A Probe into the Establishment and Analysis of the Mobile English Learning System Model

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Abstract

In the process of rapid development of network technology and communication technology, the convenience, portability, universality and other characteristics of mobile learning platform, has gradually become the inevitable direction for the future development of modern information technology teaching. In light of the fact that English has always been a difficult subject for students' learning English, the emergence of mobile learning platform can not only provide more favorable learning resources for students and help to change their learning mode, but also effectively promote students' learning interest and efficiency through timely communication with teachers and make English a basic skill essential to contemporary students to lay a solid foundation for their future development. This paper probes into the establishment and analysis of English mobile learning system model, discusses its construction background, analyzes the feasibility of constructing the mobile learning system model, and constructs and analyzes the model in such aspects as framework hierarchies, integrated mobile learning environment, design of the structure and functions of the mobile learning platform, etc.; at the same time, a comprehensive evaluation model is established for the mobile learning system model to conduct a comprehensive and objective analysis of the learning conditions of students in the mobile system, so as to improve the overall English level of students and enhance their English proficiency.

Keywords: English, Mobile Learning, Model Construction, Analysis

1. RESEARCH BACKGROUND

1.1 Literature review

Xue (2014) suggests in A Study on the Construction and Development of College English Mobile Learning Mode that most of the students nowadays were born in the 1990s, and the rapid development of network information technology has not only changed their way of life, but also affected the students' ideological values. Students nowadays are lack of interest in extensive reading and have the strong dependence on the Internet; they prefer the way of online daily communication, leading to their reluctance in talking in the real world, which has affected their learning efficiency to some extent. In the process of learning, when coming across some problems they cannot tackle, many students choose to look for the answers on the internet instead of communicating with their teachers timely. When analyzing the mobile English learning model, Luo (2006) also points out that contemporary college students are keen on network surfing and enjoy all the conveniences brought by the network. The results of a 2015 survey report on the Internet status of China shows that by the end of August 15, 2015, China's Internet users has reached 600 million, and the amount of mobile phone users has been up to 300 million, of which the generation after 90s accounts for 67% of the overall Internet users.

1.2 Research purposes

With the increasingly frequent communication between China and the rest of the world and the increasingly fierce social competition for talents, the current market demands urgently for professionals who grasp solid basic knowledge of English and can fluently and skillfully speak English. In the process of their research on domestic mobile English learning in China, Hu and Shen (2014) believes that the current overall English ability of most of the students is still relatively weak, essentially staying at the "dumb" level, there are still such problems as stumbling oral English, superficial writing, incomplete mastery of vocabulary, inaccurate pronunciation, etc., and students know little about the international cultural background and knowledge, failing to meet the demands of the society for professional talents at present. The author thinks that the cause of the present situation of students not only lies in students themselves but also in teaching directly, because teachers
fail to provide a good learning environment for students or to create a great learning atmosphere, nor do they set up modern teaching courses according to student's characteristics of personality and interests and hobbies, greatly reducing students' interests in learning. In the course of the research on the mobile English learning system, this paper finds that although many colleges and universities have been carrying out teaching activities with the multimedia information technology means, the final results are not optimistic, and the following problems are observed: lack of perfect modern teaching system, teachers limiting themselves to the restricted class time and lack of teaching practice, lack of enough interactions between teachers and students, students' oral English ability failing to be fundamentally improved, students' English knowledge failing to be expanded, students' English writing and reading abilities remaining stagnant, etc.

2. FEASIBILITY ANALYSIS OF CONSTRUCTING THE MOBILE LEARNING SYSTEM MODEL

2.1 Advantages of mobile learning system model

With the deepening development of network information technology, the network communication technology has realized a qualitative leap and mobile devices have become increasingly popular. The mobile learning mode arises at the historic moment in this context; this brand-new way of learning has promoted the development of lifelong education to some extent and has been recognized and accepted by related educationalists as well. The feasibility of constructing the mobile learning system in English teaching is mainly reflected in the following two points. First, mobile learning can break the traditional way of learning. At present, there is no clear concept and definition of mobile learning, and we may understand it as a modern advanced way of learning based on network communication technology using portable devices anytime and anywhere. Therefore, the mobile learning system model contains not only the learning using mobile devices and extensive live-action learning, but also the learning across places. On the basis of the normal education at school, mobile learning attempts to use the network technology to enhance teaching quality and management and presents such advantages as portability, mobility, and uniqueness. To create a learning environment not restricted by time and space is a common goal of each teacher. By introducing the mobile learning model, the teaching can touch every corner and teachers can not only upload the knowledge to be taught to the platform, but also keep the teaching information and courseware in the mobile devices for long time and share them to tablets, laptops, mobile phones, and other electronic equipment. The mobile learning system can fully change the original teaching mode, and bring new learning experience for students, which is of great significance to the enhancement of teaching effectiveness and students' interests.

