



Research on the Construction of Dynamic Model of College English Blended Learning Based on Learning Analysis

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Abstract. Learning is the skills through experience. In the past, learning was mainly based on passive methods, such as lectures, textbooks and memory. However, new learning methods have been developed to meet the today's learners. Active way of learning, because it encourages learners to think critically, so that learners can participate in their own learning process (Morton & Smith). Accelerate the educational reform in the promote the mixed teaching and learning model to of college English. In the early stage of this study, based on the exploratory community theory and the scale, the analysis of college English blended learning process found that there are four factors that have a significant impact on the blended learning model: teaching awareness, social role, learning atmosphere, and cognitive awareness. The K-means algorithm was used to cluster the learners. Learners can be categories: early active and late divers, and late achievers. According to the analysis results, based on the teaching scaffolding theory, this study proposes a college process, which includes the reinforcement of social existence scaffolding at the initial stage, the reinforcement of teaching existence scaffolding at the reinforcement of cognitive existence scaffolding at the end.

Keywords: Hybrid learning · Learning analysis · College English · Dynamic mode

1 Introduction

China's reform in the information age, advocate the wide application of modern information technology in higher education, and promote the online teaching reform. In the spring of 2020, during the epidemic period, the Ministry of Education requested that "classes should not be suspended". Online education was widely carried out, and all kinds of education at all levels across the country faced challenges and opportunities. College English curriculum plays an important role in higher education. Its application and interactive properties and large-scale online learning have become difficult problems [1]. The Alliance: 2016 Higher Education Edition proposed that "blended learning", one of the key trends to accelerate the adoption of higher education technology, is becoming

increasingly popular; One of the important advances in educational technology is learning analysis technology. Learning analysis technology is widely used in online education because of its advantages in analyzing massive data. Hybrid teaching and learning combines offline teaching and online learning. From the face-to-face teaching to learners. Applying learning analysis technology and blended learning to college English curriculum reform can provide effective assistance. This study is of blended and the theory of teaching scaffolding, and uses the learning analysis technology to collect, process, analyze, and cluster the data of learners' blended learning behavior, clarify the problems, and construct a dynamic college English blended inquiry learning community by building dynamic teaching scaffolding for teaching intervention in stages [2].

At present, the courses under the information-based teaching environment mainly include long-distance all-online courses, teaching and mixed learning in both online and offline forms. Among them, blended learning has been adopted by more and more courses due to its diverse teaching modes, rich teaching resources and flexible interactive means. Hybrid learning not only has the advantages of rich learning resources of online learning, flexible learning methods and easy personalized learning, but also has the advantages of convenient communication and students in traditional face-to-face classes and easy supervision of learning process. It is a concrete embodiment of the teaching. With the wide application, the interaction behavior in the classroom has also changed [3]. Because the interaction generated in learning is constantly changing, and hybrid learning includes online and offline parts, both online remote interaction and interaction, the interaction behavior in hybrid learning is complex and diverse, We need to analyze the changes of learning interaction at different times from different perspectives.

2 Related Work

2.1 Research on the Concept and Mode of Blended Learning

Blended learning is an educational model that comprehensively utilizes traditional face-to-face teaching and online learning. It combines the advantages of traditional modern technology, aiming to provide a more flexible, personalized, and efficient learning experience. The research on the concept and integrate traditional teaching and online learning the diverse needs of learners [4]. Researchers are committed to developing innovative teaching models and technical tools to optimize learners' learning experiences and outcomes.

In blended learning, learners can interact with teachers and classmates through face-to-face teaching, receive direct feedback and guidance, and participate in practical activities [5]. At the same time, they can also obtain learning resources such as courseware, videos, and online discussions through online learning platforms, and use the opportunity of self-learning to conduct in-depth learning and practice.

The research on blended learning focuses on the following aspects:

1. Teaching design: How to combine traditional classroom teaching and online learning resources for effective teaching design, promoting learners' active participation and deep learning.

