation system based on human-computer interaction, the test results show that the frequency distribution of different markers is relatively uniform, most of which are between 15.0 and 35.0, and there is no frequency ratio with a large gap. In order to verify the validity of the proposed design, 200 same translation words were input to the two systems, and the translation results are shown in Table 4.

As can be seen from Table 3, compared with the traditional auxiliary system, the optimized translation system of the designed education service platform shows higher translation accuracy and efficiency, which can more quickly and accurately extract words related to translation in the database. The data categories involved in the detection results are more comprehensive. This is mainly because the proposed method calculates the weighted function value of the translation term and realizes the construction and iterative update of the information correlation level in the database.

Based on the above data analysis, it can be seen that the frequency distribution of markers in the traditional auxiliary system is not uniform, and the frequency ratio of markers is relatively large, which indicates that there is an excessive use of markers in the system. There is lack of diversity. In the auxiliary system based on human-computer interaction, the frequency distribution of various types is relatively uniform, with good diversity, and the translation efficiency and accuracy are also better than those of traditional systems, which are more suitable for learners to use.
3.4. Voice Input Test Based on Embedded Intelligent System.  
**Test item description:** test whether the system can correctly identify and enter the corresponding pronunciation when the user performs pronunciation in Tables 5 and 6.  
**Test case data:** 30 vowels, 36 consonants, and 18 words.  
Take the first pronunciation as a test.  
**Test result definition:** success rate = number of successful cases/total number of test cases.  
**Analysis of test results:** the system can correctly input all vowels and words. Due to the short pronunciation time and low pronunciation energy of some consonants, the system cannot correctly identify the input.

### Table 5: Test cases of voice input.

<table>
<thead>
<tr>
<th>Type of pronunciation</th>
<th>Vowels</th>
<th>Consonants</th>
<th>Words</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>30</td>
<td>36</td>
<td>18</td>
</tr>
</tbody>
</table>

### Table 6: Test results.

<table>
<thead>
<tr>
<th>Type of pronunciation</th>
<th>Vowels</th>
<th>Consonants</th>
<th>Words</th>
</tr>
</thead>
<tbody>
<tr>
<td>Success rate</td>
<td>100%</td>
<td>94.4%</td>
<td>100%</td>
</tr>
</tbody>
</table>

3.4.1. Scoring Accuracy Test.  
**Test item description:** test the similarity between the automatic scoring of pronunciation and the manual scoring by experts to verify its reliability in Tables 7 and 8.  
**Test case data:** vowel pronunciation score 30. There are 36 consonant pronunciation scores and 18-word pronunciation scores.  
**Analysis of test results:** the system has high accuracy in the pronunciation of vowels and words, which is more than 97% similar to the expert experience score, which is highly reliable. For the pronunciation of consonants, due to reasons such as the length of pronunciation and the low energy, the scoring accuracy is 83.2%, which can reflect the quality of pronunciation to a certain extent, but it is not ideal.

### Table 7: Test cases of scoring accuracy.

<table>
<thead>
<tr>
<th>Type of pronunciation</th>
<th>Vowels</th>
<th>Consonants</th>
<th>Words</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>30</td>
<td>36</td>
<td>18</td>
</tr>
</tbody>
</table>

### Table 8: Test results.

<table>
<thead>
<tr>
<th>Type of pronunciation</th>
<th>Vowels</th>
<th>Consonants</th>
<th>Words</th>
</tr>
</thead>
<tbody>
<tr>
<td>Success rate</td>
<td>97.2%</td>
<td>83.2%</td>
<td>91.6%</td>
</tr>
</tbody>
</table>

3.4.2. Feedback Correction Test.  
**Test item description:** according to the pronunciation formant image comparison given by the system, check whether effective feedback correction can be achieved in Tables 9 and 10.  
**Test case data:** 30 vowel pronunciations and pronunciation of 18 words (consonants are pronounced without formants).  
**Definition of test results:** for each pronunciation, if the pronunciation score can be improved by improving the pronunciation mouth shape according to the formant image, it is considered valid. Otherwise, it is regarded as having little effect or invalid. Effective rate = effective number/total number of pronunciations.  
**Analysis of test results:** the system uses the method of pronunciation formant image comparison, and the effective rate of pronunciation correction is about 80%, which can guide learners to correct pronunciation to a certain extent. The module structure, design scheme, and concrete realization of English pronunciation training system are based on Android platform. Firstly, the main modules of the system are summarized according to the demand analysis, and a feasible design scheme is proposed for each module. Then, according to the design scheme of each module and user interface of the system, a system with pronunciation evaluation feedback is developed and implemented on the Android smartphone platform. The functional intelligent English pronunciation training system can simultaneously realize the functions of pronunciation demonstration of English phonetic symbols and words, pronunciation follow-up, pronunciation comparison, continuous follow-up reading, pronunciation score, pronunciation formant image comparison, etc. This paper presents the detailed system implementation process and some implementation codes, as well as the final implementation effect and test results of the system.

