Ecological Teaching Mode of College English Based on Cloud Computing Platform

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Abstract. Over the years, in order to improve the effectiveness of College English teaching, a large number of educators and front-line College English teachers have worked hard on the road of College English teaching reform, and have made some achievements, but also exposed some problems. The ecological teaching mode based on cloud computing platform combines the teaching mode of cloud computing and ecological teaching, which can help teachers abandon the traditional "cramming" teaching mode, support autonomous learning, meet the needs of students' personality development, realize the balance of educational resources, and inject new vitality into the traditional audio-visual teaching method.

Keywords: Cloud computing · College English · Ecological teaching mode

1 Introduction

In July 2007, the Ministry of Education officially promulgated the requirements for College English teaching, which has become an important guiding document for College English Teaching in China. Since then, colleges and universities in China have carried out the reform of College English Teaching in full swing.

Traditional teaching methods are limited by time and space. On the one hand, the classroom capacity is limited, on the other hand, the utilization of teaching resources is seriously insufficient. These deficiencies are particularly obvious in the teaching practice and experiment. In recent years, cloud computing has developed rapidly because of its service-oriented resource delivery mode and dynamic and easy to expand resource scheduling ability [1]. The combination of cloud computing and online teaching, especially practical teaching, will bring opportunities to solve the problems encountered in the current teaching practice.

2 Design of Online Teaching Practice Platform

2.1 Object Model Design of Online Teaching Practice Platform

The object model of online teaching practice platform provides a flexible and extensible object model for online teaching practice scene, which is the basis of subsequent online

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teaching practice platform design. The design of the object model of online teaching practice should be based on two considerations. First, the model can achieve rapid response and complete efficient interaction between users and platforms. Second, the model can customize different component capabilities to meet the diverse needs of users.

2.2 Recommended Function Design

The learning resource recommendation module will first split the professional training requirements, and cooperate with the user management module to obtain three key information of users, namely, school, major and grade. Through the three keywords to refine the user profile, through the text analysis of professional training requirements to extract the current user keyword list, the keyword list will also be used as the classification navigation of Learning Resource Recommendation page. Users can click different keywords to filter out the recommended content list under the corresponding keywords.

Keyword extraction here is based on text rank algorithm. Text rank algorithm is similar to page rank algorithm. It is a graph based sorting algorithm, which is based on page rank algorithm [2].

Page rank is an algorithm proposed by goge to calculate the importance of web pages by the number of links between web pages. Through a voting mechanism, links between web pages are interpreted as votes between pages to determine the importance of pages. Therefore, the implementation formula of page rank algorithm is as follows:

$$S(V_i) = (1-d) + d \times \sum_{j \in In(V_i)} \frac{1}{\left|Out(V_j)\right|} S(V_j) \tag{1}$$

d is the damping coefficient, which is generally taken as 0.85. Since the page rank value of the web page is not zero, it is necessary to introduce the damping coefficient d.

The text rank algorithm takes words as nodes, establishes the connection by establishing co-occurrence relationship between word nodes, and introduces the concept of weight for edges. When the algorithm is used to extract keywords, we regard words as nodes, so there is no similarity between two words. Generally, the weight between words is set to 1 by default, so the algorithm is basically similar to page rank algorithm. The principle of text rank algorithm can be explained as that the importance of word I is determined by the sum of the weight of word I and the word J before word I and the weight between word J and other words. The implementation formula of text rank algorithm for keyword extraction is as follows:

$$WS(V_i) = (1-d) + d \times \sum_{V_j \in In(V_i)} \frac{\omega_{ji}}{\sum_{V_k \in Out(V_j)} \omega_{jk}} WS \tag{2}$$

The text rank algorithm first splits the given text into whole sentences. After the split sentences are segmented, the stop words are filtered out, and only the words with the specified part of speech, such as nouns and adjectives, are retained to form the candidate word bank of keywords. Then the candidate keyword graph G = (V, E) is constructed, where V is the node set, which is composed of the keyword candidates generated in the previous step. Then, the connection between nodes is constructed by co-occurrence relationship. Only when the corresponding words exist in the window of length K. The

weight of each node is initialized by the formula to measure the importance in page rank, and the iterative calculation is continued until convergence. The weights of the converged nodes are arranged in descending order to get the T words with the highest weight and generate the initial candidate keyword pool. Finally, the words are marked in the original text, and the adjacent words are combined into multi word keywords and added to the keyword sequence.