2. Technical tools: Develop technical tools suitable for blended learning, including online learning platforms, virtual laboratories, online communication tools, etc., to support learners' learning needs at different times and locations.
3. Teacher Role: Research the role transformation of teachers in blended learning, cultivate their abilities in guiding learning, stimulating learning motivation, and providing effective feedback.
4. Learner evaluation: Explore how to accurately evaluate learners' learning outcomes and ability development in a blended learning environment, in order to provide effective feedback and guidance.

The mode of blended learning is of great significance in the field of education. It provides learners with more flexible and personalized learning methods, promoting collaborative learning and cross-cultural communication. At the same time, it also provides opportunities for teacher professional development and educational resource sharing. However, the effective implementation and evaluation of blended learning models still face some challenges and require further research and exploration.

In China, the concept of "blended learning" (blended learning, or blended teaching) was introduced in 2003, and was first formally put forward by He Kekang at the 7th Global Chinese Computer Education Application Conference. He showed that blended the advantages of traditional classroom learning and modern networked. In teaching practice, it is fully reflect the initiative of students as learning subjects, take students as the center, but not underestimate the leading. The blended learning mode is a deep reflection on the constructivist theory guiding the teaching practice. After that, profound in the ideology of the domestic educational technology community, and many educational researchers have taken this opportunity to carry out reform.

2.2 The Significance of Mixed Teaching of College English

Mixed which is based on traditional classroom teaching and assisted by computer. At the beginning of the development of this model, only the electronic transfer of some teaching contents was completed, and the effective connection between online and offline has not yet been formed. With the upgrading technology and teaching concepts, hybrid teaching has increasingly become a synonym for more teaching resources, strong human-computer interaction and excellent teaching effects [6].

The of mixed teaching in is of great significance, mainly in the following aspects: First, generating multiple interactions. The mixed teaching not only retains the face-to-face communication and interaction full of humanistic emotion, but also realizes real-time and non-real-time two-way interactive communication and interaction, which not only increases the flexibility of practice, but also makes up for the limitations of classroom dimensions; Second, cultivate independent learning. Teachers can allocate a certain proportion of autonomous learning hours and topics, and students can communicate with teachers, classmates, and other professionals outside the school through various platforms; Third, develop mobile teaching. Mobile media such as WeChat, WeChat and short video have broken through the mixed teaching [7]. The interaction between teachers and students has almost developed into a real-time mode, creating a more relaxed teaching environment for, and making the teachers and students closer.

2.3 Analysis of College English Teaching System Based on Association Rule Algorithm

The analysis of college English teaching systems based on association rule algorithms can help educators understand students' performance and needs in the learning process, providing personalized teaching guidance and resource support. The association rule algorithm can analyze students' learning data, discover the association relationships between different knowledge points, and provide targeted teaching suggestions for students based on these association relationships.

Firstly, through association rule algorithms, students' learning behavior data can be analyzed, such as learning time, learning resource usage, and academic performance. By mining these data, we can discover the correlation between knowledge points, such as the relationship between the understanding level of a certain knowledge point and the mastery of other knowledge points.

Secondly, a college rule algorithms can recommend relevant learning resources based on students' learning data. By analyzing students' learning behavior and academic performance, the system can automatically determine which knowledge points they have difficulties in, and then recommend suitable learning materials or practice questions to help students improve.

In addition, in the college English teaching system, association rule based algorithms can be used to provide personalized learning paths and teaching suggestions. The system can analyze the learning paths related to the current learning situation of students based on their learning data, and provide specific teaching suggestions based on individual differences of students, such as which knowledge points to focus on reviewing and what learning strategies to adopt.

The analysis of college English teaching systems based on association rule algorithms can help improve teaching effectiveness. It can discover the correlation between knowledge points based on students' learning data, and provide personalized learning support based on the characteristics of individual students. Through this analysis and recommendation approach, educators can better guide students' learning, help them master English knowledge more effectively, and improve their academic performance. However, in practical applications, it is necessary to fully consider data privacy and the credibility and reliability of the system.

