Analytic Hierarchy Process (AHP)-based English Communication Software Development

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Abstract

Nowadays, English as a universal language is more and more widely and frequently used in the context of deepening globalization and closer international trade and cooperation ties, making English proficiency one of the most important qualifications. English education is highly emphasized and starts from young in China, yet more often the case, what students receive is numb English education which leaves them strong in passing examinations but poor in free communication, which not only contributes little to students’ future jobs or development, but also goes against the core value of English education. Therefore, traditional English teaching needs to be reformed and English communication software needs to be developed to improve English communication teaching. This paper puts forward some strategies for English communication software development and application based on an analysis of the quality evaluation index for English communication software development, so as to provide references for improving English communication teaching.

Keywords: English Communication, Software Development, Function Analysis.

1. RESEARCH SUMMARY

1.1 Research background

Thanks to fast-developing information and technology, Internet-based teaching software, with its great superiority, has had profound influences on traditional teaching, in which English teachers pay so much attention to grammar teaching to prepare students for English examinations that they leave little time for students for free English communication. As a result, students lose the willingness or courage to talk in English and even lack enough English communication exercise after class, leaving them strong in grammar yet poor in free communication, which goes against the core value of English education. However, when English communication software is brought in, things will go quite different. Students are able to practice talking in English in or after class through English communication software, which not only helps students make full use of English class time, but also helps improving English teaching, both contributing to the overall development of students’ comprehensive qualities. Considering that the research on English communication software development just takes steps in China, more efforts need to be made in English communication software development and applications to accelerate its development.

1.2 Literature review

Current English communication software, enabling users to read after or practice listening, is both interesting and rich in content, making it possible for students even those poor in English to choose content suitable for them. However, lack of feedback mechanism together with repetitive and mechanical oral English practice only easily results in boredom and cannot improve students’ English communication skills, so it won’t last long. As is known, there are three kinds of English communication software: online (rich in resources), semi-online (free) and offline (flexible), of which online software requires large amount of network flow so students cannot use it wherever they want, and offline software seldom updates English resources, thus unable to meet students’ demands (Lu et al., 2014). Current English communication software app is mainly applied on Android and iOS mobile phones, and the software lasts longer as long as it is frequently maintained and updated. The advantage is that students can better practice communicating in English with easy acquisition of resources and low cost, while the disadvantage is that there’s always problem with compatibility and it is not available during maintenance and updating. Besides, as a commercial product itself, English communication software also aims for profits by means of advertisement and paid courses, which meets individual needs though, yet distracts
students’ attention, and many courses are even chicken ribs (Chen, 2013). Therefore, the following aspects should be taken into consideration in English communication software design: first, it should combine listening and speaking practice, sound and image experience as well as shadowing exercise all together; second, it should set some challenge practices to make English learning more interesting; third, it should interact more with users by sharing resources on BBS, for instance; forth, it should be more accessible with simple interface settings; fifth, it should guarantee the quality of its paid courses; sixth, it should be used offline to free students from time and space limits (Wang, 2013).

2. THE QUALITY EVALUATION INDEX FOR ENGLISH COMMUNICATION SOFTWARE DEVELOPMENT

2.1 The foundation of the quality evaluation index for English communication software development

The evaluation index system is the basis for quality evaluation of English communication software development, and accurate, specific and operable evaluation index can be gained through the following ways (Cheng, 2013).

First, grasp relative theories by reading literature on English communication software development from home and abroad, followed by case studies to analyse reasons for success and failure. Besides, participate in seminars and forums on English communication software development to lay a solid theoretical foundation for analysing index influencing the quality of English communication software development, so as to form a complete index group.

Second, invite experts and superior English scholars for suggestions on the index group before the final evaluation index system is formed, as is shown in Figure 1:

![Figure 1. English Communication Software Development Quality Evaluation Index](image-url)
As can be seen in the figure, English communication software development quality evaluation index includes teaching attitude, content of courses, teaching art, teaching quality and teaching effectiveness (Gao and Li, 2012).

Teaching attitude means whether the English communication software assists English teaching, is operable enough for teachers to make adjustments if necessary, or can make a visual evaluation on the capability and achievements of the students (Zhi, 2012).