2.2 Applicability of mobile learning system model

Mobile learning system is especially suitable for learning of languages, and the earliest mobile learning system contains many learning programs of languages. However, learning a language is not achieved overnight; it involves a complex variety of contents. Compared to other mobile learning programs, the progress and development of language learning is relatively slow. As time goes by, a complete and independent language system has been established with the maturing of modern network technology. In the 21st century, mobile communication equipment has completely entered a period of mass consumption; such a shift provides opportunities to the establishment of the English mobile learning system model. Moreover, many foreign countries have provided abundant research achievements worthy of learning and reference, which makes the domestic scholars embrace more expectations believing that the mobile learning mode will inevitably become the future development direction for English learning. At present, domestic mobile English learning software has become prevalent; Sina, Sohu, Baidu Cloud and other influential websites have successively developed their own mobile learning software; New Oriental English Training Center, the most perfect domestic English training agency, has trained a large number of excellent English professional talents using their own unique system, and its teaching team has compiled the Palm Thinking English, a set of materials suitable for mobile English learning, jointly with the Education Research Center of Peking University, providing beneficial references for universities to build the mobile English learning system model.

3. Establishment and analysis of the mobile English learning system model

3.1 Hierarchical framework of the learning system model

In order to fully, clearly, and more intuitively understand the framework and application model required to be built by mobile learning, this paper analyzes the general structure of the frame according to its hierarchies, and draws the basic model of mobile learning system as shown in Figure 1.
This system model fully realizes the mutual confluence of the modern informationalized learning mode and the mobile learning system. It is divided into four layers: platform support layer, resource structure layer, learning service layer, and mobile access layer, from bottom to top. The upper layers use the services provided by the lower layers to realize the function of mobile learning. Functions of each layer are described below: The platform support layer mainly includes campus network environment and informationalized learning platform and relevant resources; campus network is the foundation of communication of mobile learning and the guarantee for the learning environment, and the informationalized learning platform provides students with abundant learning resources and vast amounts of knowledge; the two aspects jointly form the foundation of the mobile learning system model. The resource structure layer takes the main learning objects as the main way to rebuild and organize informationalized learning resources, so as to realize the integrated standard of wireless mobile network technology and learning resources. The learning service layer is an important linking component aiming to create realistic situation cognition, information integration, cooperative study, and other specific functional services and to provide the corresponding service applications to students using the English mobile learning system. The top mobile connection layer can enable students to use a variety of mobile clients to seek for corresponding help from the learning service layer, so as to finish the complete study in the mobile system.

3.2 Construction of the integrated mobile environment

In the early stages of constructing the mobile learning system model, schools should first solve two important problems: one is to construct a carrier that can become the application and expansion network environment of the mobile learning system; the other one is to build the presentation mode and the internal structure of learning resources suited to the characteristics of the mobile learning system model, realizing the recombination and construction of the informationalized learning resources. The newly created wireless network and wired network, the reconstructed mobile learning resources, and the informationalized learning resources should be fully combined and eventually form an information-integrated learning environment. The details are shown in Figure 2 below.