3 Implementation of Online Teaching Practice Platform

3.1 Overall Implementation Scheme of the Platform

The overall architecture scheme and functional module division of online teaching practice platform have been introduced in detail [3]. Based on the previous introduction, this section will first introduce the overall implementation scheme of online teaching practice platform. The platform code implementation structure is shown in Fig. 1.

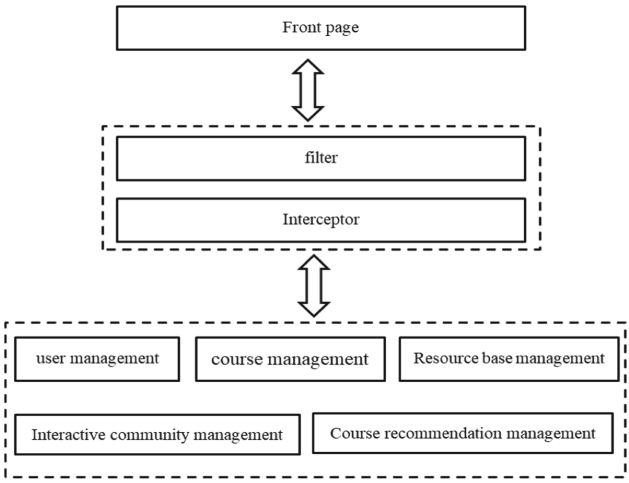

Fig. 1. Code implementation structure of online teaching practice platform

3.2 The Concrete Level Division of Code Realization of Online Teaching Practice Platform with Simulation

1) Web page presentation layer
Through the web page and the user direct interaction, based on JSP, and using strust tag to complete the page data loading and rendering. The data comes from the action layer, and at the same time, the data input by the user will be transmitted to the action layer for subsequent business logic processing.

2) Action layer
The action management layer is mainly responsible for the interaction between the front-end web page and the business logic layer. The action layer calls the relevant methods

to process the requests from the front-end page by calling the interface provided by the business logic layer. The business logic layer will return the processed data to the action layer, and the action layer will return the result data to the front-end page to display the results.

3) Business logic layer
The business logic layer is responsible for the processing of the manager of data objects and the management of methods. Sometimes it can be understood as the encapsulation of Dao layer methods.

4) Dao layer
It is mainly responsible for the specific operation of entity objects, which can also be understood as the direct data interaction with the underlying database, mainly including data search, addition, editing and deletion.

5) Model layer
It is mainly responsible for data persistence, mapping data entity and database data by mapping relationship, and realizing interaction with database through object-oriented idea [4–7]. JPA is used as O/R mapping framework, and Hibernate is used to implement. The following sections will introduce the specific function module implementation.

The user management module provides three main functions: user login, user management and group management, including user login page, user management page (user list, new user, search user) and group management page (group list, group member list and group edit). This section will focus on these three main page implementations in detail (see Fig. 2).

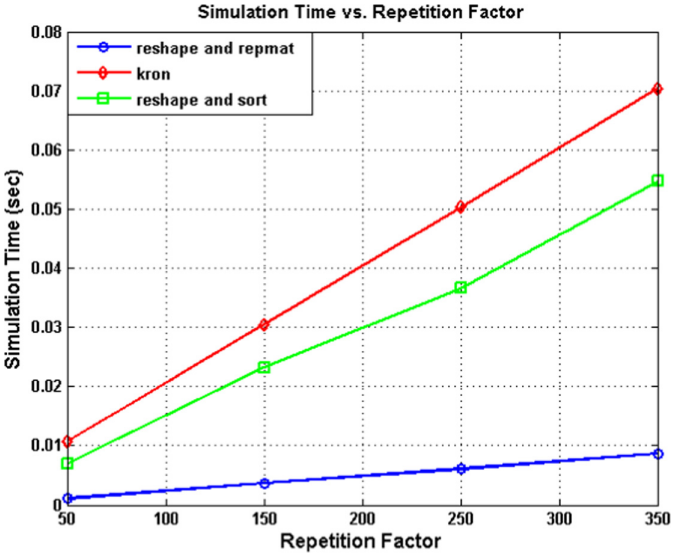

Fig. 2. Repetition factor and model layer for teaching platform

As an important function module of online teaching practice platform, learning resource recommendation module selects the most suitable content for current users from the massive content through the aggregation of learning content, so as to realize personalized learning resource recommendation. The main functions of learning resource recommendation module include three aspects: keyword extraction based on professional training requirements, content aggregation based on keywords and text similarity calculation of keyword content.