Content of courses means whether the English communication software provides scientific and integrate content to comprehensively improve students' communication ability, and frequently updates the content to ensure that students get novel knowledge and communication materials.

Teaching art means whether the English communication software can improve students' listening, speaking, reading and writing abilities in accordance of individual aptitude, and by means of heuristic method, get students totally involved in individual thinking, so as to improve their communicative level.

Teaching quality refers to the correctness of what is taught in English communication software, whether it can help students start self-study, or whether its teaching method is interesting enough to get students better involved (Li, 2012).

Teaching effectiveness means whether students get grade promotion, can freely communicate with others in English, have some knowledge about western culture so as to tell the cultural differences in English and follow classroom discipline during English learning with English communication software (Yang and Tan, 2014).

2.2 AHP Analysis of English communication software development quality

Put forward in the 1970s, AHP is an operations research decision-making technique that can solve real problems. Its core concept is to decompose different variables affecting one thing into judgment matrix by investigation and discussion, and then compare the variables with each other two at a time, so as to find out the most influential elements. AHP Analysis is carried out as follows.

First, build the hierarchical model. Classify different elements into a hierarchy and annotate the subordination relations between them. If some branch includes a lot of sub-systems, then subdivide it.

Second, compose the judgment matrix. AHP Analysis finds out the most influential elements by comparing the variables with each other two at a time, which is only possible when the differences between various influential elements are affirmed by composing judgment matrix. After that, make assignment for the comparing results according to 1-9 and the differences between various influential elements will be clear. The scale setting of difference is shown in Table 1:

<table>
<thead>
<tr>
<th>Importance</th>
<th>Definition</th>
<th>Word description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Equally important</td>
<td>Same effect</td>
</tr>
<tr>
<td>3</td>
<td>Slightly important</td>
<td>One is more important than the other</td>
</tr>
<tr>
<td>5</td>
<td>Important</td>
<td>One is obviously more important than the other</td>
</tr>
<tr>
<td>7</td>
<td>Very important</td>
<td>One is more important than the other</td>
</tr>
<tr>
<td>9</td>
<td>Absolutely important</td>
<td>One is more important than the other</td>
</tr>
<tr>
<td>2, 4, 6, 8</td>
<td></td>
<td>Middle value of 1, 3, 5, 7, 9</td>
</tr>
</tbody>
</table>

As for formula \( A_k = (a_{ij})_{n \times n} \), \( A_k \) represents the judgment matrix, \( a_{ij} \) represents the large unit in line i row j of the judgment matrix, \( n \times n \) represents the order of the judgment matrix

Third, perform consistency check. Normalize all the elements in formula \( A_k = (a_{ij})_{n \times n} \), and the result is:

\[
\bar{a}_{ij} = \frac{a_{ij}}{\sum_{k=1}^{n} a_{kj}} \quad (i, j = 1, 2, 3, ..., n)
\] (1)
Then add figures in every line of judgment matrix $A_i$, and the result is:

$$\bar{w}_i = \sum_{j=1}^{n} \bar{a}_{ij} \ (i = 1, 2, 3, \ldots, n)$$

(2)

After that, normalize the above formula, and the result is:

$$w_i = \frac{\bar{w}_i}{\sum_{j=1}^{n} \bar{w}_j} \ (i = 1, 2, \ldots, n)$$

(3)

At last, perform consistency check by computing $CR$ according to the following formula:

$$CR = \frac{CI}{RI}$$

(4)

The value of $RI$ is assigned according to Table 2:

<table>
<thead>
<tr>
<th>N</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>RI</td>
<td>0</td>
<td>0</td>
<td>0.58</td>
<td>0.89</td>
<td>1.12</td>
<td>1.24</td>
<td>1.32</td>
<td>1.41</td>
<td>1.45</td>
</tr>
</tbody>
</table>

CI formula is as follows:

$$CI = \frac{\lambda_{\text{max}} - n}{n - 1}$$

$$\lambda_{\text{max}} = \frac{1}{n} \sum_{j=1}^{n} \left[ \sum_{i=1}^{n} b_{ij} w_{ij} \right]$$

(5)

The result less than or equal to 0.1 is usable and accurate, while the result greater than 0.1 is inaccurate and needs to be re-evaluated until it is usable (Li and Lu, 2011).

