Ways to Promote Students' Deep Learning in English Teaching Based on Computer Technology

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Abstract. The current economic and social development is inseparable from computers. Computer technology has not only brought tremendous changes to all aspects of society, but also brought opportunities to the reform of our country's education industry. Adding computer technology to the process of English teaching can effectively promote students' deep learning. At the same time, this teaching model has already appeared in many schools in our country. This article explores the convenience brought about by the way that computer technology promotes students' deep learning of English by using both teachers and students. This article first explains the application and research of computer technology in traditional English teaching, and analyzes the case of improving students' classroom teaching and extracurricular collaboration by introducing computer technology and multimedia technology under computer technology. This research conducted a survey of 120 sophomore English majors and 38 English teachers in a language university. The survey method used questionnaire surveys, interview surveys and practice classroom methods to explore the reform of deep learning in English teaching. Under the path, students' understanding of computer technology promotes English teaching. This article also explores the impact of computer technology on English teachers through a survey of English teachers, including the changes in their traditional teaching methods and teaching concepts, the challenges of practical teaching methods, and the repositioning of teacher-student relationships. The experimental results show that, the deep learning path that computer technology promotes English teaching has changed the traditional English teaching method and rebuilt a new English teaching concept. Its classroom is more practical and interactive, and it is also more conducive to the cultivation of students' autonomous learning ability.

Keywords: Computer Technology, English Teaching, Idea Innovation, English Deep Learning Path

1. Introduction
From beginning to end, the main purpose of the school's English teaching is to cultivate students' comprehensive application ability of English, especially their listening and speaking ability, in order to promote the future exchange and understanding of foreign English culture [1]. However, in the current
situation, English teaching is far from reaching the purpose of listening, speaking, reading and writing, and students do not like English learning [2]. In recent years, when English teaching under computer technology wants to promote students' deep learning of English, it can not only provide students with sensory experiences such as audio, video, and pictures, but also help students create a more realistic English learning environment [3]. This model has gradually replaced the traditional English teaching method and has become one of the main contents of the current English teaching technology innovation [4].

The introduction of computer technology has changed the traditional English teaching methods. It can visualize English language knowledge through the integration of video, audio and pictures, and create a good teaching atmosphere. The computer technology-oriented English classroom teaching model can make the knowledge content that could not be expressed in language in the past, and perform well in front of students, enhance their understanding of knowledge, expand their knowledge, and promote English teaching to informatization Change of direction [5]. Among the main methods of English teaching in the classroom, the content delivery based on traditional English education is too limited, which affects the broadening of students' thinking. If computer technology wants to enrich the content of its English teaching in the English classroom, it will open up the students' English learning vision and also improve their English learning ability and skills [6, 7]. Therefore, in the process of English classroom teaching, if we want to further play the role of computer technology in English teaching, schools should regularly organize teachers to carry out information technology learning and training, and English teachers should improve their own teaching resources. Optimize, summarize its advantages repeatedly in the process of practical teaching, find out the shortcomings and correct them in time, and gradually improve the teacher's own computer technology-based English teaching level, so that students can get huge help in the process of promoting English deep learning [8].

The use of computer technology in English practice teaching cannot do without the support of traditional multimedia courseware, but many English teachers cannot produce high-quality multimedia courseware. Even if you put the contents of English teaching in the multimedia production and use computer multimedia visibility as a tool to assist English teaching, such multimedia courseware is almost the same as the textbook, except that the content of the textbook is copied to the PPT. That's it, it can't improve students' interest in learning English, and it is also difficult to attract students' attention in the classroom [9]. However, the newly emerging English teachers based on multimedia visualization production at this stage need to guide the new generation of teachers who are newly employed, guide them to determine the key and difficult points of the courseware content, unite and cooperate, and according to the current school English teaching goals and teaching methods reform make every effort to formulate a kind of teaching courseware suitable for students to learn English, and make full use of computer technology to adopt a mode of online and offline mixed teaching, students' deep learning of English will also achieve a very good teaching effect [10].

2. Method

2.1 Establishment of Pointer Network Algorithm

The pointer network is a neural network proposed by Vinyals et al. that can learn the conditional probability of the output sequence from a discrete input sequence. It is a variant of the sequence to sequence (seq2seq) network model and can be effectively used for learning. Low-dimensional combinatorial optimization problem, and can predict the solution of the problem with high accuracy. The principle of the pointer network is to map the input to a series of pointers that point to the elements of the input sequence according to probability, and xn and yn represent the input network data.