Professional training requirements (see Fig. 3) come from the training programs of different majors in Colleges and universities [8, 9]. The training programs are generally set according to the major and grade. Each major is required by different academic objectives, and there are differences in curriculum requirements in different grades of each major. The platform first carries on the text analysis to the university training plan, obtains the preliminary training plan keyword list. In the process of user registration, the platform will require users to fill in three information: school, major and grade, which can be modified at any time. Through these three key information platforms, the relevant content of professional training requirements will be positioned as the source of keyword extraction. Based on the textrank algorithm, the keyword list obtained from the keyword extraction of the training requirements will. The navigation will change dynamically according to the modification of the school, major and grade to meet the learning needs of students at different stages. Users can filter out the recommended content under different keywords by clicking the navigation keywords.

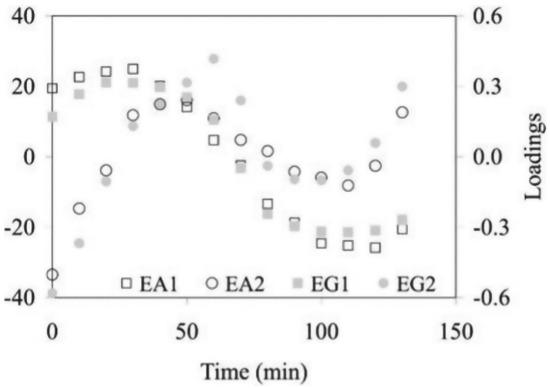

Fig. 3. Simulation for professional training requirements

4 The Teaching Idea Turns from "People Oriented" to "Harmony Oriented"

4.1 Interpretation of Ecological Education

The term "ecology" first appeared in ecology, which refers to the relationship between all animals and plants living in a certain region (or space) and between animals and

plants and their environment. It emphasizes the mutual connection, interaction and functional unity of various factors in the system, and contains the meaning of system, overall connection, harmony, symbiosis and dynamic balance [10]. There are mainly three understandings of Ecological Teaching: (1) teaching and its theory developed under the guidance of ecological theory; (2) teaching about ecological theory, that is, the content of teaching is related to ecological problems, such as environment (environmental protection) course; (3) teaching developed for the purpose of practicing ecological theory, which mainly refers to teaching under the guidance of ecological theory, At present, these specific teaching forms are still in the construction of a text [11]. Therefore, it can be said that there is still a lot of room to explore the ecological teaching mode in university education. In such a social and historical context, how to cultivate the ecological talents of graphic design major, So that they can become all-round development people with modern wisdom, cultural people, people who seek insight through and understand the whole, and people who often get "sesame open discovery"? We refer to and draw lessons from the current ecological teaching theory, combined with the teaching experience of graphic design major, summarize and explore the following paradigms and methods.

4.2 People Oriented

The direct consequence of the proposition of "people-oriented" is the expansion of human selfish desire, the depletion of natural resources and the rampant prejudice of his life. Therefore, we must start from ourselves, give up the superiority of being human and turn our values to harmony [12–14]. As far as graphic design major is concerned, the changes brought about by the development of the current environmental situation will certainly bring strength to the creative work of graphic design. Although people may not believe that designers and creative people can change our climate and environment, they can really arouse people's awareness of environmental protection, which is also the embodiment of their own sense of social responsibility. On the one hand, they need to bring good suggestions to enterprises and find a balance between ecological and social impact. On the other hand, their task is to change the embarrassing situation of ecological concept, and integrate the real ecological concept into design practice and commodity publicity. In view of this, the teaching content of graphic design courses should keep pace with the times, Under the premise of making students learn to recognize, do things, cooperate and survive as the core of the education goal, the ecological design idea is penetrated into each core course. In particular, it should be emphasized that ecological design is also the embodiment of ethical values. Rather, it is the practical expression of the core concept and professional ethics that designers should uphold [15]. Therefore, it is necessary to create a new course – "graphic design ecology", which is based on the original teaching system. In this course, we mainly teach the graphic design related to the ecological environment, teach the concept of ecological design, as well as the effective ways and relevant cases to achieve the big design with "small cost", so as to establish the students' permanent, harmonious and ecological design concept.

