The Design of English Personalized Teaching Platform in Campus Network Based on Big Data

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Abstract. With the emergence of technologies such as cloud computing, the Internet of Things(IOT), and educational big data (BD), personalized teaching (PT) has got more technical support. This article aims to explore how to apply emerging technologies to the teaching process, help teachers to carry out PT, stimulate students’ interest in learning, meet students’ individual needs, and break through traditional teaching methods. Through examining and collating a large number of literatures such as education BD and English PT platform, this paper analyses the status quo and needs, and builds a platform based on BD on this basis. The personalized English teaching platform in the campus network is used in practical teaching, and the effect of this platform in practical teaching is tested by comparative analysis. The results show that the English PT platform has realized PT well, enhanced the pertinence and initiative of students’ learning, and improved students’ comprehensive ability.

Keywords: Big Data, Campus Network, English Personalized Teaching

1. Introduction
Digitization, network, and informationization are having more and more influence on many fields in our society such as education. How to teach and learn better has become an urgent problem facing universities [1-2]. Undoubtedly, the biggest feature of the 21st century is that it presents the characteristics of the network technology era. The network has been more increasingly and widely used in the society, and campus networks have begun to appear in many colleges. However, the development of application of the network in teaching is still relatively Slow [3-4]. The continuous improvement of network technology has provided a new set of ideas for college education, and has become a new trend and method of teaching. As a further extension of classroom teaching environment and method, online teaching provides full process and all-round support for curriculum teaching and learning [5-6].

With the increasing demand for quality education in our country, multimedia teaching methods can no longer meet the needs of students. Therefore, online teaching has become urgently needed by teachers and learners [7-8]. At present, the campus network of many schools in China has been improved in terms of scale and talent support, which provides a guarantee for the implementation of online teaching [9-10]. Combining BD technology to build an online teaching platform that can
accurately discover user needs and make full use of teaching resources has gradually become the core topic of current teaching practitioners and experts.

Based on the collection and sorting of relevant literature and materials, this article analyzes the characteristics of online teaching based on the theoretical results of predecessors and continues to enrich the theoretical system of education BD and PT combined with the background of the times, and at the same time the related issues of PT and education BD are integrated, and PT concepts based on BD are analyzed and English personalized teaching platform is designed to open up new perspectives for the research of PT in English teaching in China. In-depth discussion on the teaching methods of PT from the perspective of educational BD is carried out. With the support of the concept of PT based on BD, this paper attempts to build a personalized English teaching platform based on BD for the purpose of researching PT in the educational BD environment. Teaching experiments of applying PT system based on BD provides theoretical support for personalized teaching in campus networks.

2. Proposed method

2.1. Research methods

(1) Literature research method.

In this paper, through China HowNet, Google Scholar and other databases and network resources, this author has searched and sorted out related domestic and foreign journal articles and website information on education BD and personalized English teaching. Based on the summary of literature research, the teaching experiments are carried out and the results of the experiments are sorted out and analyzed to find theoretical support and realistic basis in this research. In addition, the researcher collected and consulted relevant personalized English teaching programs and the patterns and analyzed cases of BD application in personalized English education on the Internet to ensure access to the latest and most authoritative information as well as real-time and accurate data [11-12].

(2) Experimental method.

The experiment in this research is to apply the constructed PT system based on BD to actual teaching. Through application analysis, we check the shortcomings of each system module, adjust and optimize the system. To further make clear about the teaching effect of a PT system based on BD, this research selects two classes of English majors in a university as participants, and sets up an experimental group and a control group. The two groups of learners have just passed their TEM 4 test and there is no significant difference in their learning level. The designed teaching system was used for application of PT based on BD. After that, the teaching effect of the system was reviewed by comparing students’ learning results and learning behaviors.

(3) Questionnaire survey method.

In order to further test the actual application effect of the personalized English teaching platform based on BD, in the later stage of the research, the students in the experimental group were surveyed through questionnaires. The questionnaire is mainly designed from the aspects of students’ attitudes towards personalized English teaching platforms based on BD, teaching resources, interaction and teaching implementation.

2.2. Analysis of teaching design

(1) Creating an English environment for students.

Language teaching requires a good real-situational language environment, so that learning will have better results. This is also the main feature that distinguishes PT pattern from other teaching disciplines. It can be seen from the survey that most students and teachers feel that learning English in PT pattern based on BD has benefited much from using the online teaching platform. Its biggest advantage is that it can employ advanced technologies such as BD and multimedia to create a complete network environment. Students can watch English original movies, finish their preview and complete their self-teaching by using online learning materials through the network platform. These methods can allow students to have human-machine interaction and distance learning, which not only
improves students’ integrated language abilities such as listening, speaking and reading ability, but also enhances students’ initiative in learning.

(2) Providing a better open platform.

In a completely open network environment, the fixed time and contents of learning is broken, and students can complete their learning according to their own needs and relevant conditions. Adopting this kind of learning method can promote students’ learning effect while cultivating students’ ability to construct knowledge. In addition, in the survey, it is also found that students hope to have a completely autonomous learning environment to break through the traditional teacher-feeding model. The student-centered and teacher-guided teaching and learning model can mobilize students’ enthusiasm and achieve a multiplier effect with half the effort.