The modification of the pointer network on the basis of the original seq2seq model does not get the output by weighting all the results, but directly uses the result value of softmax as the conditional probability of the output, which can be expressed by the formula:
\[ u_j^i = v^T \tanh(W_1 e_j + W_2 d_i), \ j \in (1, 2, \ldots, n) \]  
\[ p(C_i | C_1, C_2, \ldots, C_{i-1}, P; \theta) = \text{softmax}(u^i) \]

Among them, v and W_1, W_2 are the trainable parameters of the model, the vector \( u_j^i \) is the pointer of the input element, and softmax normalizes \( u_j^i \) to the distribution of the input sequence in the output element \( p(C_i | C_1, C_2, \ldots, C_{i-1}, P; \theta) \) represents the conditional probability that the input element is selected as the output element.

Near Field Search Strategy:
Near-field search, also called nearest neighbor initialization, is a type of greedy initialization (Greedy). NN starts from a random city, and selects the city closest to the current city from the remaining cities as the next city each time, and repeats the process until all cities in the range are completed. The available formula is:
\[ T_t = T_{t-1} + \min(D_{c_i c_r}) \]

Where \( T_t \) is the current path length, and \( D_{c_i c_r} \) represents the distance between the current city \( c_i \) and the remaining city \( c_r \).

2.2 Loss Function Based on SSD Algorithm
The objective function of the SSD algorithm is similar to the multi-box objective function, and it has been extended to handle multiple target categories at the same time. The total objective loss function is the weighted sum of location loss (LOC) and confidence loss (CONF), as shown in formula (4):
\[ L(x, c, l, g) = \frac{1}{N} (L_{\text{conf}}(x, c) + \alpha L_{\text{loc}}(x, l, g)) \]

In formula (4), \( N \) represents the number of default bounding boxes corresponding to the true label, and the position loss is the loss of SmoothL_1, which is used for the predicted bounding and the center position of the regression bounding box in the true label \( g \) parameter of \( l \) and width and height:
\[ L_{\text{loc}}(x, l, g) = \sum_{i \in \text{POS}} \sum_{m \in \{cx, cy, w, h\}} x_{ij}^k \text{SmoothL}_1(l_i^m - g_i^m) \]

\[ b_{ij}^x = \frac{g_i^x - d_i^x}{d_i^w}, b_{ij}^y = \frac{g_i^y - d_i^y}{d_i^h} \]

\[ b_{ij}^w = \log \left( \frac{g_i^w}{d_i^w} \right), b_{ij}^h = \log \left( \frac{g_i^h}{d_i^h} \right) \]

The loss function in the SSD algorithm is the softmax loss, using the confidence \( C \) of each category as input:
\[ L_{\text{conf}}(x, c) = -\sum_{i \in \text{POS}} x_{ij}^p \log(c_i^p) - \sum_{i \in \text{NEG}} \log(C_i^p) \]
\[ c_i^p = \frac{\exp(c_i^p)}{\sum_p \exp(c_i^p)} \]

2.3 Integrate Traditional English Teaching with Computer Technology and Use a Web-Based English Teaching Model
But with the rapid development of computer technology and network technology based on computer technology, many schools have established a campus network model that can cover the entire school. The application of the Internet has provided a large number of visual information resources for universities in English teaching at this stage. Therefore, in the process of English teaching, teachers of English majors can put them in a folder according to the content of English teaching and the resources needed for the next class and publish them on the teaching website, making full use of the Internet as a
resource sharing. The website has set up tutoring materials of different functional modules for teachers to log in to the teaching website for self-collection when needed.

2.4 Change the Traditional Teaching Concepts, Make Scientific Use, and Make Progress Together
The integration of the development of computer technology with the informationization of English teaching at the current stage has brought a very big challenge to the education reform, which makes education workers to understand vocational education with a more open attitude. However, computer technology as a concept and method has brought infinite vitality to English education to promote students' deep learning. At present, the internationalization of English education and the use of its teaching resources are more efficient, fair and open for resource sharing. This article attempts to establish a course learning platform in the English curriculum reform. By expanding the classroom scale, the teacher-student interaction space has been expanded, the teacher-student relationship has been strengthened, and the classroom teaching atmosphere and emotions have been maintained and continued in order to achieve efficiency first. Through the use of solid computer technology, it can be compared with traditional English teaching methods. Combining, continuously reducing it into English practical application-oriented teaching, integrating the direction of promoting students' deep learning.