3 Theoretical Basis for Constructing the Dynamic Model of College English Blended Learning

3.1 Hybrid Learning Theory

In a broad sense, blended learning refers to "the combination of online learning and face-to-face teaching" and "the teaching situation based on the combination of mobile classroom discussion". Among them, "30–79% of the teaching content adopts online teaching", which is a mixture of teaching and counseling methods under the "student-centered" learning environment. Since the 1990s, with the continuous information technology, blended learning has experienced a technology application stage with technology as the core; The technological integration stage of the change of the blended teaching

reform with the “interaction” between teachers and students as the core. These two stages are considered as “auxiliary” of traditional classroom face-to-face teaching. Since then, based on constructivism and connectionism, more attention has been paid to students and the use of modern information means, such as the Internet. The integration of mobile terminal and offline teaching will build a personalized learning with high participation to improve and improve offline teaching [8].

The theoretical and practical research of offline learning has become mature. As an important part of blended learning, online learning research is still in its infancy. And blended learning is not only a simple superposition of offline and online learning. The Community of Inquiry (CoI), which emphasizes collaborative constructive learning and critical reflective dialogue, in the field of online learning and blended learning.

3.2 Explore Community Theory

Garrison et al. (2001), based on the practice of online and blended teaching and the theory of social constructivism, built a theoretical model of inquiry community, which is a dynamic and process-oriented teaching theoretical model in the field of online learning and blended learning. Its three core dimensions are. Cognitive existence refers to the degree to which learning participants critical reflection and dialogue in the inquiry learning community (Garrison et al. 2004), including four stages of trigger. Social existence to community through the media, so as to as “real people” (display complete personality) (Garrison et al. 1999). The establishment requires proper cognitive existence and social existence, and on teachers’ teaching existence [9]. Teaching existence refers to the design, process and process, with the purpose of achieving learners’ learning effects with value (Anderson et al. 2001), including three subcategories: teaching (curriculum design) and organization, promoting dialogue and direct guidance. These three kinds of existence influence and promote each other [10]. Only when the three-dimensional degree reaches a high level, the learning effectiveness is the greatest. The framework of the exploration community model is shown in Fig. 1.

4 Construction of Dynamic Model of College English Blended Learning

Based on the Col theory and the scale and the clustering results of the characteristics of mixed learners, this study, based on the teaching scaffolding theory, dynamically constructs the mixed learning in stages, and the specific description is as follows:

- (1) At the beginning of the blended learning process, strengthen the construction of social existence scaffolding

At the blended learning process, learners have just entered the course, learning method, learning evaluation and learning atmosphere. At this time, teachers can strengthen teaching awareness, actively guide learners, and build a social existence framework that encourages learners to actively participate in learning and stimulate learning enthusiasm by improving the level and intensity of teaching design and organization. In the process of second language acquisition, in the process of