In terms of English courses in the process of building the campus network, wireless network will become the expansion of traditional wired network in the long run, but its layout is in the form of regional demonstration, which causes such adverse conditions as narrow coverage of network, unstable network signals, etc., failing to meet the needs of students learning English and reducing students' learning efficiency. Campus wireless networks supporting English mobile learning should have such features as form, efficiency, rapidness, expansion, etc., in which form refers to the so-called network scale, mainly meaning that the layout of wireless network should thoroughly take into consideration the stability of signals and the coverage of the network, analyze the user's intensity, and ensure that students can connect to the wireless network freely within the coverage of the campus network. It focuses on the transmission speed of the wireless network, so that the broadband connection and the network stability can support the sharing and application of informationalized learning resources and realize the modern intelligentization of the mobile Internet. Integration refers to the mutual convergence among the wireless network and the 4G network and broadband network, so as to achieve mutual authentication among networks and information share and transfer and provide a broader space for mobile English learning. Expansion mainly refers to the expectation that wireless network learning environment should have the abilities of accommodating the brand new network technology and information application, such as the integration of three networks, cloud technology, etc., to ensure the sustainable development of the English mobile learning.
Figure 2. Information integrated mobile learning environment

3.3. Analysis of the structure model of the mobile learning platform

3.3.1 Model building

Mobile learning system can stimulate students' learning motivation, make them spontaneously generate learning behaviors, thus cultivate students' good habit to learn actively; in this system, contents of learning are scattered, sites of learning are not restricted, and students can adjust their learning objectives according to their own requirements, completely breaking the traditional learning mode; in addition, situational teaching and interactive teaching should be the basic structure of the integration of mobile learning and traditional learning.

The mobile learning platform structure model can be built based on the above analysis, and each structure module is set as follows:

\[ y_i, k \in [2, j] \] (1)

Its variables of learning process in the system are as follows:

\[ b_{ni-1}, b_{n1}, \ldots, b_{nm} \quad (m \geq 1, \beta_{ji} \leq 1, b_{n1} \leq \alpha_{n1}, i \in [1, m]) \] (2)

If the variation of login times of students represents the enthusiasm of students' participation, the following formula can be obtained:

\[
\lambda_n(\rho_{nn}) = \begin{cases} 
\frac{\rho_{nn} - 9R_{nn}}{\sum_{n_m} - 9R_{nn}}, i \in [1, l] \\
\frac{\sum_{n_m} - \rho_{nn}}{\sum_{n_m} - 9R_{nn}}, i \in [l + 1, i] \\
\frac{9R_{nn} - \rho_{nn}}{\rho_{nn} - \sum_{n_m}}, i \in [l + 1, ij] 
\end{cases}
\] (3)

In order to fully embody the login average value of students in the English mobile learning system model, function average numerical calculation can be used to obtain:

\[
\lambda_n(\rho_{nn}) = \sqrt[\sum_{i=1}^{nm} \lambda_i(\rho_{nn})}
\] (4)
Based on the calculation, it can be fully observed that its variables always remain between 0 and 1; when it keeps to 1, it means that the login frequency and students’ learning enthusiasm are high; when it keeps to 0, it means that the building of the model cannot attract students’ attention and it loses the practical significance.

If the established initial login numerical sequence degree is set to \( \lambda_i^{0} \), the basic situation of students’ login can be calculated as follows:

\[
\text{cd} = \hat{\theta} \times \prod_{j=1}^{n} \left( \lambda_{ij}(c_n) - \lambda_{ij}^{0}(c_n) \right)
\]  

(5)

Where \( \hat{\theta} = \frac{\sum_{i=1}^{m} \left[ \lambda_{ij}(c_n) - \lambda_{ij}^{0}(c_n) \right] \neq 0}{\sum_{i=1}^{m} \left[ \lambda_{in}(c_n) - \lambda_{in}^{0}(c_n) \right] \neq 0} , n = 1,2,3,\ldots,g \)

3.3.2 Analysis of the specific structure flow chart of the system

Figure 3. Structure of mobile learning model

The attention of students in the English mobile learning system has the characteristics such as discontinuity, variability, etc.; as a result, mobile learning is not necessarily appropriate for learning activities of all disciplines or languages. In order to raise students’ interest in learning English courses, learning resources should be strongly targeted, and it is necessary to reorganize and represent according to the characteristic in the process of learning. It is appropriate to present learning resources in the form of subject and object and present the learning course of learning objects in the form of vivid images; at the same time, it is necessary to control each student’s learning span and the difficulty of the learning content, so as to provide high-quality learning services for students. The organizational structure among students and the regular drive in the learning behaviors are taken as the local structure, with the tree structure representing students’ learning practice, so as to improve students’ learning efficiency. The details are shown in Figure 3 below.