3. Experiment

3.1 Data input and Processing
Use \( x_i (i \in (1, n + k)) \) to represent the historical data of cloud computing resource load at the i-th time node, and use \( x_1, x_2, \ldots, x_n \) to construct historical data from the first time node to the n-th time node, \( x_2, x_3, \ldots, x_n + 1 \) to construct historical data from the second time node to \( n + 1 \) time node, and so on, to construct a historical data matrix of cloud computing resource load:

\[
X = \begin{pmatrix}
  x_1 & \cdots & x_k \\
  x_{n} & \cdots & x_{n+k-1} \\
  \vdots & \ddots & \vdots \\
  x_{n+k} & \cdots & x_{2n} \\
  x_{n+k+1} & \cdots & x_{n+k+k-1} \\
\end{pmatrix}
\]

After data cleaning and normalization, an enhanced data set \((X, Y)\) is obtained as the input data of the combined model.

BP neural network prediction:
Split the input data \((X, Y)\) into the training data set \((X_{\text{train}}, Y_{\text{train}})\) and the test data set \((X_{\text{test}}, Y_{\text{test}})\), construct the input layer, the first layer: the hidden layer of cloud computing resource load prediction based on the BPNN-LSTM combined model:

\[
f(x) = \frac{1}{1 + e^{-x}}
\]

Set the comparison prediction result \( Y_{\text{predict}} \) and actual load data (the loss function of \( Y_{\text{test}} \) is the square root function of the mean square error:

\[
\text{MSE} = \frac{1}{m} \sum_{i=1}^{m} (Y_{\text{train}} - Y_{\text{predict}})^2
\]

3.2 Experimental Research Objects and Design
The survey object of this article is English sophomore students in language universities, and selected 120 students from two classes and 38 English majors to conduct experiments. They are divided into traditional classes and control classes. The control classes are based on computer technology. Information-based teaching methods, while traditional classes use traditional English teaching
methods. After a quarter of study, conduct knowledge tests on them and questionnaires on the impact of computer technology and information-based teaching in the control class, further complete the computerized teaching mode, and understand the current status of the university's teaching mode and problems in the teaching model. In this study, a total of 120 students from two classes of language college English were trained and studied. After the training was completed, their mastery test was conducted to compare the mastery of the practical knowledge of the two classes and analyze the variance method. Questionnaire for "Computerized English Teaching Mode for College Students". Although a large amount of information can be learned from the questionnaire, there are also cases of incomplete information. Therefore, on this basis, the method of checking information on the Internet is also used. The following data analysis will uniformly investigate the information and the current situation. As shown in Table 1.

**Table 1. Statistical results of research survey reports**

| Questionnaire issuance and recovery | English teacher | Student | Total |
|------------------------------------|----------------|---------|-------|
| Issue                              | 38             | 120     | 158   |
| Recycle                            | 38             | 120     | 158   |
| Effective                          | 38             | 120     | 158   |
| Efficient recycling                | 100%           | 100%    | 100%  |

4. Results

4.1 The Survey Results of the New English Model Based On Computer Technology on Information Teaching Methods

![Survey results of computer-based English informatization teaching methods](image)

**Figure 1.** Survey results of computer-based English informatization teaching methods

The data of the research survey shown in Figure 1 shows that big data is used for analysis, and a sample survey is conducted on the computer technology-based English teaching method adopted by the language university. The sampled samples include MOOC teaching and watching English movies, online oral conversation, English listening and speaking teaching, and five teaching methods in micro classroom. From the picture we can clearly see that the popularity of watching English movies is 98.7% and 87.65% respectively. It is understood that the reason why students are interested in these two methods is that the learning method is interesting and the learning of English is relatively easy. The MOOC teaching ranks third. Online oral conversation and English listening and speaking teaching are affected by certain external factors. But according to the survey, I think that no matter which way, on the basis of modern computer technology-based informatization, any learning method will help English teaching and students learn English.
4.2 Computer Technology Promotes the Changes Brought About By Students' Deep Learning of English

Teachers who use computer technology, especially through the Internet, big data analysis and other technologies can supplement teaching plans and enrich teaching content by consulting a large number of materials, which can come from domestic or foreign sources. In addition, computer technology can help teachers draw up test questions and count students' test scores when conducting staged tests or final exams. Nowadays, the commonly used software includes spss, etc., which can save teachers a lot of time, and can quickly and objectively analyze the students' test scores in colleges and universities, so that teachers can provide feedback information when teaching work, so as to help teachers in time. The application of computer technology has deeply promoted students' interest in English learning, greatly improved students' overall performance, and provided a large amount of research and analysis basis for subsequent development of the heart model.

5. Conclusion

Experimental research results show that the advantages of multimedia teaching under computer technology can overcome the adverse effects of traditional English teaching. From an overall and long-term perspective, all schools should strive to expand multimedia classrooms to improve college English teaching to a new level.

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