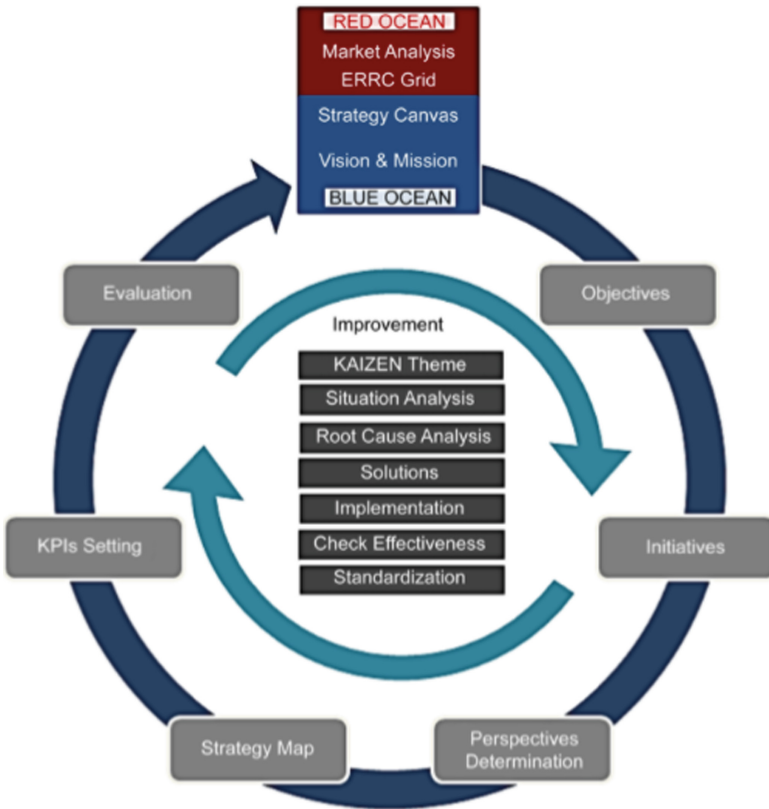


Fig. 1. Explore community model framework

interactive input and output, learners' can be improved. Teachers can create a harmonious enhance learners' sense of group belonging by organizing teacher-student and student-student interaction activities, promoting subject exchanges, supporting dialogue, helping learners to familiarize themselves with the learning and of the course learning mode, etc. Teachers to learners' learning behavior, find divers or non-participating learners, and communicate in time to avoid learners becoming achievers in the middle and later stages of clustering. Therefore, in the important to strengthen the social existence framework, which can improve the level of teaching existence and cognitive existence.

- (2) In the middle of the mixed learning process, strengthen the scaffolding of teaching

In the middle of the mixed learning process, due to the differences in the form of resources, the design and organization of learning activities, at this time, teachers should strengthen the teaching design and organization and promote learners' learning behavior by building structured guidance, timely feedback and other teaching frameworks. At the same time, this stage is the stage integration of knowledge. Teachers should provide them with cognitive existence support to help them form their cognition. At the beginning, learners have formed a good social presence with

the this scaffold. In thesome learners are lazy and diving in the online learning process. Teachers can intervene in the learning behavior of some lazy and diving learners by adding offline feedback, evaluation and other teaching supports, and urge their learning behavior to prevent learners from becoming active divers in the middle and early stages of clustering.

5 Result Analysis

Based on the sample data of the input classifier, we can analyze the main factors that affect students' passing the exam, as shown in Fig. 2. Through a comprehensive analysis of the scores for each question type, total student exam scores, homework completion status, English training frequency, English interest level, and the situation of College English Test Band 4 and 6, the following is a summary and analysis of each factor:

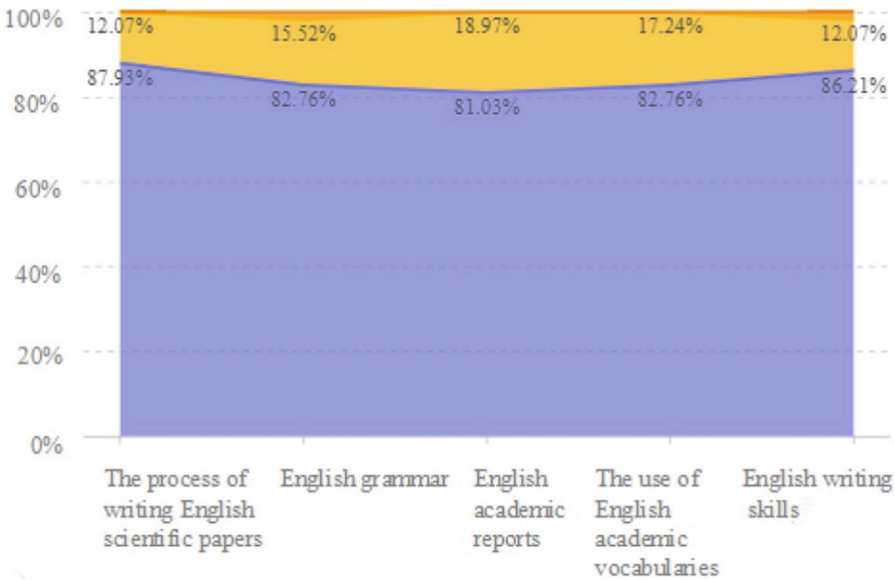


Fig. 2. Sample data analysis

1. Score for each question type: Students' performance on different question types can directly affect their overall exam results. For example, scores for different types of questions such as reading, listening, speaking, and writing can reflect students' mastery of various aspects of English. These scores can help judge students' strengths and weaknesses in different areas of ability, and guide them to strengthen corresponding exercises and improve their abilities in the following learning.
2. Total score of student exams: The overall score achieved by students in exams is an important indicator for evaluating their academic performance. The total score of the exam directly reflects students' comprehensive application ability to various question types. A higher total score in the exam means that students have good mastery in multiple areas of ability.

3. Completion of homework: Completing homework is one of the important ways for students to consolidate and apply their English knowledge. The completion of homework reflects students' enthusiasm and self-discipline for learning outside the classroom. Completing homework diligently can help improve students' comprehension, language proficiency, and problem-solving abilities.
4. Number of English training sessions: The number of English training sessions can reflect students' level of engagement in English learning. Students who actively participate in English training usually improve their listening, speaking, reading, and writing abilities, as well as enhance their memory and understanding of English knowledge. Therefore, frequent English training can help students perform better in exams.
5. Degree of interest in English: The degree of interest in English among students is closely related to their investment in learning English and their grades. For students who enjoy learning English, they are more likely to actively learn and explore English knowledge, and actively participate in English learning activities. Therefore, cultivating students' interest in English is an important part of improving their learning motivation and grades.
6. Situation of College English Test Bands 4 and 6: College English Test Bands 4 and 6 are important evaluation criteria for students' English proficiency. Exam scores can reflect students' practical application level in various fields such as reading, listening, speaking, and writing. By analyzing the situation of the CET-4 and CET-6 exams, students' strengths and weaknesses in different areas of ability can be determined, and targeted learning guidance and corresponding practice resources can be provided for them.

In summary, the scores of each question type, the total score of the student's exam, the completion of homework, the number of English training sessions, the level of interest in English, and the situation of the College English Test Band 4 and 6 are all the main factors that affect students' passing the exam. Through a comprehensive analysis of these factors, educators can provide personalized learning guidance and resource support for students to help them improve their English learning performance and abilities. This analysis method based on association rule algorithms can better understand students' learning situation and provide targeted educational services according to the characteristics of individual students.

6 Conclusion

The research on the model for in college English based on learning analysis aims to construct a dynamic model to understand and predict students' learning progress and outcomes in an English blended learning environment by analyzing their learning data and behavior. This research is of great significance for optimizing instructional design, providing personalized learning support, and improving learning outcomes. This study utilizes learning analysis techniques to collect and analyze a large amount of data generated by students during blended learning processes, such as learning behavior logs, learning resource usage, and academic performance. By combining these data with learning theories and models, a dynamic model can be constructed to describe students'

learning progress and changes. Dynamic models based on learning analysis can be used to predict students' learning outcomes and performance in future learning. By analyzing students' learning data and behavioral patterns, predictive models can be established to help educators understand their learning potential and design appropriate teaching plans in advance. In summary, the construction of a dynamic model for blended learning of college English based on learning analysis is of great significance for optimizing teaching practices and improving students' learning outcomes. By analyzing students' learning data and behavior, constructing dynamic models can help educators understand students' learning paths, knowledge acquisition, learning motivation and emotions, as well as predict students' learning outcomes. This provides educators with targeted teaching guidance and a foundation for personalized learning support.

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