2.3. Analysis of platform function requirements

(1) Teaching resources.

This part mainly provides students with access to English teaching resources and self-downloading channels. Teachers can manage their own teaching resources on the platform, such as exercises, audio and video, special exercises and tests, etc., and can upload and download these teaching resources, add, modify and delete operations. The operation of these resources will be restricted by permissions, and they cannot be accessed if the operators are not authorized users.

(2) Teaching and learning.

After students enter the online English teaching platform, there will be links to the corresponding sections in the platform. They can independently browse the course information and related knowledge content to preview their lessons before class or review what they have learned in the classroom, and conduct independent learning in a place where the Internet is unblocked. Of course, students must pass identity verification to become legal users before they can start learning.

(3) Exercises, test management and analysis.

The part of exercises is a relatively characteristic part of this network English teaching platform. According to the learning habits of students, the platform arranges the exercises in the form of tasks on a daily and weekly basis. Each time students should complete the corresponding exercises, there will be relevant special auxiliary learning materials for students to browse and learn before the students start the exercises.

2.4. Personalized learning recommendation algorithm

The text filtering system is based on personalized learning, and the learner’s interests and preferences are equivalent to the reference point in the coordinate system. Because the resources filtered by a good personalized analysis system should be able to meet the interests, preferences, and interests of each user, the selected extraction mechanism and method are extremely important in the filtration system. The algorithm is realized by certain calculation based on natural language processing and data mining to create certain information retrieval system.

3. Experiments

3.1. Platform demand modeling

(1) Determining the boundary and scope of the platform system.

The online English teaching platform implements integrated management of teaching resources, including teaching resource management, practice management, grade management, question answering, student online learning, user management, and authority management. These contents all belong to the scope of responsibility of the network teaching platform, which is the boundary of the platform system.

(2) Identifying the main participants.

Each participant has his own goals when using the platform, and achieves the goals through interaction with the system. A single participant can directly participate in one or more use cases, and
a use case can be shared by one or more participants. Participants in this platform system are teachers, students and administrators.

3.2. Implementation environment
This research is implemented with the support of a PT system based on BD, and collects relevant data in each link of the teaching process with the help of the platform. The personalized English teaching platform in campus network based on BD is supported by a hybrid teaching model and constructivist theory. It uses smart terminals such as Pad as the carrier, takes learners as the main body and learning center of the learning process, and uses the Internet as the platform. It is a system that integrates resource sharing and PT and learning, which permeates every activity of teaching and covers the digital learning environment before and after class. It effectively meets the urgent need and life-long need for learning.

4. Discussion
To test the application effect of the PT system based on BD, this study conducted a comparative analysis of the two test scores of the experimental group and the control group (one for the bottom test and one for the final score). The subjects of the experiment are English majors from a university. Class A is the experimental group and Class B is the control group. After two months of educational practice research, the data collected through a personalized English teaching platform on BD are presented and analyzed in the following.

4.1. Comparative analysis of the bottom test scores between the experimental group and the control group
The bottom test results of the two classes are shown in Table 1:

| Level       | Class A | Class B |
|-------------|---------|---------|
| Excellent   | 36%     | 28%     |
| Good        | 32%     | 42%     |
| Qualified   | 8%      | 10%     |
| Unqualified | 24%     | 20%     |

It can be seen from Table 1 and Figure 1 that in the experimental group, we have 36% of the excellent students, 32% of the good students, 8% of the qualified students, and 24% of the unqualified
students; while in the control group, we have 28% excellent, 42% good, 10% qualified, and 20% unqualified. There was no significant difference between the two classes in the bottom test.

4.2. Comparative analysis of final exam scores between the experimental group and the control group

The final exam results of the two classes are shown in Table 2:

|                | Class A | Class B |
|----------------|---------|---------|
| Excellent      | 52%     | 44%     |
| Good           | 42%     | 40%     |
| Qualified      | 6%      | 10%     |
| Unqualified    | 0%      | 6%      |

Figure 2. Figure of final exam scores between the experimental group and the control group

It can be seen from Table 2 and Figure 2 that in the experimental group, we have 52% of the excellent students, 42% of the good students, 6% of the qualified students, and no students fail; while in the control group, we have 44% of the outstanding students, 40% are good, 10% are qualified, and 6% are unqualified. After using the personalized English teaching platform based on BD, the experimental group has improved much in their test scores, and there are significant differences in the performance between the experimental group and the control group, which shows that the English PT platform based on BD has improved the students’ English performance significantly.

5. Conclusion

With the increasing maturity of Internet technology, online teaching and learning pattern has become the better learning method chosen by more and more life-long learners. However, English teaching resources and materials are vast and complex in networks, and how to accurately discover the suitable needs of users has become an important problem. The emergence of BD technology provides a technical basis for personalized English teaching in network on campus. This paper investigates the multi-level and multi-faceted needs of college English teachers and students majoring in English, and presents the ideas for the network platform design to realize personalized English teaching and learning pattern based on BD. The experiment of applying PT based on BD in university English network teaching platform has improved learners’ performance significantly and the platform is hoped to be applied to practical English teaching in universities to enhance learners’ English learning effect.
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