### Table 9: Test cases of feedback correction.

<table>
<thead>
<tr>
<th>Type of pronunciation</th>
<th>Vowels</th>
<th>Consonants</th>
<th>Words</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>30</td>
<td>36</td>
<td>18</td>
</tr>
</tbody>
</table>

### Table 10: Test results.

<table>
<thead>
<tr>
<th>Type of pronunciation</th>
<th>Vowels</th>
<th>Consonants</th>
<th>Words</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effective rate</td>
<td>87.8%</td>
<td>94.4%</td>
<td>80.6%</td>
</tr>
</tbody>
</table>

3.4.3. Comparing Results. This paper also conducts a comparative study before and after the use of cloud computing to create a corpus English service platform, which once again confirms that the English classroom teaching model based on cloud computing to create a corpus is more effective than ordinary classroom teaching. Therefore, this
paper conducts a comparative test of writing, translation, speaking, and other three items, which has a good role in promoting English teaching at this stage.

In order to present the changing trend of English scores more intuitively, this study draws the average scores of the four tests into a line graph, as shown in Figure 4.

4. Discussion

Since the users of the corpus are mainly language learners and researchers, most of the users are English language teachers and students. The construction of education service platform and English corpus based on the embedded intelligent system and cloud computing can learn from the traditional successful experience, and the library will take the lead to establish a sharing mode of cooperation between colleges and universities. A university library is used as the management center of the education service platform, responsible for the implementation and management of the project, and universities with outstanding disciplinary characteristics, rich corpus resources, and strong talents and technical strength serve as the corpus cloud service center, responsible for the overall construction of the special network corpus, while other member units enjoy and undertake the rights and obligations of coconstruction and sharing. While using the corpus on the platform for free, it is responsible for supplementing and improving the corpus in the corpus, uploading the corpus collected by the school but not in the corpus, and the management center will determine whether it is qualified for uploading before uploading [19]. Through cloud computing technology and Service-Oriented Architecture (SOA), the education service platform adopts distributed digital corpus storage and unified retrieval platform, integrates resources and services of various corpora in the Internet, builds controllable adaptive services system, supports the construction and sharing of resources, and supports the construction of a multischool collaborative social network.

4.1. Integrate Corpus Resources and Build a Unified Retrieval Platform. Convert all word indexes of a single corpus into frame web pages in hypertext format; collect, classify, index, code, and utilize massive corpus resources; and use system virtualization technology to form isomorphic or nearly isomorphic resources of the same type. Virtual resource pool completes its personalized mapping and integration from the cloud server to the client, so that those remote users who do not have corpus tools can run operating systems and application services in this virtual environment.

4.2. Provide Online Text Indexing Tools. In order to meet the needs of corpus users for text analysis, the development can implement vocabulary and text statistics, KWIC (key words in context) indexing, sorting, collocation statistics, pattern statistics, subject word extraction, and word cluster statistics. An online corpus text indexing tool with functions such as associative word statistics and reorganization, as well as word graph statistics, encapsulates it into a standard web service by the corresponding technology, which provides SaaS for user embedded devices. The program is transmitted to the user through the browser.

4.3. Evaluating the Service Quality of Corpus Resource Education Service Platform. Establish a database of education service platform, and evaluate the service function and service effect of the entire platform. The daily workflow data is synchronized and recorded through the education service platform database, and a unified education service platform database metadata standard is formulated. The education service platform database can also provide corpus construction units with corpus evaluation reports, count the usage rate of corpora, analyze the distribution of corpus, and guide
corpus construction units to better formulate corpus collection and optimization strategies.

4.4. Realize the Management and Maintenance of the System.
To manage the background data and user information of the system and ensure the safe access of users to the system, users can be divided into different levels and given different permissions, such as browsing, retrieval, editing, uploading, and downloading. Implement restricted access to specific resources, and restore information wrongly edited by users through related mechanisms.

5. Conclusion
In order to simulate the practical corpus resource education service platform, this paper builds multiple text corpora, audio corpus and video corpus based on the embedded intelligent system. The college English teaching service platform combined with corpus has changed the traditional teaching mode, which provided new research methods and ideas for language teaching. This paper uses cloud computing to create a corpus to save human and financial expenses, improve learning efficiency, avoid waste and repeated construction, and achieve data sharing. However, there are also problems with the application of corpora. First, the corpus annotation system lacks uniformity, and the development of annotation technology is slow. There is no uniform standard for labeling and coding. Part-of-speech tagging can be practically applied at present, and other aspects of tagging need to strengthen. Second, corpus-based research focuses on lexical grammar, and it is far from enough to combine other fields of corpus such as literature and translation. This lack of interdisciplinary research also restricts the level of students’ language acquisition. Third, corpus manipulation technology and computer usage level also hinder its application in college English teaching. As a retrieval tool, corpus itself is not easy for students to master, and it is difficult for students to understand the retrieved language examples. Fourth, students are accustomed to the traditional teacher-centered teaching method, and they are not enthusiastic enough to use the corpus to learn actively, and the learning effect will be greatly reduced. These limitations pose obstacles to the use of corpora in college English teaching, which needs to be further addressed.

Data Availability
The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest
The authors do not have any possible conflicts of interest.

References