<table>
<thead>
<tr>
<th>Level 1 indicator U_1</th>
<th>Weight of level 1 indicator a_i</th>
<th>Level 2 indicator U_{ij}</th>
<th>Weight of level 2 indicator a_{ij}</th>
<th>Order of evaluation</th>
<th>Percentage of ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning attitude U_1</td>
<td>0.090</td>
<td>Actively participate in online interactive teaching U_{11}</td>
<td>0.231</td>
<td>A</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Capable of autonomous learning U_{12}</td>
<td>0.092</td>
<td>B</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Earnestly and timely</td>
<td>0.096</td>
<td>C</td>
<td>3</td>
</tr>
</tbody>
</table>

Table 1. Network mobile learning evaluation questionnaire
4. INSTANCE ANALYSIS OF THE TEACHING EVALUATION COMPREHENSIVE MODEL

4.1 Determination and analysis of the elements of the evaluation indicators

In addition, after the successful construction of the mobile learning system model, in order to make it work effectively, it is needed to establish relevant evaluation mechanism to test students' learning status in the software and carry out the comprehensive evaluation of student's performance in English courses; concrete evaluation indicators should also be formulated to build a perfect systematic evaluation model. Upload the evaluation questionnaire to the Internet, randomly select one student Y and 30 comments of teachers on the student, and obtain the network mobile learning evaluation questionnaire Table 1 of student Y in the mobile learning model after processing the data.

4.2 Construction of performance model

Formulate the evaluation elements of a variety of behaviors of students' learning on the network platform based on the "Expert Meeting Law", and obtain the corresponding matrix by comparing two by two; obtain the judgment group of B1 by comparing the indicators in Level 1 indicators, and obtain the weight coefficient of each evaluation indicator of Level 1 by calculating B1 with the summing method; conduct unified examination of B1 for judging the matrix. The greatest characteristic root is $\gamma_{\text{max}}=4.136$, and the uniformity indicator $CI = \frac{\gamma_{\text{max}} - n}{n-1}$, where $n$ is the number of the evaluation indicators to be compared, $CI=0.046$. It is concluded through the calculation that when $n=4$, the value of the average random uniformity indicator $RI$ is 0.09, the uniformity ratio $CR=CI/RI=0.046/0.09=0.06$; when $CR<0.20$, the consistency of judgment matrix is worthy to be confirmed. In this paper, $CR$ is significantly less than 0.20, indicating that the judgment matrix constituted by the comparison values of each element of $U$ in Level 1 indicators built previously shows the uniformity, and the determination of weights is also reasonable.

$$ B(1) = \begin{bmatrix} 1 & 2 & 1 & 1 \\ 3 & 2 & 3 & 7 \\ 1 & 1 & 4 & 8 \\ 3 & 5 & 1 & 9 \\ 9 & 4 & 1 & 8 \end{bmatrix} $$

The above calculating formula and the survey questionnaire shows that of the English performance percentage
of student Y, A accounts for 0%, B for 17%, C for 50%, D for 30%, and "Failed" for 3%; according to the
calculation by the matrix of graded scores, the final result of the student is:

\[
\mathbf{u}_i = \begin{bmatrix} 94 \\ 86 \\ 73 \\ 67 \\ 50 \end{bmatrix} = 75.163
\]

(7)

This score indicates that the grade of English performance of student Y is medium. Based on the formula,
teachers can conduct a comprehensive analysis of the learning status of each student on the mobile learning
platform, make correct and objective evaluations of every aspect of students' performances using big data, and
timely make the proper adjustment of the mobile learning model for the evaluation results and students' performances, so as to provide a better learning platform for students.

5. CONCLUSION

The continuous development of information technology has effectively promoted the building process of
campus network. In order to better construct the English mobile learning system model and create a good
learning environment for students, in the process of the construction, schools and teachers should not only
expand and extend the mobile learning platform, but also include the basic theoretical knowledge, concepts,
technology structure, and development measures of mobile learning into the construction work and pay special
attention to them. In addition, in a wide range of applications of the English mobile learning system, it is
necessary to enhance the close cooperation between schools and the related enterprises, give full play to their
perspective positive role, provide favorable support for mobile English learning, promote its improvement on
the road of sustainable development, and offer favorable conditions for enriching English teaching method,
innovating English teaching mode, and promoting teaching justice.

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