5 Developing "Dynamic Three-Dimensional" Self-organizing Teaching with Ecological Teaching Form

5.1 The Importance of Dynamic Team Teaching

The so-called dynamic is to break the static and single teaching clue of the teacher, follow the principle of self-organization of the ecosystem, and show the situation of lively teaching content and interactive teaching links. To a certain extent, the self-organization, automatic and spontaneous organization of students is better than the interference and mandatory command of authoritative organizations [16]. As shown in Fig. 4. Therefore, the development of "self-help proposition" teaching form can maximize the promotion of students' creative initiative and the independence and expansibility of ideas. Since then, the author has been trying to apply this principle in teaching, among which the most prominent effect of "self-help proposition" teaching is the "folk art course" of graphic design major. In this course, the teaching leaders release more space for students. On the premise of grasping the teaching context and outline, students can combine their own interests to choose the subject content, such as "doll, paper-cut, batik calligraphy". After receiving the topic, the students immediately put in great enthusiasm to explore, from the static text and picture collation, to the acquisition of dynamic multimedia materials, are integrated with a unique perspective. In the process of learning and playing, students have already realized the connotation and true meaning of folk art, which is finally reflected in their major assignment of "folk element development and design".

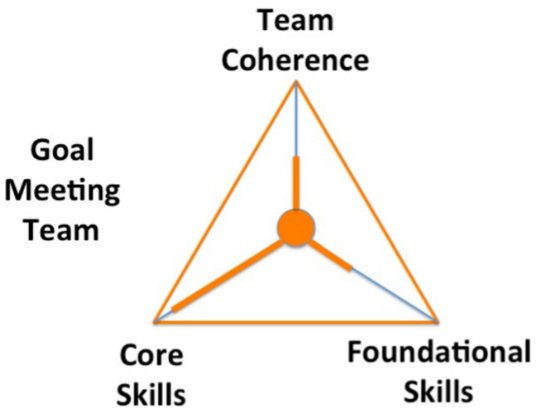

Fig. 4. The importance of dynamic team teaching

5.2 Ecological Teaching Subject "Students, Teachers and Students"

Two way dialogue means equal status and mutual respect, which is the most balanced and ecological attitude and accomplishment between the two objects. Under this premise, the teacher is no longer the instigator of knowledge, not the absolute speaker of discourse, but only the objective aspect of the teaching subject. It is true that the guidance of

teachers is important, but the ecological teaching subject pays more attention to the relationship between teachers and students and the relationship between students and students [17–19]. That is to say, as the constituent factors in the system, they should be equal, interrelated, and interact to form an organic whole. In such a dialogue atmosphere, through the establishment of students' classroom, or 3° classroom, to give students more space and freedom as the main body of teaching, and continue the excellent "classroom in class" into "lecture after class", forming a systematic, integrated and personalized education mechanism of graphic design specialty. In this link, the graphic design major of Dalian University of technology is still in the stage of seeking a breakthrough in teaching practice, but the group teaching and discussion teaching methods in graphic design courses can still provide a realistic basis for this idea.

5.3 Ecological Teaching Platform, Attaching Equal Importance to "Humanity" and "Technology"

Graphic design, as a major closely related to social environment, natural environment and humanistic environment, is no longer a simple solution to design problems in the general sense. We should pay more attention to social humanities and natural disciplines in the adjustment of knowledge structure and curriculum system, and combine specialty setting and modular curriculum to meet social needs. In the past, most of the practical courses we emphasized were limited to professional classrooms, which is certainly a necessary link in teaching and practice. However, the closed classroom teaching is more about producing idealistic works, which not only has poor operability and neglects the problems of material technology and construction technology of design works, but also is empty and unrealistic, I love the self-expression of the design like twigs [20–24]. Out of the classroom, on the one hand, directly participate in the process of market practice and project implementation; on the other hand, deeply understand the social groups, experience the life of others, not only catalyze the sublimation of creative thinking, but also the emotional experience personally. At present, the teaching syllabus of graphic design major in Dalian University of technology has been adapting to this trend and constantly adjusting, with the course of "printing technology and process" as the representative, which focuses on the purpose of multi-dimensional teaching. For example, the teachers of graphic design use social resources to guide students to visit the printing factory, so that they can directly learn and communicate with the printing technicians, and strive to give students the most rare social experience. And the introduction of social service design projects into the classroom, or even the establishment of "Internship cooperation" and "manager lecture" relationship with some fixed design companies and printing plants, are beneficial to expand the teaching platform and produce good teaching results.

6 Conclusion

The ecological English teaching based on cloud computing has the characteristics of interaction, real-time and sharing. It can break the dependence of traditional E-learning on computer technology, break through the limitation of time and space, bring students a new learning experience, stimulate students' learning autonomy, and form a teaching

ecological chain of "teaching, learning, evaluation and reform". College English teachers should always bear in mind that students are the most important ecological subject [25]. College English teaching should not only pay attention to students' language knowledge input, but also regard students as an organic life body. Therefore, more attention should be paid to the development of their emotions and complete life education should be given to students, so that the ecological English teaching can develop in a positive and healthy way.

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