3. DESIGN OF ENGLISH COMMUNICATION LEARNING SYSTEM

3.1 User experience design

User experience design should take the user’s demand for information and security into consideration, the former meaning providing different information supports and service for different users, and the latter meaning granting different permission to different users so that they cannot exercise their permission beyond what they are granted, as is shown in Figure 2:

![Figure 2. System User Structure Diagram](image)

To be specific, once logging in from the same login window, the teacher, student and administrator will enter different English communication software systems for different tasks according to their identities.
3.2 Learning system design

English communication learning system should meet the following requirements: first, it shouldn’t be accessed until the user logs in with authentication; second, it should provide students with learning materials of high quality; third, the teachers can make some adjustments and addition to the learning materials with special login authentication; last but not least, it should enable students to communicate in English with each on the Internet. The specific system data flow diagram is shown in Figure 3:

![System Data Flow Diagram](image)

Figure 3. System Data Flow Diagram

To be specific, users need identify themselves when logging in. The student user will enter the navigation module and directory module where he can choose suitable learning module. Once finishing the English communication learning, the student will be provided with after-class exercise which is recorded in the background. And after that, he can choose either to do supplemental exercise or to go back to the navigation module for further learning, or even to finish all the learning tasks. However, the teacher user will enter the interface for teachers where he can make some adjustments, deletion and addition to the learning materials to be provided for students in the content maintenance module. When students finish the after-class exercise, the teacher will have a general knowledge about the students’ English communication learning according to the data recorded by the software (Cheng, 2014).

3.3 Strategies for English communication software application in English teaching

3.3.1 To reform traditional teaching concept

In traditional English teaching, driven by higher enrolment rate and better grades, most English teachers paid more attention to grammatical teaching instead of English communicative ability cultivation of the students, making it hard for English communication software to be used in traditional English teaching. Therefore, the following can be done to reform traditional teaching.

3.3.2 To put students first in English teaching

Usually putting teachers first, traditional English teaching aimed at preparing students for English examinations through cramming students with grammars, which went against the fact that knowledge was to be grasped through exercise and study by the students themselves rather than taught by others. Therefore, scientific English teaching should put students first by encouraging them to learn by themselves and choose suitable and individualized learning materials when using English communication software. As for teachers, they should adjust themselves to the role of an organizer and guide from that of a class dominator, which poses great challenges for their teaching competence (Wang, 2016).

3.3.3 To put emphasis on competence cultivation
As an important qualification, English competence refers to one’s English application or English communication competence instead of examination taking ability, so English communication competence comprises one of the indispensable parts of a comprehensive talent. However, the fact is that dumb English is popular among current English teaching, which poses great threats to teaching quality, so it is necessary that dumb English be avoided to improve students’ English communication competence. To achieve that goal, English communication software should be used to instruct students in English communication learning with it in order to improve their English application ability and even their overall English proficiency (Zhu, 2015).

3.3.4 To absorb novel teaching concept

First, it is necessary to put students first in English teaching so that they can be instructed to have a comprehensive view about themselves and then choose the most suitable materials for specialized learning with English communication software, which makes it possible to meet various demands of the students. Second, more attention should be paid to guiding students in English self-study, so that they can solve problems and consolidate their comprehension about English knowledge with reference to online resources and books (Zhang, 2013).

3.4 To transform the teachers’ role

Traditionally speaking, the teacher was the class dominator who had the whole class in control, while things are quite different in English communication learning system. As for English teaching in universities, the teachers should take good advantage of the Internet to assist them in collecting English communicative materials, designing English teaching in class, helping students build a complete knowledge system and guiding students to teach themselves English with English communication software in a correct way. What’s more, teachers should inspire students’ interest in English learning to feel its humanistic spirit while at the same time guarantee good communication atmosphere in class. Besides, it is necessary for the teachers to follow the learning and discussion process of the students in group study and make an evaluation after class so that amendments can be made in time to improve the quality of English teaching in universities (Ke, 2017).

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REFERENCES

Ceng P., Mao Y.S., Guo Q., Li F.R. (2011). Design and implementation of English word formation software, computer applications and software, 28 (10), 142-145.
Wang S.Q. (2016). The application of games in primary school English learning software, Digital education, 2 (03), 73-76.

